

SPECIAL CLIMATE STATEMENT 43 – INTERIM

Extreme January heat

Last update 9 January, 2013

*Climate Information Services
Bureau of Meteorology*

Note: This statement is based on data available as of 9 January 2013 which may be subject to change as a result of standard quality control procedures.

Introduction

Large parts of central and southern Australia are currently under the influence of a persistent and widespread heatwave event. This event is ongoing with further significant records likely to be set. Further updates of this statement and associated significant observations will be made as they occur, and a full and comprehensive report on this significant climatic event will be made when the current event ends.

The last four months of 2012 were abnormally hot across Australia, and particularly so for maximum (day-time) temperatures. For September to December (i.e. the last four months of 2012) the average Australian maximum temperature was the highest on record with a national anomaly of +1.61 °C, slightly ahead of the previous record of 1.60 °C set in 2002 (national records go back to 1910). In this context the current heatwave event extends a four month spell of record hot conditions affecting Australia. These hot conditions have been exacerbated by very dry conditions affecting much of Australia since mid 2012 and a delayed start to a weak Australian monsoon.

The start of the current heatwave event traces back to late December 2012, and all states and territories have seen unusually hot temperatures with many site records approached or exceeded across southern and central Australia. A full list of records broken at stations with long records (>30 years) is given below.

The current heatwave event commenced with a build up of extreme heat in the southwest of Western Australia from 25-30 December 2012 as a high in the Bight and a trough near the west coast directed hot easterly winds over the area. Particularly hot conditions were observed on the 30th, with Cape Naturaliste observing 37.7 °C, its hottest December day in 56 years of record.

From 31 December the high pressure system began to shift eastward, bringing well above average temperatures across southern WA between the 30 December and 2 January. Temperatures reached 47.7 °C at Eyre on the 2nd its hottest day in 24 years of record, while Eucla recorded 48.2 °C on the 3rd, its hottest day since records began in 1957.

By 4 January the high pressure system had moved off eastern Australia, with northerly winds directing very hot air into southeast Australia, while southerly winds eased temperatures in WA. Hobart experienced a minimum temperature of 23.4 °C on the 4th (its hottest January night on record), followed by a maximum of 41.8 °C (its hottest maximum temperature on record for any month in 130 years of records) and the highest temperature observed anywhere in southern Tasmania.

The area of intense heat moved northeast on the 5th as the high pressure system, now centred over the Tasman Sea, and a low pressure trough directed hot northerly winds into the Riverina and western NSW. Areas affected recorded temperatures well in excess of 40 °C, with Marree in SA recording 48.4 °C, Yarrowonga in VIC recording 45.7 °C and Hay in NSW recording 47.7 °C, breaking its annual daytime temperature record.

The area of intense heat lingered over eastern SA and the southern half of NSW until 8 January when the high pressure system in the Tasman Sea began to move eastward. On 8 January, north-westerly winds ahead of a cold front extended the

influence of the heatwave to the coast of NSW with temperatures reaching 41 °C in Bega, 42.4 °C in Nowra and 42.4 °C at Sydney Observatory Hill.

Western Australia saw a second wave of recording breaking heat on 8 January as a second high pressure system moved into the Great Australian Bight directing hot easterly winds in the state. The highest temperature recorded in WA on 8 January was 48.3 °C at Leonora, breaking Leonora's previous record of 47.8 °C with temperatures above 45 °C widespread in interior Western Australia.

Record-breaking daily temperatures

Tables 1 to 3 below give a list of all significant daily maximum and minimum temperature records broken during the course of this heatwave event to date. Many stations have also approached but not exceeded historical records including Adelaide (45.0 °C, its fourth warmest day on record). Many stations with shorter periods of observation (i.e., less than 30 years) have also broken records.

Maximum temperatures recorded in each state during the course of the events

Tables 4 and 5 below give a list of the highest maximum and minimum temperatures recorded in each state over the course of the heatwave event.

