

Reefs that experience frequent temperature changes most likely to resist coral bleaching

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A healthy coral reef. Credit: Brian Zgliczynski

As scientists and conservationists race to work out the best way to conserve the world's coral reefs, a new study reveals why some reefs appear to be more resistant to coral bleaching during ocean warming events and calls for higher-resolution data to be collected.

The authors, from a number of American Universities and Bangor University in the UK, writing in *Nature Communications* utilise data collected from 118 coral [reef](#) locations globally. They illustrate how reefs over very small distances - as little as tens or hundreds of meters of each other, can be subject to different daily sea temperature changes - based on their depth and their position on the reef. These reefs end up having different fates during [ocean](#) warming events. Reefs subjected to high [sea temperature](#) fluctuations on daily or tidal timescales leading up to the ocean warming event are better able to resist [coral bleaching](#), such that a 1°C increase in daily temperature range reduces the odds of more

severe bleaching by a factor of 33.

In the short term, this information helps to explain the patchy distribution of coral bleaching across reefs during [thermal stress](#) events. In the long term, the information helps to identify reefs that may have a greater potential for resisting thermal stress, information that can help guide marine spatial planning and conservation targets and priorities.



A healthy coral reef. Credit: Brian Zgliczynski

"Rising ocean temperatures and ocean warming events driven by global climate change represent the greatest current threat to the integrity of [coral reef ecosystems](#) worldwide" says co-author Gareth Williams of Bangor University's School of Ocean Sciences.

"These warming events have become more frequent and are projected to keep increasing in frequency in the coming decades" says Williams.

Coral reefs represent one of the most diverse ecosystems on our planet, providing essential

ecosystem services, like fisheries and shoreline protection, to millions of people.



Bleached white corals. Credit: Paul Marshall

"It is vital we identify the mechanisms behind the apparent resistance to bleaching on some reefs" says Williams.

"Importantly, our results show that the resistance of corals to bleaching in areas of high-frequency temperature variability occurs in reef regions throughout the world. This positive news should not distract from the urgent need to reduce greenhouse gas emissions to protect [coral reefs](#) globally, but instead help guide strategic management actions in the inevitable interim."

More information: Aryan Safaie et al, High frequency temperature variability reduces the risk of coral bleaching, *Nature Communications* (2018). [DOI: 10.1038/s41467-018-04074-2](https://doi.org/10.1038/s41467-018-04074-2)

Provided by Bangor University

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