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The EBM Toolbox: Tools and resources for measuring blue carbon

Editor's note: The goal of The EBM Toolbox is to promote awareness of tools for facilitating EBM and MSP processes. It is brought to you by the EBM Tools Network, a voluntary alliance of tool users, developers, and training providers.

The EBM Tools Network's discussion listserv recently tackled a question about what tools are currently available for quantifying blue carbon. Blue carbon is an area that is developing rapidly, and Network members had many great suggestions for tools and resources for getting started with blue carbon projects.

First of all, what is blue carbon and what are blue carbon projects?

Blue carbon is the carbon sequestered and stored in coastal and marine ecosystems. In particular, tidal marshes, mangroves, and seagrasses extract carbon dioxide (CO₂) from the atmosphere and store carbon within plant biomass. This carbon is eventually transferred to the soil carbon pool, and wetlands that build over time are continually sequestering carbon as they bury old soil with new. When these ecosystems are degraded, the stored carbon can be released into the atmosphere very rapidly.

- [*The Science and Management of Coastal Blue Carbon*](#) gives an excellent overview of how wetlands store greenhouse gases (it's not just CO₂!), the climate mitigation benefits of conservation and restoration actions, and how to key considerations for coastal managers thinking about blue carbon projects.
- [*Building Blue Carbon Projects – an Introductory Guide*](#) provides a snapshot of common blue carbon project elements based on existing projects and introduces key issues for consideration. [See a webinar about the guide](#)

What tools are available for quantifying blue carbon?

We learned about two software or online tools that are currently available for estimating blue carbon.

- The [*Integrated Valuation of Ecosystem Services and Tradeoffs \(InVEST\) Coastal Blue Carbon Model*](#) provides spatially-explicit information on disturbances to vegetation caused by climate change (e.g., sea level rise) and human activities (e.g., draining of a wetland or shoreline hardening). The Blue Carbon model can also be used to value avoided emissions and identify where on the land or seascape there are net gains or losses in carbon over time. [See a webinar about this tool in action in Galveston Bay, Texas \(US\)](#).
- The [*Blue Carbon Mapping Tool*](#) provides a rapid overview of the approximate total carbon stock value for a selected area of interest. This information is further broken down to provide information on the contribution of each ecosystem to the total carbon stock of the selected area. The tool is currently configured for the United Arab Emirates. [See a webinar about this tool in action](#)

In addition to the tools above, a number of guides and project reports also provide critical information for quantifying blue carbon.

- [*Coastal Blue Carbon: methods for assessing carbon stocks and emissions factors in mangroves, tidal salt marshes, and seagrass meadows*](#) provides scientists and coastal managers with methods for measuring carbon stocks and greenhouse gas emissions in coastal ecosystems.
- [*A User-friendly Model for Predicting Greenhouse Gas Fluxes and Carbon Storage in Tidal Wetlands*](#) lays out a preliminary model for estimating greenhouse gasses in tidal wetlands using data from Waquoit Bay, Massachusetts, US. The model is currently being expanded for broader application in New England and the US East Coast.
- [*Coastal Blue Carbon Opportunity Assessment for the Snohomish Estuary: The Climate Benefits of Estuary Restoration*](#) quantifies the climate mitigation benefits of restoring tidal wetland habitat using examples from the Snohomish Estuary in Puget Sound, Washington State, US. The project approach developed for this assessment is transferable to other estuaries.
- [*Protocols for the measurement, monitoring and reporting of structure, biomass and carbon stocks in mangrove forests*](#) describes the approaches necessary for the measurement, monitoring, and reporting of structure, biomass, and carbon stocks in mangrove forests.

Last but definitely not least!

2015 was a big year for blue carbon with the approval of the [*VM0033 Methodology for Tidal Wetland and Seagrass Restoration*](#) by Verified Carbon Standard (VCS). This is the first globally applicable greenhouse gas accounting methodology for coastal wetland restoration and allows salt marsh, seagrass, mangrove, and other tidal wetland restoration projects to earn carbon credits. [A manual for project developers considering and planning blue carbon projects using the VCS VM0033 Methodology](#) is available.

Interested in learning even more? Check out the following resources:

- [Restore America's Estuaries Coastal Blue Carbon page](#)
- [The Blue Carbon Initiative's website](#)
- [The Blue Carbon Community's Blue Carbon Portal](#)

Many thanks to the EBM Tools Network for providing this information! If you are interested in joining the Network to share information about tools and resources for coastal and marine conservation and management, [sign up here](#).