

Project 5: North American Blue Carbon: Next Steps in Science for Policy		Operating Year(s): 2015–2016
Planned Budget for Two Years: C\$620,000		
Year 1: C\$305,000		
Year 2: C\$315,000		
Strategic Priority/Subtheme		
<ul style="list-style-type: none"> • Climate Change Mitigation and Adaptation / Blue Carbon (Coastal and Marine Ecosystems) • Sustainable Communities and Ecosystems / Priority Species and Ecosystems; Landscapes and Seascapes; and Sustainable Communities 		
<p>This project falls within the Climate Change Mitigation and Adaptation strategic priority, and specifically the Blue Carbon (Marine and Coastal Ecosystems) strategic objective within this priority. It supports work to map coastal habitats, in particular seagrass meadows, and develop approaches to conserve and restore blue carbon ecosystems. This project builds on and complements previous work on forest and coastal/marine carbon cycle research, to obtain an improved understanding of the current and future role of these ecosystem-based systems in North America’s carbon cycle. This project also helps to enhance information-sharing and communication by continuing to strengthen the North American Blue Carbon Community of Practice, which was established with the first CEC blue carbon project (Phase 1, 2013–2014), and it builds on the outcomes of the JPAC’s November 2014 meeting on “North America’s Coasts in a Changing Climate.”</p> <p>Throughout North America, coastal/marine ecosystems play an important role in national greenhouse gas budgets, and there are large regional differences in the distribution of carbon sources and sinks. Understanding the current and projected future roles of these systems in North America, including the impacts of management and climate change, is required in order to inform sustainable management of carbon sinks in coastal/marine ecosystems.</p> <p>The results of the project will contribute to improved management of these systems, in order to protect and manage sinks and reduce sources and to achieve climate change mitigation objectives. As blue carbon habitats also have a wide range of other ecosystem benefits, including fish and wildlife habitat, nurseries for shellfish, fish, and corals, protection from flood and storm-caused tidal surges, and water quality improvement, the project also addresses the Priority Species and Ecosystems, Landscapes and Seascapes and Sustainable Communities subthemes by supporting the improved management of transboundary landscapes and seascapes. Shared information about the science, management, and policy opportunities (including federal policies and market-based opportunities) will improve management and resiliency of coastal areas in all three countries.</p> <p>Lastly, the blue carbon and forest carbon projects of the CEC have similar objectives and have already started to coordinate activities pertaining to mangrove forests. Some of the carbon accumulating in aquatic systems originates from upstream land ecosystems, and management, land use and disturbance of those ecosystems can affect carbon (C) accumulation rates in blue carbon systems. Both projects will create opportunities in the next two years for further cooperation and synergies among the two related land and marine sectors.</p>		

How will this project address the cross-cutting themes?

- *Learning from and assisting vulnerable groups and indigenous communities.*

Conservation of blue carbon habitats supports sustainable livelihoods for local and indigenous communities not only in local fisheries, since those ecosystems are important nurseries and refuge habitats for shellfish, fish, and corals, but also by supporting enhanced recreation/tourism in blue carbon ecosystems. There are additional co-benefits of blue carbon ecosystem conservation that promote sustainable coastal communities, including wave and erosion protection (less damage during storms), as well as water quality improvements. These co-benefits can improve the livelihoods of vulnerable groups and indigenous communities throughout North America.

- *Enhancing information-sharing, transparency, capacity building, and communication.*

This project helps to enhance information-sharing and communication by continuing to strengthen the North American Blue Carbon Community of Practice, which was established during the first CEC blue carbon project (Phase I). In order to strengthen and grow the community of practice, two workshops will be part of this project. In addition, the project will build on the products from the first CEC blue carbon project, which include: a comprehensive set of maps of blue carbon ecosystems; data generated from on-the-ground research; expanded guidelines for coastal managers about best practices to protect, manage and restore blue carbon habitats that included a wide geographic scope and up-to-date science; and the continued development of market opportunities for blue carbon ecosystems. The project will also collaborate with national experts, including those in the CEC-funded projects on land-cover change and forest carbon, and with academic and nongovernmental networks and the North American Carbon Program (NACP).

