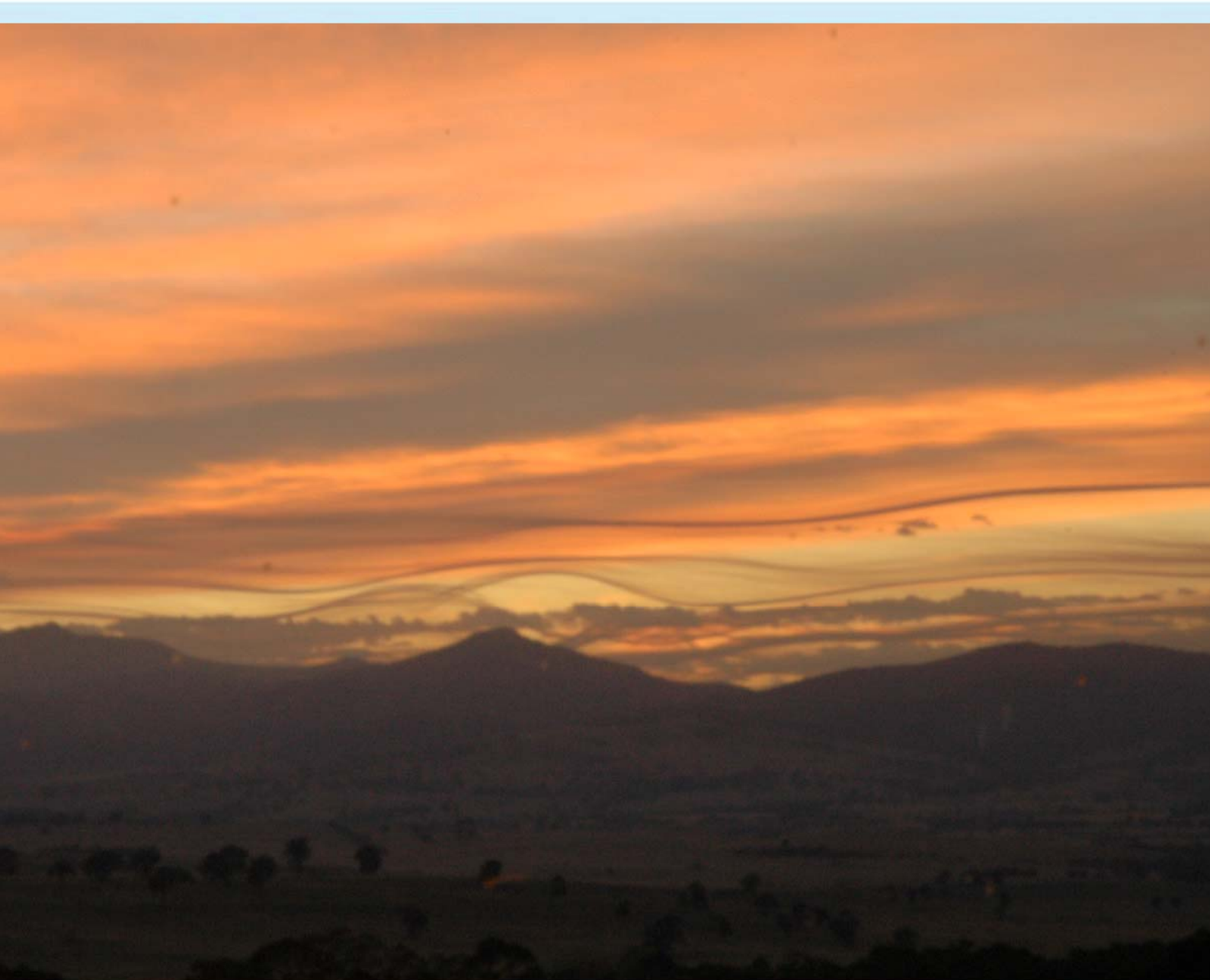




Australian Government
Bureau of Meteorology

Special Climate Statement 48 – one of southeast Australia’s most significant heatwaves

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1 Introduction

One of the most significant multi-day heatwaves on record affected southeast Australia over the period from 13 to 18 January 2014. A dome of very hot air developed over Western Australia in the second week of January, setting a number of records in that state, before moving eastwards to be over the southeast of the continent. A high-pressure system remained near-stationary over the Tasman Sea from the 13th onwards, directing mainly northerly winds over southeast Australia (including Tasmania), before a trough moved across the region on the 17th and 18th, bringing cooler air and ending the heatwave there.

The major area affected by the heatwave consisted of Victoria, Tasmania (particularly the western half), southern New South Wales away from the coast, and the southern half of South Australia. Over most parts of this region, it ranked alongside the heatwaves of January-February 2009, January 1939 and (from the limited information available) January 1908 as the most significant multi-day heatwaves on record. While peak temperatures mostly fell short of those observed in 2009 and 1939, extreme heat persisted for a longer period than it did in those heatwaves over some areas, particularly near-coastal regions of Victoria and South Australia (including Melbourne and Adelaide).

Numerous records were broken for extended periods of heat. Most notably, state-average data reveal that Victoria had its hottest four-day period on record, for both maximum and daily mean temperature. In both cases these surpassed records set in 2009, while for three-day periods the 2014 heatwave ranked second behind that of 2009. These two heatwaves, both of which have occurred in the last five years, stand ahead of any others recorded on a statewide basis. The heatwave was more notable for persistent heat than for individual extreme hot days, but some locations still had their hottest day on record, particularly in the southeast of South Australia, and around and to the west of the Snowy Mountains in New South Wales.

