OUR PACIFIC OCEAN, OUR STORIES

Learning more about ocean acidification

Upolu, Samoa © Stuart Chape

What is Ocean Acidification?

Our global ocean absorbs approximately 30% of the carbon dioxide (CO_2) released into the atmosphere. This CO_2 combines with seawater to produce carbonic acid, turning the seawater more acidic and depleting the seawater of carbonate that many forms of sea life need to build their shells. CO_2 is an acid gas, so the addition of CO_2 to the ocean from burning fossil fuels is making seawater more acidic; we call this process "ocean acidification."

Q Why is ocean acidification a problem?

A It reduces the ocean's concentration of carbonate

With decreasing seawater saturation of carbonate, marine life, including calcifying plankton and algae, clams, sea urchins, and corals, will find it difficult to build their skeletons and shells. This will lead to a reduction in the growth rates of many of these creatures.

One study[1] projects that by 2050, coral reefs will dissolve faster than they can build their skeletons. Loss of coral reefs will mean loss of critical habitat for important seafood species and would result in increased rates of coastal erosion.

This will have a huge impact on ocean and coastal ecosystems, including coral reef ecosystems, shellfish, and plankton – the basis of the food web. Ocean acidification threatens our biodiversity. Eventually this will affect livelihoods, food security, and indigenous cultural practices and traditions.

1 Eyre, Bradley D., et al. "Coral reefs will transition to net dissolving before end of century." Science 359.6378 (2018): 908-911.

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A resilient Pacific environment sustaining our livelihoods and natural heritage in harmony with our cultures.

Q Why is ocean acidification a problem?

A Many species of fish could experience reduced productivity and growth rates

A study[2] that looked at ocean acidification effects on yellowfin tuna found that larvae reared at decreasing pH levels (pH 8.1, 7.6, 7.3 and 6.9) showed increasing organ damage in the kidney, liver, pancreas, eye and muscle, which correlated with decreased growth and survival.

A loss of fisheries productivity would threaten national economies that are highly dependent on fisheries resources, particularly Pacific islands. Fish is a cornerstone of food security for the people of the Pacific – fish provide 50–90% of animal protein in the diet of coastal communities across a broad spectrum of Pacific islands, and national fish consumption per person in many Pacific islands is more than 3–4 times the global average[3].

A Ocean acidification adds to other stresses coral reefs face, like ocean warming and coral bleaching

Ocean acidification can be considered a "stress multiplier" for coral reefs, as it combines with other stresses that corals are currently facing, e.g., rising sea surface temperatures, increasing frequency and duration of bleaching events, increasing intensity of tropical cyclones, overfishing, destructive fishing methods, and land-based sources of pollution.

Loss of coral reefs would mean loss of critical habitats for important seafood species and would result in increased rates of coastal erosion, since coral reefs are known[4] to reduce 97% of wave energy that would otherwise impact shorelines. Additionally, loss of reefs would pose a financial threat to the tourism industry of many islands.

Telling our Pacific Stories

As a reporter or journalist, your role in communicating with the general public is vital, especially in informing communities and encouraging behavioural change.

Reporting on ocean acidification can be a difficult task, especially when translating the science for your audience.

How about trying some of the below?

- Easier said than done with such a scientific topic but **try to avoid using complicated words** in your reporting and media coverage, and when you can't avoid it make sure you provide short and simple explanations of scientific terms.
- **Tell the stories of the people in your community who are experiencing these impacts**. Use local examples of ocean acidification impacts in your community or country whenever you can. It is important to contextualise and also highlight the experience of Pacific people at every opportunity, to show the human face of climate change impacts.
- **Support stories that encourage the preservation of ecosystems** that naturally mitigate[5] ocean acidification. Highlight communities fighting back against coastal development, NGOs protecting coastal ecosystems that are known carbon sinks, and businesses promoting clean renewable energy.
- **Provide ways that people can combat ocean acidification and climate change impacts**. What can people change about their lifestyles that can help reduce carbon emissions and ocean acidification?

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2 Frommel, Andrea Y., et al. "Ocean acidification has lethal and sub-lethal effects on larval development of yellowfin tuna, Thunnus albacares." Journal of experimental marine biology and ecology 482 (2016): 18-24.

3 Bell, Johann D., Johanna E. Johnson, and Alistair James Hobday, eds. Vulnerability of tropical Pacific fisheries and aquaculture to climate change. SPC FAME Digital Library, 2011.

4 Ferrario, Filippo, et al. "The effectiveness of coral reefs for coastal hazard risk reduction and adaptation." Nature communications 5 (2014): 3794.

5 Aquatic vegetation like mangroves and seagrasses, for example, can sequester CO_2 thereby locally buffering nearby marine ecosystems against ocean acidification.

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