



# CAN-090-Global Coral Bleaching- World's Oceans

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## Scientists Brace for Next Round of Global Coral Bleaching

The coral bleaching event that devastated reefs worldwide during the past three years is over for now, but as ocean temperatures continue to rise, bleaching is likely to continue on a regional level.

WRITTEN BY [Jim W. Harper](#)



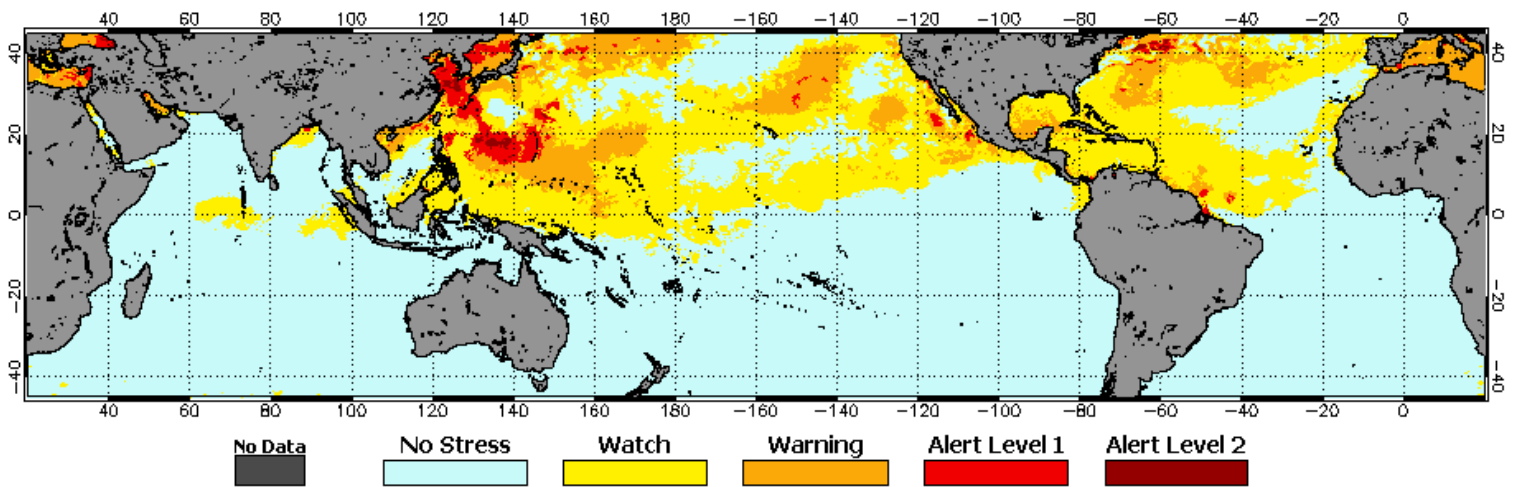
Riccardo Rodolfo-Metalpa documenting the coral bleaching in New Caledonia in March 2016. NOAA

**SICKLY WHITE CORALS** in hot water across the globe are catching a break. New satellite data showing cooler surface currents signals an end to a record three years of temperature-induced stress on the world's shallow coral reefs. But future episodes of deadly overheating are predicted to become commonplace, and this year could see the return of damaging climatic patterns.

The Third Global Coral Bleaching Event ended in May after an unprecedented three-peat, according to the United States National Oceanic and Atmospheric Administration (NOAA). "This event lasted from June 2014 to May 2017 and has now

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ended as a global event,” Mark Eakin, the coordinator of NOAA’s Coral Reef Watch, said in an email. Its [current maps show cooler ocean surface temperatures](#) in light blue, as compared to an entire ocean in dramatic red during the three-year event.

NOAA’s coral reef watch map shows that the latest global coral bleaching event has ended. (NOAA)

The previous two global bleaching events on tropical reefs in 1998 and 2010 did not repeat in subsequent years. Could 2018 bring another round of coral bleaching at the planetary scale?

