

## The human impact of heatwaves and extreme weather

9 January 2013

In the last century, Australia's average temperature rose by slightly less than one degree over the preindustrial average. Without concerted action by all countries, including Australia, the world is on a path to exceeding 4°C by the 2060s.<sup>1</sup>

While some further warming is already locked in to the climate system, the worst is still avoidable. The tasks now are to avoid the unmanageable consequences of full-blown climate change and, at the same time, manage the unavoidable. This means recognising the full human cost of disasters, an early investment in community resilience—strengthening communities' capacity to recovery, as well proper resourcing of emergency services.

To delay action is to court a lot of unnecessary human suffering.

### A Continental Heat Wave

According to the Bureau of Meteorology, the four months to January 2013 have been 'abnormally hot' and dry across Australia, with records for temperatures—night and day—broken in many places.

For example, Hobart had its hottest night-time temperature on record (23.4°C) on the 4<sup>th</sup> January, followed by its highest maximum of 41.8°C. Many weather stations report temperatures edging closely towards historical records. Adelaide hit 45°C that week, its fourth warmest day on record.

From September to December the average Australian maximum temperature (40.33°C) was the highest since 1910, when reliable records were first kept.

The first seven days of 2013 were amongst the top-20 hottest days on record with, for the first time, six consecutive days over 39°C.

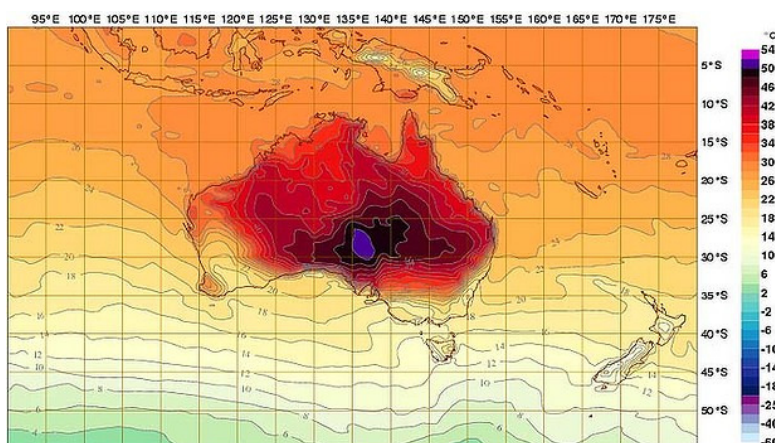
The heatwave is unusual in its continental spread – typical heatwaves affect a region of Australia, but this one started in Western Australia on 30<sup>th</sup> December and has rolled through the entire country. Also the extremely hot conditions are taking place outside of an El Niño year.

The Bureau notes that the unusually hot, dry conditions have far from ended, with still more records likely to be broken. Indeed, temperatures forecast for central Australia are so high that the Bureau has been obliged to extend the range on their temperature charts to 54°C, adding a new colour to the map.

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### Jeopardised human health and wellbeing

The Australian climate is inherently moody, but it is becoming more hostile, exacting a heavy toll on people's physical and mental health. Extreme heat has taken more lives than any other natural hazard in Australia's 200-year history. During the 2009 Victorian bushfires, 173 people perished as a direct result of the bushfires and another 374 people lost their lives to extreme heat during the same week. More than 2,000 people were treated for heat-related illness in the fires' aftermath<sup>3</sup>.



***Following a severe weather event, as many as one in five<sup>4</sup> people will suffer the debilitating effects of extreme stress, emotional injury and despair. An increasingly hostile climate will spell a substantial rise in the incidence of post-traumatic stress, anxiety and depression.***

- Heat waves can lead to restless, sleepless nights<sup>5</sup>. Temperature outside of mid-20°s Celsius can lead to impaired sleep<sup>6</sup>, leading to tiredness and diminished productivity.
- In a heat wave, people quickly become grumpier, more strained. Tempers flare. Thinking and concentration are impaired. Normal road rage is amplified. Domestic disputes turn nasty more easily. This has costs and consequences: it ties up law enforcement, hospitals, and other critical services<sup>7</sup>.
- Literature shows that aggressive, anti-social behaviour is also heightened during a heat wave, aided and abetted by binge-drinking and other kinds of drug abuse. The human cost can be high, even tragic as the risk of accidents, violence, and self-harm go up.

