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Special Climate Statement 62—exceptional September heat in eastern Australia

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Table of Contents

List of Tables

List of Figures

1 Introduction

On 22 September 2017, Australia as a whole had its warmest September day since national area-averaged temperature records began in 1911. In the following week, New South Wales and Queensland had their warmest September days on record, and South Australia, Victoria and the Northern Territory each had days in their top-10 warmest for September. More than 20% of Australia by area recorded its hottest September day on record during 22–29 September.

From the 20th of September, a high pressure system centred over New South Wales kept much of eastern and northern Australia mostly cloud free, despite some frontal cloud crossing the southern coastline (see Figure 1). With very low rainfall during most of the month, and below-average soil moisture[1], the sunny days quickly led to rapid heating of the land surface and overlying air in Central Australia, Queensland, and much of New South Wales.

By the 22nd, the high pressure system was located over the northern Tasman Sea, with an associated weak ridge over the southeast maintaining generally clear skies. The high became slow moving and remained over the Tasman, while a complex low pressure system tracked across the south of the Great Australian Bight, during the 23rd.

On the 23rd, maximum temperatures were more than 16 degrees warmer than average in some parts of the country (see Figure 2). Warm air was drawn along a vigorous surface trough extending from central and northern Australia into southern and eastern parts of the country. Hot, dry northerly winds ahead of the trough and cold front contributed to New South Wales, southern Queensland, and areas in neighbouring States experiencing unprecedented hot weather for this time of the year.

As the cold front crossed the southeast of the country overnight on the 23rd to 24th, a cool change moderated temperatures, although persistent northeasterly flow along the trough saw conditions remain very much warmer than average in northeast New South Wales and southern Queensland on the 24th.

A new high pressure system crossed the southeast into the Tasman Sea during the 26th and 27th, with northerly winds and exceptionally high temperatures again returning to much of Queensland, the east of the Northern Territory, and northern New South Wales.

Australia as a whole had its warmest September day on record on the 22nd. On the 23rd, New South Wales had its overall warmest September day on record.

[1] Root zone soil moisture was below average across much of central and eastern Australia.

In New South Wales on the 23rd, seven sites broke the State's previous high temperature record for September, with Wilcannia's 40.5 °C the hottest in the State and the first time a temperature of 40 degrees or more had been observed in New South Wales in September. This record was surpassed four days later when a temperature of 41.4 °C was observed at Wanaaring on the 27th. During this week, almost 70% of New South Wales by area had its hottest September day on record.

On the 23rd, the warmth also extended south into Victoria with Mildura recording 37.7 °C—a new Victorian high-temperature record for September.

By the 27th, the heat was concentrated further north and Queensland as a whole experienced its warmest September day on record. Birdsville reached 42.8 °C on the 27th, setting a new Queensland record for the hottest September temperature in the State—beating the previous Queensland record of 42.4 °C at the same site on 22 September 2003.

From the 23rd to the 29th, 31 ACORN-SAT locations (out of 62 locations that make up the Bureau's high quality, long-term temperature dataset across mainland eastern Australia) had recorded their hottest September day on record: 18 in New South Wales and Australian Capital Territory; 5 in Victoria; and 8 in Queensland. There was also a record at Tennant Creek in the Northern Territory.

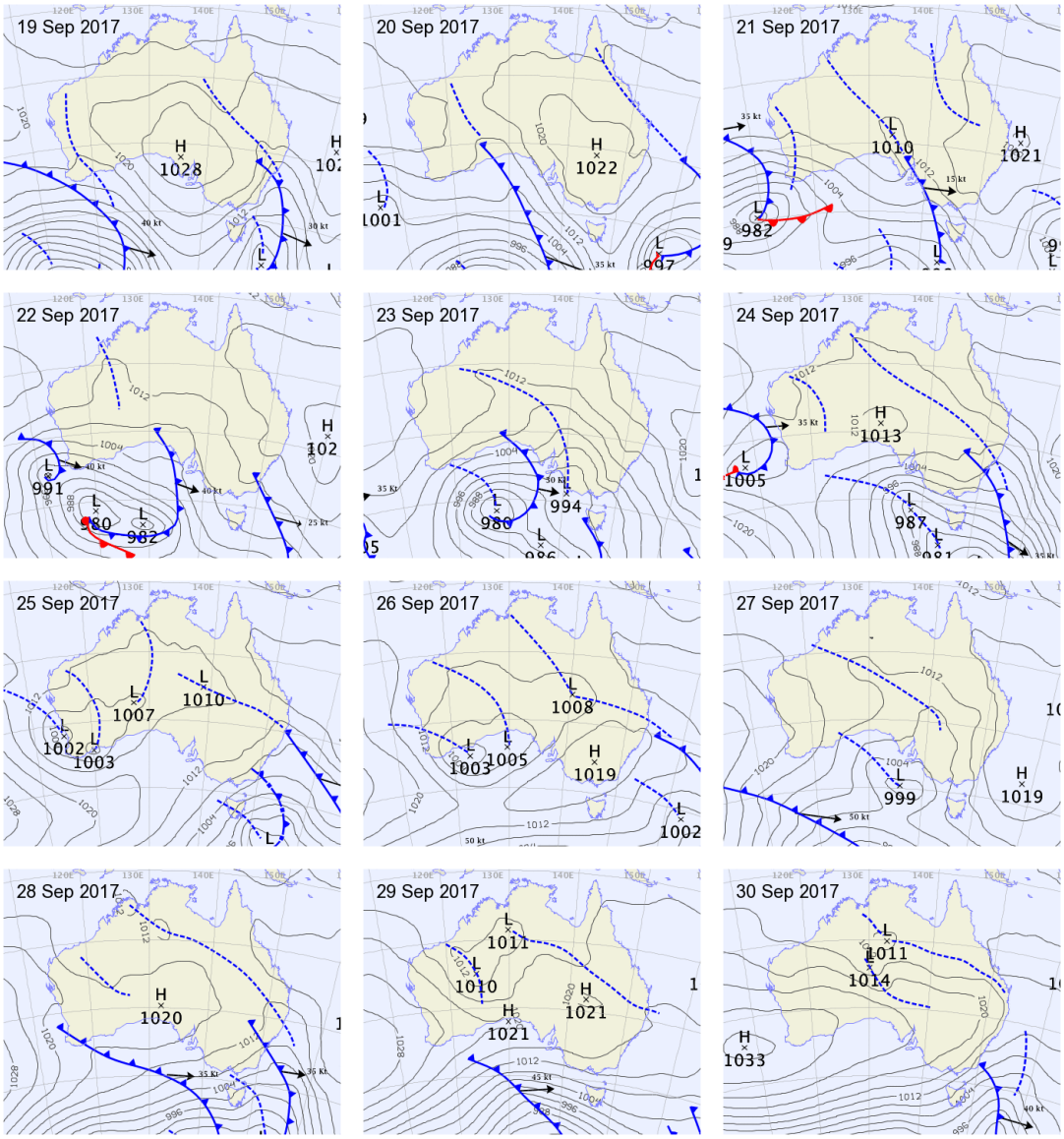

Figure 1: Mean sea level pressure charts for 19–30 September 2017.

