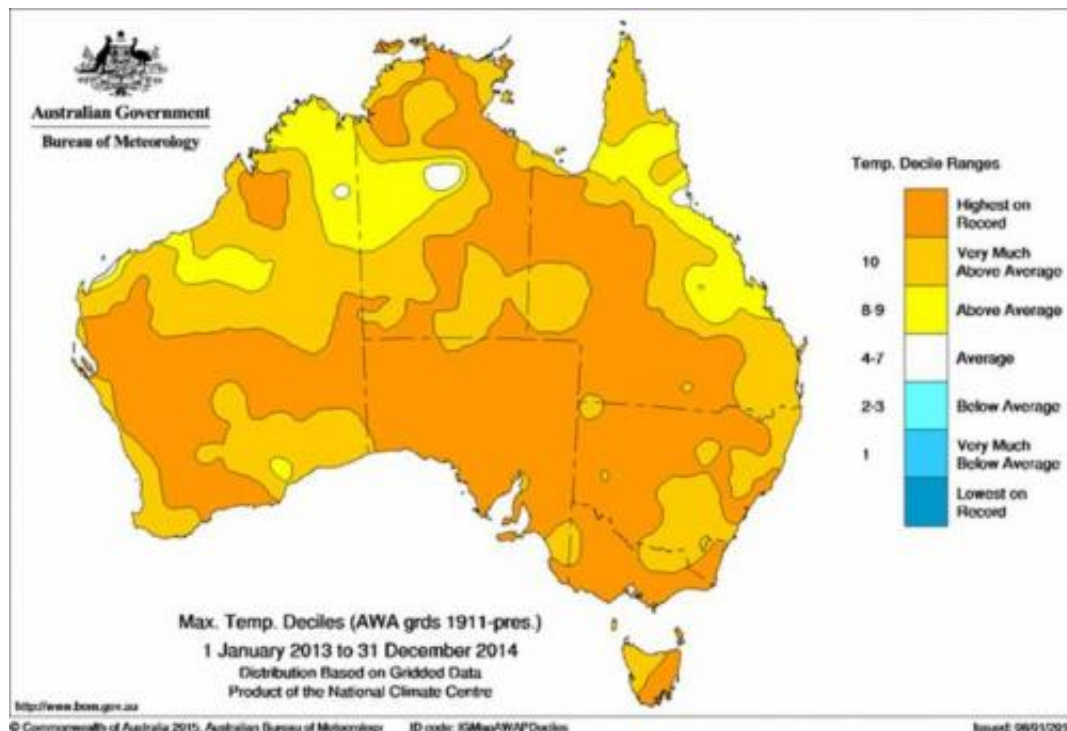


# Who's been affected by Australia's extreme heat? Everyone

January 30 2015, by Mary Voice



The past two years were the hottest ever recorded across much of Australia.  
Bureau of Meteorology, Author provided

Australia has been hit by two years of heat: 2013 was the hottest ever recorded and 2014 wasn't far behind, taking third place. The country has also sweltered through several significant heatwaves, and, though you might not have noticed them so much, episodes of unusual winter warmth too.

We regularly hear about the strong likelihood of a warmer future climate and the resulting plausible impacts. But occasionally we, as a community living on an already dry and warm continent, would do well to review what is happening right now. The past two years have given us the chance to do that.

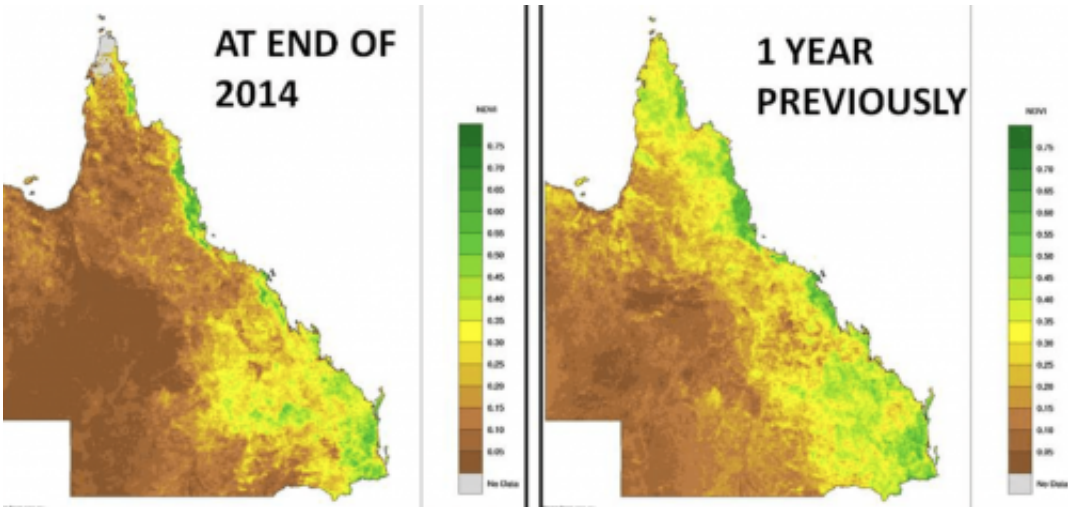
Who (and what) has been hit by this [heat](#), and how? The short answer is "everyone", but in the interest of thoroughness let's break it down a bit further.