2 Detailed description of the heatwave

2.1 Evolution of the heatwave

Extreme heat initially developed in the Pilbara and Gascoyne regions of Western Australia from 8 January. Some very high temperatures occurred during this period, including 48.7°C at Onslow on 8 January, and 49.2°C at Emu Creek on 10 January. This heat moved south to cover much of the Southwest Land Division in Western Australia over the weekend of 11-12 January. Temperatures widely exceeded 45°C on one or both days of the weekend in the central and northern wheatbelt, and reached the low to mid 40s in coastal areas, including Perth, which also had its hottest night on record on 12 January.

Extreme heat moved into southeast Australia from 13 January onwards. Temperatures exceeded 40°C over much of South Australia and northern Victoria on the 13th, although seabreezes moderated conditions along parts of the coast. Winds across southeast Australia turned more northerly on the 14th, allowing extreme heat to extend to much of the Victorian coast. The 14th also saw the highest temperatures of the heatwave in parts of South Australia, and in western Tasmania.

The heat continued largely unabated over the southeast mainland (although less so in most of Tasmania) from the 15th to the 17th, and gradually extended northeastwards into southern inland New South Wales and the ACT. The most extreme heat finished on the 17th over South Australia and most of Victoria as a trough crossed both States, but very hot conditions continued into the 18th further north, in New South Wales and the far northeast of Victoria. Temperatures returned to near or below normal throughout the region from the 19th onwards.

2.2 The highest temperatures of the heatwave and notable site values

The highest absolute temperatures occurred in the initial phase of the event, in Western Australia. Emu Creek reached 49.2°C on 10 January, and Onslow 48.8°C on 8 January, while further south, Kellerberrin reached 47.5°C on the 12th, and Cunderdin, Mullewa and Murchison all reached 47°C.

In southeast Australia, temperatures peaked at 47.2°C at Keith West, in the Upper Southeast district of South Australia, on 14 January. The highest temperatures of the heatwave in Victoria and Tasmania also occurred on the 14th; 46.5°C at Charlton and 40.2°C at Bushy Park respectively. Another notable reading on the 14th was 38.6°C at

Scotts Peak, which equalled the highest temperature ever observed at any site in western Tasmania¹.

Temperatures remained high for the following three days. 46°C was exceeded in Victoria on both the 15th (46.2°C at Charlton) and the 17th (46.3°C at Avalon). The 17th was also the hottest day of the heatwave in New South Wales, with 45.5°C at Hay Airport. Very hot conditions continued into the 18th in New South Wales and the far northeast of Victoria before temperatures in those regions returned closer to normal levels from the 19th.

Relatively few site records were set at locations with 40 or more years of data in southeast Australia (Table 1), with most locations failing to surpass the peak values reached during the 2009 heatwave. The most significant records were set in the southeast of South Australia on the 14th, and in and to the west of the Snowy Mountains in New South Wales on the 16th. It was also notably warm at high-elevation locations in Tasmania on the 14th, with Mount Read (30.4°C) and Mount Wellington (29.8°C) both reaching their highest temperatures on record (Mount Read equalled this record again on the 16th). A few records were also set in Western Australia in the first phase of the heatwave, including Perth’s hottest night on record, 29.7°C on the 12th.

In Adelaide, the temperature reached 45.1°C on the 14th, the fourth-highest temperature on record for the city and the fifth occasion on which it has reached 45°C. Three of those five occasions have been in the last five years (in 2009, 2013 and 2014). At Canberra, where there were three days of 40°C or above, nine of the thirteen recorded days of 40°C or above have occurred in the last eight years (one in 2007, three in 2009, two in 2013, two in 2014).

Melbourne’s highest temperature peaked at 43.9°C, on both the 16th and 17th. These values were the equal ninth-highest on record, while the minima of 28.6°C and 27.0°C on the 15th and 16th rank third and sixth respectively. The daily mean temperature² of 35.45°C on the 16th was Melbourne’s highest on record, just surpassing the 35.4°C observed on 30 January 2009. All four instances of daily mean temperature of 35°C or above in Melbourne have occurred since 2009, two in 2009 and two in 2014. The combined maximum and minimum temperature is an important measure of heatwave intensity, as high night temperatures exacerbate the impact of hot days.

It reached 45°C in Victoria on three days during the heatwave. There have now been 21 calendar days in the period from 2001-2014 when it has reached 45°C at one or more Victorian locations (1.5 days per year), compared with 13 days in the 44 years

¹ This equalled 38.6°C at Strahan on 15 February 1982.

² Daily mean temperature is calculated as the mean of the maximum and minimum temperature.

(0.3 days per year) from 1957 to 2000 (Figure 1)³. This is an approximately fivefold increase in the average annual frequency of such temperatures.

On a number of occasions during the heatwave, temperatures rose sharply for a period during the night, as a result of outflows from nearby thunderstorms. At Laverton on the night of 14-15 January, temperatures rose to 38.6°C at 11.55 p.m., while in the early morning of 16 January, Bendigo reached 36.8°C at 4.37 a.m., and Longerenong 35.1°C at 6.00 a.m. Laverton’s 37.4°C at midnight on the 15th is the second-highest midnight temperature on record for any Victorian location, behind 37.5°C at Rutherglen on 8 February 2009, while Longerenong’s 35.1°C on the 16th is the third-highest 6 a.m. temperature on record in Victoria, after readings of 35.6°C at Wilsons Promontory on 29 January 2009 and 12 January 2010.

