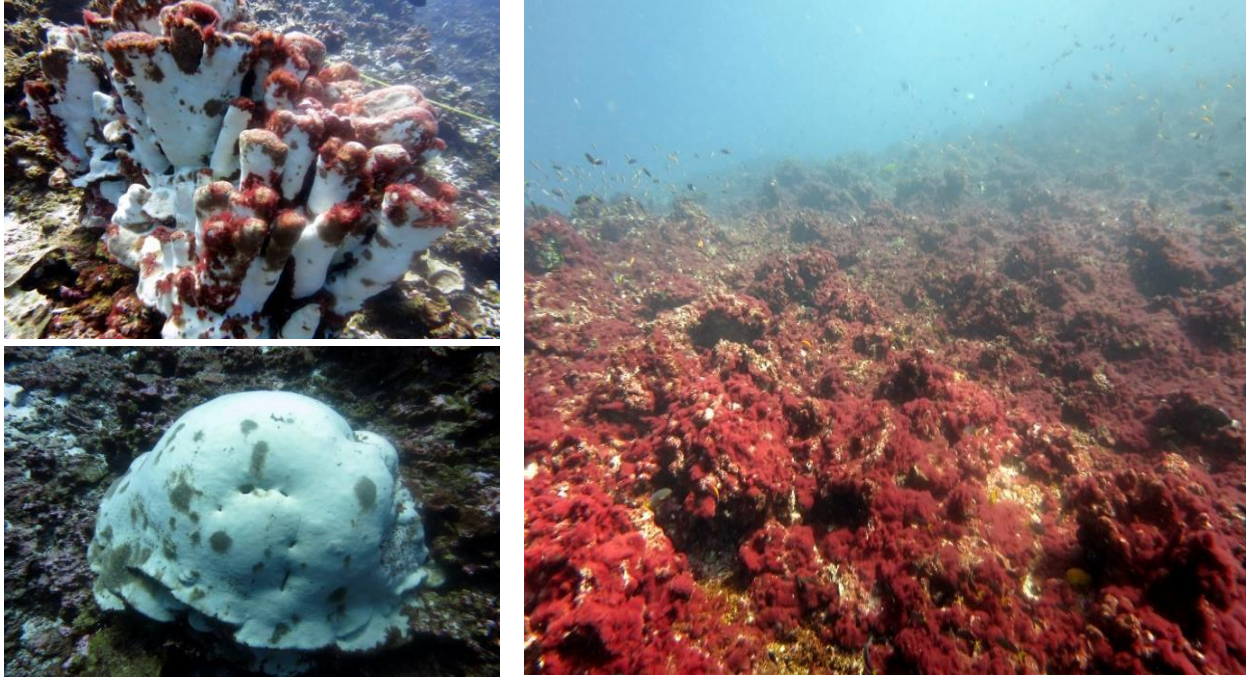


Are Corals the New Canary in a Coal Mine?  
By: Erin O'Reilly

*A graveyard of white coral skeletons.* Not the desired phrase to describe the underwater rainforests of coral reefs, but this is the image encountered by a dive team at Jarvis Island in the Pacific Remote Islands Marine National Monument. Upon resurfacing, lead coral ecologist Dr. Bernardo Vargas-Ángel shared his shock regarding the condition of the reef he witnessed. The underwater garden he experienced just a year before was obliterated. 95% of the reef was composed of the white skeletal remains of a once thriving reef.