Contacts for further information

The following climatologist may be contact for further information about this event:

Dr Karl Braganza (03) 9669 5344
Dr David Jones (03) 9669 4085
Dr Aaron Coutts-Smith (02) 9296 1525

General notes

Values in this statement are current as of 9 January 2013, and subject to the Bureau's normal quality control processes.

Table 1: New daily maximum temperature records set during the event (stations with 30 or more years of historical records). Highlighted records indicate the monthly record is also an annual record.

Station number	Location	State	Temperature (°C)	Date	Previous Record	Date	Years of record
9519	Cape Naturaliste	WA	37.7	30-Dec	37.6	26/12/2007	56
9842	Jarrahwod	WA	40.5	30-Dec	40.5	26/12/2007	38
11003	Eucla	WA	48.2	3-Jan	47.9	3/01/1979	53
94029	Hobart	TAS	41.8	4-Jan	40.8	4/01/1976	120
94008	Hobart Airport	TAS	40.3	4-Jan	40.1	3/01/1991	55
95003	Bushy Park	TAS	40.3	4-Jan	39.5	20/01/1973	53
92027	Orford	TAS	38.8	4-Jan	38.7	21/01/1997	45
92045	Larapuna	TAS	36.5	4-Jan	36.1	16/01/1960	56
97053	Strathgordon Village	TAS	34.8	4-Jan	34.5	4/01/1976	32
91223	Marawah	TAS	33.2	4-Jan	33	29/01/2009	42
94087	Mount Wellington	TAS	29.5	4-Jan	29.2	22/01/2006	34
90171	Portland	VIC	42.1	4-Jan	41.6	26/01/2006	31
23034	Adelaide Airport	SA	44.1	4-Jan	44	28/01/2009	58
18040	Kimba	SA	46	4-Jan	45.6	31/01/1968	46
15511	Curtin Springs	NT	45.6	4-Jan	45.5	28/01/2011	49
17110	Leigh Creek Airport	SA	46.2	5-Jan	46.1	25/01/2011	31
75031	Hay (Miller St)	NSW	47.7	5-Jan	46	23/01/2001	56
72043	Tumbarumba	NSW	40	5-Jan	39.8	30/01/2009	46
17110	Leigh Creek Airport	SA	46.3	6-Jan	46.2	5/01/2013	31
72043	Tumbarumba	NSW	40	6-Jan	39.8	30/01/2009	46
12046	Leonora	WA	47.8	7-Jan	47.8	1/01/1957	57
15511	Curtin Springs	NT	45.7	8-Jan	45.6	4/01/2013	49
15603	Kulgera	NT	44.9	8-Jan	44.9	28/01/2011	33
12046	Leonora	WA	48.3	8-Jan	47.8	17/01/1958	57
12090	Yeelirrie	WA	47.9	8-Jan	45.8	7/01/1983	40
7139	Paynes Find	WA	47.2	8-Jan	46.5	20/01/1991	34
7045	Meekatharra Airport	WA	47.1	8-Jan	45.7	5/01/2008	63
13017	Giles MO	WA	45.6	8-Jan	44.8	28/01/2011	57

Table 2: New daily minimum temperature records set during the event (stations with 30 or more years of historical records). Highlighted records indicate the monthly record is also an annual record.

Station number	Location	State	Temperature (°C)	Date	Previous Record	Date	Years of record
9225	Perth Metro	WA	27.3	29-Dec	27.1	18/12/1979	115
9021	Perth Airport	WA	27.5	29-Dec	26.9	24/12/1960	69
9111	Karnet	WA	23.5	29-Dec	22.6	29/12/2009	47
9519	Cape Naturaliste	WA	24.3	30-Dec	24.3	26/12/2007	56
9518	Cape Leeuwin	WA	23.8	1-Jan	23.5	26/01/2012	107
94029	Hobart	TAS	23.4	4-Jan	22.9	10/01/1887	120
94008	Hobart Airport	TAS	21.8	4-Jan	21.2	3/01/2012	55
94010	Cape Bruny Lighthouse	TAS	20.4	4-Jan	20	16/01/1960	57
71032	Thredbo AWS	NSW	17.1	5-Jan	17	26/01/2003	33
84070	Point Hicks	VIC	25	5-Jan	23.8	3/01/2012	47
75031	Hay (Miller St)	NSW	31	8-Jan	31	24/01/2001	56
75041	Griffith Airport	NSW	30	8-Jan	30	30/01/2006	37
71041	Thredbo Village	NSW	21	8-Jan	19.2	8/01/1979	42
10092	Merredin	WA	29.7	8-Jan	29.3	26/01/2011	48
9842	Jarrahwod	WA	26	8-Jan	24.3	12/01/1978	33
9518	Cape Leeuwin	WA	24.2	8-Jan	23.5	26/01/2012	107
9741	Albany Airport	WA	20.4	8-Jan	20	26/01/1974	48