Another notable feature of the heatwave was the very large diurnal temperature ranges recorded at some inland locations. Westmere, in western Victoria, had a minimum of 5.0°C and a maximum of 39.3°C on the 13th. 34.3°C is the largest diurnal temperature range on record at any Victorian site, surpassing 34.1°C (34.0°C/–0.1°C) at Fiskville (near Ballan) on 12 January 1957. On the 17th, Canberra (39.7°C/11.2°C) had its largest diurnal range on record⁴, 28.5°C, while Braidwood (38.3°C/7.5°C) and Goulburn Airport (37.4°C/6.9°C) had diurnal ranges in excess of 30°C.

2.3 Extent and duration of the heatwave

The heatwave affected large parts of southeastern Australia (Figure 2), with maximum temperatures for the period 13-17 January 12°C or more above normal in most of Victoria, most areas of South Australia within 200 kilometres of the coast, and parts of central Tasmania.

The main focus was in Victoria. In Victoria, the statewide average maximum temperature exceeded 41°C on four successive days from 14 to 17 January (Table 2), surpassing the record of three successive days set in 2009. The daily mean temperature exceeded 32°C on three successive days, also breaking a record set in 2009, while four successive days with daily means in excess of 30°C matched the 2009 record. (Before this heatwave, there had only been four days with statewide mean temperatures exceeding 32°C, three in 2009 and one in 1959). Three consecutive days with statewide average minimum temperature exceeding 22°C broke the record of two

³ 1957 is taken as the starting point as daily data prior to 1957 have not yet been digitised at a number of key locations (e.g. Ouyen, Horsham, Echuca), and hence this indicator would miss a number of days with temperatures above 45°C prior to 1957.

⁴ The previous record was 28.4°C on three separate occasions, most recently on 18 January 2013.

set in 1997 and 2009. While no individual days set records at a state level in Victoria, two days during the heatwave ranked in the ten highest on record for both maximum and minimum temperature (Table 2), while three days had mean temperatures ranking in the all-time top seven. As for days reaching 45°C at individual locations, the frequency of days with a statewide mean temperature of 30°C has increased markedly since 2001 (Figure 3).

The peak period of the southern Australian heatwave occurred at the same time as below-normal temperatures, associated with a monsoonal low, affected much of the Northern Territory and northern Western Australia, and hence nationally-averaged temperatures fell well short of those experienced in January 2013.

2.4 Consecutive days with temperatures above thresholds

The heatwave was notable for its duration. Although peak temperatures generally fell short of those experienced during the 2009 heatwave, it lasted for longer in some locations, particularly near the coasts of Victoria and South Australia.

Some records set for consecutive days with maximum or minimum temperature above thresholds are shown in Table 3. The majority of these records occurred in near-coastal regions of South Australia and central and western Victoria, but there were also some in inland parts of Victoria and southern New South Wales, and in alpine areas.

Melbourne set records with four consecutive days of 41°C and above and two consecutive nights of 27°C and above, while Adelaide set a record with five consecutive days of 42°C and above. In both cases, the 2014 heatwave was less intense but longer than that of 2009 (when Melbourne and Adelaide had three and four consecutive days, respectively, of 43°C and above); conversely, it was more intense but shorter than that of 1908 (when the two cities had five and six consecutive days, respectively, of 40°C or above). Canberra also set a record with four consecutive days of 39°C. A detailed set of historical heatwave records for various thresholds for all three cities is given in Table 4. The heatwave index used in the Bureau’s heatwave forecasts reached its second-highest level on record for Melbourne, and its third-highest in Adelaide (in both cases the 2009 heatwave produced the highest value).

In general terms, the 2014 heatwave can be considered as broadly comparable for extended heat in coastal areas of Victoria and South Australia with those of 2009 and 1908, with the ranking of the three depending on the indicator used. In inland areas, while records were set locally, most locations fell short of benchmarks set in 2009 and

1939. It is difficult to make a full assessment of the 1908 heatwave as few stations in inland Victoria or New South Wales had data comparable with current standards⁵.

⁵ Stevenson screens had been installed at most South Australian stations, and at Melbourne and some other coastal Victorian stations, by January 1908, but most stations in inland areas of Victoria and southern New South Wales did not have Stevenson screens installed until later in 1908. Data from Mildura, where a Stevenson screen was installed in 1906, suggest that the 1908 heatwave was less significant there than the 1939, 2009 and 2014 heatwaves, with only one day over 44°C.

