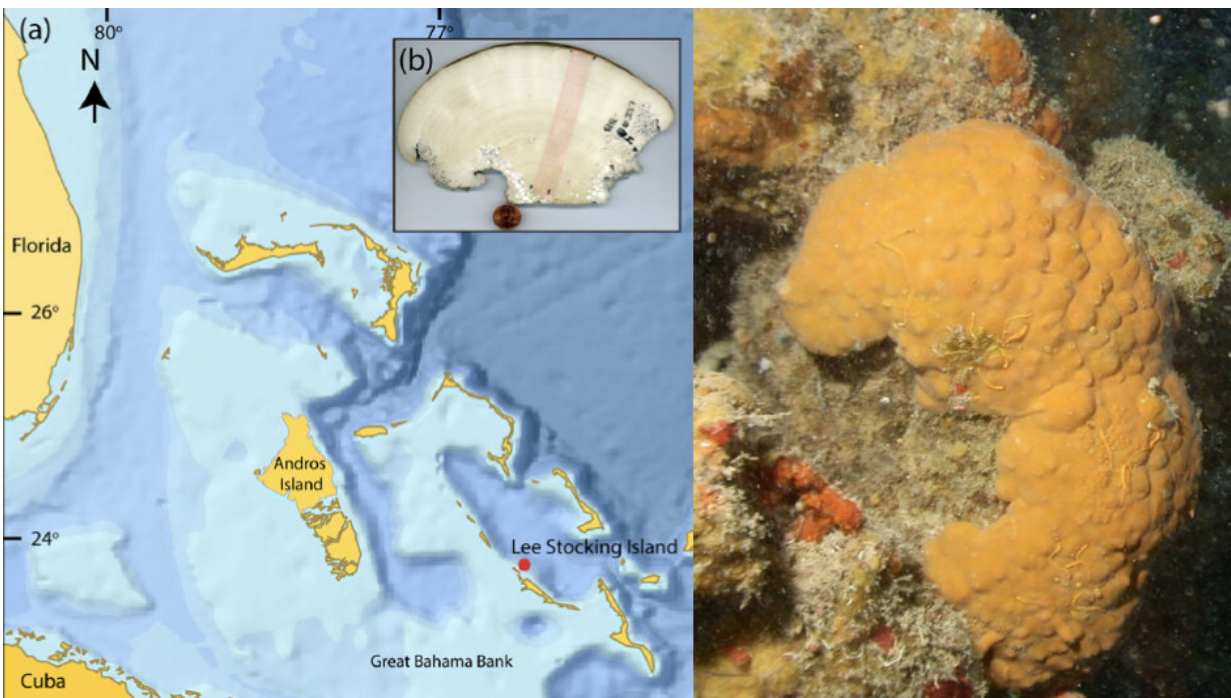


600-year-old marine sponge holds centuries-old climate records

January 14 2021, by Diana Udel



Credit: University of Miami

Scientists used a 600-year-old marine sponge to reconstruct a record of ocean temperature in the North Atlantic revealing past volcanic activity as well as the current global warming trend from the release of carbon dioxide and other heat trapping gasses into Earth's atmosphere and absorbed by the oceans.

The University of Miami (UM) Rosenstiel School of Marine and Atmospheric Science-led research team used geochemical proxies to reconstruct a 600 year-long record of Atlantic Ocean temperatures from the skeleton of a sclerosponge (*Ceratoporella nicholsoni*).

The basketball-sized sclerosponge was collected via submersible more than 430 feet (133 meters) below the surface in Exuma Sound, The Bahamas by the study's senior author Peter Swart, a professor of marine geosciences at the UM Rosenstiel School. Sclerosponges are slow growing [marine organisms](#) with a soft outer body and hard limestone skeleton that record upper ocean temperature and [climate conditions](#). Although individuals could be as old as 1000-2000 years their distribution is poorly documented because of the difficulty and expense of collection.

"Atlantic Ocean temperatures fluctuate on various timescales, including multi-decadal, and this influences the weather and climate in North America, Europe, and Africa," said Swart. "This 600-year-long temperature reconstruction can help us understand how the climate has changed in the past so that scientists can better project how conditions may change in the future. "

To understand [environmental changes](#) beyond what modern instruments can provide, scientists turn to long-lived marine organisms like Sclerosponges that record ambient environmental conditions in their skeletons.

"Predicting and projecting future temperatures in the Atlantic can help us better prepare for hurricanes, as well as fluctuations in summertime precipitation rates in Florida," said the study's lead author Amanda J. Waite, a UM Rosenstiel School alumna.

"This record highlights both the important role [volcanic eruptions](#) had on

North Atlantic temperature both before and after industrialization and the increasing contribution of manmade factors, such as greenhouse gases and air pollution, to the temperature record over the twentieth century," said Lisa Murphy, a co-author of the study and a lecturer at the Rosenstiel School's department of atmospheric sciences.

The samples were dated using uranium-thorium by scientists at GEOMAR Helmholtz-Zentrum für Ozeanforschung Kiel in Germany.

More information: Amanda J. Waite et al, Observational and Model Evidence for an Important Role for Volcanic Forcing Driving Atlantic Multidecadal Variability Over the Last 600 Years, *Geophysical Research Letters* (2020). [DOI: 10.1029/2020GL089428](https://doi.org/10.1029/2020GL089428)

Provided by University of Miami

Citation: 600-year-old marine sponge holds centuries-old climate records (2021, January 14) retrieved 4 June 2024 from

<https://phys.org/news/2021-01-year-old-marine-sponge-centuries-old-climate.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.