

News

Coral marches to the poles

Reefs may simply move house when the oceans heat up.

[Nicola Jones](#)



The corals found to have migrated north since 1930 were all classed as 'vulnerable' or 'near threatened'. Aqua Image / Alamy
Corals around Japan are fleeing northwards, according to a new study. One type has been spotted 'sprinting' at 14 kilometres a year, thanks to a lift from ocean currents. That means ocean ecosystems could shift rapidly in the face of climate-change impacts such as warming seas, the authors say.

The study, due to be published in *Geophysical Research Letters*¹, is the first documentation of coral mass migration, but matches up with several other observations. As early as 2004 in Florida, for instance, staghorn and elkhorn corals were observed farther north than their usual ranges², and in Australia, reef-dwelling fish have been found farther south than before.

Hiroya Yamano of the Center for Global Environmental Research in Tsukuba, Japan, and his colleagues checked out records of corals seen in Japanese waters since the 1930s. Here, sea surface temperatures in winter have increased by 0.7–2.4 °C over the past 100 years.

“For corals it is good news, but for ecosystems, maybe not.”

Hiroya Yamano

Of nine different coral types for which Yamano and his team had enough information to determine the location of colonies, they found that four had moved polewards over the decades, and five had remained stable. The four that moved, they note, have been listed as 'near threatened' or 'vulnerable' by the International Union for Conservation of Nature since 1998.

The team also notes that there are many places where ocean currents run polewards, such as along the east coasts of the United States, South America, Africa and Australia — all of which could help help carry coral polyps to newly suitable areas for colonies or reefs.

Stunning speeds

The speed of the corals' movement is stunning, says Paul Sammarco of the Louisiana Universities Marine Consortium in Chauvin, who was not involved with the study. "That's pretty fast. In fact, you wouldn't even see it in geological time — it would be like they're here today and in the North Pole tomorrow," he says.

The average rate of range expansion for land-dwelling plants and animals has been clocked at less than a kilometre a year, and for animals living on the sea floor, speeds of less than 5 km a year have previously been seen. The record holders, however, are squid — one species has been tracked moving at a rate of nearly 200 km a year over eight years to find better waters.

The full picture of how corals are likely to react to climate change is complicated. When levels of atmospheric carbon dioxide rise and dissolve in the ocean, the more acidic waters can strip coral polyps of their calcium carbonate shells and dissolve reefs. Surprisingly, some corals seem to thrive even when 'naked', but the loss of hard reef material is bad news for fish and other creatures that live there. At the same time, higher temperatures can cause corals to kick out their symbiotic algae, a process known as bleaching, leaving them stressed and vulnerable. The year 2010 saw particularly dramatic bleaching (see ['Coral bleaching goes from bad to worse'](#)).

Reef raiders

Stressed corals are also expected to be more susceptible to 'epizootics' — epidemics that affect animals other than humans — which have wiped out swathes of reefs. A recent paper³ suggests that there is a natural solution to this problem: coral colonies affected by rising temperatures are often repopulated by fast-growing, short-lived corals that are less likely to spread disease, thus making devastating epizootics less likely.

But such a change in coral population is not necessarily a good thing, says Sammarco — any more than burning down a forest of old, established trees and replacing it with pioneer species is always a positive development in ecological terms.

Sammarco is convinced that a new 'hypertropical' region will develop in the middle of today's tropical oceans, in which higher temperatures will bring a new ecology. "I'm predicting pretty much total extinction of corals in that zone," he says. The fact that corals have been spotted moving house isn't unexpected, he says, and gives hope for their survival. But the moves are still likely to be disruptive, says Yamano. "For corals it is good news, but for ecosystems, maybe not."

• References

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