



## **Presentation to the Maryland Commission on Climate Change Adaptation and Resiliency Working Group Scientific and Technical Working Group**

### **Collaborative Activities on Blue Carbon in Chesapeake Bay**

Coastal ecosystems are some of the most productive on Earth and provide essential ecosystem services, such as coastal protection from storms and nursery grounds for fish. They also provide another integral service - sequestering and storing carbon from the atmosphere. Much like land-based 'sinks,' this 'blue' carbon is a vital and often overlooked piece of the solution to global climate change. Blue Carbon is defined as the carbon accumulating in vegetated, tidally influenced ecosystems such as tidal forests, tidal marshes and intertidal to subtidal seagrass meadows (International Blue Carbon Working Group, 2015). Blue Carbon Ecosystems (BCEs) are defined as coastal wetland ecosystems with manageable and atmospherically significant carbon stocks and fluxes (Windham-Myers et al., 2019).

#### **Blue Carbon Potential in Maryland**

A state like Maryland, with aggressive Greenhouse Gas Reduction Act (GGRA) goals and a propensity to look creatively at solutions, is ideally positioned to invest in understanding and utilizing blue carbon in its carbon solutions toolkit. We know that the vast majority (83%) of the global carbon cycle is circulated through the ocean. We also know that coastal habitats account for approximately half of the total carbon sequestered in ocean sediments. Maryland has over 3,500 miles of shoreline and an abundance of two of the three most productive blue carbon habitats (245,840 acres of salt marshes and 59,000 acres of seagrasses), providing ample opportunity for blue carbon research and project implementation.

Similar to practices on land, BCEs sequester and store carbon when protected or restored. DNR estimates that over 2,600 acres of coastal wetland have been restored since 2006. This resulted in approximately 11,000 MT of CO<sub>2</sub>e being reduced. When degraded or destroyed, these ecosystems turn from sinks to sources as they emit the carbon they have stored for centuries. Experts estimate that as much as 1.02 billion tons of carbon dioxide are being released annually from degraded ecosystems, which is equivalent to 19% of emissions from tropical deforestation globally.

#### **Benefits to Maryland's GGRA Goals**

Maryland has exhibited exceptional leadership in land-based practices that help sequester carbon through improved management of existing forests and farms to capture and

contain more carbon in trees and soils. This leadership is being extended to our shorelines in order to utilize the benefits of carbon sequestration through natural systems.

The Maryland Commission on Climate Change (MCCC) has identified blue carbon as a priority. As a result of discussions with key state agency leaders, several blue carbon priorities have been identified by Maryland's Department of the Environment and Department of Natural Resources including:

- Review current algorithm for calculating blue carbon sequestration in GHG Inventories and propose enhancements if necessary;
- Better understand the quantity and spatial distribution of methane emissions associated with wetlands in the Chesapeake Bay and its watersheds
- Create opportunities to connect agency staff with researchers working on blue carbon in Chesapeake Bay;
- Identify standards for data collection, quality control and archiving if the MDE algorithms are to be upgraded;
- Enhance understanding and appreciation for the intersection of blue carbon, Chesapeake Bay restoration, and maintaining a healthy ocean ecosystem;
- Explore innovations in funding/ financing/ valuation systems, including methods to assess blue carbon co-benefits as part of project selection processes;
- Identify and seek solutions to ongoing challenges or barriers;
- Highlight connections between blue carbon, living shorelines and ocean health including spotlighting successes.

### **A Partnership Approach**

Blue carbon is a complex topic with scientific, ecological, sociological, and financial implications. A great deal of work has been done internationally and in certain areas domestically. Taking advantage of this expertise is essential to move Maryland's blue carbon priorities forward expeditiously. Among the organizations prioritizing blue carbon as a natural systems solution are [COMPASS](#) and [Restore America's Estuaries \(RAE\)](#). COMPASS is focused on providing a baseline scientific understanding of blue carbon in a manner that is accessible and relevant to policy makers. RAE has a longstanding investment in understanding the calculations involved in quantifying the benefits of blue carbon as well as a continued commitment to coastal and estuarine restoration. Utilizing the Chesapeake Bay, our nation's largest estuary, as a focal point allows the state of Maryland, RAE and COMPASS to advance their various goals related to blue carbon.