Project Summary (including a clear statement of project goal)

This project has a five-year goal aligned with the CEC's 2015–2020 Strategic Plan and other international initiatives related to greenhouse gas accounting and to climate change adaptation and mitigation. The project goal is that by 2020, the three countries will have advanced protocols to develop and apply conservation and restoration approaches for promoting carbon sequestration in coastal and marine blue carbon ecosystems. To achieve this, the project will seek to: identify and fill scientific and mapping gaps for blue carbon habitats, with a particular focus on seagrass meadows, which are the least well-mapped and least well-understood of the three blue carbon ecosystems. It will also identify policy opportunities for applying blue carbon science and tools to better conserve and restore coastal and marine habitats; advance methodologies to protect or restore blue carbon habitats, including serving as a model for countries seeking to implement carbon credits for blue carbon habitat conservation and restoration; and further develop the North American Blue Carbon Community of Practice. For 2015–2016, the project will build on activities conducted in Phase I, and will advance the science and policy needed to protect these habitats and promote more-sustainable and more-resilient coasts.

Short-term Outcomes (at halfway point)

1. Application of a harmonized protocol, with site-specific methods and an agreed-upon terminology to map seagrass meadows.
2. Comprehensive analysis and improved understanding of the notion of coastal system permanency as it relates to the development of a conservation methodology to conserve threatened coastal wetlands through market-based mechanisms and other opportunities.
3. Facilitated trinational communication and information exchange among the scientific and policy communities, through a workshop.

Long-term Outcomes (by the end of the project)

1. Shared geospatial data and maps of seagrass meadows in all three countries (5 new sites total), in specific priority regions; this will fill gaps identified in Phase I.
2. Shared carbon data in the newly mapped seagrass meadows. Carbon data will include carbon stored in soils under seagrasses, depth of soil, and sequestration rates of carbon by the seagrass plants.
3. Enhanced understanding through shared lessons and analyses, for all three countries, of the federal, international and market-based opportunities for blue carbon integration into existing or potential policies across North America.
4. Facilitated trinational communication and information exchange among the scientific and policy communities, through a stronger North American Community of Practice for Blue Carbon.

Longer-term, Environmental Outcomes (post-project)

1. Enhanced coastal conservation and restoration, due to changes in management of coastal ecosystems.
2. Increased opportunities for leveraging national and international climate mitigation, or adaptation, into environmental policy or legislation that increases coastal ecosystem conservation.
3. More support, through market-driven funding, for coastal conservation and restoration projects.
4. Enhanced awareness in all three countries of the multiple benefits (including carbon sequestration and storage) of coastal ecosystems.

Performance Measures (quantified SMART measures)			
Outcomes	Measures	Target	Indicator
Shared geospatial data and maps of seagrass meadows in all three countries, in specific priority regions. Shared carbon data on seagrass carbon storage (in soils) and sequestration (in plants).	Number of new maps (5 new areas) of key seagrass blue carbon ecosystems in all three countries, in locations that have been identified as gaps, which are made publicly available. New soil carbon data for each of the 5 newly mapped seagrass areas.	100% of available geospatial data from reliable sources, in the three countries, combined and released. All new carbon data collected released in a format that is easily understood. Potentially work to publish these data in the peer-reviewed literature.	Increase in the number of blue carbon maps, especially seagrass maps, available through the CEC. Increase the seagrass carbon storage and sequestration data available for North America by adding data from 5 new seagrass sites.
Shared conservation methodology to conserve threatened wetlands, through market-based mechanisms and other opportunities	Completion of the conservation methodology to enable the protection of threatened wetlands, and thus secure avoided-emissions credits for habitats that are threatened by coastal development	Completed conservation methodology to conserve threatened wetlands through market-based mechanisms	Availability of conservation methodology in the public domain
Enhanced understanding, through shared lessons and analyses, in all three countries, of the federal, international and market-based opportunities for blue carbon integration into existing or potential policies across North America	Publication of shared lessons and analyses, in all three countries, of the federal, international and market-based opportunities for blue carbon integration	Final report 100% complete and disseminated	Report made available to the public
Facilitated trilateral communication and information exchange among the scientific and policy communities, through a stronger North American Community of Practice for Blue Carbon	Number of participants at workshops and participating in CEC work, by region/country, area of expertise, and organization/agency collaboration of scientists, in the three countries	Involvement of 75% of the subject-matter experts identified by the three countries, in reviewing and consulting on trilateral blue carbon work	Increased numbers of experts participating in CEC work, since Phase 1 of the project, with an increased focus on seagrass-mapping experts and seagrass-science experts