“We don’t know when the next bleaching event is going to happen, but we do know that they will become more frequent,” Ruben van Hooidonk, a coral expert at the University of Miami, said in an email.

“If greenhouse gas emissions are not drastically reduced, most reefs will see annual bleaching by mid-century,” he added. Van Hooidonk served as lead author on a [study](#) published last year that predicted that by 2043 worldwide bleaching of reefs would become routine.

The third global bleaching event was particularly devastating across the Pacific. The relatively isolated reefs of Hawaii experienced their second mass-bleaching event in 2014. More than 90 percent of the iconic Great Barrier Reef bleached in 2016.

Today, the Pacific island of Guam may be experiencing its fifth consecutive year of mass bleaching, which began there in 2013. The NOAA’s Eakin is gathering data to confirm its persistence this year. He foresees increases of both local and global bleaching events.

“We are likely to have mass bleaching sooner than the next global event,” said Eakin. “However, both are becoming much more frequent. Unfortunately, we don’t have the capacity to make predictions more than a few months out. We can only predict that they will continue to become more frequent.”

Since 2014, more than 70 percent of the world’s shallow reefs experienced bathwater conditions that pushed them to their limits. Under such stress, coral polyps expel the algae that supply both nutrition and their vibrant colors. Still alive, the corals appear white or “bleached.”

Corals will starve and die if they remain in a bleached state for several weeks. In 2016 alone, 29 percent of corals died across the Great Barrier Reef, according to Eakin. The observations caused some [scientists to weep](#).

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Similar to a forest of dead trees, dead corals eventually become a dysfunctional ecosystem, their bone-white skeletons often cloaked in brown algae.

Bad news for communities that rely on reefs for fish and tourism, the underwater skeletons of corals provide a stark white visual representation of global warming and were the subject of the new documentary "[Chasing Coral](#)," which filmed reefs during the third global event.

Global bleaching is different from a regional or mass bleaching event, which was first observed in the early 1980s. A global event must occur across the Atlantic, Pacific and Indian ocean basins. The first such event in 1998 hit more than 50 countries and 16 percent of corals died. An example of widespread stress that did not reach the global threshold was in 2005, when the Caribbean experienced its worst mass-bleaching event.

Bleaching peaks in the warmest months. Because northern and southern hemispheres experience summer at opposite times, the timing of mass bleaching varies from country to country.

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A NOAA expedition to remote regions of the Pacific Ocean this year found evidence of coral bleaching on Jarvis Island. (NOAA)

High surface temperatures explain coral bleaching on a global scale. Globally, 2016 was also the hottest year on record for both land and sea temperatures.

In addition to steady global warming, surface temperatures in the ocean spike during the El Niño climate pattern. Global coral bleaching coincides with strong El Niños in places as distinct as the uninhabited South Pacific and Miami's South Beach.

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The most recent El Niño pattern likely started in late 2014 and ended in mid-2016. The possible return of El Niño in 2017, although not currently favored, is a foreboding forecast for reefs still trying to recover. El Niño and its warm surface temperatures return every two to seven years.

The geographic spread of coral bleaching has progressed rapidly, and only a few decades ago mass coral bleaching was completely unknown to science.

Since the 1980s, high ocean temperature conducive to coral bleaching has become three times more likely, according to [a study published in the scientific journal Nature in December 2016](#).

The 2010 global bleaching event was not as severe as 1998, and Eakin hesitates to declare which global event was the worst. The Third Global Coral Bleaching Event was certainly the longest and affected the largest number of reefs.

“I believe the 2014-17 global bleaching event has been more damaging [than 1998] but we do not yet have the data to show this,” said Eakin. “The 2014-17 global event has been the longest, most widespread and is unique in that most sites have been exposed to bleaching two or more times during this event. These repeated bleaching episodes have been particularly damaging.”

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