

Australia has warmed by 0.9C since 1910, with more in store

March 4 2014, by Michael Hopkin



Summary of findings from the State of the Climate 2014 report. Credit: State of the Climate 2014

Australia is almost a degree warmer, on average, than it was a century ago, according to the [State of the Climate 2014](#) report compiled by the CSIRO and Bureau of Meteorology.

Australia has warmed by 0.9C since 1910 – roughly in line with global rates of atmospheric warming – and is set to continue warming at a rate that depends on how fast greenhouse emissions can be reduced.

The finding reiterates the previous State of the Climate report, released

in 2012.

According to the 2014 report:

- Seven of Australia's 10 warmest years have happened since 1998;
- Over the past 15 years, very warm months have occurred at five times the long-term average, while very cool months have declined by a third;
- By 2070, temperatures will be anywhere between 1C and 5C warmer than the 1980-1999 average, depending on future emissions cuts
- Winter rainfall has declined by 17% since 1970 in Australia's southwest, and by 15% since the mid-1990s in the southeast;
- Tropical cyclones are forecast to decrease in frequency but increase in severity;
- Sea-level rises will increase the frequency of extreme sea-level events.

More heatwaves

Bureau of Meteorology assistant director Peter May said the report shows that Australia is "loading the dice" for more future heatwaves.

"The warming both in Australia and globally is certain, and is human-induced. The impacts of that are making themselves felt through an increased frequency of heatwaves, and fewer periods of extreme cold temperatures," he said.

"We are locked into a certain degree of future changes even if we stopped carbon emissions tomorrow."

He said it was beyond the report's scope to advocate for political action, or to advise on whether the government's commitment to [cut emissions](#)

[by 5% by 2020](#) goes far enough.

"(The report is) really about providing information for policymakers - it's neither the Bureau nor CSIRO's role to dictate what those responses should be. We're providing the scientific advice on the way things are," May said.

Sarah Perkins, a climate research fellow at the University of New South Wales, said: "No matter how you slice and dice it, the evidence is clear that human-induced climate change is continuing to increase the risk of extreme weather and temperatures."

"This is coming from Australia's national research institutions. We're all saying it, because the science is clear and the evidence is there for us all to see," she said.

Heatwaves are a pressing issue for Australia, both because of their direct link to warming temperatures, and because of their rapid impacts on health, Perkins said.

"When you have a heatwave it kills people and damages infrastructure within a matter of days - when you have a drought the crops die slowly, the economic impacts are much slower. Impacts via short, intense extreme temperatures are generally more measurable."

"Even if we did completely switch to green technology tomorrow, the next 50 years we would see this projected change. However in the next 100 years we could start to see a reduction in extreme events and changes to rainfall because we've started to make those changes."

"More and more reports are coming out globally. Despite the polar vortex bringing some very cold conditions to parts of America, they were not on the same scale as the record-breaking hot temperatures that

are consistently occurring across the globe. No state in America had its coldest winter on record, and many other parts of the Northern Hemisphere had very mild winters, including Alaska."

Consistent findings

Roger Jones, a professorial research fellow at Victoria University, said the findings were consistent with a recent report from the Climate Council that dangerous fire weather is already on the rise.

"Fire weather is currently around the worst case predicted for 2030-2050," he said.

The picture in terms of rainfall is less clear-cut. Australia had very wet years in 2010 and 2011, and overall rainfall has increased. But many heavily populated areas are enduring declining rainfall, Jones said.

"If you do a spatial average over Australia you find, as the report says, that rainfall has increased slightly. But if you do a population-weighted average it has decreased. The increase in rainfall in northern Australia coincides with warming in the region," he said.

Sophie Lewis, a postdoctoral research fellow at the University of Melbourne, said the report reflects an increase in scientific knowledge since the 2012 report.

"We now have studies for extreme events in Australia that provide scientifically robust attribution that can be used to understand observed events. We knew that by increasing average temperatures we would see an increase in the frequency and severity of extremes, but we hadn't analysed specific events. That's why we're seeing these official reports issue quite definitive statements about the causes of extremes," she said.

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