

Growth potential remains at risk on even the most remote coral reefs

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Credit: Chris Perry

Coral reefs in the Indian Ocean that were severely damaged by a global

warming event 17 years ago have bounced back to optimum health and have the potential to keep pace with rising sea levels, but only if they escape the impacts of future warming events, researchers from the University of Exeter have found.

Chris Perry, Professor of Geography in the College of Life and Environmental Sciences, and his team measured changes to 28 reefs across the Chagos Archipelago, the remote British Indian Ocean Territory 300 miles south of the Maldives, that lost 90 per cent of its coral cover during 1998, when sea temperatures rose to unprecedented levels.

In contrast to reefs across the globe, which have suffered severe and continuing damage due to the combined effects of climate change and local disturbances, the researchers found that the coral communities on most of the reefs they looked at had recovered rapidly from this major 'bleaching' event. The research is published today, December 16, in the journal *Scientific Reports*.

Coral bleaching is caused by stress from high [sea temperatures](#) and occurs when the relationship between the coral host and an algae that lives within it, which provides most the coral with its food, breaks down. Under stress the corals then expel the algae and if this occurs for periods of more than a few weeks the corals will die.

"These reefs are, in many ways, outliers in terms of what is happening globally," said Professor Perry. "Most reefs across the Caribbean, and indeed in many other areas of the world have seen rapid loss of [coral](#) cover and their growth potential has been massively reduced. In contrast, these reefs recovered very quickly and the most likely reason for this is their relative isolation from direct human disturbance."

The research team, which included scientists from Lancaster University

and from Australia, measured the carbonate budgets of the reefs, which is a measure of the amount of calcium carbonate that the [coral reefs](#) produce, as a measure of reef health.

"Recovery of these reefs has been quite well documented but this is the first time we have looked at the rate of carbonate being produced in these isolated systems," added co-author, Professor Nick Graham of the Lancaster Environment Centre, Lancaster University. "The resulting growth potential for many of the reefs appears to be good, particularly on the reefs dominated by branching and table corals. However, these same species are also the most vulnerable to higher [sea surface temperatures](#). The major global sea surface warming event predicted for early 2016 is thus a major threat."

"In the short-term there is little that can be done to stop such warming events, but limiting future CO₂ emissions should be a critical global ambition in terms of protecting these unique marine ecosystems, while effectively protecting isolated systems such as Chagos from local impacts is essential to instil any capacity for future recovery," added Professor Perry.

Provided by University of Exeter

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