Call to Collaborators

The Smithsonian's GCRW welcomes collaborators who seek to advance our understanding of how coastal wetlands will respond to a changing planet. The facilities include an on-site lab, extensive boardwalks and electrical service throughout the marsh. ***To inquire about research partnerships, please email Smithsonian senior scientist Pat Megonigal at megonigalp@si.edu.***

Funding

Research at the Smithsonian's Global Change Research Wetland is supported by the U.S. Geological Survey, the U.S. Department of Energy, the National Oceanic and Atmospheric Administration, the National Science Foundation and the Smithsonian Environmental Research Center.

Experimental chambers are used to raise the amount of CO_2 in the atmosphere of a tidal wetland plant community.

Location

Place matters. The Global Change Research Wetland is part of a richly-documented research setting that includes long-term data sets on forests, streams, estuaries and landscapes. Visiting researchers have access to the Smithsonian Environmental Research Center's scientific expertise, labs, docks, boats, towers and data. SERC is located on the western shore of the Chesapeake Bay, 26 miles east of Washington, D.C. As a leading center on coastal watersheds, ecosystem services and environmental education, we welcome researchers and interested members of the public.

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Smithsonian Environmental Research Center

THE SMITHSONIAN'S

Global Change Research Wetland

"I was drawn to this research site because it's among the world's most thoroughly studied wetland ecosystems. It offers a wealth of data and the infrastructure I need to conduct a range of experiments on global change."

– Pat Megonigal, Smithsonian Biogeochemist

A Premier Wetland for Global Change Research

Carbon dioxide, temperature, nitrogen pollution and sea level are all on the rise. Coastal wetlands are on the front lines of these global changes. Understanding how they respond requires a commitment to long-term research, composed of rich data sets and careful observations. This forms the heart of the Smithsonian's Global Change Research Wetland.

The research site has been home to tidal wetland ecology studies for more than four decades. Over the years, it has become a premier location for field experiments exploring global change. Scientists use the 60 hectares of marsh to examine the role of wetlands in the present Chesapeake Bay, and predict what the future holds for coastal wetland ecosystems as they cope with change.

Wetlands provide some of nature's most valuable ecosystem services. They improve water quality, serve as nurseries and habitat for wildlife, mitigate the damage of hurricanes, and sequester carbon. Tidal wetlands support healthy estuaries and robust coastal communities.

Investigations

One of the most enduring experiments hosted at the Smithsonian's Global Change Research Wetland had its genesis in the question of whether plants would be a carbon sink as CO_2 levels rise. That study began in 1987 and continues to this day. The site is also home to three other major studies, each building on the body of data that has been amassed over the decades. The main research questions include:

- Do plant responses to elevated atmospheric CO_2 change over time?
- Does water pollution influence ecosystem responses to elevated CO_2?
- Will global change help wetlands survive sea-level rise?
- Does elevated CO_2 promote invasion by non-native plants?

Top view of a "marsh organ", used to manipulate sea level.

Discoveries

There have been dozens of papers published with data from these studies. Some of the findings include:

- High levels of carbon dioxide consistently improved the growth of certain plant species in over a quarter century of treatment.
- Future high levels of carbon dioxide will help many tidal wetlands rise in elevation by creating new soil faster. This implies an improved ability to cope with the accelerated pace of sea-level rise.

A new facility for studying the interactions of elevated CO_2, sea level rise and nitrogen pollution.

- Nitrogen pollution favors different plant species than elevated carbon dioxide. When the two are combined, the positive influence of elevated carbon dioxide on plant growth is reduced.

A researcher adjusts an instrument that measures soil elevation.