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A particular feature of this heatwave event has been the exceptional spatial extent of high temperatures. The table below gives the national and state/territory average maximum temperature for each day of the heatwave event. Australia set a new record for the highest national area-average temperature, recording 40.33 °C and surpassing the previous record set on 21 December 1972 (40.17 °C). To date (data up to the 8 January 2013) the national area-average for each of the first 8 days of 2013 have been in the top 20 hottest days on record, with 8 January the third hottest on record and the first time 7 consecutive days over 39 °C has ever been recorded for Australia.

On Monday Australia recorded a new area-averaged mean temperature (average of the maximum and minimum) record of 32.23 °C, surpassing the old record of 31.86 °C set on 21 December 1972. This new record was subsequently broken on 8 January (32.36 °C), making 7-8 January 2013 also Australia's hottest 2-day period on record.

Table 3: Daily area average maximum temperatures to date.

Area-averaged maximum temperature each day of the event (°C)								
	Record	Date	29-Dec-12	30-Dec-12	31-Dec-12	1-Jan-13	2-Jan-13	3-Jan-13
Aust	40.2	21/12/1972	36.8	37.1	37.6	38.6	39.2	39.6
QLD	41.6	14/11/1915	37.4	37.3	35.6	36.0	38.8	39.3
NSW	44.1	14/01/1939	32.9	32.9	35.2	37.0	35.6	36.1
VIC	44.5	7/02/2009	26.0	27.1	29.6	29.7	28.1	36.8
TAS	33.3	30/01/2009	18.1	18.3	19.2	17.7	19.0	26.7
SA	45.3	2/01/1960	35.5	37.3	39.0	40.3	41.3	43.6
WA	43.0	31/12/1972	38.3	38.5	39.6	41.2	41.1	39.3
NT	42.9	27/12/1990	39.1	39.3	39.4	39.2	39.8	40.6

Table 3: continued

Area-averaged maximum temperature each day of the event (°C)							
	Record	Date	4-Jan-13	5-Jan-13	6-Jan-13	7-Jan-13	8-Jan-13
Aust	40.2	21/12/1972	39.3	39.3	39.7	40.3	40.1
QLD	41.6	14/11/1915	38.4	38.1	37.9	36.8	37.2
NSW	44.1	14/01/1939	39.4	41.1	40.1	39.9	39.6
VIC	44.5	7/02/2009	41.2	35.4	33.3	37.8	32.5
TAS	33.3	30/01/2009	33.0	24.5	24.5	27.1	21.8
SA	45.3	2/01/1960	43.8	40.5	41.8	43.4	41.4
WA	43.0	31/12/1972	37.4	39.2	40.9	42.4	42.7
NT	42.9	27/12/1990	40.9	40.4	39.8	40.1	40.5

Table 4: State high maximum temperatures recorded each day of the event.

