



CAN-031-Coral Bleaching-Worlds Ocean

Join us to save coral reefs

Vic Ferguson

The World Federation for Coral Reef Conservation 281.971.7703 P.O. Box 311117 Houston Texas 77231

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OCEAN ALERT: CORAL BLEACHING IS MASSIVELY HAPPENING!

14/10/2015 [MARC ARENAS CAMPS](#) [DEIXA UN COMENTARI](#)

We would like that the main picture of this post had been modified using Photoshop, but unfortunately this is not the case. Thanks to the project [XL Catlin Seaview Survey](#), we now know that coral bleaching is massively happening. What causes coral bleaching? How does coral become bleached? Which is the importance of coral in the ocean ecosystems? These questions and more are answered in this post.

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WHAT IS CORAL BLEACHING?

Coral bleaching is the result of the expulsion of symbiotic algae living in the coral tissues (zooxanthellae), producing them to become completely white.



Coral before and after a bleaching event

(Picture: [Kendall Kritzik, Creative Commons](#)).

The presence of zooxanthellae is frequent in marine cnidarians, especially in species that live in shallow waters, and they are the responsible of the greenish, bluish, yellowish or brownish colour of many coral species. In fact, each cubic millimetre of tissue of the



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host has 30,000 algae cells. These zooxanthellae are single-celled algae, usually dinoflagellates, that are able to live in [mutualism](#) with the coral. So, if zooxanthellae and coral live in mutualism, which are the benefits of this relationship? Coral gets the products of photosynthesis, organic carbon and nitrogen; while the algae receive nutrients, carbon dioxide, protection and a good position with access to sunshine.

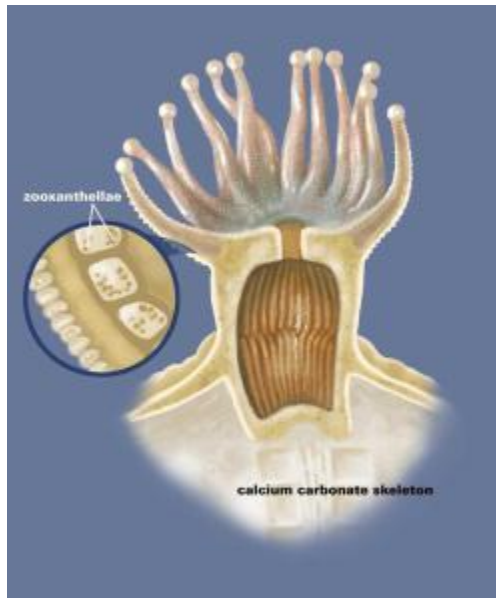


Diagram of the location of zooxanthellae in a coral (Picture: [Ocean Portal](#)).

WHAT CAUSES CORAL BLEACHING?

Several causes of coral bleaching have been detected:

1. **Increased ocean temperature.** Climate change is the foremost responsible of the increase in ocean temperature and this is the main stress causing coral bleaching, but it is not the only one. The rise of temperatures may be also produced by El Niño phenomenon. With just an increase of 1°C of the water for only one month, corals begin to become bleached.
2. **Reduced ocean temperature.** As warmer water ocean may produce coral bleaching, colder water may also produce these events. Some proofs support this idea: in January 2010, cold water temperature in Florida might have produced coral bleaching that resulted in coral death.
3. **Runoff and pollution.** Near-shore corals can be bleached due to the pollution carried by precipitation's runoffs.



