

Researchers reveal scary news for corals from the Ice Age

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There is growing scientific concern that corals could retreat from equatorial seas and oceans as the Earth continues to warm, a team of international marine researchers warned today.

Working on clues in the fossil [coral](#) record from the last major episode of global warming, the period between the last two ice ages about 125,000 years ago, the researchers found evidence of a sharp decline in coral diversity near the equator.

"When the climate warmed rapidly during the Last Interglacial, coral [species diversity](#) was much lower close to the Equator than at [higher latitudes](#)," Professor John Pandolfi said.

Professor Pandolfi is a Chief Investigator with the Australian Research Council Centre of Excellence for Coral [Reef Studies](#) and is Director of the Centre for Marine Science at the School of Biological Sciences, The University of Queensland.

"It appears that during this period the number of coral species present in equatorial oceans was only 50-60 per cent of the diversity found further away from the equator, and diversity was greatest in the [northern hemisphere](#)," he said.

Professor Pandolfi and his German colleagues found that, when [sea surface temperatures](#) warmed by about 0.7 of a degree Celsius during the interglacial [warm period](#), it was enough to drive many species of coral

out of equatorial waters up to 10 degrees of latitude on either side of the equator.

"Our results suggest that the poleward [range expansions](#) of reef corals occurring with intensified global warming today may soon be followed by equatorial range retractions," the team says in their latest paper, published in the Proceedings of the US National Academy of Science.

"Earlier work revealed that the corals had marched as far south as Margaret River in Western Australia during the interglacial – and we wanted to establish what was happening at the 'hot end' of the corals' range," Professor Pandolfi said.

"The answer is, increased temperatures resulted in the extirpation of many [coral species](#) in equatorial waters, leading to much poorer reef systems."

What concerns the scientists is that the planet has already warmed by 0.7 of a degree since the start of the industrial age – a similar amount to the last interglacial – and while the corals have not yet abandoned equatorial waters, modern equatorial diversity is lower compared to adjacent latitudes north and south.

"If this is the case, it has serious implications for the nations of the Coral Triangle, such as Indonesia and the Philippines, where tens of millions of people rely upon the oceans for their livelihoods and food.

"The picture that is forming is one of corals moving back and forth, towards the poles during warm periods, and retracting towards the equator in cooler times, in search of the most favourable water conditions.

"It is going to be important to factor this kind of dynamism into how we

manage them in the hot times which we now know lie ahead."

Professor Pandolfi has devoted many years to studying major fossilised coral reef deposits around the world most of which are now on dry land – but which grew in the ocean during warmer periods when sea levels were much higher than today.

"Many of these reefs lie 4-6 metres above today's high tide mark, and are a clear indicator of how much the oceans rose during the last interglacial.

"The thought that just 0.7 of a degree of sea surface warming back then caused a 4-6 metre ocean rise is distinctly disturbing – because that is how much the Earth has already heated in the current warming episode, and the predictions are for a further one degree or more by 2050.

"Corals, we know, have responded quite readily to rising sea levels in the absence of human stressors. The question will be: can humans respond equally well?"

The paper "Equatorial decline of reef corals during the last Pleistocene interglacial" by Wolfgang Kiessling, Carl Simpson, Brian Beck, Heike Mewis and John M. Pandolfi appears in the latest issue of the journal *Proceedings of the US [National Academy of Science](#)* (PNAS).

Provided by University of Queensland

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