

True or False? Facts and myths about bushfires and climate change

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In this Factsheet, we consider some common statements about bushfires and climate change caused by carbon and other greenhouse gas pollution. Our fact checks are drawn from the latest Australian and international research, which is referenced throughout.

Bushfire risk is rising.



- + **Extreme fire weather has increased**, and the fire season has lengthened, across large parts of Australia since the 1970s.¹
- + The annual cumulative Forest Fire Danger Index (FFDI), which represents the occurrence and severity of daily fire weather across the year, increased with statistical significance at 16 of 38 climate reference sites across Australia from 1973 to 2010, with non-statistically significant increases at the other sites.²
- + There was a rapid increase in the annual cumulative FFDI at many locations around the country in the late 1990s and early 2000s.³
- + **By 2050**, compared with the climate of 1980 to 1999, the number of extreme fire-weather days is projected to grow in southern and eastern Australia; by 10 to 50 per cent for a low greenhouse gas emissions scenario (assumes strengthening global action to limit climate change, in line with the 2015 Paris Agreement) and by 100 to 300 per cent for high emissions (assumes greater climate change due to higher levels of carbon pollution or a climate system more sensitive to greenhouse gases).⁴
- + **NSW** - The impacts of climate change include: the frequency of occurrence of days of very high to extreme fire-risk may increase by 3 to 50 per cent by 2050 in all regions and the fire season is likely to be extended in most regions.⁵
- + **Victoria** - Instead of a 'catastrophic' blaze every 30 years or so, on average, it could face the prospect of a 'Black Saturday' level event every two or three years.⁶ With low global emissions, these events are projected to occur every 16 years.
- + **Tasmania** - Under a high global warming scenario, the total number of days per year categorised as 'Very High Fire Danger' is projected to increase by at least 120 per cent. This is about a 10 per cent per decade increase to

2100 characterised by: a steady increase in fire danger, especially in spring; a lengthening of the fire season; and more days at the high fire danger ratings.⁷

- + **South Australia** - In Adelaide, the annual cumulative FFDI is likely to increase by between 2 and 8 per cent for 2020 and 3 to 25 per cent for 2050.⁸
- + **Western Australia** - The number of days per year with severe fire danger weather is projected to nearly double in south-west Western Australia by 2090 under higher global warming scenarios.⁹

Climate change isn't influencing bushfires.



- + **The average temperature of the continent has risen** by almost 1°C since Federation, while rainfall in the south has fallen. The mix of warmer and drier weather is raising the risk of severe, extreme and catastrophic fire weather conditions in south-eastern Australia.
- + **Australian average surface air temperature has increased** by 0.9°C since 1910, and increasing greenhouse gases have contributed to this rise.¹⁰
- + **Extreme fire weather days have increased** ... from 1973... due to warmer and drier conditions.¹¹
- + There is high confidence that projected warming and drying in southern and eastern Australia will lead to fuels that are drier and more ready-to-burn, with increases in the average FFDI and a greater number of days with severe fire danger.¹²
- + The fire season is spreading further into spring and autumn.¹³ Record-breaking spring temperatures in 2015, strongly influenced by climate change, contributed to an early start to the 2015-2016 bushfire season in Australia.¹⁴
- + The increasing length of the fire season will reduce the window of opportunity for hazard reduction at the time when the need for hazard reduction becomes greater.¹⁵
- + **Fire authorities added two new danger ratings** in response to the Victorian 'Black Saturday' bushfires of 7 February 2009, - Extreme (above an FDI of 75) and Catastrophic/ Code Red (above 100).¹⁶ Extreme fire weather days have become more frequent over time.¹⁷

Fuel is always the main factor in fire risk.



FALSE

- + **Fuel load and human activity** are clearly important factors in the risk of fire. However, weather conditions including drought, high winds and extreme temperatures are often a major influence on the number, size, and intensity of bushfires in southern Australia.¹⁸

Recent hot weather is within normal bounds.



