

CariCAS Seagrass Carbon Mapping

Advancing Science and Collaboration to Protect Seagrasses in the Caribbean and Around the World

At a glance

The Caribbean is home to half the world's seagrass meadows by surface area. But Caribbean seagrasses also face some of the greatest threats in the world from rapidly expanding tourism, shipping and development. And as Caribbean nations take conservation action, they are serving as models for others around the world to protect seagrasses and the multiple benefits they bring to people, nature and the climate.

Scientific Knowledge

CariCAS has created in-depth guidance and training materials to help government agencies, conservation organizations and others gather the scientific data needed to develop effective seagrass conservation plans for the benefit of people, nature and the climate.



Practical Field and Laboratory Guide

Step-by-step instructions and graphics on selecting the right seagrass meadows to sample, documenting field data, collecting and preserving seagrasses specimens and analyzing samples in the lab.

Available in both [English](#) and [Spanish](#).



Video Workshops

Footage from the field on the vital role seagrasses play in the fight against climate change. Expert presentations on the steps of collecting and analyzing seagrass carbon.

Available in [English](#) and [Spanish](#).

OVERVIEW

Seagrasses are the unsung heroes in our fight against climate change. Seagrasses filter pollutants from the water, stabilize coastlines, serve as nurseries for fish and provide other essential services to billions of people around the world. While they cover just a tiny fraction of the ocean floor, they account for 10 percent of the ocean's ability to sequester carbon. In fact, various studies have shown seagrasses can remove climate-changing carbon dioxide from the atmosphere up to 35 times faster than tropical rainforests. Seagrasses not only remove carbon from the air, they also counter the harmful impacts of carbon in ocean waters, reducing acidification that threatens corals, shellfish and other marine species. According to a 2021 study, seagrass systems can decrease acidification by 30 percent.

But the world is losing seagrasses faster than forests. Almost 20 percent of monitored seagrass meadows across the globe have disappeared since the late 1800s. The destruction of seagrasses from poor water quality, development, disease, invasive species and other challenges not only threatens our climate, but also puts coastal communities at risk.

GAP AND OPPORTUNITY

While science has demonstrated the vital importance of seagrasses to people and nature, nations around the world lack data specific to the health, density, distribution and carbon storage of their local seagrass habitats. Without such information, they cannot develop and implement the conservation strategies needed to keep these systems healthy and productive for future generations.

Caribbean Carbon Accounting in Seagrass (CariCAS) is working to change that. Collaborating with nearly two dozen Caribbean nations and territories, CariCAS is expanding research capacity across the region and fostering a Caribbean-wide network of scientists, communities, government agencies and non-profits working together with the common goal of assessing the carbon storage potential of Caribbean seagrasses and, ultimately, helping protect seagrass habitats.

Building a Regional Network to Protect a Global Seagrass Hotspot

CLIMATE IMPACT

CariCAS was launched in 2024 by [The Nature Conservancy](#) and [Florida International University](#), to assess the potential for Caribbean seagrass to store carbon, ensuring Caribbean nations have the tools and support needed to protect this global seagrass blue carbon hotspot. CariCAS developed in-depth [guidance and scientific protocols](#) for collecting samples of seagrasses and their soils and measuring their carbon storage, nutrient content and other characteristics. CariCAS also led partner trainings so Caribbean researchers would collect consistent and highly accurate data across the region. Together, the partners collected data on seagrasses in nearly 100 locations stretching from Panama to Bermuda and from Tobago to Guatemala.

The data – which was compiled into a first-of-its kind study of Caribbean seagrasses – revealed the region is a hotspot not just for the extent of seagrass habitats located there, but also for the amount of carbon stored in those habitats. Additionally, the research found that seagrasses capture greater amounts of carbon the closer they are to mangrove systems and their ability to sequester carbon is influenced by their height and soil type, providing valuable insights for conservation planning.

Overall, the CariCAS project doubled the carbon stock data for seagrass habitats across the Caribbean, data that will help nations factor seagrass carbon into their greenhouse gas inventories as well as their nationally determined commitments submitted under the climate Paris Agreement.

Equipped with the protocols and data, Caribbean nations now are going even further to conduct additional research into the health and benefits of their local seagrasses. In Trinidad and Tobago, for example, researchers are using the CariCAS data to compare the carbon storage of declining seagrasses across the islands' coastal areas. In Jamaica, CariCAS partners expanded on the initial sampling effort to inventory carbon stocks in their territorial waters. The Nature Conservancy and Florida International University are also collaborating with partners in Mexico, Panama and Colombia to create a comprehensive map of seagrass habitat stretching along the Caribbean coasts of North, Central and South America.

CariCAS's science is not just being used by Caribbean nations. It also is drawing attention from around the world.

HOW TO ENGAGE

If you are interested in learning how to protect seagrass habitats in your area, you can access CariCAS training videos and guidebooks by visiting the [Seagrass Ecosystems Research Lab](#).

To learn more about CariCAS and protecting seagrasses around the world, contact Lindsey Smart (lindsey.smart@tnc.org) or Johannes Krause (jkrause@fiu.edu).

Global Action for Seagrass Conservation

Governments and communities in Asia, Europe and Africa are starting to use the scientific protocols and guidance created by CariCAS to study their own seagrass habitats. Businesses are also taking notice, looking at ways they can use the protocols and data to conserve seagrass habitat, offset their emissions and earn credits that can be sold in global carbon markets

IMPACT STORIES

**1**

Bermuda

A study led by Bermuda researchers working with CariCAS revealed ground-breaking insights that could shape how seagrass carbon is measured around the world. Bermuda's seagrasses have been rapidly declining over the last two decades, prompting questions about local carbon stocks. The study found that carbon stored in Bermuda's seagrass meadows had declined, but there was no correlation between the amount of seagrass lost in specific areas and the reduction of carbon stored in the sediment of those same areas. The researchers concluded that carbon sequestered by seagrass meadows is spread across the sediment of Bermuda's entire coastal system and that the loss of seagrasses in one area impacts the carbon stored in sediment of other areas.

2

Jamaica

After participating in CariCAS's Caribbean-wide seagrass study, the University of the West Indies in Jamaica partnered with The Nature Conservancy to refine existing maps of seagrass extent in Jamaica and used the CariCAS protocols to more than double the number of seagrass sediment cores available for Jamaica. The University is now working with the Conservancy, The Pew Charitable Trusts and the Jamaican government to incorporate seagrass and mangrove carbon storage into Jamaica's nationally determined contributions under the Paris Agreement on climate change, helping prioritize protection and restoration of these critical habitats.

3

Cambodia

CariCAS's video trainings and scientific protocols caught the attention of the international conservation charity Flora & Fauna International (FFI). The group asked to use CariCAS's materials in Cambodia where it is working to protect the country's seagrass meadows that face serious threats from development, nutrient pollution and destructive fishing practices. FFI translated CariCAS's materials and protocols into Khmer and organized workshops for local communities, conservationists and government officials.