Tasks necessary to reach the environmental outcomes

- 1) Support mapping and scientific efforts in seagrass meadows, in order to fill key gaps in our understanding of the extent and condition of seagrass ecosystems, in all three countries
- 2) Support policy analyses to determine the most important policy drivers/opportunities for blue carbon ecosystem conservation and restoration in each country (including market, federal and international policy opportunities) and continue the development of market opportunities for blue carbon ecosystems
- 3) Develop a strong community of practice and outreach and prepare communication materials for targeted audiences, including decision-makers, managers and coastal communities

Task #1) Blue Carbon Science and Mapping

Subtask	Project outputs	How does the subtask/output move the project towards the environmental outcome	Timing	Budget (C\$) (activities)
<p>1.1 Improve mapping and geospatial data for seagrass ecosystems, specifically targeting areas of high priority for acquiring new data in each country. This will include holding a small workshop with all the seagrass experts in each country to identify the target areas and develop appropriate methods for mapping in each country (since the different types of seagrass habitat are likely to require somewhat different methods in Mexico versus in Canada and the US). Each mapping effort can also be funded to collect some basic carbon sequestration and storage data in the newly mapped</p>	<p>Develop new maps of key seagrass meadows, in all three countries, in locations that have been identified as priorities and gaps, building on the work done in Phase I of this project. Work would include 2 sites in Mexico, 1 in Canada and 1 in the US, as well as one additional site to be identified by the seagrass experts and based on priority gaps identified in the mapping effort completed in Phase I of the blue carbon project.</p> <p>Carbon measurements will accompany the new mapping efforts. Each of the four sites (2 in Mexico, 1 in Canada, and 1 in the US) and potentially the additional</p>	<p>This will improve our understanding of the extent and condition of seagrass ecosystems across all three countries, in order to better manage and conserve these critical ecosystems that tend to be understudied and undervalued.</p>	<p>In the first year, hold the workshop and then support the creation of new maps, which may involve fieldwork or remote sensing or other techniques to map areas that are gaps identified in Phase I of this project. By the end of year 2, translate and publish new maps combined with other CEC blue carbon maps from Phase I.</p>	<p>Year 1: \$165,000 Year 2: \$185,000</p>

<p>seagrass areas, in order to increase our understanding of carbon dynamics in seagrass ecosystems since, of the three blue carbon ecosystem types, seagrasses have shown some of the highest variability in sequestration and storage rates. (Additional high-priority data gaps [e.g., salt marshes in Canada] will also be considered.)</p>	<p>5th site, if funds allow, will be given additional funds (up to ~\$20,000 per site) for measuring carbon sequestration and storage in the newly mapped seagrass areas. Carbon measurements should include measurements of soil carbon content and bulk density in cores taken to at least 1 meter depth, total depth of soils, and rates of carbon sequestration (plant uptake).</p>			
<p>Task #2) Blue Carbon Policy</p>				
<p>Subtask</p>	<p>Project outputs</p>	<p>How does the subtask/output move the project towards the environmental outcome</p>	<p>Timing</p>	<p>Budget (C\$) (activities)</p>
<p>2.1 Complete analyses in all three countries, but with a particular focus on Canada and Mexico, of the federal and international policy opportunities for blue carbon integration into existing or potential policies (may include regional, local case studies), in order to share lessons across North America. This would include an analysis of how market mechanisms (such as the voluntary carbon market) can be leveraged in each</p>	<p>A summary of existing Mexico and Canada national policies where blue carbon could be incorporated into the implementation of policies. This will be comparable to a similar effort already completed in the US which has paved the way for including carbon services of ecosystems in US priorities and efforts. Also, a review of market and international opportunities and how each of the three countries could engage in those policies.</p>	<p>These analyses are key to helping each country determine what policy tools it already has that can be leveraged to conserve or restore blue carbon ecosystems, including federal, market-based, or international opportunities. Because of differences in the way that market or international policies may apply, it is important to examine and identify</p>	<p>These studies would be conducted in year 1 so that results could be shared at the workshop in year 2 with the whole community of practice.</p>	<p>Year 1: \$30,000 Year 2: \$20,000</p>