## People who grow food

Farmers and graziers have suffered, particularly in drought-ridden Queensland, because extra heat means less effective rainfall. In semi-arid regions, a rise of 2C can lead to the loss of an extra 0.2 to 2 mm of water per day (depending on wind strength and other local factors) from soil, rivers, dams and [plant transpiration](#).

Before the Queensland drought began two years ago, water was plentiful from the 2010-12 wet phase. Not only did rainfall decline, but most of central Queensland has been about 1.5C warmer than normal for most of the past two years. This has accelerated the drought's impact, as surface water evaporated more quickly.

For a conservative estimate, the heat drove an extra loss of some 105-150mm from lakes, water holes and reservoirs over the two years, putting extra water stress on regional communities and farm water supplies. The Queensland pastoral and farming region has definitely been hit by the heat, as shown by the increase in brown tones and decline in yellow and green tones in the map on the left below.



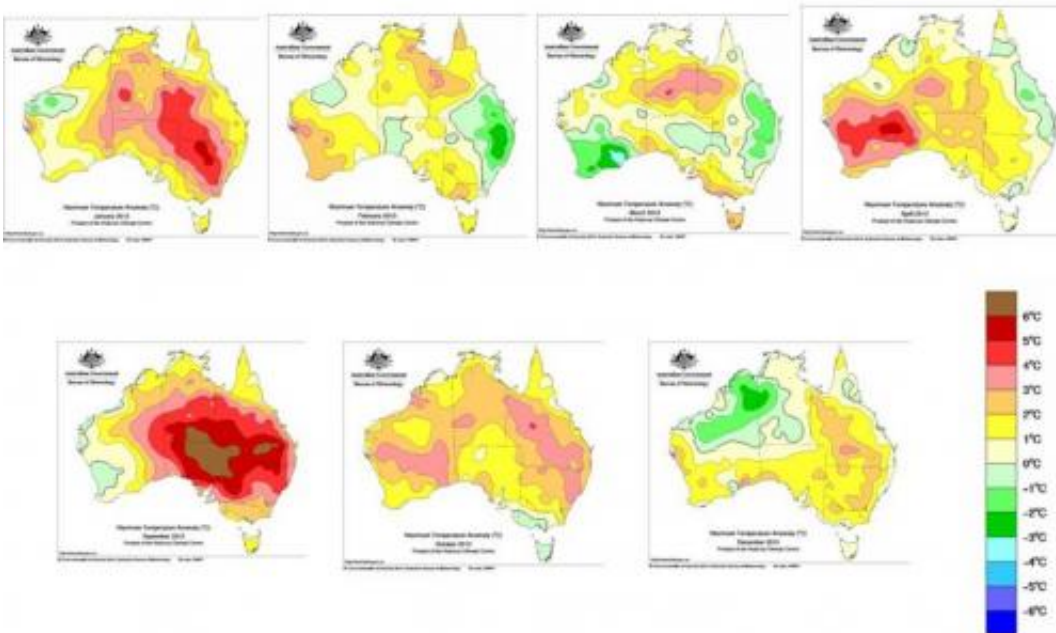
Changing vegetation index for Queensland. Bureau of Meteorology, Author provided

It's the same story in other parts of the country, where pasture and vegetation have been badly stressed by the combination of heat and drought. As a result, the national cattle herd is estimated to have [declined by more than 8%](#).

