University News

Kelp forests impacted when underwater worlds collide

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Tropical and temperate species have evolved separate from one another in different ecosystems, but researchers are now discovering what happens when climate-driven changes break down these long-standing geographic barriers.

Seaweed-eating tropical fishes are moving down the Australian coastlines and increasing in abundance on temperate reefs, where lush kelp forests normally prevail. While the long-term impact is still unknown, early research suggests that these tropical marine species are changing the ecology of temperate reefs, destroying their capacity to recover from both human and natural disturbances.

UWA Oceans Institute researchers Scott Bennett, Julia Santana-Garcon and Associate Professor Thomas Wernberg, together with researchers from Curtin University, have been investigating the impact of these climate-driven changes in species distribution.

Extreme ocean temperatures during the 2011 marine heatwave, devastated temperate kelp forests in Western Australia. At the same time, a strong Leeuwin Current resulted in an increase in tropical species on these temperate reefs, where they are now thriving. The large increase in seaweed-eating tropical fishes has resulted in high grazing rates on seaweed turf, which are comparable to global coral reefs, keeping the turfs 'mowed' and preventing large kelps from recovering.

The researchers conducted a study of the temperate reefs off Port Gregory to assess changes in fish and benthic community structure since the 2011 heatwave.

UWA Oceans Institute researcher Scott Bennett said the team had experimentally translocated kelps back onto the reefs and, using underwater video, measured fish feeding rates and observed their feeding habits.

"These translocated kelps were consumed within hours and underwater video footage revealed that feeding rates were on average three times higher than had previously been observed globally," Mr Bennett said.

"The findings from the research highlight the potential sensitivity of ecosystems to climate warming and extreme weather events.

"Many of Australia's unique temperate reefs lay down-stream of coral reef systems and this makes them vulnerable to changes in their ecology as the oceans warm."

This study was originally published in the prestigious international journal *Ecology Letters*.

Media references

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