

# Sydney coral recovery is nature's warning shot

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Credit: Matthew Nitschke

A team of marine biologists from the University of Technology Sydney and Macquarie University provided the first evidence of bleaching in Sydney Harbour's unique temperate corals last April. Since then, the scientists have recorded widespread recovery, suggesting Sydney's corals can survive higher than normal temperatures with the caveat that the

environmental stress is brief.

In the wake of the devastating bleaching of the Great Barrier Reef, the scientists are relieved to see their local corals recover, but they also see the event as a warning shot: corals in cooler locations are not immune to bleaching as oceans continue to warm.

PhD candidate Samantha Goyen from the UTS Climate Change Cluster (C3) said the research team had been unsure what to expect in the follow-up study, because tropical corals typically die after bleaching events.

"Up to 45 per cent of corals at selected sites were bleached in April, which was unprecedented this far south of the tropics. However, as of now, almost every single coral we tracked is showing signs of [recovery](#)," she said.

Goyen logged the water temperatures of sites populated by corals and said a short period of stress seems to be key to the levels of recovery observed.

"Bleaching is a symptom that the coral is struggling under the conditions. What we have seen is a strong aptitude for recovery in the Sydney Harbour corals following the return to normal water temperatures."

C3 colleague Dr Matthew Nitschke said the study shows that, like their tropical counterparts, Sydney Harbour corals appear sensitive to prolonged temperatures above normal.

"However, their biology appears to be robust. The widespread coral recovery observed as temperatures returned to normal suggests these corals may also have some unique characteristics that make them incredibly hardy," Dr Nitschke said.

"Their condition is even more impressive given that the recovery period also included a significant storm event for Sydney Harbour in June, which would have likely stirred up sediment and limited light availability for some time."

Associate Professor Joshua Madin of the Quantitative Ecology and Evolution group at Macquarie University said more work is needed to understand why some coral species can live successfully so far from the tropics and, in particular, if these corals may have a greater propensity for recovery after bleaching than their tropical counterparts.

"Our goal is to investigate the characteristics of corals that determine who wins and who loses during extreme events. The Sydney Harbour corals are teaching us a lot about what it takes to live in cooler climates, but also about the possibility of these cooler places as refuges for corals in the future when seas will be warmer," Associate Professor Madin said.

To gain a greater understanding of the biology of these corals, long-term experiments are being conducted in collaboration with Manly SEA LIFE Sanctuary.

"Using coral fragments grown in aquaria, we can measure metabolic properties such as calcification and photosynthesis. Such information will tell us a lot about the unique physiology of these southerly corals especially in response to stress," Goyen said.

Associate Prof David Suggett, who leads the UTS C3 Future Reefs team, said continued monitoring is required to understand if this recovery event has occurred in isolation or is something we can expect to see repeated on a yearly basis.

"We know that coral ecosystems and populations can bounce back from disturbances, but this is highly dependent on a sufficient disturbance-

free window of time. With the global coral bleaching event now into its second consecutive year, we can only see this as nature's warning shot. The recovery mechanism following stress for these corals is yet to be identified, but this mechanism is important to understand in order to predict [coral](#) resilience into the future."

Provided by University of Technology, Sydney

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