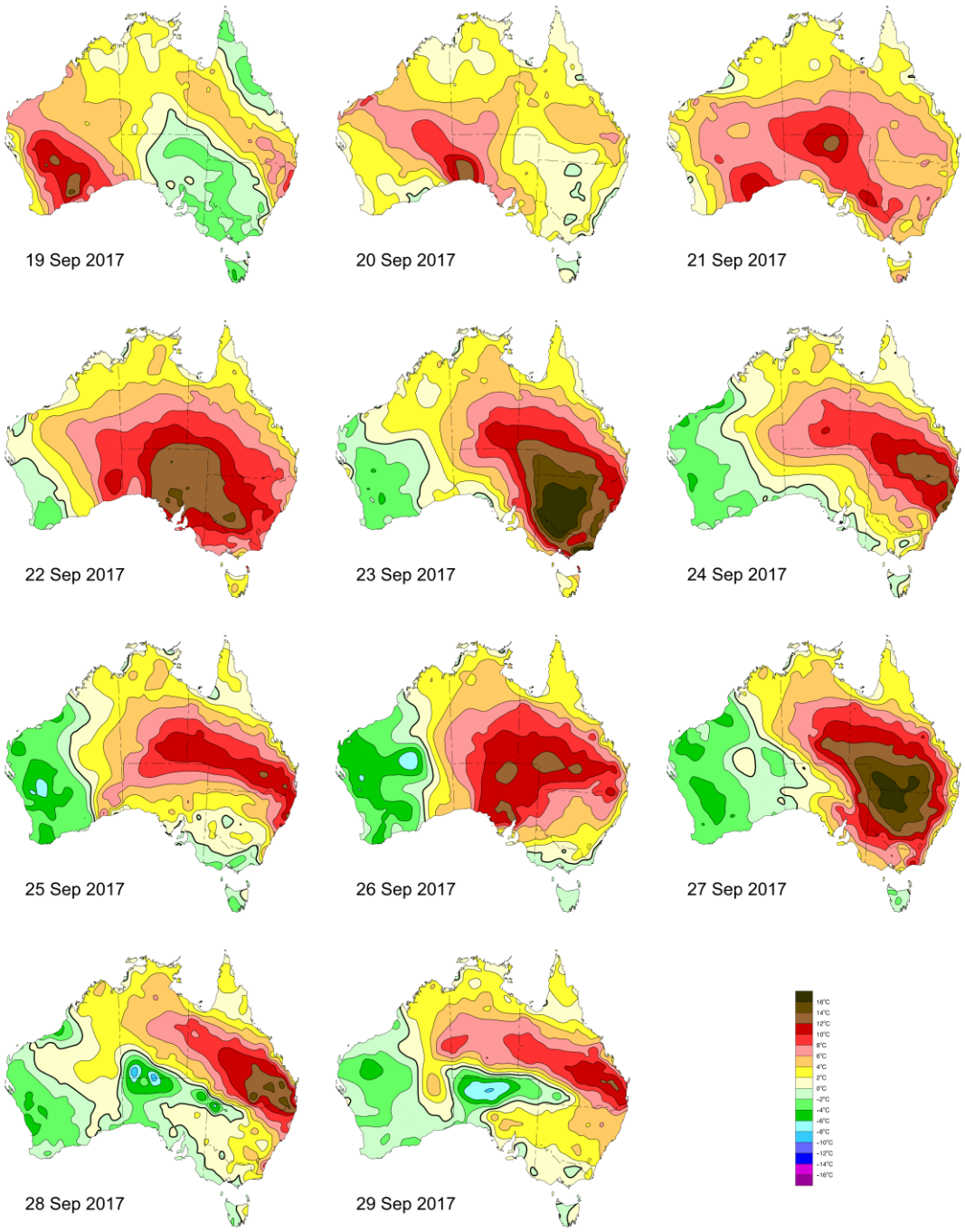

Figure 2: Daily maximum temperature difference from the long-term average (1961–1990) for 19–29 September 2017.

2 Extreme temperatures

2.1 Friday 22 September 2017

2.1.1 Australia

The significant heat began on 21 September 2017—when almost all of Australia observed above-average maximum temperatures—and intensified the next day. Australia as a whole recorded its warmest September day on record on 22 September 2017. Australia's mean maximum temperature on the 22nd was 33.47 °C—more than six degrees warmer than the September average and breaking the previous record for this month of 33.39 °C from 30 September 1998.

It was a day of generally warmer-than-average temperatures across most of the country rather than extreme heat, with no long-term sites breaking high temperature records. Nevertheless, more than 29% of the country had maximum temperatures in the top 1% of all September daily maximum temperatures observed since 1911.

Large parts of South Australia and western New South Wales were more than 12 degrees warmer than the long-term average for this time of the year (see Figure 3).

As the warmth moved further east, many September records were broken on the 23rd in New South Wales. However, southwest Western Australia had cooled down in the wake of a cold front, lowering the overall national temperature. The 21st and 23rd were still very warm, with the two days tied for Australia's equal-ninth warmest September day on record.

2.1.2 South Australia

Before the heat moved into the eastern States, South Australia had its fifth-warmest September day on record. Its mean maximum temperature on the 22nd was 35.60 °C, compared to the September record of 36.46 °C from 24 September 1990.