***The emotional and psychological toll of extreme weather event disasters can linger for months, even years.***

- Higher rates of drug and alcohol misuse, violence, family dissolution, and suicide are more likely to follow more extreme weather events. Evidence is beginning to emerge that drought and heat waves lead to higher rates of self-harm and suicide, as much as 8 per cent higher.<sup>8</sup>
- More than one in 10 primary school children were suffering from post-traumatic stress disorder the three months following Cyclone Larry in Northern Queensland in March 2006<sup>9</sup>. Common symptoms included flashbacks, nightmares and general state of distress, all of which may have had a deleterious effect on the children's education and future life prospects.<sup>10</sup> In the aftermath of Hurricane Katrina, which struck New Orleans in 2005, the incidence of post-traumatic stress disorder among survivors was high even two years later.<sup>11</sup>
- Following the 2009 tragedy at Kinglake, Victoria, reports have emerged of higher-than-normal drug and alcohol abuse, as well as disempowerment following an initial burst of solidarity in the first few months post-disaster. Social workers express concerns about truancy, drug abuse, and thoughts of suicide amongst youngsters who have had their faith in the world shaken to its core.

***Mental illness is already the second largest contributor to the disease burden in Australia. In any given year, one in five Australians suffers from a mental disorder of some kind, potentially making millions of people more vulnerable to mental ill-health in an increasingly hostile climate.***<sup>12</sup>

- The treatment and management of mental health problems already costs taxpayers over \$5 billion per year,<sup>13</sup> while the cost in lost productivity is estimated at another \$2.7 billion<sup>14</sup>—costs set to rise in a changing climate. Mental health problems also tend to coalesce with economic and social ones, meaning that the overall toll is likely to be larger still.
- Just how much Australians' mental health burden grows in the future depends significantly on how quickly and substantially we act on climate change now. Seeing action on climate change as an investment in preventative health care is an important first step.

***The 2009 Black Saturday bushfires and the 2011 floods in Queensland showed that while top-down disaster response and recovery efforts play vital roles, local-level organisations are also critical. But as extreme weather events like the current heatwaves unfold, community organisations struggle to cope.***

- Ambulance transport and hospital admissions rise significantly during extreme weather events, straining emergency responders.<sup>15</sup>
- The Australian Council of Social Service (ACOSS) has said that many community organisations, which typically rely heavily on volunteers and provide a range of vital services, including support for young mothers, childcare, welfare and aged care, are likely to permanently collapse. This would leave society's most disadvantaged, including the elderly, mentally ill and the homeless, "at real and increased risk of death". Asked how long they would need to make alternative arrangements if their buildings or premises became inaccessible, a quarter of the 600-plus respondents to a national survey<sup>16</sup> said "they would fail completely", with a further 16 per cent

saying they would need at least a month to restart. Just one in nine of the community groups said they could reopen within a day.

## A global warning

By itself the current heatwave doesn't tell the whole story. Australia's average temperature, like that of the globe as a whole, continues to rise: by around 0.9°C in the last century (slightly higher than the global rise of nearly 0.8°C). Each decade since the 1970s has been hotter than the last.<sup>17</sup>

In the past half-century, there have been fewer cold days and nights and more hot days, hot nights and heat waves.<sup>18</sup>

In Australia, the majority of more intense fire seasons have occurred since the late 1990s, with seasons starting earlier and finishing later.<sup>19</sup> Modelling commissioned by The Climate Institute in 2007 by the Bushfire CRC and CSIRO found that, on present trends, the incidence of catastrophic fire days would nearly double by 2020 in south-eastern Australia. By 2050 Melbournians' risk a catastrophic fire day not once in every thirty-three years (as at present) but once every two and a half years.<sup>20</sup>

At the same time, atmospheric levels of carbon dioxide and other greenhouse gases are at record highs and continue to climb. Carbon dioxide and methane concentrations are the highest they have been for hundreds of thousands of years.

The extra heat energy in the climate system means that all weather now takes place in the context of a warmer and still-warming world.