FALSE

- + **2013 was Australia's hottest year** on record, with many places smashing local records.¹⁹ 2015 was the 5th hottest with eight out of the ten hottest years occurring since 2002.²⁰ And, globally, 2015 was the hottest year on record.²¹
- + **Climatologists from the University of Melbourne** came to the clear conclusion (less than 90 per cent certain) that climate change caused by human activity had a substantial influence (fivefold increase in risk) on the record extreme summer temperatures over Australia in 2012-13. They concluded that natural climate variation alone was unlikely to explain the record summer temperatures which followed prolonged La Niña-neutral conditions which are ordinarily correlated with cooler summers.²²
- + **More extreme events have been recorded** over the latter half of the 20th century, coinciding with changes to climate over that time. Higher maximum and minimum temperatures, more hot days and fewer cold days, and more intense rainfall events have all been observed and are expected to increase with future climate change.²³

Australia's climate is changing.



TRUE

- + **Australia is becoming hotter.** The continent's average temperature is now nearly 1°C higher than it was in 1910.²⁴ 2013 was Australia's hottest year on record.²⁵
- + The duration, frequency and intensity of heatwaves have increased across many parts of Australia, based on daily temperature records since 1950.²⁶
- + Over the past 15 years, the frequency of very warm months has increased five-fold and the frequency of very cool months has declined by around a third, compared to 1951-1980.²⁷

- + Since 2001, the number of extreme heat records in Australia has outnumbered extreme cool records by almost 3 to 1 for daytime maximum temperatures, and almost 5 to 1 for night-time minimum temperatures.²⁸
- + **Australian land and sea surface temperatures** have now warmed about 1°C, with the majority of the warming occurring since 1950.²⁹ Warming surface temperature has been apparent in all seasons and all states and territories since 1950.³⁰
- + **Cool season rainfall** in the south of the country, particularly in the south-west and the south-east has fallen significantly since the early 1970s (south-west) and 1990s (south-east). Southern drying trends throughout the 20th century were characterised by a 10 to 20 per cent reduction in cool season (April to September) rainfall across the south of the continent.³¹

The costs of bushfires and other weather-related disasters are mounting.



TRUE

- + **From 1966, the total insured loss from bushfires alone** is equivalent to \$5.6 billion in today's money, the Insurance Council of Australia suggests. This translates to an average annual loss of approximately \$160 million over the period.³²
- + **The cost to the community of Victoria's 'Black Saturday' bushfires** in February 2009 was estimated to be more than \$4 billion by the subsequent Royal Commission. This figure does not include health and social costs, flow-on costs to business or environmental costs.³³
- + **The economic cost of fire** to Australia was estimated a decade ago to be 1.15 per cent of GDP.³⁴
- + **The total economic cost of natural disasters in Australia**, including bushfires, was estimated to have exceeded \$6 billion in 2012. These costs are expected to double by 2030 and to rise to an average of \$23 billion per year by 2050, even without any consideration of the potential impact of climate change.³⁵
- + **The mental and social tolls of bushfires impose substantial additional costs on communities**, aside from the physical injury from heat, flames and smoke. The cost in the treatment and lost productivity associated with mental disorders is already estimated at nearly \$8 billion annually. Mental health problems also tend to coalesce with economic and social ones, meaning that the overall toll is likely to be larger still.³⁶

For more information

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ENDNOTES

¹ CSIRO and The Bureau of Meteorology, 2014, *State of the Climate 2014*, 3.

² *Ibid.*, 8.

³ C. Lucas, K. Hennessy, G. Mills and J. Bathols, 2007, *Bushfire Weather in Southeast Australia: Recent Trends and Projected Climate Change Impacts*, Consultancy Report prepared for The Climate Institute by Bushfire CRC, Bureau of Meteorology, CSIRO Marine & Atmospheric Research, 3.

⁴ CSIRO and The Bureau of Meteorology, 2014, *op cit.*, 15.

[Note: by 2100, the low emissions scenario would see warming of roughly 2 to 3°C, which broadly reflects expected outcomes under current global Paris pledges as at the end of 2015.]

⁵ Department of Environment, 2010, *Impacts of Climate Change on Natural Hazards Profile: Statewide Overview*, December, 9.