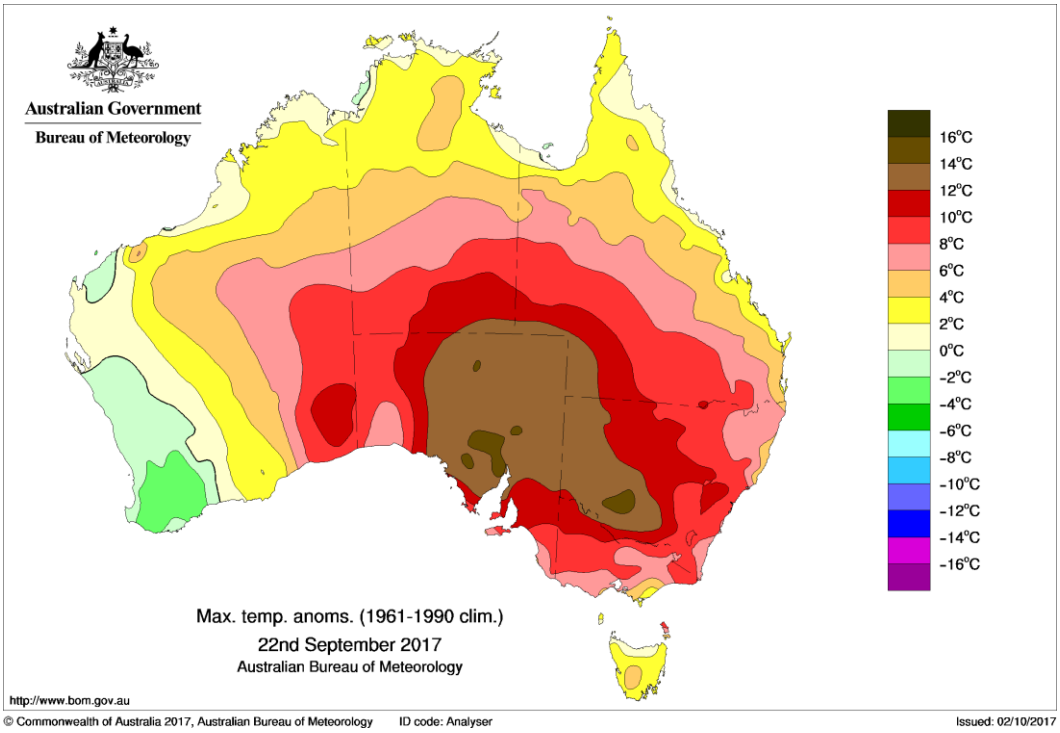

Figure 3: Maximum temperature difference from the long-term average (1961–1990) for 22 September 2017, Australia's overall warmest September day on record (since 1911).

2.2 Saturday 23 September 2017

2.2.1 New South Wales

New South Wales as a whole experienced its warmest September day on record on the 23rd—the mean maximum temperature was 35.81 °C, well above the previous record of 34.20 °C from 22 September 2003 and 14.89 °C warmer than the long-term average for September.

On 23–24 September, highest daily maximum temperature records for September were set at every non-coastal New South Wales ACORN-SAT location except for Moree, Inverell, and Cabramurra.

More than 62% of New South Wales by area had its hottest September day on record on the 23rd, and more than 99% of the State was in the top 1% of all September maximum temperatures observed since 1911.

Eight sites equalled or broke the New South Wales high temperature record for September (previously 39.6 °C at Wanaaring on 28 September 2004), with Wilcannia's 40.5 °C the hottest in the State. Also equalling or breaking the old record were White Cliffs (40.3 °C), Wanaaring (40.2 °C), Delta (40.2 °C), Bourke (40.0 °C), Walgett (39.8 °C), Ivanhoe (39.7 °C), and Hay (39.6 °C). The new State record was short-lived though, with Wanaaring reaching 41.4 °C on the 27th.

For most New South Wales sites, the extreme heat did not last for multiple consecutive days. However, Menindee recorded two consecutive days over 35 °C for the first time in September on the 22nd and 23rd.

In the extremely dry air, minimum temperatures on the morning of the 23rd showed an exceptionally high amount of local variation. There were cold nights in some valley locations where temperature inversions developed, but much warmer conditions at more elevated or exposed locations. One particularly striking example was in the Southern Highlands, where there was a minimum of −0.3 °C at Goulburn Airport, but 17.9 °C at High Range, about 72 kilometres to the northeast. At those sites that did get cold overnight, there were some exceptionally large diurnal temperature ranges or difference between the daily maximum and minimum temperatures. Several sites had diurnal ranges near 30 °C (including Goulburn Airport, which reached 30.5 °C after its below-freezing start to the day). The diurnal temperature range of 28.9 °C at Canberra Airport (minimum 1.3 °C, maximum 30.2 °C) is the largest on record for any month, surpassing the previous record of 28.5 °C that occurred on both 13 January 1939 and 17 January 2014.[2]

[2] This includes data from the Canberra Airport sites (70014 and 70351) from 1939 to the present, and Acton (70099) from 1913 to 1939.