Date	State	Daily Maximum Temperature (°C)	Location
29-Dec-12	WA	42.5	Gosnells City (9106)
30-Dec-12	WA	42.8	Telfer Aero (13030)
31-Dec-12	WA	43.9	Geraldton Airport (8315)
1-Jan-13	WA	46.1	Munglinup West (12044)
2-Jan-13	WA	47.7	Eyre (11019)
3-Jan-13	WA	48.6	Red Rocks Point
4-Jan-13	WA	42.5	Marble Bar (4106)
5-Jan-13	WA	43	Mullewa (8095)
6-Jan-13	WA	44.8	Warburton (13011)
7-Jan-13	WA	47.8	Leonora (12046)

8-Jan-13	WA	48.3	Leonora (12046) - PRELIMINARY – MAX 1:00 PM AEDST
30-Dec-12	SA	40.8	Moomba Airport (17123)
31-Dec-12	SA	43.4	Marree Comparison (17031)
1-Jan-13	SA	44	Marree Comparison (17031)
2-Jan-13	SA	45.3	Oodnadatta airport (17043)
3-Jan-13	SA	46.8	Nullarbor (18106)
4-Jan-13	SA	48.2	Wudinna (18083)
5-Jan-13	SA	48.4	Marree comparison (17031)
6-Jan-13	SA	48.2	Marree comparison (17031)
7-Jan-13	SA	47.5	Oodnadatta airport (17043)
8-Jan-13	SA	48.4	Marree comparison (17031) - PRELIMINARY – MAX 1:00 PM AEDST
31-Dec-12	VIC	35.5	Mildura Airport (76031)
1-Jan-13	VIC	36.4	Mildura Airport (76031)
2-Jan-13	VIC	34.1	Mildura Airport (76031)
3-Jan-13	VIC	40	Mildura Airport (76031), Hopetoun (71010)
4-Jan-13	VIC	45.2	Hopetoun Airport (71010)
5-Jan-13	VIC	45.7	Yarrawonga (81124)
6-Jan-13	VIC	42.4	Yarrawonga (81124)
7-Jan-13	VIC	44.2	Mildura Airport (76031)
8-Jan-13	VIC	38.9	Mildura Airport (76031) and Rutherglen Research (82039)- PRELIMINARY – MAX 1:00 PM AEDST
31-Dec-12	NSW	40.9	Wanaaring Post Office (48079)
1-Jan-13	NSW	43.3	Wanaaring Post Office (48079)
2-Jan-13	NSW	42.3	Mungindi Post Office (52020)
3-Jan-13	NSW	42.5	Lightning Ridge Visitors Information Centre (48243)
4-Jan-13	NSW	47.6	Pooncarie Mail Agency (46012)
5-Jan-13	NSW	47.9	Hay Airport (75019)
6-Jan-13	NSW	47.6	Wilcannia Aerodrome(46012)
7-Jan-13	NSW	46.8	Pooncarie Mail Agency (46012)
8-Jan-13	NSW	45.9	Wilcannia Aerodrome(46012) - PRELIMINARY – MAX 1:00 PM AEDST
3-Jan-13	TAS	35.4	Friendly Beaches (92114)
4-Jan-13	TAS	41.8	Hobart (94029)
5-Jan-13	TAS	34	Cressy Research Station (91306)
6-Jan-13	TAS	31	Cressy Research Station (91306)
7-Jan-13	TAS	35.6	Ouse Fire Station (95048)
8-Jan-13	TAS	31.9	Swansea (92148) - PRELIMINARY – MAX 1:00 PM AEDST
3-Jan-13	QLD	45.5	Birdsville Airport (38026)
4-Jan-13	QLD	47.3	Birdsville Airport (38026)
5-Jan-13	QLD	46.7	Birdsville Airport (38026)
6-Jan-13	QLD	46.3	Birdsville Airport (38026)
7-Jan-13	QLD	45.1	Birdsville Airport (38026)
8-Jan-13	QLD	44.6	Birdsville Airport (38026) - PRELIMINARY – MAX 1:00 PM AEDST
2-Jan-13	NT	43.2	Walungurru (15664)
3-Jan-13	NT	44	Watarrka (15652)
4-Jan-13	NT	45.6	Curtain Springs (15511)
5-Jan-13	NT	45.2	Yulara Aerodrome (15635) & Watarrka (15652)
6-Jan-13	NT	45.2	Yulara Aerodrome (15635)

7-Jan-13	NT	45.9	Yulara Aerodrome (15635)
8-Jan-13	NT	46.6	Walungurru (15664) - PRELIMINARY – MAX 1:00 PM AEDST

Table 5: State high minimum temperatures recorded each day of the event.

