CAN-175-Heatwaves and Coral
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For a Diver Every day is Ocean Day

Marine heatwaves a bigger threat to coral than previously thought

Mortality events a distinct biological phenomenon, researchers say.

Coral reefs and animals are under even more pressure than we thought, research suggests.

GUILLERMO DIAZ-PULIDO.

Severe marine heatwaves don't just trigger bleaching events on coral reefs, they lead to heat-induced mortality of coral animals, according to a new study.

To make matters worse, their skeletons start to decay within weeks, meaning the 3D coral framework that provides home to many other animals on the reef is also at risk, a team of Australian and US researchers argue.

And therefore, they argue, severe heatwave-induced mortality events should be considered a distinct biological phenomenon.

"Until now, we have described coral bleaching as an event where the symbiotic relationship between coral and its microbes breaks down and corals lose their main source of nutrition, and the coral can die if the symbiosis is not restored," says Professor Tracy Ainsworth from Australia's UNSW Sydney.

"But what we are now seeing is that severe marine heatwave events can have a far more severe impact than coral bleaching: the water temperatures are so warm that the coral animal doesn't bleach – in terms of a loss of its symbiosis – the animal dies and its underlying skeleton is all that remains."

The study brought together researchers from four Australian universities – UNSW, University of Newcastle, University of Technology Sydney (UTS), and James Cook University – and the US National Oceanographic and Atmospheric Administration.

Their findings are published in journal *Current Biology*.

In 2016 the team's research showed that an increase of just 0.5C degrees Celsius in ocean temperature changes the extent of mortality that happens in coral during bleaching.

The new work drills down into finer detail in terms of the impact of such a change.

"We find that the skeleton is immediately overgrown by rapid growth of algae and bacteria," says Newcastle's Bill Leggat.

“We were able to study the consequences of this process of rapid colonisation using CT scanning of the coral skeleton – as would be used in medical imaging. We show that this process is devastating not just for the animal tissue, but also for the skeleton that is left behind, which is rapidly eroded and weakened.”

Novel bio-optical techniques allowed researchers at UTS to visualise and study the rapid transition in the coral microbiome for the first time.

“With this technique, we can see microbial communities go from symbionts to harmful coral skeleton-dissolvers,” says co-author David Suggett.

“Adopting these techniques more broadly will be central to understanding how this process occurs on reefs globally. We anticipate that heatwave mortality events, and rapid reef decay, will become more frequent as the intensity of marine heatwaves increase."

EXPLORE #BLEACHING #CORAL REEF

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