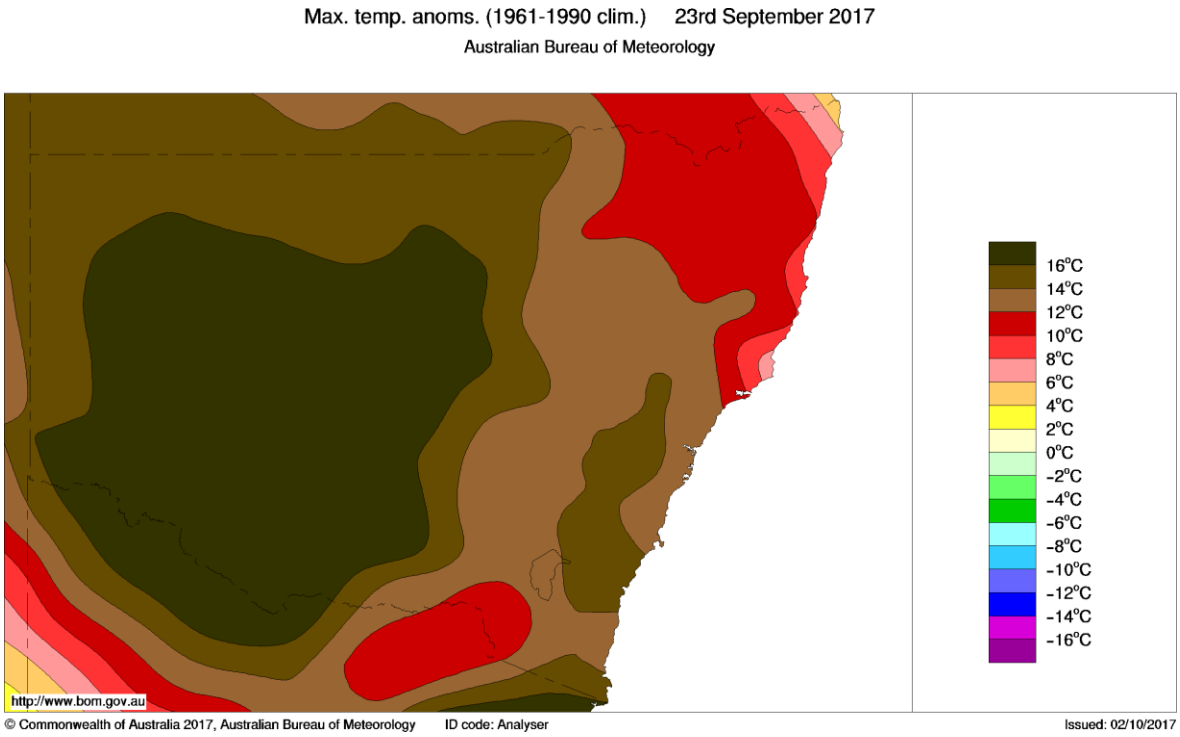

Figure 4: Maximum temperature difference from the long-term average (1961–1990) for 23 September 2017, New South Wales's overall warmest September day on record (since 1911).

2.2.2 Queensland

It was warmer than average throughout northern Australia on the 23rd. Queensland experienced its fourth-warmest September day on record—the mean maximum temperature on 23 September was 36.47 °C, compared to the September record of 37.43 °C on 30 September 1988.

In southern Queensland, almost ten percent of the State had its hottest September day on record on the 23rd. More than half the State, covering the whole southwest, had daytime temperatures in the top 1% of all September daily maximum temperatures observed since 1911.

2.2.3 Victoria

With the heat also extending south, Victoria had its fifth-warmest September day on record. Victoria's mean maximum temperature on the 23rd was 28.98 °C, compared to the September record of 31.34 °C on 28 September 1928. More than 23% of Victoria by area had its hottest September day, and more than 76% of the State recorded temperatures in the top 1% of all September daily maximum temperatures.

Mildura reached 37.7 °C on 23 September, setting a new Victorian high temperature record for September. The previous Victorian record for September was 37.4 °C at Mildura on 22 September 2003.

Record large diurnal temperature ranges were observed at several sites with 50 or more years of temperature observations. Gabo Island Lighthouse (19.6 °C), Point Hicks (24.4 °C), and East Sale (29.5 °C) each broke their previous September diurnal temperature range records by more than two degrees.

2.2.4 Northern Territory

In the Northern Territory, both the 22nd and the 23rd ranked in the top-20 warmest September days on record since 1911.

As the heat continued, Alice Springs recorded seven consecutive days of 35 °C or more from the 21st to the 27th, breaking the site's old September record of five consecutive such days in September 2003.

2.3 Sunday 24 to Tuesday 26 September 2017

From the 24th to the 26th, temperatures remained six or more degrees warmer than average over large areas of the Northern Territory, southern Queensland, and northern New South Wales and South Australia.

2.3.1 New South Wales

In northern and coastal New South Wales, there wasn't much relief from the heat overnight to 9am on the 24th as night time temperatures stayed above 20 degrees. Sydney (Observatory Hill) and several other long-term sites in eastern New South Wales had their warmest September minimum temperatures on record (see Table 2). At Sydney, the 6am temperature of 28.1 °C was 3.5 °C above the previous highest September temperature on record for that time of the day, set on 24 September 2003.

During the day, the exceptional heat contracted to the North Coast, with maximum temperature records broken at sites including Coffs Harbour and Port Macquarie.

2.3.2 Queensland

On the 24th, with a mean maximum temperature of 35.88 °C, Queensland as a whole had its eighth-warmest September day on record since 1911. Then on the 26th, Queensland recorded a mean maximum temperature of 36.49 °C, its fourth-warmest September day on record.

2.3.3 Northern Territory

Daytime temperatures remained very much warmer than average in the Northern Territory. Northern Territory as a whole had its seventh-warmest September day on record on the 26th, when the mean maximum temperature was 38.01 °C, compared to the Northern Territory record for September of 38.70 °C on 27 September 2012. Almost half of the Territory had daytime temperatures in the top 1% of hottest September days on record.

2.4 Thursday 27 September 2017

Exceptional heat returned to eastern Australia on the 27th. Across most of Queensland and the Northern Territory, and parts of northern New South Wales, the 27th was warmer than it had been on the previous weekend.

2.4.1 Queensland

More than 36% of Queensland by area set new September high temperature records on the 27th (based on national gridded data since 1911).

Queensland had its overall warmest September day on record, more than nine degrees warmer than average. The mean maximum temperature in Queensland was 37.79 °C, compared to the previous September record of 37.43 °C set on 30 September 1988.

September 2017 now makes up four of the top-10 warmest September days on record for Queensland as a whole (out of more than 3200 September days since 1911).

Each day from the 23rd to the 27th saw more than 40% of Queensland with temperatures in the top 1% of September daily maximum temperatures on record since 1911.

Birdsville recorded a maximum temperature of 42.8 °C on the 27th, a new State record-high temperature for Queensland in September. The previous September record was 42.4 °C at the same site on 22 September 2003. Birdsville's maximum temperature was also very close to the Australian September record of 43.1 °C at West Roebuck, Western Australia, from 27 September 2003.

The persistent heat resulted in Charleville (6 days) and Injune (5 days) breaking their previous September records (of 5 and 3 days respectively) for consecutive days of 35 °C or more.

2.4.2 New South Wales

The extreme heat on the 27th did not reach southern parts of New South Wales, so for New South Wales as a whole, area average temperatures didn't reach the extremes of the 23rd. However, the heat in the northern half of the State was sufficient that, with a mean maximum temperature of 32.91 °C, it was still New South Wales's fifth-warmest September day on record.

More than 15% of New South Wales by area set new September high temperature records.

The New South Wales record for the highest September temperature set at Wilcannia on the 23rd was surpassed again when 41.4 °C was observed at Wanaaring on the 27th. Two other sites, Bourke (40.8 °C) and Delta (41.3 °C), also broke the previous State record.

With daily minimum temperatures closer to average and even cooler than average in some southern areas of the State, record-large diurnal temperature ranges were observed at several sites with more than 50 years of temperature observations. Mungindi (29.9 °C), and Grenfell (28.2 °C) each broke their previous September diurnal range records by more than two degrees. And Bathurst, with more than 100 years of temperature data, also had its largest September diurnal range on record of 27.4 °C. The previous record was 27.2 °C set on both the 22nd and 23rd of the month, with the pre-2017 record being 27.1 °C on 30 September 1980.

