

Climate Impacts at 1.5°C and 2°C – a Pacific Perspective

2°C is not safe

2°C cannot be seen as a safe limit for global warming. Significant climate impacts are already occurring at the current level of global warming (approaching 1°C) and higher levels of warming will only increase the risk of severe, pervasive and irreversible impacts. This was concluded by a comprehensive assessment of the differences in impacts between 1.5°C and 2°C, undertaken as part of the review of the long-term global goal of the UNFCCCⁱ.

High risks from extreme weather under 2°C

The recent IPCC reports show that a warming of 2°C above preindustrial (late 19th century) would already lead to high risks from extreme weather. This includes events to which the Pacific islands are particularly exposed, such as tropical cyclones, droughts and floods, and as well extreme heat waves in the future.

Occurrence of heat extremes double between 1.5°C and 2°C

The risk posed by climate extremes rises rapidly with increased warming, with increases already observed in many parts of the world, in particular for heat and precipitation extremes. Limiting warming to 1.5°C significantly reduces these risks: for example, the predicted occurrence of heat extremes is nearly double at warming of 2°C compared to 1.5°Cⁱⁱ.

Limiting warming to 1.5°C will reduce risks of sea-level rise

Limiting warming to 1.5°C would reduce the rate of sea level rise and limit the magnitude significantly. It will further reduce the melting of the polar ice sheets, which contributes directly to the risk of large-scale sea-level rise. For the longer term, over many centuries, recent science indicates that there is a high risk of a sea-level rise of many metres (potentially up to 9m) as a result of a sustained 2°C warmingⁱⁱⁱ.

Warming above 1.5°C is an existential threat to coral reefs

Close to 100% of tropical coral reefs will experience severe bleaching under a sustained warming above 1.5°C. This, in conjunction with the detrimental impacts of ocean acidification, represents an existential threat to these unique ecosystems and the livelihoods depending on them.

Limiting warming to 1.5°C will reduce risks for food production

Limiting warming to 1.5°C by 2100 would substantially reduce key risks for the Pacific islands, such as risks to food production.

ⁱ <http://unfccc.int/resource/docs/2015/sb/eng/inf01.pdf>

ⁱⁱ Fischer, E. M. & Knutti, R. Anthropogenic contribution to global occurrence of heavy-precipitation and high-temperature extremes. *Nat. Clim. Chang.* 1–6 (2015). doi:10.1038/nclimate2617

ⁱⁱⁱ Dutton, A. *et al.* Sea-level rise due to polar ice-sheet mass loss during past warm periods. *Science* (80-.). **349**, (2015).

Levermann, A. *et al.* The multimillennial sea-level commitment of global warming. *Proc. Natl. Acad. Sci. U. S. A.* 1–6 (2013). doi:10.1073/pnas.1219414110