



April to June 2006: Very dry and cold over southern Australia.

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National Climate Centre.

Summary

Strong high pressure systems have dominated the weather patterns across Australia for two months, but especially in June. The cold and dry air, light winds and clear skies associated with these high pressure systems have resulted in record low rainfall totals and record low minimum temperatures over large areas for various periods ranging from the last one to four months.

June Rainfall

The southwest of WA was especially hard hit with most areas west of a line running from Carnarvon to Kalgoorlie, to Perth and to Albany having their driest June on record (see Figure 1). June, on average, is the wettest month in this part of the country. In many locations the previous record was broken by a large margin.

The very low June totals in the southwest followed a very dry autumn, with obvious implications for winter crops and runoff into reservoirs.

Other parts of the country with a driest June on record were the far southeast of SA, parts of southern Victoria, and parts of northern and southeast Tasmania.

Image & Tables below: Figure 1 – June Rainfall Deciles; Table 1 – Spatial summaries of notably low June rainfall; Table 2 – Stations with record low June rainfall.

June Temperatures

There was a close match between dry areas in June and those regions being unusually cold overnight. With the exception of the northeast half of Queensland and much of Tasmania, June minimum temperatures were well below average. Minima within the coolest 10% of the post-1950 record covered most of the NT, WA, SA, NSW and Victoria. Record low minima occurred over much of SA and adjacent parts of the southern NT and eastern WA, parts of western WA, western NSW and northwest Victoria (see Figure 2). Taken over the country as a whole, this June was the second coldest on record for minimum temperatures, with June 1982 holding the record (see Table 3).

In South Australia, the minimum temperature anomaly of -2.77°C was the third lowest for **any** month behind February 1954 (-3.51°C) and May 1976 (-2.91°C).

Cold frosty nights were a feature of the month, with dozens of locations breaking either their **all-time** daily minimum temperature record, or their June daily minimum temperature record (Tables 6 and 7). The period from the 14th to 17th was particularly notable as several sites broke long-standing records on two consecutive nights (e.g. 14th and 15th at Balgair (WA) and 16th and 17th at Katanning (WA)).

The record June minimum temperature for anywhere in WA was broken during the month and then broken again. The old record of -5.7°C at Wandering on 1st June 1964 was exceeded with -5.9°C at Eyre on the 14th, and then again with -6.0°C at Collie East on the 17th. Furthermore, the old record was equalled twice; at Salmon Gums Research Station on the 15th and at Bridgetown on the 17th.

Maximum temperatures were also below normal across the NT, most of both SA and western Queensland, northwest NSW, the far east of WA and in some coastal areas in the southeast of the mainland. As a result, the national June mean temperature was the equal fourth lowest in the post-1950 record.

Image & Tables below: Figure 2 – June Minimum Temperature Deciles; Table 3 – Spatial summaries of June Minimum Temperatures; Table 4 – Spatial summaries of June Mean Temperatures; Table 5 – Stations with record low June Average Minimum Temperature; Table 6 – Stations with record low daily minimum temperature for all months; Table 7 – Stations with record low June daily minimum temperature.

April to June Rainfall

A tale of two halves with very much above average to record high rainfall in northern areas, but pronounced dry conditions and a poor start to the cropping season in the south. The northern half of the country experienced its fifth wettest April to June (wetter years were 1968, 1983, 1955 and 2000), while the south endured its fifth driest, with only 1902, 1976 and 1972 and 1940 being drier (see Table 8). Poor autumn and early winter rains have been a recurring feature of the southern Australian climate for several years, particularly since the El Niño of 1997, and may be an emerging signature of climate change.

Image & Tables below: Figure 3 – April to June Rainfall Deciles; Table 8 – Spatial summaries of April to June rainfall.

April to June Temperatures

Apart from large sections of the east coast and a small part of the west coast, the April to June period has been one of the coldest on record since high-quality monthly records began in 1950. In terms of a national average, the past three months were the second coldest for both minimum and mean temperature (see Tables 9 and 10).