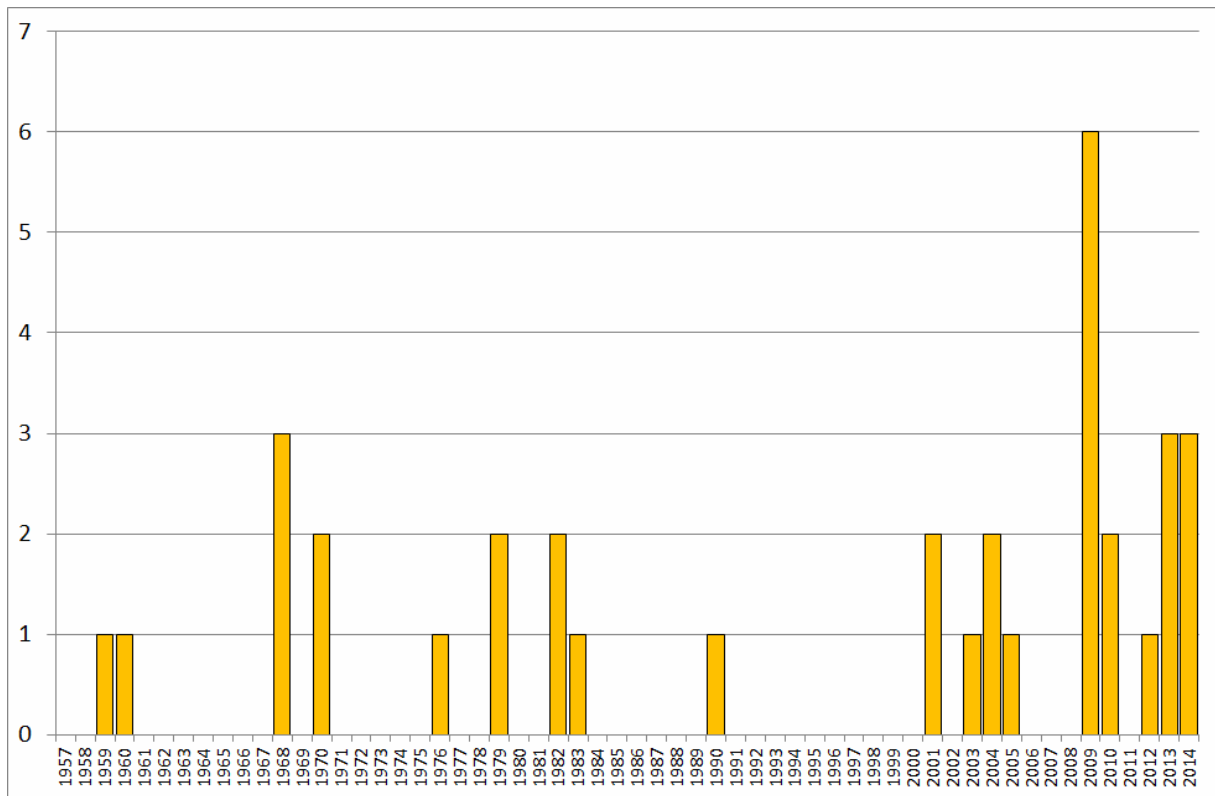


Figure 1. Number of days per year on which at least one location in Victoria has reached 45°C or above. (2014 data as of 19 January).

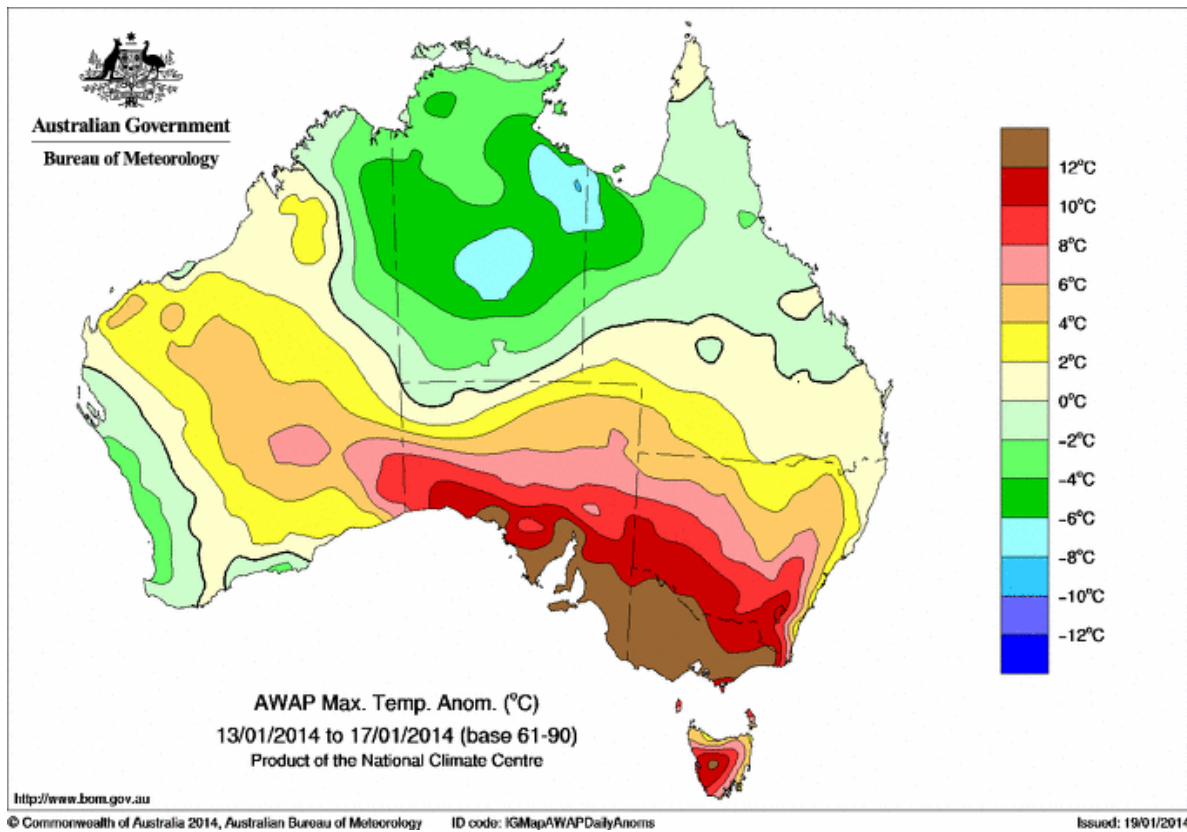


Figure 2. Maximum temperature anomalies for Australia, 13-17 January 2014.