⁶ Lucas et al., *op cit.*, 31 and 35.

⁷ P. Fox–Hughes, R.M.B Harris, G. Lee, J. Jabour, M.R. Grose, T.A. Remenyi and N.L. Bindoff, 2015, *Climate Futures for Tasmania Future Fire Danger: The Summary and The Technical Report*, Antarctic Climate & Ecosystems Cooperative Research Centre, Hobart, Tasmania, 5.

⁸ J.M. Balston, and A. Williams, 2014, *Modelling Bushfire Changes for South Australian Regions*, Department of Environment, Water and Natural Resources South Australia, Adelaide, South Australia, 45.

⁹ W. Steffen, L. Hughes, and A. Pearce, 2015, *The Heat Is On: Climate Change, Extreme heat and Bushfires in Western Australia*, Climate Council, 2 and 16.

¹⁰ CSIRO, 2015, *Climate Change in Australia Technical Report*, 42.

¹¹ *Ibid.*, 8.

¹² *Ibid.*, 139.

¹³ H. Clarke, C. Lucas and P Smith, 2013, *Changes in Australian fire weather between 1973 and 2010*, International Journal of Climatology, 33, 931–944.

¹⁴ W. Steffen and J. Fenwick, 2016, *The Hottest Year on Record (Again)*, Climate Council, 7.

¹⁵ L. Hughes, 2013, *Be Prepared: Climate Change and the NSW Bushfire Threat*, Climate Council, 20.

¹⁶ Australian Emergency Management Committee, 2009, *Australia's Revised Arrangements for Bushfire Advice and Alerts*, National Bushfire Warnings Taskforce, October; Balston *op cit.*, 9.

¹⁷ CSIRO, *op cit.*, 51.

¹⁸ Geoscience Australia, *What Causes Bushfires?*, Accessed January 19, 2016, <http://www.ga.gov.au/scientific-topics/hazards/bushfire/basics/causes>.

¹⁹ CSIRO and The Bureau of Meteorology, *op cit.*, 4.

²⁰ Bureau of Meteorology, 2016, *Annual Climate Statement 2015*, <http://www.bom.gov.au/climate/current/annual/aus/>.

²¹ Provisional full-year figures for global average temperatures released by The Met Office, UK on 20 January 2016

²² S. C. Lewis and D. J. Karoly, 2013, *Anthropogenic Contributions to Australia's Record Summer Temperatures of 2013*, Geophys. Res. Lett., 40, 3705–3709.

²³ Fox–Hughes et al., *op cit.*, 4.

²⁴ CSIRO, *op cit.*, 42.

²⁵ Bureau of Meteorology, 2014, *Annual Climate Statement 2013*, <http://www.bom.gov.au/climate/current/annual/aus/2013/>.

²⁶ CSIRO and The Bureau of Meteorology, *op cit.*, 8.

²⁷ *Ibid.*, 4.

²⁸ CSIRO, *op cit.*, 43.

²⁹ Bureau of Meteorology, *Annual Climate Statement 2013*, *op cit.*

³⁰ CSIRO, *op cit.*, 42.

³¹ *Ibid.*, 44.

³² L. Hughes and W. Steffen, 2013, *Be Prepared: Climate Change and the Australian Bushfire Threat*, Climate Council, 9.

³³ 2009 Victorian Bushfires Royal Commission, 2010, *Final Report: Summary*, July, 1.

³⁴ R. Kershaw, 2013, *The Economic Cost of Fire: Factors to be Incorporated into a National Policy on Fire Services Resourcing: interim Report*, EB Economics, 4.

³⁵ Australian Business Roundtable for Disaster Resilience and Safer Communities, 2013, *White Paper Final Report: Building Our Nation's Resilience to Natural Disasters*, 21.

³⁶ The Climate Institute, 2011, *A Climate of Suffering: The Real Costs of Living with Inaction on Climate Change*, 4, http://www.climateinstitute.org.au/verve/resources/tci_aclimateof_suffering_august2011_web.pdf.