2.5 Saturday 28 to Sunday 29 September 2017

On the 28th and 29th, the exceptional heat was confined to southeast Queensland and the New South Wales Northern Rivers district, where daytime temperatures were more than 10 degrees warmer than average.

2.5.1 New South Wales

Casino Airport in northeast New South Wales recorded 40.2 °C, making it the seventh site to reach at least 40 °C in New South Wales during the month—no site had recorded a 40 degree day in New South Wales in September before 2017.

2.5.2 Queensland

To the west of Brisbane, on the 28th, Amberley and Gatton each had their hottest September day on record, with Amberley reaching 40.1 °C. There were also records further north, including 39.6 °C at Gayndah.

On the 29th, Brisbane Airport, Gympie and Maryborough broke their September daily maximum temperature records. Brisbane City, at 37.0 °C, had its hottest September day since 1943[3].

[3] This combines data from sites 40214 and 40913. There were no observations in central Brisbane from 1986 to 1999 but data from other nearby sites indicate that it is unlikely that a higher September temperature occurred in central Brisbane during that period.

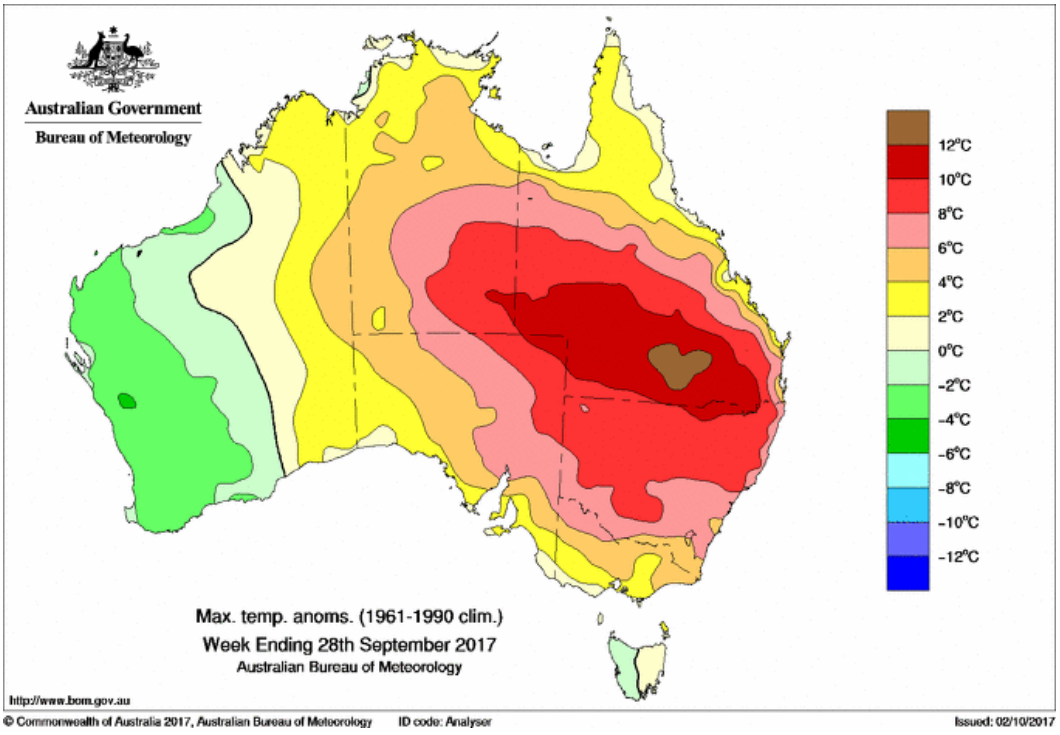

Figure 5: Mean maximum temperature difference from the long-term average (1961–1990) for the week ending 28 September 2017. The warmth in eastern Australia persisted throughout the week, while temperatures tended to be cooler than average for western parts of Western Australia.

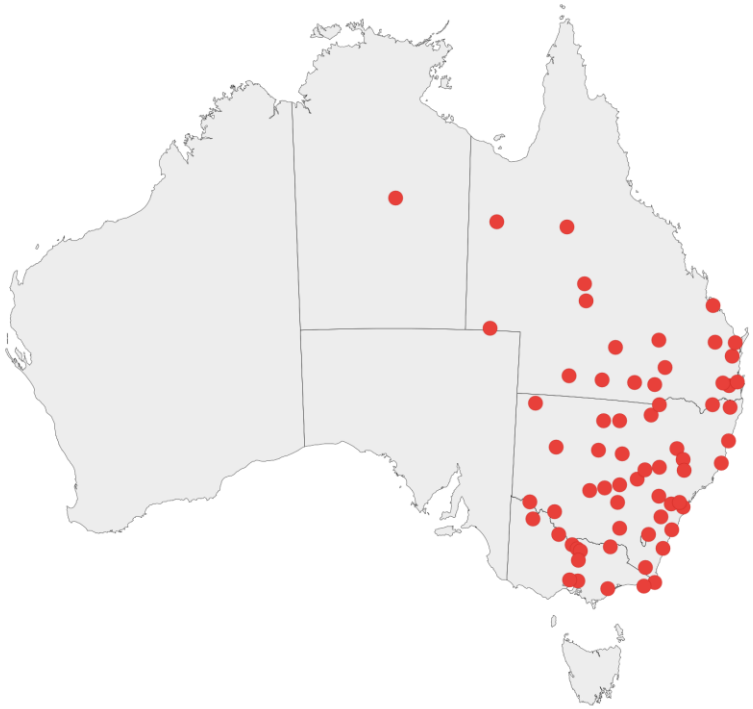

Figure 6: Locations with 50 or more years of temperature observations that recorded their highest daily maximum temperature for September from 23–29 September 2017.

Figure 7: Locations with 50 or more years of temperature observations that recorded their highest daily minimum temperature for September from 23–29 September 2017.