<p>country. It would also include an analysis of how each country may or may not be able to participate in international policies, such as the UNFCCC mechanisms, and whether the protocols under development for the Verified Carbon Standard (VCS) could be used to support participation in programs such as the Clean Development Mechanism (CDM) or Nationally Appropriate Mitigation Actions (NAMAs).</p>		<p>the key opportunities for each country individually, to ensure each country understands the best policy tools available to it for conserving and restoring coastal ecosystems.</p>		
<p>2.2 Support the development of a methodology for carbon storage from wetland conservation, initially scoped in Phase 1 of this project. Once verified, this will be an accepted reference for securing carbon credits under a voluntary carbon system for wetland protection.</p>	<p>Conservation methodology for carbon storage from wetlands</p>	<p>The conservation methodology will enable the conservation of threatened wetlands and thus secure avoided-emissions credits for habitats that are threatened by development of some kind. This is a key step toward protecting more intact, healthy blue carbon ecosystems before they get degraded or destroyed.</p>	<p>Year 1 Year 2</p>	<p>Year 1: \$35,000 Year 2: \$35,000</p>

Task #3) Blue Carbon Community of Practice				
Subtask	Project outputs	How does the subtask/output move the project towards the environmental outcome	Timing	Budget (C\$) (activities)
3.1 Collaborate and share lessons learned among blue carbon experts in North America, through blue carbon workshops and outputs; include new partners, such as blue carbon experts in academic and nonprofit institutions, and indigenous experts.	Two face-to-face workshops to share results of science projects and policy analyses to inform decision-making, in all three countries Build collaborations and trinational projects	Sharing expertise and results will make sure that progress made in each country can be used to help expand blue carbon efforts in all three countries	One workshop in each year	Year 1: \$75,000 Year 2: \$75,000

Explain how this project meets the selection criteria adopted by Council in the Strategic Plan (see below)

The goal of all projects funded by the CEC will be to support the efforts of the Parties to conserve, protect and/or enhance the North American environment. The following criteria will guide the Secretariat, Working Groups, Committees, and other appropriate officials of the Parties in considering cooperative activities for Council approval under operational plans. These selection criteria do not apply for activities to be funded through the NAPECA grant program.

- **How does the project contribute to achieving Council’s strategic objectives as described within the current Strategic Plan, or as related to other priorities subsequently confirmed by Council?**

This project falls within the Climate Change Mitigation and Adaptation strategic priority, and specifically the Blue Carbon (Marine and Coastal Ecosystems) strategic objective within this priority. It supports work to map coastal habitats, in particular seagrass meadows, and to develop approaches to conserve and restore blue carbon ecosystems. This project builds on and complements previous work on forest and coastal/marine carbon cycle research, to obtain an improved understanding of the current and future roles of these ecosystem-based systems in North America’s carbon cycle. This project also helps to enhance information-sharing and communication by continuing to strengthen the North American Blue Carbon Community of Practice, which was established with the first CEC blue carbon project (Phase 1, 2013–2014) and build on the outcomes of JPAC’s November 2014 meeting on “North America’s Coasts in a Changing Climate.”

Globally, terrestrial and marine ecosystems over the past two decades have annually removed from the atmosphere over 50% of the carbon emissions from human sources, such as those from the burning of fossil fuels and from deforestation. Throughout North America,

coastal/marine ecosystems play an important role in national greenhouse gas budgets, with large regional differences in the distribution of sources and sinks. Understanding the current and projected future roles of these systems in North America, including the impacts of management and climate change, is required in order to inform sustainable management of carbon sinks in coastal/marine ecosystems.

- **Are the proposed objectives North American in scope? In other words, how are the proposed results relevant to protecting the environment in North America? (For example, what would Council members announce to the press at the successful completion of this project?)**

This project will provide important information at the North American scale to help understand and quantify the carbon cycle and provide policy-relevant analyses about possible strategies for mitigating climate change through coastal/marine ecosystem management, including the protection of coastal habitats as carbon sinks and the reduction of emissions from coastal degradation. The project will enhance the collaboration among North American scientists, coastal managers, and policy-makers involved in modeling terrestrial and aquatic systems in accordance with IPCC guidelines; coordinate land cover mapping using satellites; and support mapping and research (particularly in seagrass meadows) to fill key knowledge gaps on the extent and condition of blue carbon ecosystems, particularly seagrasses, and to also help us improve our understanding of soil carbon and carbon density in seagrass ecosystems.