Not every extreme weather event can be directly or wholly attributed to carbon pollution. But by continuing to pollute, we are almost certainly worsening some – loading the dice in favour of more frequent and more intense extreme events, such as bushfires, drought, and heat waves.

## For more information

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## ENDNOTES

- <sup>1</sup> The World Bank, *Turn Down the Heat*, A Report for the World Bank by the Potsdam Institute for Climate Impact Research and Climate Analytics, The World Bank (2012), <<http://climatechange.worldbank.org/content/climate-change-report-warns-dramatically-warmer-world-century>>, accessed 9 January 2012.
- <sup>2</sup> M. Hannam, 'Temperature off the charts as Australia turns deep purple' *The Age*, (9 January 2013), <<http://www.theage.com.au/environment/weather/temperatures-off-the-charts-as-australia-turns-deep-purple-20130108-2ce33.html>>, accessed 9 January 2013. [Link to Bureau of Meteorology included.]
- <sup>3</sup> citation
- <sup>4</sup> G. A. Bonanno et al. 'Weighing the Costs of Disaster: Consequences, Risk, and Resilience in Individuals, Families, and Communities', *Psychological Science in the Public Interest*, 11/1 (2010), 1–49.
- <sup>5</sup> <http://www.ncbi.nlm.nih.gov/pubmed/22083643>
- <sup>6</sup> <http://theconversation.edu.au/too-hot-to-sleep-heres-why-11492>
- <sup>7</sup> citation
- <sup>8</sup> T. J. Doherty & S. Clayton, 'The Psychological Impacts of Global Climate Change', *American Psychologist*, 66/4 (2011), 265–276.
- <sup>9</sup> citation
- <sup>10</sup> B. M. McDermott et al., 'Vulnerability factors for disaster-induced child post-traumatic stress disorder: the case for low family resilience and previous mental illness', *Australian and New Zealand Journal of Psychiatry*, 44/4 (2010), 384–389.
- <sup>11</sup> C. Bankhead, 'The Psychological Impacts of Hurricane Katrina Persist', [web page] (2007), <<http://www.medpagetoday.com/Psychiatry/AnxietyStress/7563>>, accessed 30 May 2011.
- <sup>12</sup> Doherty & Clayton, *Ibid.*
- <sup>13</sup> Australian Institute of Health and Welfare, *Mental health services in Australia 2007-08*, Cat. No. HSE 88, (Canberra: AIHW, 2010).
- <sup>14</sup> M. F. Hilton et al. 'Using the interaction of mental health symptoms and treatment status to estimate lost employee productivity', *Australian and New Zealand Journal of Psychiatry*, 44/2 (2010), 151–61.
- <sup>15</sup> [http://climatecommission.gov.au/wp-content/uploads/111129\\_FINAL-FOR-WEB.pdf](http://climatecommission.gov.au/wp-content/uploads/111129_FINAL-FOR-WEB.pdf)
- <sup>16</sup> [http://acoss.org.au/policy/climate\\_change\\_and\\_the\\_sector/climate\\_change\\_and\\_the\\_sector/](http://acoss.org.au/policy/climate_change_and_the_sector/climate_change_and_the_sector/)
- <sup>17</sup> CSIRO, 'Our Climate is Changing', (2011) <http://www.csiro.au/Outcomes/Climate/Understanding/Climate-is-changing.aspx>, accessed 9 January 2013.
- <sup>18</sup> CSIRO, *Ibid.*; S. E. Perkins, L. V. Alexander and J. R. Nairn, 'Increasing frequency, intensity and duration of observed global heatwaves and warm spells', *Geophys. Res. Lett.*, 39 (2012), L20714.
- <sup>19</sup> C. Lucas et al., *Bushfire Weather in Southeast Australia: recent Trends and Projected Climate Change Impacts*, (2007), <<http://www.climateinstitute.org.au/articles/publications/briefing-bushfire-weather-in-south-east-australia.html>>, accessed 9 January 2013.
- <sup>20</sup> O. Pechony & D. T. Shindell. 'Driving forces of global wildfires over the past millennium and the forthcoming century', *Proceedings of the National Academy of Sciences of the United States of America*, 107 (2010), 19167–19170.