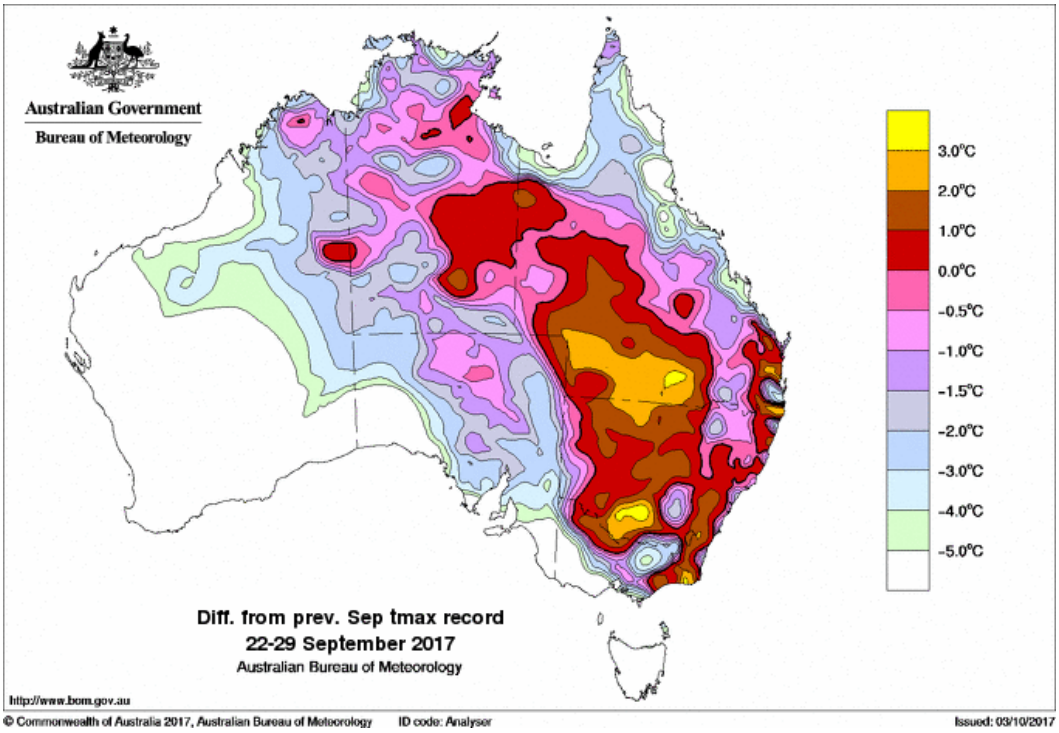

Figure 8: Difference between the highest maximum temperature observed during 22–29 September 2017 and the previous highest September temperature on record (based on gridded spatial analyses from 1911 to 2016). Areas coloured red to yellow are analysed to have had their hottest September day on record since 1911.

3 Extreme fire weather

September rainfall was below average across most of southeastern Australia (see Figure 9) and New South Wales had its driest September on record. With soils drier than average for this time of the year, the hot weather, and strong winds combined to create dangerous fire weather conditions across large areas of the country during 22–28 September.

State fire agencies issued severe to extreme fire weather warnings in the lead-up to the exceptional heat. In Queensland on the 22nd for example, extreme fire weather warnings were issued for Maranoa and Warrego, while severe warnings were issued for Channel Country and Darling Downs and Granite Belt.

There were more than 90 bushfires reported across New South Wales on the 23rd, with 12 total fire bans in effect across the State. A grass fire near Goulburn cut the Hume Highway for much of the afternoon. There was also a 950ha fire at Innes View, inland of Port Macquarie on the New South Wales mid-north coast, and a fire on the Queensland-New South Wales border that burnt 570ha of the Maryland National Park.

One common measure of fire weather conditions is the McArthur Forest Fire Danger Index (FFDI). FFDI values exceeded extreme levels at many sites across the country from the 22nd to the 27th, with the highest values in inland areas, away from dense forests.

For September as a whole, accumulated FFDI values were above average throughout most of eastern and northern Australia (see Figure 10).

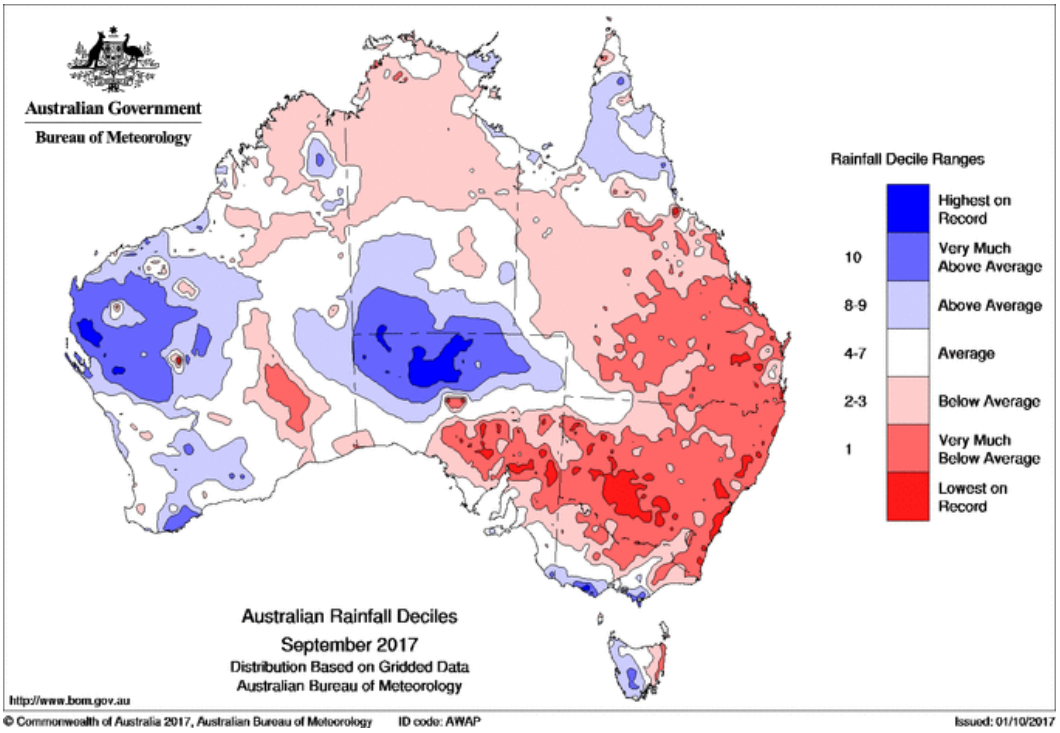

Figure 9: Rainfall deciles for September 2017 (based on all years of national rainfall data since 1900). The above-average rainfall across central Australia fell in the last three days of the month.

