CTA-200-Carbon Dioxide and Marine Habitats

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For a Diver Every day is Ocean Day

Biologists test the waters off Japan

New study looks at impact of carbon dioxide on marine habitats.

A boxfish swimming above dense mats of diatoms in a high CO2 site along the Shikine volcanic gradient off Japan. NICOLAS FLOC'H

New international research has highlighted the risk rising levels of carbon dioxide in the atmosphere and subsequent ocean acidification pose to marine ecosystems.

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Using submerged natural CO2 seeps off the Japanese Island of Shikine, marine biologists showed that even slightly higher CO2 concentrations than those existing today may cause profound changes in habitats and the fish that rely on them.

Writing in the journal *Science of The Total Environment*, a team from the universities of Palermo (Italy), Tsukuba (Japan) and Plymouth (UK) reports that under elevated dissolved CO2 conditions habitats are dominated by few ephemeral algae.

In such conditions, they say, species such as complex corals and canopy-forming macroalgae mostly disappear.

RECOMMENDED

Warming waters are altering marine life abundance

CLIMATE

This shift from complex reefs to habitats dominated by opportunistic low-profile algae led to a 45% decrease in fish diversity, with a loss of coral-associated species and a rearrangement of feeding behaviour.

"Our findings show that the CO2-induced habitat shifts and food web simplification, which we observed along a volcanic gradient in a climatic transition zone, will impact specialist tropical species favoring temperate generalist fish," says Palermo's Carlo Cattano, the study's lead author.

"Our data also suggests that near-future projected ocean acidification levels will oppose the ongoing poleward expansion of corals, and consequently of reef-associated fish, due to global warming."

The researchers say their study supports previous research demonstrating the ecological effects of habitat changes due to ongoing ocean acidification.

This has shown that decreased seawater pH may impair calcification and accelerate dissolution for many calcifying habitat-formers, while rising CO2 concentrations may favour non-calcifying autotrophs enhancing the primary production and carbon fixation rates.

As a result, there will be losers and winners under increasingly acidified conditions, and fish species that rely on specific resources during their different life stages could disappear.

This would lead to the composition of fish communities changing in the near future with potentially severe consequences for marine ecosystem functioning and the goods and services they provide to humans.

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The only thing necessary for the triumph of evil is that good men do nothing"....*Edmund Burke*

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