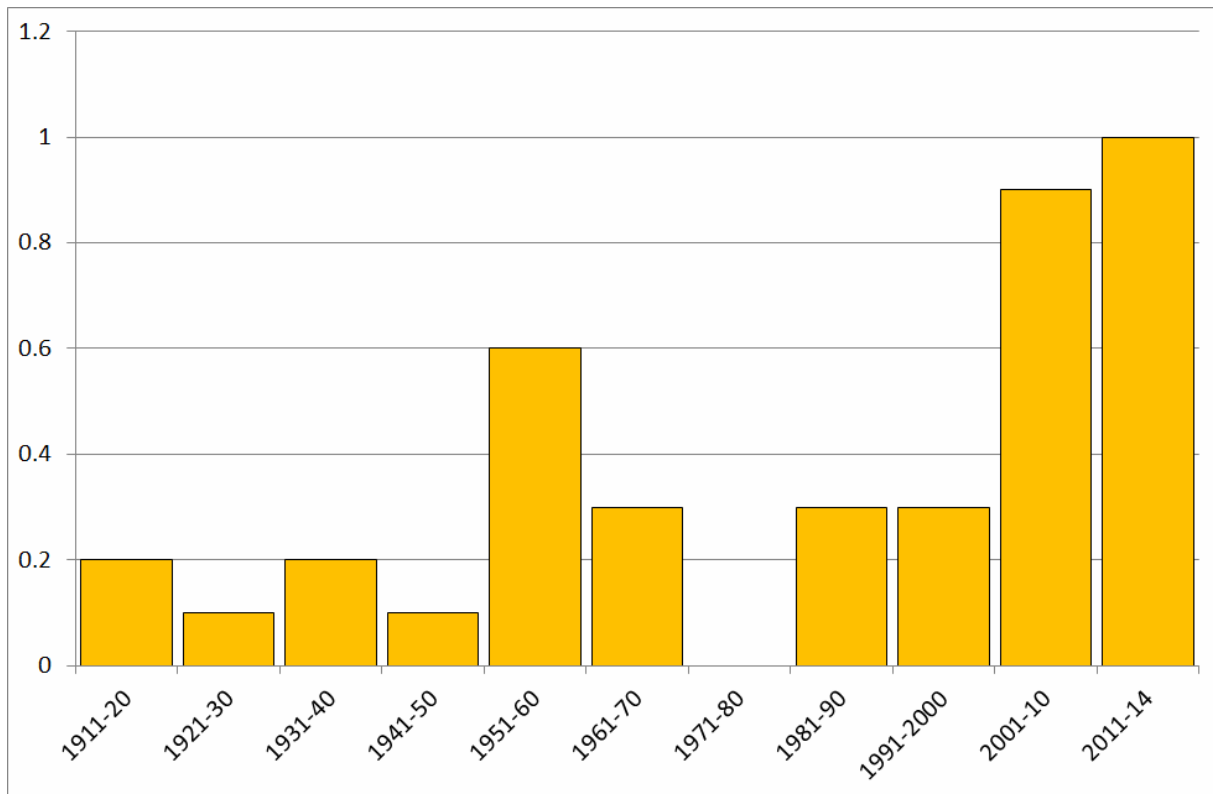


Figure 3. Average annual frequency of days with Victorian statewide mean temperature of 30°C or above, by decade.

Location	State	Site numbers	Value (°C)	Date	Previous record
<i>Maximum temperature</i>					
Emu Creek	WA	6072	49.2	10 Jan	49.1 (2/1/2010)
Kellerberrin	WA	10073	47.5	12 Jan	46.5 (10/1/2010) (Jan) 47.5 (3/2/2007) (all)
Northam	WA	10111	46.3	12 Jan	46.2 (3/1/2008)
York	WA	10144/10311	46.6	12 Jan	45.9 (3/1/2008)
Beverley	WA	10515	46.4	12 Jan	45.6 (3/1/1997)
Brookton	WA	10524	45.2	12 Jan	44.9 (3/1/1997)
Corrigin	WA	10536	45.9	12 Jan	44.9 (3/1/1997)
Lake Grace	WA	10592/10911	45.1	12 Jan	45.0 (3/1/1997)
Ongerup	WA	10622	44.5	12 Jan	44.1 (3/1/1997)
Pingelly	WA	10626	44.4	12 Jan	44.1 (3/1/1997)
Wagin	WA	10647	44.0	12 Jan	43.7 (3/1/1997, 26/12/2007)
Elliston	SA	18069	43.2	14 Jan	43.1 (13/1/1979, 10/1/1987)
Neptune Island	SA	18115	36.9	16 Jan	35.0 (23/1/1982) (Jan) 36.8 (8/2/1970) (all)
Cape Willoughby	SA	22803	42.2	14 Jan	41.5 (23/1/1982)
Keith	SA	25507	46.0	14 Jan	45.5 (28/1/2009)
Mount Gambier	SA	26020/26021	44.1	16 Jan	43.6 (4/1/2013 and 3 earlier occasions)
Naracoorte	SA	26023/26099	45.8	14 Jan	45.7 (28/1/2009)
Tumbarumba	NSW	72043	40.5	16 Jan	40.0 (5, 6/1/2013) (Jan) 40.2 (7/2/2009) (all)
Cabramurra	NSW	72091/72161	32.4	16 Jan	32.0 (23/1/2001, 18/1/2003, 30/1/2009)
Burrinjuck Dam	NSW	73007	42.5 (=)	16 Jan	42.5 (12/1/2007)
Stawell	VIC	79042/79080/ 79105	44.0 (=)	14 Jan	44.0 (31/1/1968)
Bairnsdale	VIC	84080/84108/ 85279	44.6	17 Jan	44.0 (25/1/2003)
Maryborough	VIC	88043	43.8	14 Jan	43.6 (30/1/2009)
Lake St. Clair	TAS	96015/96071	33.9	16 Jan	33.0 (24/1/1982, 20/1/1997)
Strathgordon	TAS	97053	36.2	14 Jan	35.5 (3/1/1991)
Strahan	TAS	97067/97072	38.0	14 Jan	36.2 (20/1/1973)