Date	State	Daily Minimum Temperature (°C)	Location
29-Dec-12	WA	30.5	Telfer Aero (13030)
30-Dec-12	WA	30.3	Mount Magnet Aero (7600)
31-Dec-12	WA	31.8	Telfer Aero (13030)
1-Jan-13	WA	29.6	Karratha Aero (4083)
2-Jan-13	WA	29	Bedout Island (4100)
3-Jan-13	WA	29	Troughton Island (1007)
4-Jan-13	WA	32	Wiluna (13012)
5-Jan-13	WA	30.2	Emu Creek Station (6072)
6-Jan-13	WA	30.1	Roebourne (4035)
7-Jan-13	WA	31.4	Telfer Aero (13030)
8-Jan-13	WA	32.4	Leonora (12046)
9-Jan-13	WA	33.1	Carnegie (13015) – PRELIMINARY – MIN to 1:00PM AEDST
3-Jan-13	SA	26.5	Cooberpedy Airport (16090)
4-Jan-13	SA	28	Elliston (18069)
5-Jan-13	SA	25.8	Andamooka (16065)
6-Jan-13	SA	29	Arkaroola (17099)
7-Jan-13	SA	30.9	Moomba (17123)
8-Jan-13	SA	30.4	Oodnadatta airport (17043)
9-Jan-13	SA	28.6	Moomba (17123) - PRELIMINARY – MIN 1:00 PM AEDST
4-Jan-13	VIC	25.1	Nhill Aerodrome (78015)
5-Jan-13	VIC	29	Echuca Aerodrome (80015)
6-Jan-13	VIC	22.6	Hunters Hill (82139)
7-Jan-13	VIC	21.6	Yarrawonga (81124)
8-Jan-13	VIC	25.2	Mildura Airport (76031)
9-Jan-13	VIC	13.4	Portland NTC (90192) - PRELIMINARY – MIN to 1:00PM AEDST
4-Jan-13	NSW	27.6	Bourke Airport AWS (48245)
5-Jan-13	NSW	29.9	Hay Airport (75019)
6-Jan-13	NSW	32	White Cliffs (46129)
7-Jan-13	NSW	30.1	Tibooburra (46037)
8-Jan-13	NSW	31.3	Ivanhoe Aerodrome (49000)
9-Jan-13	NSW	29.7	Cessnock Airport (61260) - PRELIMINARY – MIN to 1:00PM AEDST
4-Jan-13	TAS	23.4	Hobart (94029)
5-Jan-13	TAS	20.3	Flinders Island (99005)
6-Jan-13	TAS	14.8	Swan Island (92123)
7-Jan-13	TAS	14.3	Hobart (94029)
8-Jan-13	TAS	17	Flinders Island (99005)
9-Jan-13	TAS	12.8	Flinders Island (99005) - PRELIMINARY – MIN to 1:00PM AEDST
3-Jan-13	QLD	28.5	Boulia Airport (38003)
4-Jan-13	QLD	29.5	Boulia Airport (38003)

5-Jan-13	QLD	30.5	Birdsville Airport (38026)
6-Jan-13	QLD	31.1	Birdsville Airport (38026)
7-Jan-13	QLD	31.2	Ballera Gas Field (45009)
8-Jan-13	QLD	29	Boulia Airport (38003)
9-Jan-13	QLD	33.1	Thargomindah Airport (45025) - PRELIMINARY – MIN to 1:00PM AEDST
3-Jan-13	NT	28.4	Warruwi (14401)
4-Jan-13	NT	31.6	Kulgera (15603)
5-Jan-13	NT	29.1	Tennant Creek Airport (15135)
6-Jan-13	NT	28.5	Kulgera (15603)
7-Jan-13	NT	29.0	Walungurru (15664)
8-Jan-13	NT	30.7	Curtain Springs (15511)
9-Jan-13	NT	30.2	Curtain Springs (15511) - PRELIMINARY – MIN to 1:00PM AEDST