The 2013 national wheat crop was [down by about 11%](#) from the previous three-year average, due to drought and increased moisture stress from the [spring 2013 heatwave](#). The 2014 crop is [forecast to drop](#) by 14% for wheat, 22% for barley, and 12% for canola.

## People who eat food

## Hot warm season months in 2013 (Jan, Feb, Mar, Apr, Sep, Oct, Dec)



Warm-season months that were significantly hotter than average in 2013. Bureau of Meteorology, Author provided

Food-borne diseases [peak in the hotter months of the year](#) and their incidence is also [affected by heatwaves](#).

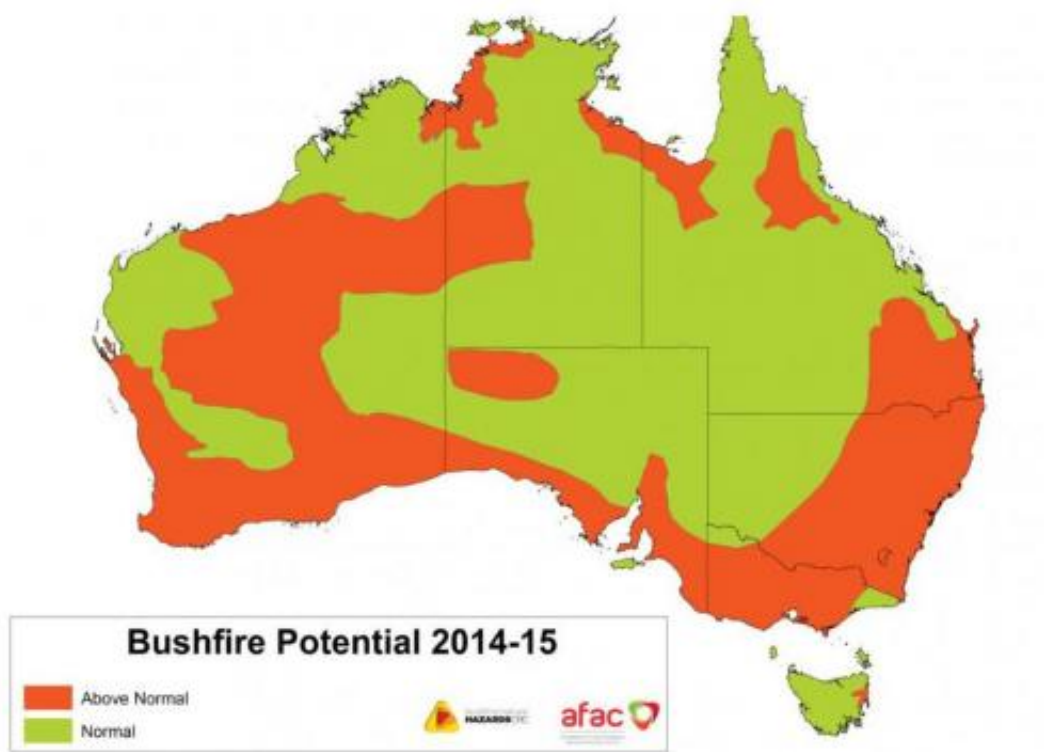
An [Australian National University study](#) identified about 10,000 gastroenteritis episodes, on average, per day in Australia and about 80 associated hospitalizations. Given the link between hot weather and food poisoning, just a few extra heatwave days across our major cities could potentially put hundreds of extra people at risk.

## People who fight bushfires

Fighting bushfires is a hazardous and exhausting task. Victoria was the

state hardest hit by bushfires in 2013, followed by South Australia and Western Australia. As a result of 2014's hot spring and the past dry six months, large areas of southern Australia are at [increased risk of bushfire](#) this summer. The recent fires in the Adelaide Hills, which [claimed 27 homes](#), have underlined the danger.

