

Climate 'brings opportunities and threats to the Pacific'

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(Phys.org) —Climate change will bring both big opportunities and threats to the fish-dependent nations of the Pacific, international scientists say.

While the coral reef fisheries of Pacific islands are likely to take a major hit from warming and ocean acidification, there is potential for well-managed tuna stocks to grow, improving both national [food security](#) and economic prospects in many countries.

The finding appears in the journal *Nature Climate Change* and is the work of a team of [marine scientists](#) from Australia, France, New Caledonia and Fiji.

"Nowhere else in the world do so many countries and territories depend as heavily on fish and shellfish for economic development, government revenue, food security and livelihoods, they point out, adding fishing accounts for 25% or more of the GDP of 12 of the 22 Pacific countries.

"Fish is also a cornerstone of food security in the region," says Professor Morgan Pratchett of the ARC Centre of Excellence for Coral [Reef Studies](#) and James Cook University.

"The tropical Pacific has warmed substantially over the past 50 years," the report says. "This has reduced the sea's salinity over large areas and is a trend we expect to see continue as [tropical rainfall](#) rises.

"The outlook for [El Nino](#) events is still unclear, but there are expected to be fewer, stronger tropical cyclones. Some important currents will weaken. The ocean will continue to acidify with further increases in [atmospheric CO2](#), much of which dissolves in seawater. Sea levels will rise between a half and one metre by 2100. All these changes will affect fish – and the people and communities that depend on them."

The researchers consider that the Pacific Warm Pool – an immense area of hot water north of [Papua New Guinea](#) – is liable to expand, and this may cause a decline in the plankton on which tuna feed.

This will cause tuna to shift their feeding and breeding grounds towards the south and east Pacific, meaning that countries lying to the east of 170 degrees may emerge as 'winners' and gain more fish, while others to the west may be 'losers'.

Overall, there could be a 'net gain' in the Pacific tuna catch, provided the stocks are well managed and fishing pressure controlled, the report indicates.

For coral reef fisheries the outlook is uniformly dire: "Even under good management (for example, controlling runoff), coral cover is expected to decrease from the present-day maximum of 40% to 1-30% by 2035 and 10-20% by 2050," due mainly to bleaching, says Professor Pratchett, who was responsible for analysis of coastal fisheries projections.

"At the same time mangroves and seagrass beds – important as fish nurseries – are also likely to suffer."

A projected 20 per cent decline in coral reef fish, shellfish and crustacean harvests is likely to have a significant effect on regional food security, the scientists caution.

"In countries (such as) PNG, Samoa, the Solomon Islands and Vanuatu, even well-managed coastal fisheries will not supply the 35 kg of fish per capita per year recommended for good nutrition in the years to come owing to the limited areas of coral reef relative to population size, and rapid population growth."

Good management of [tuna stocks](#), especially, could in fact enhance regional food security under climate change, they add.

More information: Bell, J. et al. Mixed responses of tropical Pacific fisheries and aquaculture to climate change, *Nature Climate Change*.

Provided by James Cook University

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