<i>Minimum temperature</i>					
Wongan Hills	WA	8137	30.5	12 Jan	29.4 (26/1/1968)
Perth Airport	WA	9021	28.5	12 Jan	27.8 (15/1/2013)
Perth Metro	WA	9034/9225	29.7	12 Jan	27.8 (21/1/1989) (Jan) 29.3 (3/2/1962 and 2 earlier occasions) (all)
Pearce	WA	9053	31.2	12 Jan	30.6 (31/1/1984)
Cape Borda	SA	22801/22823	29.1	16 Jan	27.4 (20/1/1973) (Jan) 28.2 (19/2/1997) (all)
Bendigo	VIC	81003/81123	28.6	16 Jan	27.8 (24/1/1952) (Jan) 28.0 (25/2/1968) (all)
Essendon	VIC	86038	28.8	15 Jan	26.7 (29/1/1943)
Moorabbin	VIC	86077	28.6	15 Jan	28.0 (21/1/1997)
Ararat	VIC	89000/89085	27.4	15 Jan	26.5 (3/1/1991) (Jan) 26.7 (15/2/1982) (all)
Cape Nelson	VIC	90014/90184	28.5	17 Jan	27.3 (5/1/2007)

Table 1. Records set during the event for highest maximum temperature at locations with 40 or more years of data. Values which set a record for any month are shown in bold.

1-day		3-day		4-day	
Average (°C)	Date	Average (°C)	Dates	Average (°C)	Dates
<i>Maximum temperature</i>					
44.48	7/2/2009	42.12	28-30/1/2009	41.73	14-17/1/2014
43.10	13/1/1939	41.71	14-16/1/2014	41.48	28-31/1/2009
42.86	31/1/1968	41.57	15-17/1/2014	40.87	27-30/1/2009
42.64	10/1/1939	41.42	29-31/1/2009	40.59	13-16/1/2014
42.41	24/1/1982	40.70	17-19/1/1959	40.05	29/1-1/2/2009
42.37	29/1/2009	40.38	27-29/1/2009	39.89	16-19/1/1959
42.33	30/1/2009	40.30	13-15/1/2014	39.09	31/1-3/2/1912
42.20	14/1/2014	39.82	16-18/1/1959	39.08	15-18/1/2014
41.89	25/1/2003	39.79	27-29/1/1943	38.95	17-20/1/1959
41.77	17/1/2014	39.43	9-11/1/2010	38.79	15-18/1/1959
<i>Minimum temperature</i>					
24.40	29/1/2009	22.81	29-31/1/2009	22.21	29/1-1/2/2009
24.24	12/1/2010	22.77	15-17/1/2014	22.07	15-18/1/2014
23.96	18/1/1959	22.09	6-8/2/1997	21.77	14-17/1/2014
23.72	21/1/1997	21.84	18-20/1/1959	21.72	28-31/1/2009
23.27	24/1/1952	21.77	28-30/1/2009	21.61	6-9/2/1997
23.14	25/2/1968	21.75	16-18/1/2014	21.25	17-20/1/1959
23.11	11/1/2008	21.56	14-16/1/2014	21.21	30/1-2/2/2009
23.03	15/1/2014	21.49	7-9/2/1997	21.11	5-8/2/1997
22.95	3/1/1991	21.48	30/1-1/2/2009	20.87	23-26/1/2001
22.86	16/1/2014	21.30	17-19/1/1959	20.48	14-17/1/1960
<i>Mean temperature</i>					
33.38	29/1/2009	32.17	15-17/1/2014	31.75	14-17/1/2014
32.41	30/1/2009	32.11	29-31/1/2009	31.60	28-31/1/2009
32.26	15/1/2014	31.95	28-30/1/2009	31.13	29/1-1/2/2009
32.15	16/1/2014	31.63	14-16/1/2014	30.57	15-18/1/2014
32.14	7/2/2009	31.00	17-19/1/1959	30.36	27-30/1/2009
32.13	18/1/1959	30.38	30/1-1/2/2009	30.10	17-20/1/1959
32.09	17/1/2014	30.01	16-18/1/2014	30.04	13-16/1/2014
31.58	24/1/1982	29.93	18-20/1/1959	29.71	16-19/1/1959
31.49	22/1/2006	29.68	1-3/2/1912	29.56	30/1-2/2/2009
31.45	31/1/1968	29.68	27-29/1/2009	29.43	31/1-3/2/1912

Table 2. The 10 highest values on record for statewide-average temperature for Victoria for periods of 1, 3 and 4 days. Values which occurred during the 2014 heatwave are shown in bold. The data set from which these values are drawn starts in 1911.