## SOUTHERN AUSTRALIA SEASONAL BUSHFIRE OUTLOOK 2014-15: NOVEMBER UPDATE



Much of Australia faces a worse-than-usual bushfire danger this summer  
 Bushfire and Natural Hazards Cooperative Research Council, Author provided

## People who work

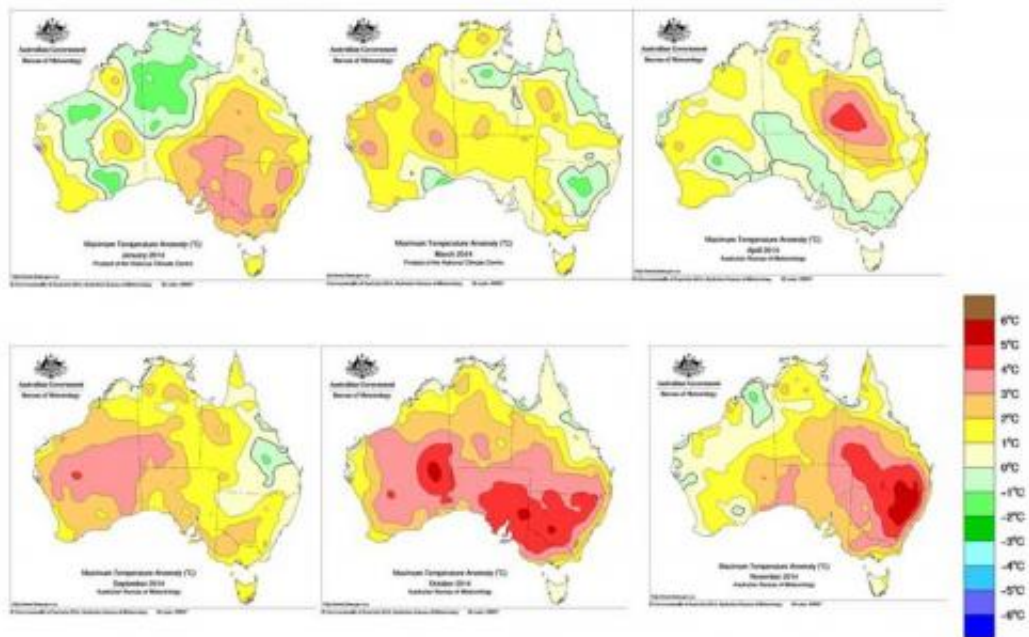
Productivity losses occur during heat waves, particularly for those working outdoors, doing physically active jobs, or working without air-conditioning.

Of course, people living in naturally hot environments, such as parts of Australia, do develop a certain level of resilience to heat, but there are limits. Heat stress occurs as air temperatures approach the body's core temperature of 37C (humidity, air movement and sun exposure are also factors). Australian National University researchers [have shown](#) that the capacity for strenuous physical activity drops off rapidly as heat loading increases above a coping threshold.

The exact effect is difficult to quantify – one [US-based study](#) estimated that heat stress has reduced labour capacity by about 10% in peak months, in tropical and mid-latitudes, with [northern Australia likely to be one of the hardest-hit places](#). Certainly, workers in Western Australia's mining heartland would have felt the effects of this month's heatwave, which featured [temperatures in the high 40s](#).



## Hot warm season months in 2014 (Jan, Mar, Apr, Sep, Oct, Nov)



Warm-season months that were significantly hotter than average in 2014. Bureau of Meteorology, Author provided

Over the past two years, 13 of the 16 warm season months (see maps below) have experienced heatwaves, here defined as a monthly average maximum temperature at least 3C above the long-term average across a substantial portion of Australia.

Thirteen months of extra heat stress in two years! And in some of those months, the anomaly exceeded 5C over areas larger than Tasmania.

The biggest working-in-heat problems are preventing dehydration and stopping the body's core temperature from rising. Research (see review [here](#)) suggests that for fit, healthy adults, dehydration is responsible for most of the problems of working in the heat, including reduced

productivity, higher accident rates and compensation claims. Chronic heat fatigue, known in the tropical north as "mango madness", is also a recognised contributor to work-related incidents in the hot summer months.

## **People who are very old or very young**

Heatwaves [kill more Australians than any other natural disaster](#). Most at risk are the very elderly, the very young and those with chronic health problems.

For example, reports of the January 2014 heatwave in Victoria estimate that there were [about 200 heat-related deaths](#) and many extra calls for ambulances or nursing services. A full national assessment for the years 2013 and 2014 (data are generally only available for individual heatwaves) would surely tell us that many people's health has been hit by the heat.

This list doesn't include other factors directly or indirectly exacerbated by persistent heat, including air-conditioning and refrigeration costs for industry and food storage, dams and water infrastructure, and the effects on livestock.

While many of us are familiar with the impacts of short, sharp heatwaves, it can be harder to appreciate the damage done by long periods of excess heat. But as the past two years have taught us, the impacts spread far and wide, and they affect us all.

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