



CAN-121-Coral-bleaching five times as fast

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Reprinted 1/16/18

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A 2014 aerial view of the Great Barrier Reef off the coast of the Whitsunday Islands along the central coast of Queensland. (Sarah Lai/AFP/Getty Images)



Coral reefs are bleaching four to five times as frequently as they did around 1980, scientists [said](#) Thursday in a study that suggests climate change may be happening too rapidly for some reefs to withstand.

“With a fourfold increase over the last 35 years, if you take that forward, it’s unfortunately in complete agreement with what the climate models have been saying,” said Mark Eakin, one of the study’s authors and head of the National Oceanic and Atmospheric Administration’s Coral Reef Watch. “[We’re] looking at 90 percent of reefs seeing the heat stress that causes severe bleaching on an annual basis by mid-century.”

Coral bleaching occurs when corals lose their color after the symbiotic algae that live in coral cells and provide them with nutrients are expelled due to heat stress. The longer this state of stress lasts, the longer the estranged algae stay away and the less likely that corals will recover. So scientists tend to distinguish between moderate bleaching,

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which can be managed, and severe bleaching, which can kill corals and also leave surviving corals more vulnerable to disease and other threats.

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The study comes after the unprecedented 2014-2017 global bleaching event that produced devastating consequences to the Great Barrier Reef off Australia and many other global reefs.

The new survey of 100 major coral reefs, from 1980 through 2016, found only a handful that had not suffered severe bleaching's during that period. More striking, it found that the rate of severe bleaching is increasing over time. The average reef in the group bleached severely once every 25 or 30 years at the beginning of the 1980s, but by 2016 the recurrence time for severe bleaching was just 5.9 years. The study said that as ocean waters have grown steadily warmer, global bleaching events are now triggered not only in warm water El Nino years, but potentially in any year, including cooler La Nina years.

The change has occurred during about 1 degree Celsius (1.8 degrees Fahrenheit) of overall global warming so far, highlighting the fact that corals — whose existence, based on an ancient symbiosis with photosynthetic algae, evolved millions of years ago — are a particularly sensitive system.

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Eakin is one of 25 authors of the study in Science, whose contributors hail from institutions in Australia, Canada, Saudi Arabia, the United Kingdom and the United States. The paper's first author is Terry Hughes of the Australian Research Council Center for Excellence for Coral Reef Studies at James Cook University in Townsville, Australia. In the past two years, Hughes and his colleagues led the key aerial and underwater surveys that first documented the full scope of damage to the Great Barrier Reef.

Eakin acknowledged that scientists have been surprised, and even caught a bit flat-footed, by the rapid changes to coral reefs that have emerged in recent years. "It did in some ways even sneak up on scientists," he said of the 2014-2017 bleaching event. "I wasn't expecting to see a multiyear bleaching event for another decade. It is happening faster than even those of us who are well attuned to it are expecting. It wasn't beyond what we thought was possible; we were just being hopeful."

The 2014-2017 bleaching event is still being analyzed for its total toll, but it affected 75 percent of the world's reefs. And it is clear that in its wake, enormous portions of the world's largest reef, the Great Barrier Reef, have been badly damaged. Recent research has found that [900 miles](#) of the 1,400-mile-long reef experienced this severe form of bleaching in the last year or two.

[*\[240-year-old nautical maps show coral loss is much worse than we knew\]*](#)

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Closer to home for the United States, the [Florida reef tract](#), the third-largest in the world, bleached back to back in 2014 and 2015 but had a reprieve in 2016.

Nonetheless, the research shows that there are still a handful of famous global reefs that have not severely bleached during the era studied and so presumably represent some of the globe's most undamaged reef ecosystems. Those include two Australian reefs far to the west of the Great Barrier Reef in the Timor Sea — Ashmore Reef and Rowley Shoals — and reefs at St. Lucia off the coast of South Africa and Cocos Island in the Indian Ocean.

The main worry over the growing rate of severe bleaching is that reefs will not be able to recover quickly enough. It takes 10 to 15 years for the quickest-growing corals to reestablish themselves and far longer for some other species that are considered essential to a fully diverse and functional reef. This is why more and more it appears that reefs will need human assistance — such as artificial nurseries to grow and breed more competitive corals — to thrive.

And even then, we'll probably need to adjust to a world in which some reefs just won't be the way they were, given the current rate of global warming and how much change is already in the pipeline.

"There's some things you don't have time to change," said Eakin.

Read more at Energy & Environment:

[The race to save Florida's devastated coral reef from global warming](#)

['An enormous loss': 900 miles of the Great Barrier Reef have bleached severely since 2016](#)

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