### **Events**

#### **Webinar: Accounting for Maryland's Blue Carbon**

This webinar and panel discussion will explore the feasibility of developing an algorithm used by Maryland in the carbon inventory. Questions include: Is enough known about Maryland's coastal wetlands to justify a refinement? Is there adequate data available to justify a more detailed approach? If the inhomogeneity is too complex, what monitoring is required to quantify carbon sequestration in restoration projects?

Science overview:

Brian Needelman (UMCP) and Pat Megonigal/ or James Holmquist (SERC)

Mapping Blue Carbon Regionally: Dr. Lydia Olander (Duke University)

Panel Discussion (*Overview speakers plus [potential] panelists*)

Moderator: Cindy Palinkas (UMCES)

Panelists: Stephanie Simpson (TNC)  
Doug Myers (CBF)  
Elliott Campbell (DNR)

**Outcome:** A summary report with recommendations for a pragmatic approach for algorithms to account for blue carbon in Maryland.

## **Webinar: Environmental Finance Mechanisms for Enhancing Maryland's Blue Carbon**

A discussion highlighting the opportunity for private investment and innovative finance mechanisms to accelerate coastal resilience and carbon sequestration.

Potential speakers: Tim Male (Environmental Policy Innovation Center), Nancy Kopp (Treasurer), Nick Dilks (Ecosystem Investment Partners), Eric Swanson (Paulson Institute), TNC representative, Lisa Wainger (UMCES), Dan Nees (Center for Global Sustainability, UMCP), Gregorio Sandi (MDE).

## **Workshop: Living Shorelines in Practice - Enhancing Coastal Resilience**

*DNR, Restore Americas Estuaries and MDE*

This could be run as part of the 'State-of-the-Coast' Conference (29th September- 1st October) as an integral part of the event or run sequentially. This workshop will link Blue Carbon to the recovery of Chesapeake Bay and GHG reduction targets (including land conservation targets, nutrient credits, carbon credits, slowing saltwater intrusion, equitable access to easement opportunities). The session will also address managing methane and other potential adverse consequences of wetland restoration or creation.

The program will focus on Maryland and explore some of the successes and future opportunities through agency, private sector, NGO presentations. This can be interspersed with examples of programs and projects from across the US (building on RAE recent and upcoming activities).

*Possible addition: The European ECOSHAPE and 'Engineering with Nature' could be included. There are two recorded webinars (one hosted by the EU and Minister of Environment for the Netherlands) focusing on policy and conducting projects 'at-scale'. The second webinar deals more with the science and manuals developed by the science and engineering community. A representative could be invited to*

*participate in workshop panels - without lengthy presentations as the focus is on the US and Maryland.*

**Outcome (for Maryland):**

A summary of exemplar projects, project contacts and lessons learned that can be used to promote blue carbon across Maryland.

**Planning Committee:** *(suggested)*

Kristen Fiedler (DMMP)  
Allison Breitenother (MCCC ARWG and DNR)  
Elliott Campbell (DNR)  
Suzanne Dorsey (MDE)  
Jason Dubow (MDP)  
Matt Fleming (DNR)  
Josh Foster (MDOT)  
Pat Megonigal or James Holmquist (SERC)  
Doug Myers (CBF)  
Cindy Palinkas (UMCES)  
Brian Needelman (UMCP)

**Coordinators:**

Hillary Stevens (RAE)  
Allison Breitenother (MCCC ARWG)  
MDSG Science Fellow/Peter Goodwin/Dave Nemazie (MCCC STWG)