

## Rising ocean acidity worst for Caribbean and Pacific

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[BOGOTÁ] The current trend of increasing ocean acidification, which threatens fisheries around the world, is driven mainly by man-made changes and is higher even than that seen at the end of the last ice age, some 11,000 year ago, a study has said.

Much of the carbon released by human activity ends up in the oceans, increasing their acidity and reducing the growth of corals and molluscs, which in turn may affect fisheries and aquaculture.

Fisheries in the Pacific and the Caribbean may suffer the most — in these regions, man-made acidification has already caused a 30-fold increase in the natural variation in ocean acidity, according to a study published in *Nature Climate Change* last month (22 January 2012).

Regional acidification far exceeds pre-industrial levels, and coral calcification (growth) rates may have fallen by 15 per cent in the western tropical Pacific and the Caribbean, the study shows.

"Coral reefs provide economic and environmental services to nearly 500 million people, and decreases in coral calcification would reduce the benefits that they provide to coastal communities including tourism revenues, food security, and shoreline protection from waves and storms," Elizabeth McLeod, co-author of the study and researcher at The Nature Conservancy, in the United States, told SciDev.Net.

The researchers studied ocean acidification trends between the years 800 and 2100 using three computer models, and compared natural variations in acidity with the current changes.

"Our results clearly prove that the current multidecadal trends are due to human activities and cannot be explained in terms of natural changes," Tobias Friedrich, lead author and researcher at the University of Hawaii, United States, told SciDev.Net.

Activities such as fossil-fuel burning and cement production have released more than 500 billion tonnes of carbon into the atmosphere since the start of the industrial revolution. Around 30 per cent of this ended up in the oceans.

Tropical Pacific coral reefs have adapted to live with small variations in acidity, but the change over



Caribbean fisheries may be among the most vulnerable to ocean acidification  
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the past 200 years has been much larger — in some regions as high as 30 times larger, Friedrich said.

Combined with other stressors, such as coastal pollution and surface warming, this is likely to severely reduce coral reef diversity and resilience by the middle of this century, the researchers concluded.

Coral reefs are biodiversity hotspots and provide "invaluable marine resources", so this is likely to affect species that people depend on for food, Friedrich said.

McLeod said that the effects on commercial fisheries and shellfish industries will result in an estimated annual damage of US\$870 billion by 2100.

Johann Bell, principal fisheries scientist at the Secretariat of the Pacific Community in New Caledonia, told SciDev.Net many coastal communities depend on fish for 50–90 per cent of the animal protein in their diets, but that the degradation of coral reefs "is expected to lead to decreases in the production of coastal fisheries".

Carles Pelejero of the Sea Science Institute at the Spanish National Research Council (CSIC) in Barcelona, Spain, told SciDev.Net the study confirms that the levels of ocean acidification have been unprecedented.

But he added, there was a need to study what levels of acidification different species can tolerate and how this might affect fisheries and aquaculture.

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Summary:

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