In some instances the **minimum** temperature anomalies were so extreme that they were among the lowest for **any** three-month period as follows:

Minimum Temperature Anomalies ($^{\circ}\text{C}$)

New South Wales: -2.23 (coldest), previous record -2.18 in Oct-Dec 1956

Southern Australia: -1.63 (2nd coldest), record -1.66 in Oct-Dec 1956

Western Australia: -1.42 (2nd coldest), record -1.44 in April-June 2000

Image & Tables below: Figure 4 – April to June Minimum Temperature Deciles; Figure 5 – April to June Mean Temperature Deciles; Table 9 – Spatial summaries of April to June Minimum Temperature; Table 10 – Spatial summaries of April to June Mean Temperature.

Further Information:

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Figures

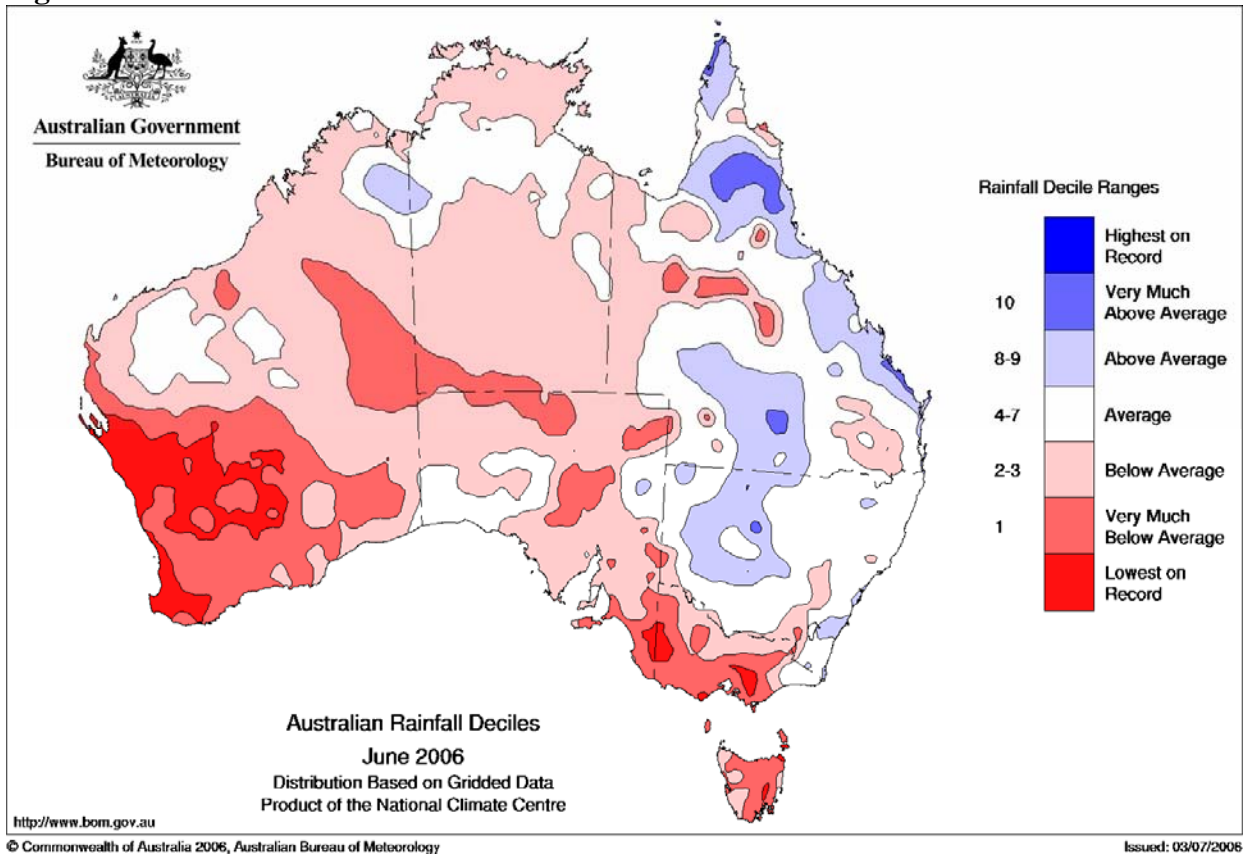


Figure 1. Rainfall deciles for June 2006.