Location	State	Site numbers	Threshold (°C)	Number of days and dates	Previous record
<i>Maximum temperature</i>					
Ceduna	SA	18012	45 (=)	2 (14-15 Jan)	2 (29-30/1/2011 + 4 earlier occasions)
Kimba	SA	18040	42 (=)	4 (13-16 Jan)	4 (27-30/1/2009 + 2 earlier occasions)
Elliston	SA	18069	40 (=)	3 (14-16 Jan)	3 (30/10-1/11/1987, 27-29/1/2009)
Neptune Island	SA	18115	30 (=)	3 (14-16 Jan)	3 (1-3/2/1993, 18-20/2/2001)
Port Augusta	SA	16092/19036/ 19066/18201	45	5 (13-17 Jan)	3 (20-22/1/2006)
Snowtown	SA	21046/21133	45	3 (14-16 Jan)	2 (22-23/1/2001 + 2 earlier occasions)
Warooka	SA	22018	40	5 (13-17 Jan)	4 (27-30/1/2009)
Cape Borda	SA	22801/22823	35	5 (13-17 Jan)	4 (11-14/11/2009, 8-11/1/2010)
Kingscote	SA	22807/22841	40	3 (14-16 Jan)	2 (30-31/1/2011 + 2 earlier occasions)
			35 (=)	5 (13-17 Jan)	5 (11-15/11/2009)
Parafield	SA	23013	42 (=)	5 (13-17 Jan)	5 (27-31/1/2009)
Adelaide Airport	SA	23034	40 (=)	4 (14-17 Jan)	4 (27-30/1/2009)
Edinburgh	SA	23083	42 (=)	4 (14-17 Jan)	4 (27-30/1/2009)
Adelaide	SA	23000/23090	42	5 (13-17 Jan)	4 (27-30/1/2009)
Roseworthy	SA	23020/23122	45	3 (14-16 Jan)	2 (6-7/2/2009 + 2 earlier occasions)
			42	5 (13-17 Jan)	4 (29/12/2007-1/1/2008, 27-30/1/2009)
Victor Harbor	SA	23751/23804	35	5 (13-17 Jan)	4 (4-7/2/1967, 19-22/1/2006)
Renmark	SA	24016/24048	42 (=)	5 (13-17 Jan)	5 (27-31/1/2009)
Meningie	SA	24518	42	3 (14-16 Jan)	2 (28-29/1/2009)
			40 (=)	4 (13-16 Jan)	4 (27-30/1/2009)
Murray Bridge	SA	24521	42 (=)	4 (14-17 Jan)	4 (27-30/1/2009, 8-11/1/2010)
Strathalbyn	SA	23747/24580	40	5 (13-17 Jan)	4 (27-30/1/2009 + 2 earlier occasions)
Keith	SA	25507	42	4 (14-17 Jan)	3 (9-11/1/2010 + 2 earlier occasions)
Lameroo	SA	25509	40 (=)	5 (13-17 Jan)	5 (18-22/2/1997, 27-31/1/2009)
Coonawarra	SA	26045/26091	40 (=)	4 (13-16 Jan)	4 (27-30/1/2009)
Naracoorte	SA	26023/26099	42 (=)	3 (14-16 Jan)	3 (20-22/1/2006, 28-30/1/2009)
			40	5 (13-17 Jan)	4 (27-30/1/2009)
Goulburn	NSW	70037/70263	38	4 (15-18 Jan)	3 (6-8/2/2009)
Canberra Airport	ACT	70014/70351	39	4 (15-18 Jan)	3 (6-8/2/2009)
Thredbo Village	NSW	71041	30 (=)	4 (15-18 Jan)	4 (29/1-1/2/2009)
Tumbarumba	NSW	72043	38	5 (14-18 Jan)	4 (29/1-1/2/2009, 5-

					8/2/2009)
Albury	NSW	72059/72097/ 72146/72160	40 (=)	5 (14-18 Jan)	5 (28/1-1/2/2009)
Cabramurra	NSW	72091/72161	30	4 (15-18 Jan)	3 (6-8/2/2009)
Khancoban	NSW	72060/72162	40	4 (15-18 Jan)	3 (30/1-1/2/2009, 6-8/2/2009)
Hay	NSW	75031	42 (=)	5 (13-17 Jan)	5 (5-9/1/1979, 28/1-1/2/2009)
Walpeup	VIC	76064	42	5 (13-17 Jan)	3 (9-11/1/2010 + 4 earlier occasions)
Nhill	VIC	78031/78015	42 (=)	4 (14-17 Jan)	4 (28-31/1/2009)
Longerenong	VIC	79028	42 (=)	4 (14-17 Jan)	4 (28-31/1/2009)
Horsham	VIC	79023/79100	42 (=)	4 (14-17 Jan)	4 (28-31/1/2009)
Stawell	VIC	79042/79080/ 79105	40 (=)	4 (14-17 Jan)	4 (28-31/1/2009)
Echuca	VIC	80015	42 (=)	4 (14-17 Jan)	4 (28-31/1/2009)
Kyabram	VIC	80091	42 (=)	4 (14-17 Jan)	4 (28-31/1/2009)
Tatura	VIC	81049	40 (=)	4 (14-17 Jan)	4 (28-31/1/2009)
Bendigo	VIC	81003/81123	42 (=)	4 (14-17 Jan)	4 (28-31/1/2009)
Shepparton	VIC	81084/81125	42 (=)	4 (14-17 Jan)	4 (28-31/1/2009)
Rutherglen	VIC	82039	40 (=)	5 (14-18 Jan)	5 (11-15/1/1939, 28/1-1/2/2009)
Wangaratta	VIC	82053/82138	38 (=)	7 (12-18 Jan)	7 (26/1-1/2/2009)
Corryong	VIC	82011/82169	40	5 (14-18 Jan)	4 (29/1-1/2/2009, 5-8/2/2009)
			38	8 (12-19 Jan)	5 (28/1-1/2/2009, 4-8/1/2013)
Benalla	VIC	82002/82170	38	7 (12-18 Jan)	5 (20-24/1/1973, 28/1-1/2/2009)
Omeo	VIC	83025/83090	35	5 (13-17 Jan)	4 (28-31/1/2009 + 2 earlier occasions)
Bairnsdale	VIC	84080/84108/ 85279	40 (=)	2 (14-15 Jan)	2 (29-30/1/2009 + 3 earlier occasions)
Essendon	VIC	86038	42	4 (14-17 Jan)	3 (28-30/1/2009)
Melbourne	VIC	86071	41	4 (14-17 Jan)	3 (28-30/1/2009 + 2 earlier occasions)
Moorabbin	VIC	86077	40	4 (14-17 Jan)	3 (28-30/1/2009)
Scoresby	VIC	86104	40	4 (14-17 Jan)	3 (28-30/1/2009)
Melbourne Airport	VIC	86282	42	4 (14-17 Jan)	3 (28-30/1/2009)
Laverton	VIC	87031	40	4 (14-17 Jan)	3 (17-19/1/1959, 28-30/1/2009)
Lake Eildon	VIC	88023	40 (=)	4 (14-17 Jan)	4 (28-31/1/2009)
Mangalore	VIC	88109	42 (=)	4 (14-17 Jan)	4 (28-31/1/2009)
Ballarat	VIC	89002	38 (=)	4 (14-17 Jan)	4 (17-20/2/1914)
Hamilton	VIC	90044/90173	40 (=)	3 (14-16 Jan)	3 (17-19/1/1959, 28-30/1/2009)
			38	5 (13-17 Jan)	4 (27-30/1/2009)
Colac	VIC	90022/90147/ 90174/90035	38	4 (14-17 Jan)	3 (28-30/1/2009 + 2 earlier occasions)
Casterton	VIC	90135/90182	40 (=)	4 (13-16 Jan)	4 (27-30/1/2009)
Marrawah	TAS	91223	30 (=)	2 (15-16 Jan)	2 (29-30/1/2009)

