Tuesday 25 September 2018

Climate change to create strange bedfellows on deep ocean reefs

Warming ocean temperatures over the next 40 years are predicted to create novel combinations of marine life on deep ocean reefs that are unlike deep reef communities today.

In research published in the journal Nature Climate Change, a team of Institute for Marine and Antarctic Studies (IMAS) scientists studied how habitat-forming species on deep reefs across eastern Australia may respond to rising water temperatures driven by climate change.

Their modelling predicted that many species of deep-sea sponges and corals will contract their distribution to cooler southerly waters as their habitats experience 'tropicalisation' in coming decades and that different groups of organisms will respond to warming in different ways.

This process will lead to sub-tropical species sharing deep reefs with organisms that already live in more temperate waters, creating novel mixed communities.

Lead author Dr Martin Pierre Marzloff said that while shallow reefs have been extensively studied and their likely response to climate change is somewhat predictable, the likely impacts on deeper reefs are poorly understood.

"Deep-ocean reefs are typically highly diverse and productive, and vital to the healthy functioning of coastal oceans," Dr Marzloff said.

"Our study is the first to show how these reefs might be affected by climate change at this scale.

"By modelling the impacts of warming waters on key reef species groups off eastern Australia, a global hotspot of ocean warming, we were able to predict how deep reefs are likely to change with ocean warming," Dr Marzloff said

Project leader and co-author Professor Craig Johnson said the research showed that by 2060 deep ocean reefs will be home to previously unknown combinations of species.

"We analysed 13 different groups of deep-reef invertebrate species across the full latitudinal range of temperate eastern Australian waters and found that their distribution is primarily related to ocean temperatures," Professor Johnson said.

"As ocean temperatures rise these organisms will change their distributions, but the study showed that different groups are likely to move in different ways and so we will end up with unique assemblages of species that have no counterpart today.

"Organisms such as corals and sponges in sub-tropical waters are expected to extend their range to cooler southerly latitudes, but species already in temperate waters have nowhere to go once they reach the southerly edge of the continental shelf.

"This will result in the emergence of some strange bedfellows as the different reef species are forced together.

"These changes may have dramatic consequences for the way deep reef ecosystems operate and how productive they are.

"It is therefore critical that we better understand the mechanisms at work and how to best manage the ecosystems that are likely to be affected," Professor Johnson said.

Media contact: Andrew Rhodes (03) 6226 6683, email: ajrhodes@utas.edu.au

Information released by:
Communications and Media Office
University of Tasmania
+61 3 6226 2124
Media.Office@utas.edu.au Twitter.com/utas_newsroom