Lessons Learned from the Blue Carbon Inventory Project: International Collaboration to Enhance the Management and Carbon Accounting of Coastal Ecosystems - Zachary Cannizzo

Accurate and transparent tracking and reporting of coastal blue carbon in national inventories, alongside robust management and restoration of coastal ecosystems, is essential to many countries' plans and international commitments around climate change adaptation and mitigation. However, many countries lack sufficient data, capacity, and expertise to achieve these objectives. The Blue Carbon Inventory (BCI) Project works with partner countries to advance the development of climate change mitigation, coastal wetland management, and resilience strategies that reflect the societal and climate value of coastal wetlands. This U. S.-based multi-agency and multi-partner project works with partner governments and coastal managers to provide technical guidance, and co-develop local capacity for long-term management and carbon accounting of coastal wetlands. These efforts ensure the capacity and expertise exist within local institutions to effectively manage coastal wetlands for the many ecosystem services they provide and to quantify those benefits for inclusion in national greenhouse gas inventories, carbon markets, and other pay-for-service programs. By enhancing the inclusion of coastal wetlands into national greenhouse inventories, the BCI project advances the long-term sustainable management and restoration of these wetlands.
BCI has been successfully implemented in Costa Rica and Ghana with current efforts focused on expansion to Palau, the Philippines, Indonesia, and other interested countries. Here, we will share the approach developed to address the key goals of enhanced coastal wetland management and carbon storage accounting. Sharing these successes, lessons learned, and early outcomes can guide future science, restoration, management, and international collaboration around coastal wetlands and their climate benefits.

The Coastal Carbon Network: Bridging gaps in blue carbon science through data stewardship and community engagement - Rose Cheney

In the face of a changing climate, tidal wetlands are extremely important carbon sinks. Archiving soil carbon data from these habitats is crucial to inventorying efforts and future carbon cycle modeling. In 2021, The Coastal Carbon Network (CCN) conducted an analysis of the Coastal Carbon Library, examining the quantity, quality, and representativeness of soil carbon data from tidal wetland habitats within the contiguous United States. In 2023, the Coastal Carbon Network collaborated with 5 university research groups to facilitate the publication of over 15 soil carbon datasets from states where available data was underrepresenting their coastal wetland habitats. CCN team members worked with student researchers and collaborators to curate soil carbon data in compliance with CCN data library structure. These datasets represent states that lacked spatial coverage and data quantity on the 2021 report card, including Maine, North Carolina, Georgia, South Carolina and Virginia. Through this project, the CCN was able to facilitate the publication of legacy soil carbon datasets and train student researchers in data curation practices, while increasing both the

quality and quantity of soil carbon data represented in the Library. The Coastal Carbon Library version 1.2.0 now includes 5,485 soil cores from the United States, 163 of these published through this effort, 91 including dated stratigraphy. This project is an example of how dedicated funding to data management has improved soil carbon data representation in US states, which could be replicated on a larger scale to serve future carbon modeling efforts.

Blue Carbon Conservation Across Borders - Angela Kemsley

WILDCOAST is working to protect, conserve, and restore blue carbon ecosystems in California and Mexico. During this presentation WILDCOAST staff will walk you through our international blue carbon strategy of conservation and restoration at four of North America's most important blue carbon sites: San Diego, California (United States); Laguna San Ignacio, Baja California Sur (Mexico); La Paz, Baja California Sur (Mexico), and; Oaxaca (Mexico).

We will give examples of the seven pillars of our blue carbon strategy including: 1) Legal protection; 2) Restoration; 3) Co-management; 4) Research; 5) Policy; 6) Communications, and; 7) Networking, and give suggestions on how to apply this strategy to other sites and projects.

Blue carbon is carbon removed from the atmosphere through photosynthesizing organisms in coastal and marine ecosystems, which is then buried in the soil or sediment and store for millennia if left undisturbed. These ecosystems, including mangroves, salt marshes, and sea grasses, store up to five times more carbon than their terrestrial counterparts, making them a great natural solution to climate change.

WILDCOAST is an international team that conserves coastal and marine ecosystems and addresses climate change through natural solutions. To achieve our mission, we establish and manage protected areas, protect and restore blue carbon ecosystems, and partner with local communities, governments, and the private sector. WILDCOAST is currently helping to conserve more than 38.8 million acres of some of the most ecologically important coastline, ocean habitat, wetlands, islands, and wildlife-rich wilderness in the world.

Comparison of Tropical Seagrass Blue Carbon and Restoration in Four Tropical Ocean Basins - Anitra Thorhaug

Tropical seagrass has declined globally by roughly 6 % y-1 from 1910-2010 (Waycott, 2006),and presently accelerates. Seagrass ecosystems comprise one of the highest global Carbon-sequestering ecosystems, distributed throughout climatic zones. We present seagrass blue-carbon per nation in each of four tropical/subtropical regions: the Caribbean, Southeast Asia including PNG, Indian Ocean, plus Gulf of Mexico (GOM). In Caribbean, GOM, Southeast Asia we will also compare seagrass Blue Carbon with that of mangroves. Seagrass restoration significantly enhances blue carbon and can function as a partial solution to climate warming,

although present large-scale seagrass-restoration projects are not well-conceptualized or coordinated. Mangroves regularly are measured with higher organic-carbon-m-2, however, mangroves' extents are generally less than seagrass per oceanic basin. We find important benefits from seagrass-restoration beyond sequestration include prevention of Carbon back-flux, enhancement both artisanal-fisheries and seagrass animal biodiversity. Additionally quality-of-life is improved in tropical developing-nation coastal villages restoring seagrass and mangroves. We have also reviewed tropical (Thorhaug et al , 2020), and global (van Katwijk, Thorhaug et al. 2016) seagrass restoration in the GOM, Caribbean, and SE Asia, finding that The GOM and Caribbean has more successful projects and large-scale projects than southeast Asia. Seagrass blue-carbon comparison of natural and restored tropical seagrass demonstrated more sequestration in restored seagrass in the GOM (Thorhaug et al.2017) .When planning which of the two ecosystems to restore it is important to be aware that seagrass initially sequesters large amounts of carbon within weeks of being restored , whereas with mangroves it is years.

Co-authors: John Barry Gallagher, University of Tasmania Arctic Laboratories; Arthur Schwarz, Biology Dept. SW Adventist University; J.Lopez-Portillo, INECOL; , GP Berlyn, Yale School of Environment; HM Poulos, Wesleyan University, College of Environment & Earth & Environmental Sciences