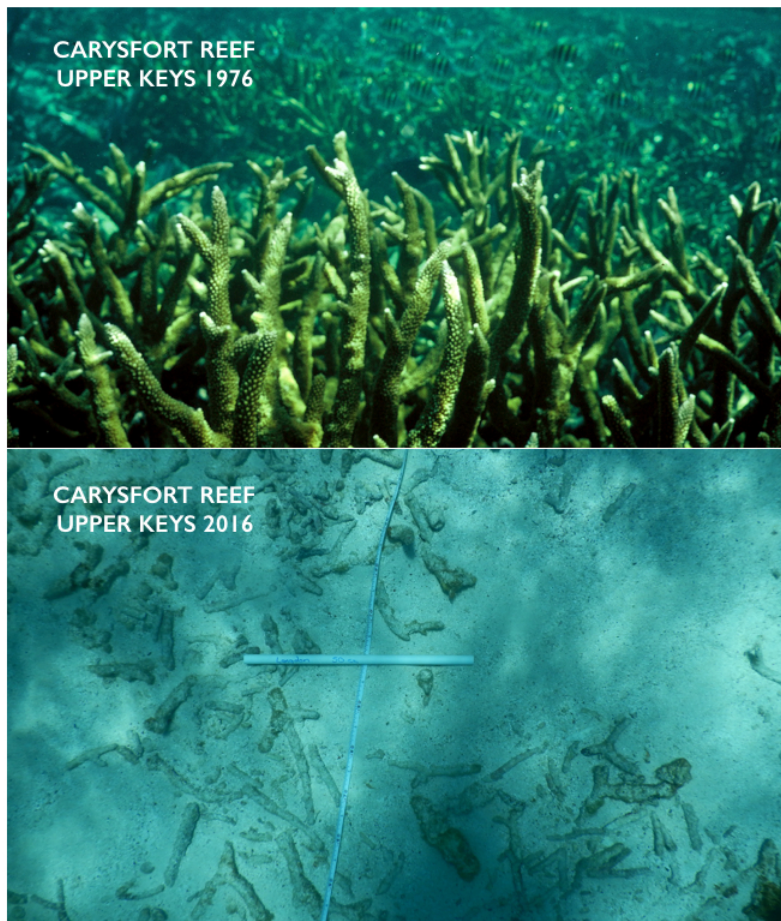


New study found ocean acidification may be impacting coral reefs in the Florida keys

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Carysfort 2016 - The extensive thickets of staghorn corals are gone today replaced by a structure-less bottom littered with the decaying skeletons of staghorn coral. Credit: Chris Langdon, Ph.D.

In a new study, University of Miami (UM) Rosenstiel School of Marine and Atmospheric Science researchers found that the limestone that forms the foundation of coral reefs along the Florida Reef Tract is dissolving during the fall and winter months on many reefs in the Florida Keys. The research showed that the upper Florida Keys were the most impacted by the annual loss of reef.

Each year the oceans absorb CO₂ from the atmosphere and become more acidic, a process called [ocean acidification](#). Projections, based largely on laboratory studies, led scientists to predict that ocean pH would not fall low enough to cause reefs to start dissolving until 2050-2060.

For two years, the researchers collected water samples along the 200-kilometer (124-mile) stretch of the Florida Reef Tract north of Biscayne National Park to the Looe Key National Marine Sanctuary. The data provide a snapshot on the health of the reefs, and establish a baseline from which future changes can be judged.

The results showed that reef dissolution is a significant problem on reefs in the upper Keys with the loss of limestone exceeding the amount the corals are able to produce on an annual basis. As a result these reefs are expected to begin wasting away leaving less habitat for commercial and recreationally important fish species. Florida Keys' reefs have an estimated asset value of \$7.6 billion.

In the natural scheme of things in the spring and summer months, environmental conditions in the ocean, such as water temperature, light and seagrass growth, are favorable for the growth of coral limestone. While, during the fall and winter, low light and temperature conditions along with the annual decomposition of seagrass, result in a slowing, or small-scale loss of reef growth. However, as atmospheric CO₂ is absorbed by seawater, ocean pH declines. The result is that the natural

summer growth cycle of coral is no longer large enough to offset the effects of dissolution from ocean acidification.

"We don't have as much time as we previously thought," said Chris Langdon, UM Rosenstiel School professor of marine biology and ecology, and a senior author of the study. "The reefs are beginning to dissolve away." "This is one more reason why we need to get serious about reducing carbon dioxide emission sooner rather than later," said Langdon.

The data for the study were collected in 2009-2010. The researchers suggest that a more recent analysis should be conducted to see how the reefs are faring today. "The worst bleaching years on record in the Florida Keys were 2014-2015, so there's a chance the reefs could be worse now," said Langdon.

More information: Dynamics of carbonate chemistry, production and calcification of the Florida Reef Tract (2009-2010): evidence for seasonal dissolution, [DOI: 10.1002/2015GB005327](https://doi.org/10.1002/2015GB005327)

Provided by University of Miami

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