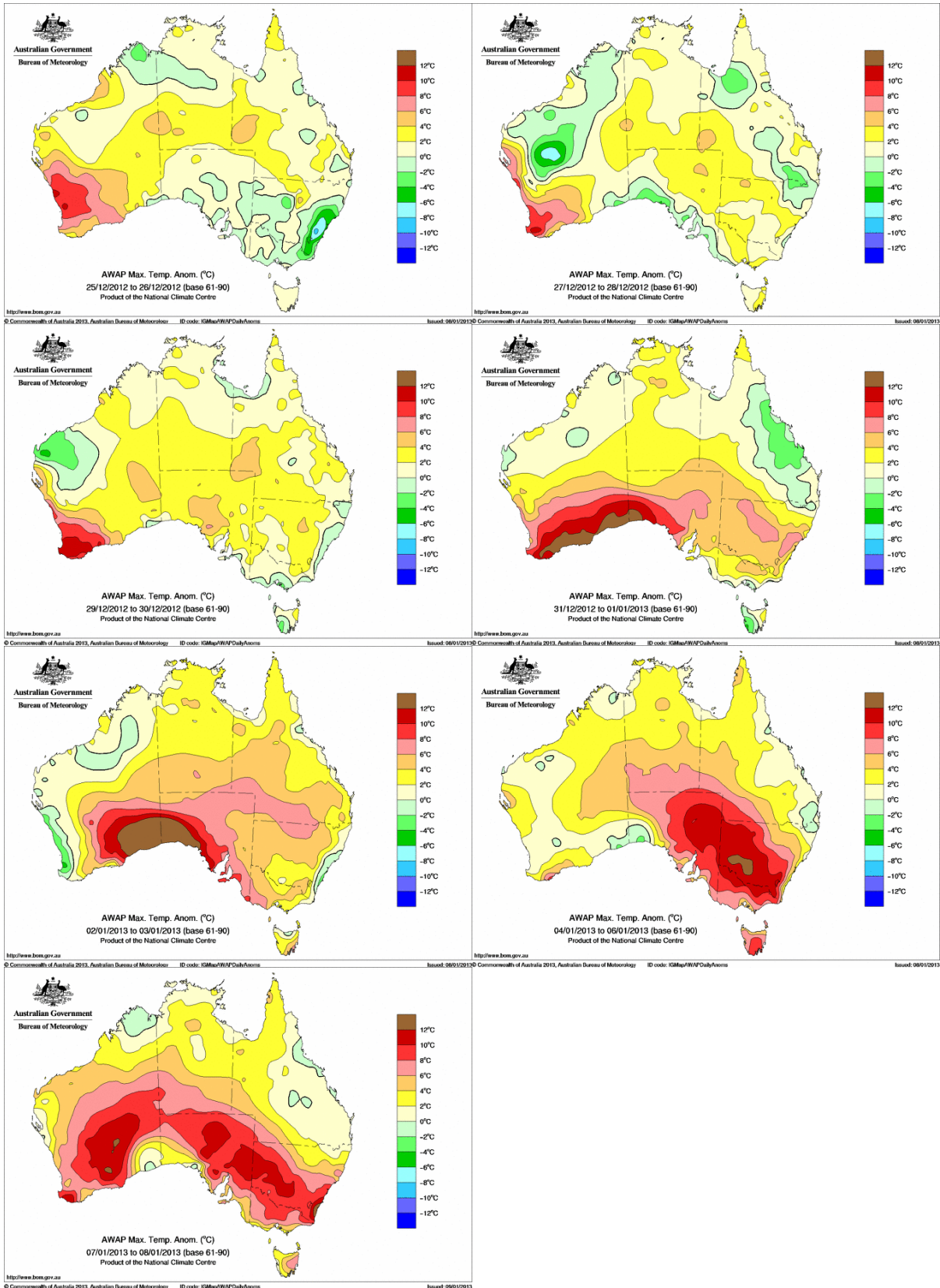


Figure 1: The maximum temperature anomaly from the 1961-1990 average for consecutive two day periods over the period 25 December 2012 to 8 Jan 2013. Units are °C.