

Coral Reef Bleaching Devastating Australia's Great Barrier Reef

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The Great Barrier Reef is experiencing severe coral bleaching this year. (Photo credit: XL Catlin Seaview Survey)

Coral reef bleaching is occurring at an unprecedented rate on Australia's Great Barrier Reef. A recent aerial survey of 911 reefs by Australia's National Coral Bleaching Task Force found evidence of bleaching on 93 percent of the reefs. The damage is most severe in the Great Barrier Reef's northern section, where no reef has escaped bleaching. To put this in perspective, the bleaching is currently affecting an area about the size of the state of Maine.

"Mass coral bleachings have only been happening for 20 years, and they are irrevocably, totally, absolutely linked to man-induced climate change," Dr. Justin Marshall, a professor at the University of Queensland and the chief investigator for citizen science project [CoralWatch](#), told a reporter from NPR.

Corals are anthozoans, which is the largest class of organisms in the phylum Cnidaria. Cnidarians are an ancient class of animals that have a fairly simple body plan made up of specialized tissues and a gastrovascular cavity that opens at one end. This end, typically called the mouth, is covered with tentacles that help the animal gather food particles from the water and defend itself from predators.

Corals have a symbiotic relationship with zooxanthellae, which are tiny marine algae that live within the coral's gastrodermal cells. The corals provide the algae with a protected place in which to live as well as the compounds necessary to photosynthesize, while the algae provide the coral with oxygen (a product of photosynthesis), and help the coral remove wastes.

Coral reefs are composed of thousands of individual corals that form a colony. The reefs are made when stony corals secrete a skeleton of calcium carbonate. Coral reef colonies vary in shape and include branching corals, cup corals, and table corals.

The primary cause of coral bleaching is heat stress due to high sea temperatures. A temperature increase of only 1°C for just four weeks can cause a bleaching event. According to the Great Barrier Reef Marine Park Authority, coral bleaching happens when the symbiotic relationship between the coral and marine algae is impaired. Without the photosynthesizing marine algae, the tissue of the coral appears transparent and its bright-white skeleton is revealed. Corals begin to starve once they begin to bleach.

Coral reefs can recover from bleaching if conditions return to normal and the coral-zooxanthellae relationship is repaired. However, the stress caused by bleaching can lead to decreased coral growth and reproduction as well as increased vulnerability to disease.

Coral bleaching is not an unknown event. In 1998, over 50 percent of the Great Barrier Reef was affected by bleaching. Globally, 10 percent of the world's coral reefs died during the 1998 event, which corresponded with the highest sea temperatures ever recorded up to that time. In 2002, coral bleaching affected 60 percent of the Great Barrier Reef, which was, until now, the largest bleaching event on record.

As summer winds down in Australia and the water begins to cool, it is expected that some of the bleached areas will recover. However, in areas where the most severe bleaching has occurred, scientists expect that 90 percent of the reef will die.

"We are currently experiencing the longest coral reef bleaching event ever observed," Dr. C. Mark Eakin, coordinator of [NOAA's Coral Reef Watch program](#) told a reporter from *The New York Times*. "We are going to lose a lot of the world's reefs during this event."

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