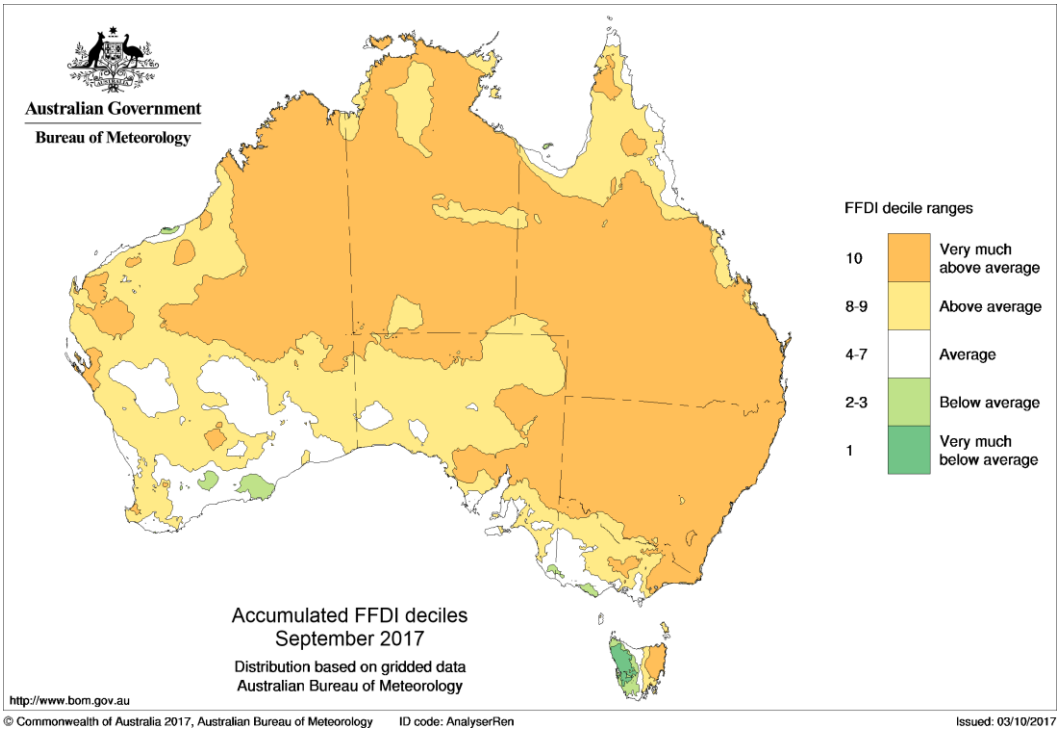

Figure 10: September 2017 deciles of monthly accumulated FFDI values (based on all years of FFDI data since 1950).

4 Longer-term climatological context

While all exceptional climate events have proximate causes in antecedent and concurrent weather conditions, long-term trends now also play a role.

Australian annually-averaged temperature has warmed by around one degree since 1910, and spring has warmed by a similar amount. The annual warming trend is consistent with that observed for the globe.

Studies undertaken by the Bureau and other scientific institutions have shown that climate change has contributed to the severity and frequency of recent heat events, including spring warmth[4].

[4]

Arblaster, JM, Lim, EP, Hendon, HH, Trewin, BC, Wheeler, MC, Liu, G & Braganza, K, 2014, 'Understanding Australia's hottest spring on record', Bulletin of the American Meteorological Society, vol. 96, no. 12, pp. S37–S41.

Hope, P, Lim, E-P, Wang, G, Hendon, HH & Arblaster, JM 2015, 'Contributors to the Record High Temperatures Across Australia in Late Spring 2014', Bulletin of the American Meteorological Society, vol. 96, no. 12, pp. S149–S153.

Herring, SC, Hoell, A, Hoerling, MP, Kossin, JP, Schreck III, CJ & Stott, PA, Eds., 2016: Explaining Extreme Events of 2015 from a Climate Perspective. Bulletin of the American Meteorological Society, vol. 97, no.12, pp. S1–S145, doi:10.1175/BAMS-ExplainingExtremeEvents2015.1.

5 Summary tables

Table 1: Sites with 50 or more years of data that had September daily maximum temperature records. Locations that broke their previous September record on more than one day during the week are in italics.

Station number	Name	State	New daily record (°C)	Date of new record	Previous record (°C)	Date of previous record
49002	Balranald	NSW	37.6	2017-09-23	36.7	2003-09-22
63005	Bathurst	NSW	31.2	2017-09-23	29.4	1934-09-14
70005	Bombala	NSW	30.1	2017-09-23	29.0	1980-09-30
48245 48013 48239	*Bourke*	*NSW*	*40.8*	*2017-09-27*	*38.9*	*2003-09-22*
48015	Brewarrina	NSW	39.0	2017-09-27	=39.0	2004-09-28
70351 70014	Canberra	NSW	30.2	2017-09-23	28.6	1965-09-26
48027 48030	*Cobar*	*NSW*	*38.7*	*2017-09-23*	*38.0*	*2003-09-22*
59151 59040	Coffs Harbour	NSW	38.8	2017-09-24	35.2	1981-09-23
48031	*Collarenebri*	*NSW*	*39.0*	*2017-09-27*	*37.5*	*2000-09-29*
50052	Condobolin	NSW	37.0	2017-09-23	36.2	1980-09-30
65070 65012	*Dubbo*	*NSW*	*35.5*	*2017-09-23*	*34.4*	*1965-09-26*
64009	Dunedoo	NSW	34.4	2017-09-27	34.2	1980-09-30
55024	Gunnedah	NSW	35.0	2017-09-23	34.2	2000-09-29
75032	Hillston	NSW	37.6	2017-09-23	36.8	2003-09-22
72023	Hume	NSW	29.8	2017-09-23	28.8	2008-09-27
63039	Katoomba	NSW	28.6	2017-09-23	26.6	1965-09-26
75039	Lake Cargelligo	NSW	37.1	2017-09-23	36.2	2003-09-22
69018	Moruya Heads	NSW	34.9	2017-09-23	34.7	1980-09-30
52020	*Mungindi*	*NSW*	*39.9*	*2017-09-27*	*38.8*	*2000-09-29*
68072 68076	Nowra	NSW	36.3	2017-09-23	35.1	1965-09-26

