



Australian Meteorological and Oceanographic Society (AMOS)

Statement on the IPCC Special Report on Global Warming of 1.5°C

Supplementary to the [Canadian Meteorological and Oceanographic Society \(CMOS\) Statement](#)

Australia has a highly variable climate, and our ecosystems, cities and agriculture are extremely vulnerable to long term changes in temperature and rainfall. Since 1910, Australia has warmed more than 1°C, leading to an increase in the frequency of extreme heat events and the severity of drought conditions during periods of below average rainfall (Australian State of the Climate Report, 2018). There has been a shift towards drier conditions in the southern part of Australia between April and October. There has also been a long-term increase in extreme fire weather, and in the length of the fire season, across large parts of Australia. Oceans around Australia have warmed by around 1°C since 1910, contributing to longer and more frequent marine heatwaves and coral bleaching events¹. Sea levels are rising around Australia, increasing the risk of inundation (Australian State of the Climate Report, 2018).

Along with other countries, Australia would see significant benefits from limiting global warming to 1.5°C. These benefits would include fewer and less intense heatwaves, fewer bushfires, less frequent marine heatwaves and coral bleaching, and less sea level rise. The impacts of drought would be less intense due to reduced temperatures, and changes in extreme rainfall would be reduced relative to warming of 2°C or more.

Projection and attribution studies using climate models (King et al. 2017) find that extremely hot summers, such as the summer of 2012/13, would occur in more than half of years in a 1.5°C world but more than three quarters of years in a 2°C world. Marine heatwaves, such as the Coral Sea heatwave in 2016, leading to mass coral bleaching, would occur in around two thirds of years in a 1.5°C world but more than 80% of years in a 2°C world, leading to widespread coral mortality (see IPCC Special Report on 1.5°C, Chapter 3). High temperatures leading to intensified drought impacts (water restrictions, reduced crop yields), such as occurred across Australia in 2006, would occur in around half of years under 1.5°C and three quarters of years under 2°C of warming. There is also concern that extreme events may increase more rapidly than average temperatures, leading to the possibility of unprecedented temperatures of 50°C for Sydney or Melbourne under 2°C of global warming (Lewis et al. 2017).

In the neighbouring Pacific region, many islands would face particular challenges from rising sea level and inundation, loss of nearby coral reefs and changes in fisheries, increased extreme rainfall and more intense tropical cyclones as well as more extreme drought conditions on some islands. These impacts would be greater for warming that exceeds 1.5°C.

¹ See AMOS position statement on Coral Bleaching

In the Antarctic region, limiting warming to below 1.5°C would reduce the risk of large-scale melting of ice sheets and resulting rises in sea level. The threshold of global temperature increase that may initiate irreversible loss of the West Antarctic Ice Sheet is estimated to lie between 1.5°C and 2°C (Hoegh-Guldberg et al., 2018)

For every additional degree of warming above the natural pre-industrial level, the impacts of warming are more severe. In some cases, thresholds may be passed leading to irreversible changes such as the loss of species or ecosystems.

AMOS therefore strongly supports efforts to meet the Paris Agreement target of reducing emissions to prevent average global warming exceeding 1.5°C, while recognising that this represents an enormous challenge. Australia's current emissions trajectory and the pledged greenhouse gas emissions reductions are insufficient for meeting the Paris Agreement global warming limits (e.g. <https://www.nature.com/articles/nclimate3186>.)

Further information:

Australian State of the Climate Report 2018: <http://www.bom.gov.au/state-of-the-climate/australias-changing-climate.shtml>

Hoegh-Guldberg, O. et al., 2018: Impacts of 1.5°C Global Warming on Natural and Human Systems. In: IPCC Special Report on Global Warming of 1.5°C.

IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty (2018): <https://www.ipcc.ch/sr15/>

King, A. D., Karoly, D. J., & Henley, B. J. (2017). Australian climate extremes at 1.5 °C and 2 °C of global warming. *Nature Climate Change*, 6, 222–227, doi:10.1038/nclimate3296.

Lewis, S. C., King, A. D., & Mitchell, D. M. (2017). Australia's unprecedented future temperature extremes under Paris limits to warming. *Geophysical Research Letters*, 44, 9947–9956, doi:10.1002/2017GL074612.