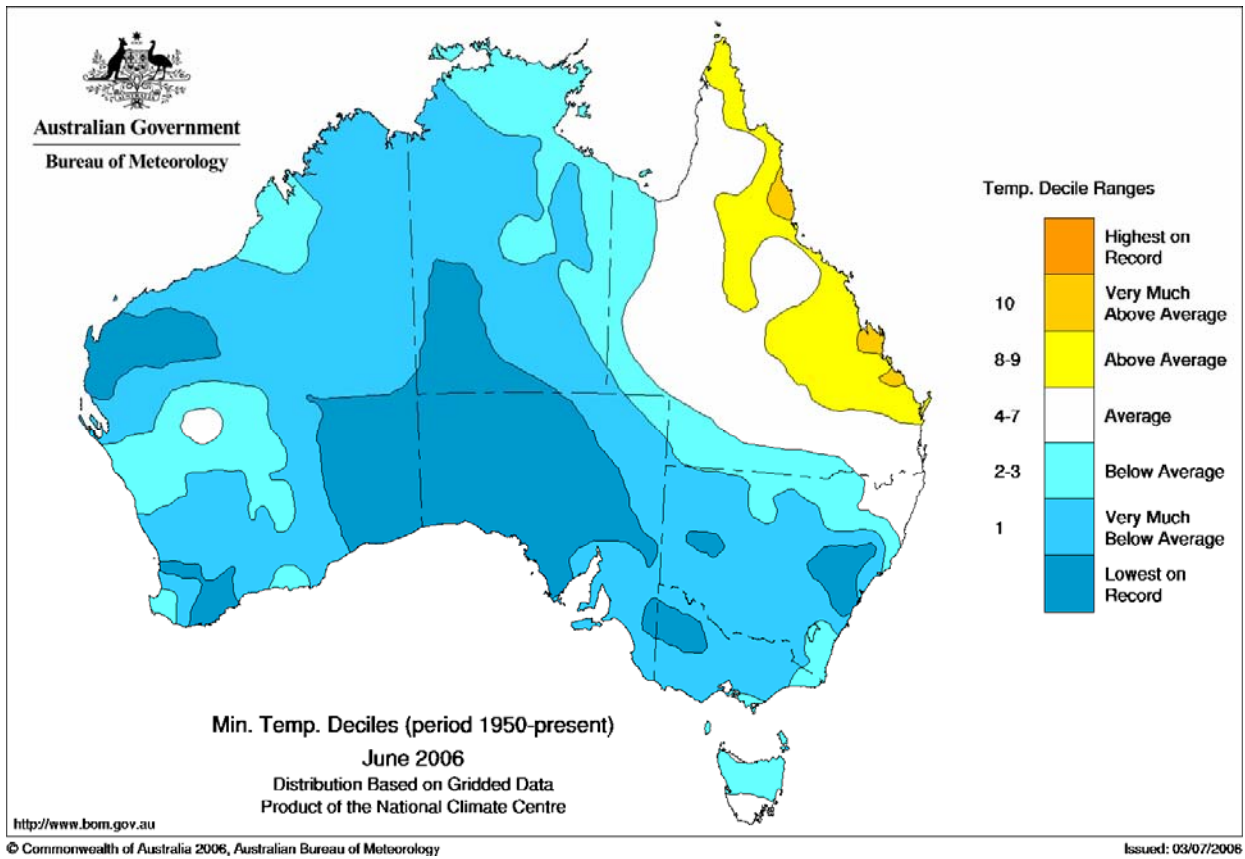


Figure 2. Minimum temperature deciles for June 2006.

