

Reefs protect vulnerable Caribbean fish from climate change

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Researchers predicted that changes in fish community could be reduced by 30 to 80 per cent with a doubling of reef area. Credit: Katina Rogers/Flickr

New research from UBC's Institute for the Oceans and Fisheries suggests that larger reef areas may help protect the Caribbean's coral

reef fish communities from the impacts of ocean warming.

"We are seeing alterations to local reef [fish](#) populations due to warming [ocean temperatures](#), particularly in those Caribbean countries that are closer to the equator, like Trinidad and Tobago, where commercially important fishes such as Cero and Northern red snapper are on the decline already," said Ravi Maharaj, first author and Ph.D. candidate at the Institute for the Oceans and Fisheries.

The study looked at the size of reefs in the exclusive economic zones (EEZ) – estimated from satellite imagery – of nine Caribbean countries and assessed the impact of rising [ocean](#) temperatures on the fish that are most important to the local [fisheries](#). The researchers examined how reef size may moderate such impacts.

Using sea water temperature and fisheries records going back to the 1970s, researchers found that the Caribbean Sea is warming, and fish that like cooler temperatures were decreasing in dominance in the catch. But they also found that the change in fish composition was slower in countries with larger [coral reefs](#) compared to countries with smaller coral reefs.

Using findings from the study, the researchers predict that changes in fish community can be reduced by 30 to 80 per cent with a doubling of reef area. This highlights the potential effectiveness of interventions that may maintain and restore reef habitats to reduce climate impacts on fish communities.

"With a small degree of warming, some fish may be able to acclimate but they need suitable habitat to grow and thrive," said Maharaj. "More refuge can be found in bigger reefs, however, with the addition of habitat loss due to pollution, coral bleaching, damage from the storms that frequent the area as well as unmanaged fishing pressures, such fish

refuge is becoming rarer."

Most of the fisheries along the many coral reefs in the Caribbean are small-scale and subsistence-based, providing one of the main sources of food and employment, however, the fisheries are currently unmanaged. The researchers say that policy makers should focus their attention on habitat protection and fisheries management in the area.

"There is a dire need for effective fisheries and conservation measures mechanisms in the Caribbean region, as the interactions between climate impacts and unmanaged fisheries are likely to weaken the resilience of fish populations," said senior author William Cheung, associate professor in the Institute for the Oceans and Fisheries. "Our results show that increasing the resilience of fish populations to [climate impacts](#) will involve managing for the broader ecosystem, particularly through protection and restoration of critical fish habitats."

The study "Regional variability in the sensitivity of Caribbean [reef](#) fish assemblages to ocean warming" was published in *Marine Ecology Progress Series*.

More information: RR Maharaj et al. Regional variability in the sensitivity of Caribbean reef fish assemblages to ocean warming, *Marine Ecology Progress Series* (2017). [DOI: 10.3354/meps12462](https://doi.org/10.3354/meps12462)

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