51039	Nyngan	NSW	37.5	2017-09-24	37.4	2003-09-22
66124	Parramatta North	NSW	36.5	2017-09-23	35.4	2003-09-22
50031	Peak Hill	NSW	35.9	2017-09-23	34.7	1965-09-26
60139 60026	Port Macquarie	NSW	38.2	2017-09-24	37.9	2003-09-23
55049	Quirindi	NSW	34.5	2017-09-23	33.3	1965-09-28
67105 76033	Richmond	NSW	36.9	2017-09-23	35.9	1980-09-30
61363 61089	Scone	NSW	35.2	2017-09-23	34.1	1965-09-27
70080	Taralga	NSW	27.5	2017-09-23	27.0	1965-09-26
46126 46037	Tibooburra	NSW	40.0	2017-09-23	39.3	2003-09-22
72150 72151	Wagga Wagga	NSW	32.9	2017-09-23	32.8	1928-09-28
58088 52026	*Walgett*	*NSW*	*39.2*	*2017-09-23*	*38.0*	*2000-09-29*
46012 46043	Wilcannia	NSW	40.5	2017-09-23	39.4	2003-09-22
50017 73054	Wyalong	NSW	34.5	2017-09-23	34.4	1980-09-30
15135 15087	Tennant Creek	NT	39.4	2017-09-27	39.0	2013-09-24
40004	Amberley	QLD	40.1	2017-09-28	39.2	1943-09-22
38026 38002	Birdsville	QLD	42.8	2017-09-27	42.4	2003-09-22
44010	*Bollon*	*QLD*	*40.0*	*2017-09-28*	*38.9*	*2000-09-29*
40842 40223	Brisbane	QLD	34.9	2017-09-29	33.8	1974-09-14
44021 44022	Charleville	QLD	40.7	2017-09-27	39.0	2013-09-25
44026	*Cunnamulla*	*QLD*	*40.7*	*2017-09-27*	*38.2*	*2013-09-25*
40082	*Gatton*	*QLD*	*39.5*	*2017-09-28*	*38.5*	*2000-09-30*
39066 39039	Gayndah	QLD	39.6	2017-09-28	39.4	1943-09-22
39123	Gladstone	QLD	33.8	2017-09-29	33.8	2013-09-11

40093	Gympie	QLD	38.2	2017-09-29	37.2	1988-09-30
43015	Injune	QLD	40.1	2017-09-27	39.3	2013-09-26
36026	Isisford	QLD	41.0	2017-09-27	40.7	2013-09-26
36031 36167 36030	*Longreach*	*QLD*	*41.5*	*2017-09-27*	*40.8*	*2013-09-26*
40126	Maryborough	QLD	34.7	2017-09-29	34.1	1991-09-29
29127	Mount Isa	QLD	40.4	2017-09-27	39.8	2013-09-25
30045	Richmond	QLD	40.3	2017-09-27	40.2	2013-09-26
43109 43034	St George	QLD	40.4	2017-09-27	39.2	2013-09-26
41095	Stanthorpe	QLD	32.6	2017-09-28	32.2	2013-09-26
43035	Surat	QLD	40.0	2017-09-27	39.3	2013-09-26
45025 45017	*Thargomindah*	*QLD*	*42.5*	*2017-09-27*	*39.5*	*2004-09-28*
80015	Echuca	VIC	36.0	2017-09-23	34.0	2001-09-30
84016	Gabo Island Lighthouse	VIC	31.2	2017-09-23	31.0	1973-09-30
80023	Kerang	VIC	36.6	2017-09-23	34.9	1928-09-28
80091	Kyabram	VIC	33.9	2017-09-23	32.2	2009-09-12
87031	Laverton	VIC	31.3	2017-09-23	31.2	2009-09-12
88109	Mangalore	VIC	31.8	2017-09-23	29.7	2008-09-27
76031 76077	Mildura	VIC	37.7	2017-09-23	37.4	2003-09-22
76047	Ouyen	VIC	36.6	2017-09-23	35.6	2003-09-22
84070	Point Hicks	VIC	36.4	2017-09-23	31.1	1981-09-18
85072	Sale	VIC	33.9	2017-09-23	33.0	1980-09-30
86104	Scoresby	VIC	30.8	2017-09-23	30.0	1987-09-26
81049	Tatura	VIC	33.7	2017-09-23	31.7	2008-09-27

Table 2: Locations with 50 or more years of data that had September daily minimum temperature records. Locations that broke their previous September record on more than one date during the week are in italics.

Station number	Name	State	New daily record (°C)	Date of new record	Previous record (°C)	Date of previous record
48031	*Collarenebri*	*NSW*	*24.8*	*2017-09-28*	*24.1*	*2003-09-24*
50052	Condobolin	NSW	19.9	2017-09-23	19.8	2012-09-28
64008	*Coonabarabran*	*NSW*	*20.1*	*2017-09-28*	*15.6*	*1969-09-03*
61055	Newcastle	NSW	21.9	2017-09-24	19.8	2003-09-23
51039	Nyngan	NSW	20.5	2017-09-28	20.4	2004-09-29
55049	*Quirindi*	*NSW*	*21.0*	*2017-09-24*	*19.4*	*2004-09-29*
61363 61089	Scone	NSW	25.8	2017-09-24	24.3	2003-09-23
66062	Sydney (Observatory Hill)	NSW	23.0	2017-09-24	22.0	2003-09-24
66037	Sydney Airport	NSW	21.8	2017-09-24	21.2	1946-09-12
44010	Bollon	QLD	26.5	2017-09-24	22.3	2000-09-30
40043	Cape Moreton	QLD	21.6	2017-09-29	21.1	1947-09-15
44021 44022	Charleville	QLD	25.9	2017-09-27	25.0	2009-09-22
43035	Surat	QLD	22.6	2017-09-28	22.1	2000-09-30
35069	Tambo	QLD	25.5	2017-09-28	23.3	1996-09-12

Notes

This statement is based on data available as of 2 October 2017. There may be some changes because of late-arriving data or the Bureau's standard quality control processes.

The dataset from which area averages and spatial analyses are drawn from commences in 1911. The Australian Climate Observations Reference Network – Surface Air Temperature (ACORN-SAT) dataset (http://www.bom.gov.au/climate/change/acorn-sat/) commences in 1910. Station data prior to national introduction of standardised instrument shelters in 1910 are used only if they are known to have been measured using standard equipment comparable with current standards. This is discussed further at http://www.bom.gov.au/climate/change/acorn-sat/#tabs=Early-data.

Additional information about the longer-term climatological context can be found in State of the Climate 2016 at http://www.bom.gov.au/state-of-the-climate/

Further information is available from http://www.bom.gov.au/climate.