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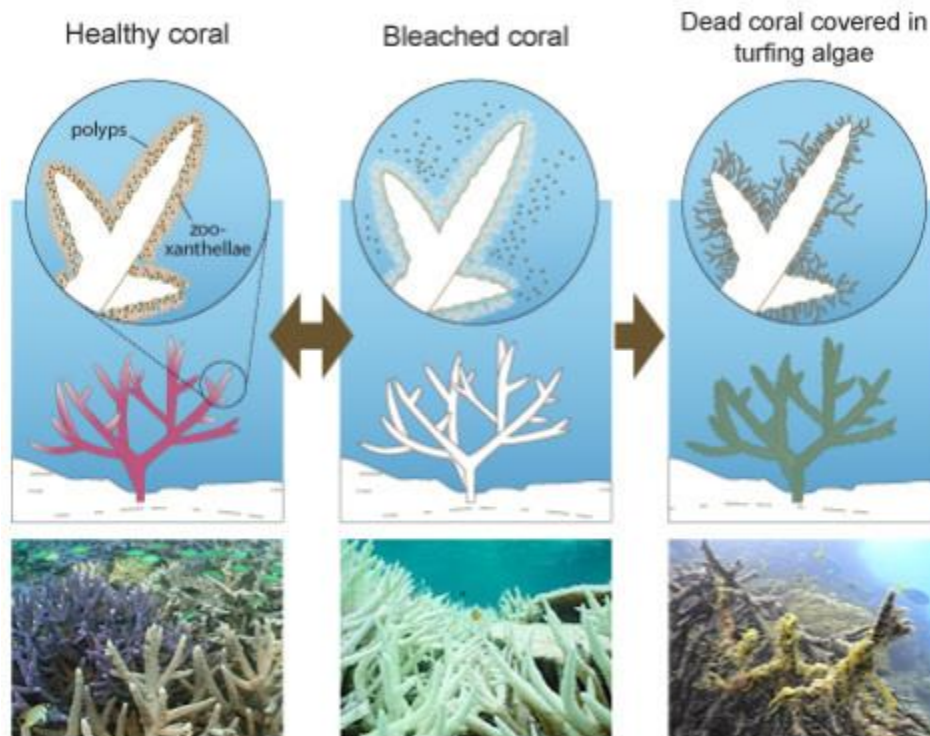
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4. **Freshwater inundation.** Due to a low salinity produced by a freshwater inundation, corals may start bleaching.
5. **Overexposure to sunlight.** High solar irradiation causes bleaching.
6. **Extreme low tides.** Long exposures to the air can produce bleaching in shallow corals.
7. **Disease.** Diseases cause coral to be more susceptible.

All these causes produce a stress to the coral and, as a result, corals expel the algae living in their tissues.

HOW DOES CORAL BECOME BLEACHED?

When corals are in a healthy state, they are home to algae, so that they are in a symbiotic relationship. But, when corals are stressed, the photosynthetic machinery of algae produce toxic molecules that cause the corals to expel the symbionts. If the stress is not severe, corals can recover, but they become bleached in severe and prolonged stresses. As a result, corals death because they loose their main source of food and are more susceptible to disease.



Coral bleaching process (Picture: [Great Barrier Reef Marine Park Authority, Australian Government](#)).

MASSIVE CORAL BLEACHING EPISODES

Two worldwide episodes of coral bleaching were detected in the 1998

(which killed 16% of the coral reefs around the world) and 2010, but a recent study carried out by the



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NOAA and the University of Queensland confirm a more severe coral bleaching episode this year (2015). This new episode, which is triggered by El Niño of this year (together with the global change), is predicted to affect the 38% of the worldwide coral reefs, killing 12,000 square kilometres of reefs. The more altered zones will be Australia and the Pacific and Indian oceans.



Bleaching in American Samoa. The first picture (before) was taken in December 2014 and the second (after) in February 2015 (Picture: [XL Catlin Seaview Survey](#)).

Nevertheless, coral bleaching doesn't only occur in massive episodes. Each year, during summer months,

some limited coral bleaching is reported all over the globe.

WHY ARE CORALS IMPORTANT?

Despite the fact that coral reefs comprise less than 1% of the underwater ecosystems, they play a major role in the ocean. One quarter of marine life depends on coral because they are the nursery of the sea, so they are an important protein source for animals and humans. Moreover, they protect shorelines from waves and tsunamis. In addition, from an economical point of view, they are one of the most important places of tourist interest and support fishing industries. In fact, they provide food and livelihoods for more than 500 million people around the world.

WHAT CAN YOU DO?



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All the activities you do to lessen your carbon dioxide production are good to prevent the Earth from global change and, therefore, are good to avoid coral bleaching. Keep doing like that! **Share with us: which are the actions that you take to prevent global change?**

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The only thing necessary for the triumph of evil is that good men do nothing"....Edmund Burke