- **What specific, clear and tangible results will be achieved and how will progress toward each result be measured over time? Identify performance measures to be used to indicate success at reaching all outcomes and/or performance.**

The project will produce the following outputs: new maps and data on the location and characteristics of seagrass blue carbon habitats in North America as well as new data on the carbon storage and sequestration of these newly mapped seagrass areas in all three countries; development (in writing) of the conservation methodology for a voluntary carbon market; and expanded guidelines, including a detailed analysis of policy opportunities in each country where blue carbon benefits can be leveraged for coastal habitat conservation, which will contribute to supporting coastal managers with best practices to protect, manage and restore blue carbon habitats. Progress will be measured through: 1) in the short term, the strengthening of a North American experts group linking blue carbon and land cover experts, the development of a cooperative work plan for this group, and a workshop held with partners to develop the planned outputs; 2) in the medium term, improved North American seagrass maps and carbon data in key areas identified as gaps in the Phase I mapping effort; 3) in the long term, the dissemination of geographically-specific guidelines, based on recent policy analysis, for coastal managers about best opportunities and practices to protect, manage and restore blue carbon habitats. Ultimately, the project will demonstrate success through the uptake of the improved knowledge base and original tools, including market-based and non-market-based mechanisms, by the blue carbon community and related experts, to inform blue carbon science and blue carbon habitat management, in the context of climate change mitigation and adaptation.

Performance measures include the number and quality of improved maps available to the North American Blue Carbon Community of Practice, as well as analyses of the opportunities for Canada, Mexico, and the US to incorporate carbon services into existing federal, international, and market policies, in order to leverage carbon services for habitat conservation and/or climate mitigation and adaptation.

- **Explain why the CEC is the most effective vehicle for the Parties to use in undertaking the project, considering these points:**
 - **the value added of doing it under the CEC cooperative program,**
 - **any other public, private or social organizations that work on such activities, and**
 - **opportunities to cooperate and/or leverage resources with such organizations.**

This project builds on and complements previous and ongoing CEC work to address some of the key science needs for blue carbon, and apply this scientific understanding to improving management of these critical habitats for carbon sequestration. In addition, a common online mapping platform that contains up-to-date, integrated terrestrial and coastal carbon information for North America will be an important tool for researchers.

Because research on blue carbon is a fairly new topic, relatively little is known about the sequestration, storage, and emissions potential in North American coastal ecosystems. The White House Priority Agenda for Enhancing the Climate Resilience of America's Natural Resources highlights the role, in the North American community, of practice facilitated by the CEC as a means to improve understanding of carbon storage and cycling in ecosystems in order to assess, restore, and protect coastal habitats. By supporting research to fill knowledge gaps and the sharing of information among scientists in the three countries, the project will sustain efforts spearheaded during the CEC's 2013–2014 project North America's Blue Carbon: Assessing the Role of Coastal Habitats in the Continent's Carbon Budget to collaborate on this topic at the continental scale. A preliminary scoping study carried out under the CEC's 2011–2012 project Ecosystem Carbon Sources and Storage: Information to Quantify and Manage for Greenhouse Gas Emissions Reductions identified the need for harmonized data and maps, a community of continental experts, and more research into how to quantify blue carbon. While the CEC's 2013–2014 blue carbon project made strides in meeting those needs, this project will capitalize on the momentum that is gaining in all three countries to further the potential to fully integrate blue carbon into the North America carbon budget. The project will reduce duplication of efforts; harmonize approaches, to improve consistency in analyses and reporting; leverage previous work on forest carbon and land use change; and collaborate in the development and application of analytical tools and models that can be applied in all three countries. Work produced by this project will provide the North American blue carbon community enough information and data to identify research opportunities and partnerships for advancing the estimations of blue carbon contributions in North America.

- **Does the project propose a clear timeline for implementation of the activities, including a target end-date for CEC involvement? Where applicable, describe how the work will continue after CEC involvement ends.**

This project has been designed as the first phase of a five-year initiative, with work hopefully continuing through to the end of the current strategic plan. It is hoped that the CEC support of and partnership with strategic research initiatives within the three countries will increase the capacity of the partner institutions to continue work to fill key research gaps and to advance management decisions that lead to increased conservation and restoration of coastal blue carbon habitats. The publication of the research in peer-reviewed journals will also facilitate integration of blue carbon into relevant policies.