King Island	TAS	98001/98017	30 (=)	3 (15-17 Jan)	3 (16-18/2/2007 + 2 earlier occasions)
<i>Minimum temperature</i>					
Cleve	SA	18014	30	2 (16-17 Jan)	No past instance of 2 or more
Maitland	SA	22008	25	4 (14-17 Jan)	3 (30/1-1/2/2011 + 5 earlier occasions)
Warooka	SA	22018	25	3 (15-17 Jan)	2 (19-20/1/1973, 2-3/2/1993)
Meningie	SA	24518	25	3 (13-16 Jan)	No past instance of 2 or more
Strathalbyn	SA	23747/24580	20 (=)	4 (14-17 Jan)	4 (1-4/2/1993, 28-31/1/2009)
Keith	SA	25507	25 (=)	3 (15-17 Jan)	3 (20-22/1/2006)
Cabramurra	NSW	72091/72161	20	3 (16-18 Jan)	2 (5-6/1/2013 + 2 earlier occasions)
Ouyen	VIC	76047	25 (=)	3 (15-17 Jan)	3 (29-31/1/2009 + 2 earlier occasions)
Swan Hill	VIC	77042/77094	25 (=)	3 (15-17 Jan)	3 (2-4/1/1991, 3-5/2/2000)
Kerang	VIC	80023	25	4 (14-17 Jan)	3 (2-4/1/1991, 6-8/2/1997)
Melbourne	VIC	86071	27	2 (15-16 Jan)	No past instance of 2 or more
			25 (=)	3 (15-17 Jan)	3 (18-20/2/1968)
Castlemaine	VIC	88014/88110	25	2 (16-17 Jan)	No past instance of 2 or more
Colac	VIC	90022/90147/ 90174/90035	20 (=)	3 (15-17 Jan)	3 (29-31/1/2009 + 3 earlier occasions)

Table 3. Locations which set records for the most consecutive days with temperatures at or above the stated threshold.

Threshold (°C)	Adelaide		Melbourne		Canberra Airport	
	Number of days	Dates	Number of days	Dates	Number of days	Dates
45	1	14/1/2014 + 4 other occasions	1	7/2/2009 + 2 other occasions	0	
44	2	9-10/1/1939, 12-13/1/1939	2	29-30/1/2009	0	
43	4	27-30/1/2009	3	28-30/1/2009	0	
42	5	13-17/1/2014	3	28-30/1/2009	1	1/2/1968, 18/1/2013
41	5	13-17/1/2014 + 2 other occasions	4	14-17/1/2014	2	31/1-1/2/1968
40	6	14-19/1/1908, 27/1-1/2/2009	5	16-20/1/1908	3	6-8/2/2009
39	6	27/1-1/2/2009 + 2 other occasions	6	15-20/1/1908	4	15-18/1/2014
38	12	6-17/3/2008	6	15-20/1/1908	4	22-25/1/1952, 15-18/1/2014
37	13	5-17/3/2008	6	15-20/1/1908	5	6-10/1/1979, 14-18/1/2014
36	13	5-17/3/2008	6	15-20/1/1908, 13-18/1/1981	5	14-18/1/2014 + 4 other occasions
35	15	3-17/3/2008	6	15-20/1/1908, 13-18/1/1981	9	21-29/1/1947

Table 4. Maximum number of days with maximum temperature at or above thresholds at Adelaide, Melbourne and Canberra. Values which occurred during the 2014 heatwave are shown in bold.

Further information

This statement is based on data available as of 19 January 2014. Some changes may occur as a result of late-arriving data or the Bureau’s routine quality control procedures.

Temperature data prior to 1910 are generally not used for the purposes of this Statement due to the lack of standardisation of instrument shelters, making most pre-1910 observations not strictly comparable with more recent data. However, data which are known to have been measured in a Stevenson screen are included. This includes Melbourne data from 1 January 1908, and Adelaide data from 1 January 1887.