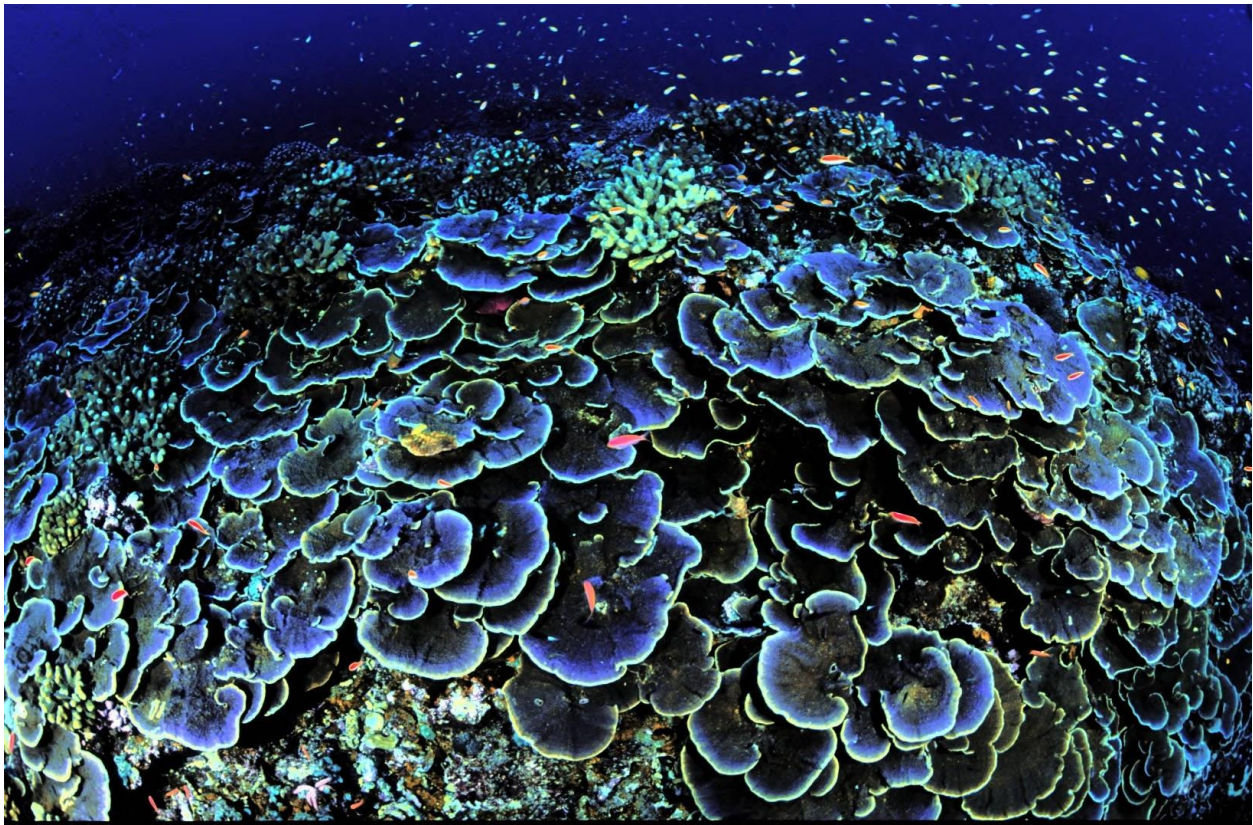
*Photo Credit: Jarvis Island, NOAA-CREP, 2016*

How does a vibrant underwater zoo become a boneyard of white, lifeless coral? With rising ocean temperatures and acidity, corals are stressed and expel the algae contained in their tissues. This devastating phenomenon is known as coral bleaching. Instead of reefs being a colorful living mosaic of yellows, purples, oranges, greens, and pinks, now all that remains are their white skeletons. For corals, a colorful reef is equivalent to a healthy reef. Not only do the algae provide the unique coloring, but they also serve as a major food source for the corals. Without the algae, corals are no longer able to be the colorful underwater rainforests full of life they once were.

Corals have become the 21st century's canary in a coal mine: a warning to humans about the dangers of climate change. Oceans absorb roughly one-third of the carbon dioxide we emit, increasing ocean temperature and acidity. Bleached coral reefs serve as the first sign of the many negative effects to come from climate change. If even remote and pristine areas are being affected by climate change, then other less protected ecosystems are surely in even worse condition.

Corals are sensitive to slight changes in ocean temperature. A mere 1°C increase in the warmest temperature causes corals to bleach. Due to this seemingly small shift, the world's oceans could lose their underwater rainforests and instead be left with coral graveyards. While sensitive, corals can usually survive short periods of warmer water. However, the 2015-2016 El Niño made the waters in the remote Pacific too warm, for too long. The water was 4°C above normal for an extended period of time, which proved too much for the corals to endure. Instead a bath, the corals were now trying to survive in a jacuzzi.

The Pacific Remote Island Marine National Monument serves as a living laboratory to study how climate change effects coral reefs worldwide. Since most of the islands within the Monument are uninhabited, they allow scientists like Bernardo to study the effects of climate change in an area with little direct human impact. If even these corals are bleaching, climate change is mostly likely the cause. Not only will the effects of climate change be studied, but also the ability of corals to recover from such a devastating event. Hopefully we will witness Jarvis' transition from a coral graveyard back to the healthy underwater rainforest it once was.



*Photo Credit: Jarvis Island, United States Fish and Wildlife Service, 2013*