- **Where applicable, identify with reasonable specificity:**
 - **Linkages with other relevant CEC projects, past or present, in order to create synergies, capitalize on experience, or avoid duplication**
 - **The target audience, as well as its receptivity and capacity to use the information that may be produced as a result of the project**
 - **The beneficiaries of capacity building activities that the project may include**
 - **The relevant stakeholders, with particular attention to communities, academia, NGOs and industry, and their involvement and contribution to a successful outcome**

Building on the CEC's previous blue carbon, forest carbon, and land cover mapping work, this project will complement the 2015–2016 project, Integrated Modeling and Assessment of Climate Change Mitigation Options in the North American Forest Sector, and leverage previous and current investments to benefit the blue carbon science and management efforts in North America. In addition, the CEC has identified blue carbon as a key element in designing climate-resilient marine protected area networks, and the information generated and shared within the Blue Carbon Community of Practice can be used to inform the 2015–2016 project, Marine Protected Areas: Strengthening Management Effectiveness and Supporting Coastal Community Resilience.

The project will also work closely with ongoing blue carbon work by North American and international organizations and NGOs, to avoid duplication of effort and to evaluate, for their applicability in the North American context, and adapt emerging research and tools. By working with these partners, this project will ensure that the results of this work will have value for policy-makers and managers of blue carbon habitats.

These initiatives and organizations include the following:

- The US Interagency Blue Carbon work group, made up of federal agencies interested in national and international blue carbon efforts. This group has been meeting for three years, primarily as a mechanism for information-sharing, as well as for developing collaborations between agencies. Agencies regularly attending these meetings include the US Environmental Protection Agency (EPA), US Geological Survey (USGS), US Fish and Wildlife Service (USFWS), the US State Department, The US Agency for International Development (USAID), and National Oceanic and Atmospheric Administration (NOAA).
- Fisheries and Oceans Canada (DFO), which in 2011 created a competitive funding envelope to develop a more comprehensive, science-based understanding of the impacts of climate change. This fund is intended to further develop the science and technology knowledge base in three designated priority areas: Canada's North, Marine and Freshwater Infrastructure, and Marine and Freshwater Ecosystem Impacts.
- Parks Canada is working with Simon Fraser University to determine real fluxes in carbon and carbon storage in lakes in several western Canadian national parks.
- Mexico's National Commission for Protected Natural Areas (Conanp), in coordination with the National Forestry Commission (Conafor), the Mexican Fund for Nature Conservation (FMCN), the Center for Research and Advanced Studies in Merida (Cinvestav-Mérida), the US Forest Service (USFS) and the US (USAID), has undertaken a project that will allow the assessment of mangrove in relation to climate change mitigation. The project involves developing the methodology to determine the occurrence and density of carbon in mangrove of Mexican Protected Areas, in order to: provide a baseline of the mangrove condition; elaborate a set of

recommendations for the conservation, restoration and assisted mitigation of local mangrove populations; and have a validated protocol for sampling, classification and localization of mangrove populations and for the estimation of carbon, according to the mangrove type. This project was piloted in the Sian Ka'an Biosphere Reserve in 2011, was replicated in La Encrucijada Biosphere Reserve in 2012, and was conducted in Marismas Nacionales Nayarit Biosphere Reserve in 2013. The results of Sian Ka'an show that the carbon stocks depend on the height of mangroves and that phosphorous levels in the soil limit carbon sequestration. The coastal wetlands of Sian Ka'an, covering more than 172,000 ha, may store up to 58.0 million metric tons of carbon.

- The United States Forest Service (USFS) and Mexico (Conafor, Conabio and Conanp) efforts to map, monitor, and estimate carbon stocks and model carbon dynamics in mangrove forests. These institutions are considering establishing permanent carbon monitoring sites in Protected Areas in Mexico. The high-resolution, global mangrove forest spatial dataset developed by Chandra Giri from the United States Geological Survey (USGS) and others could be used as the model for future mapping efforts involving salt marshes and seagrasses.
- Restore America's Estuaries (RAE), a US nonprofit organization whose mission is to preserve the nation's network of estuaries by protecting and restoring the lands and waters essential to the richness and diversity of coastal life. They are focused on restoring coastal and estuarine habitats, as a key strategy in adapting to climate change, as well as in mitigating its impacts. RAE is leading an initiative to bring tidal wetlands restoration, protection, creation and avoided loss into the carbon markets. They have an ongoing study in the Pacific Northwest investigating the potential of carbon markets to support watershed restoration and a proposal submitted for a project in the Gulf of Mexico.
- Conservation International (CI) is an international nonprofit organization that works to ensure a healthy and productive planet, through science, policy and field work. CI has a number of ongoing blue carbon efforts, including the international Blue Carbon Science Work Group, which meets about twice a year and recently released a manual of blue carbon methodologies internationally and a data archive for global blue carbon data.