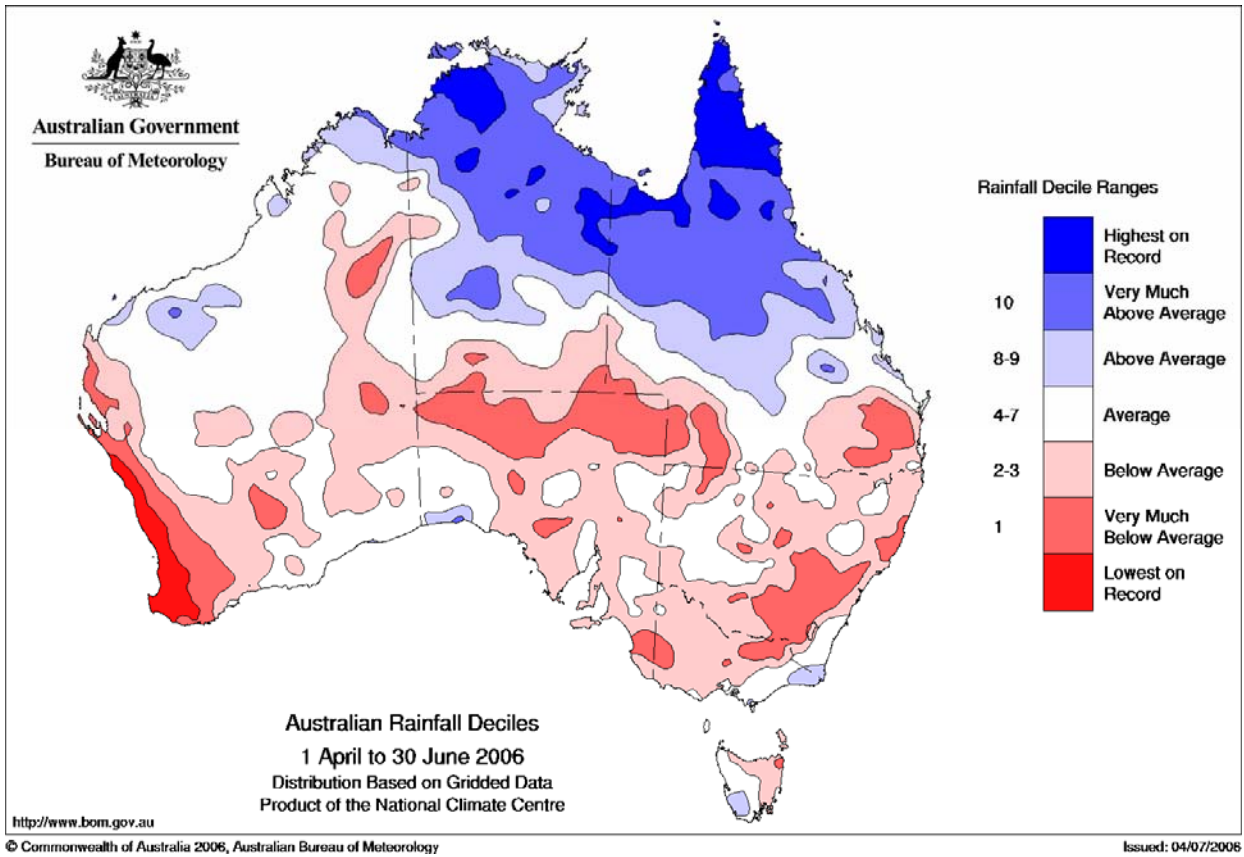


Figure 3. Rainfall deciles for the period 1 April to 30 June 2006.

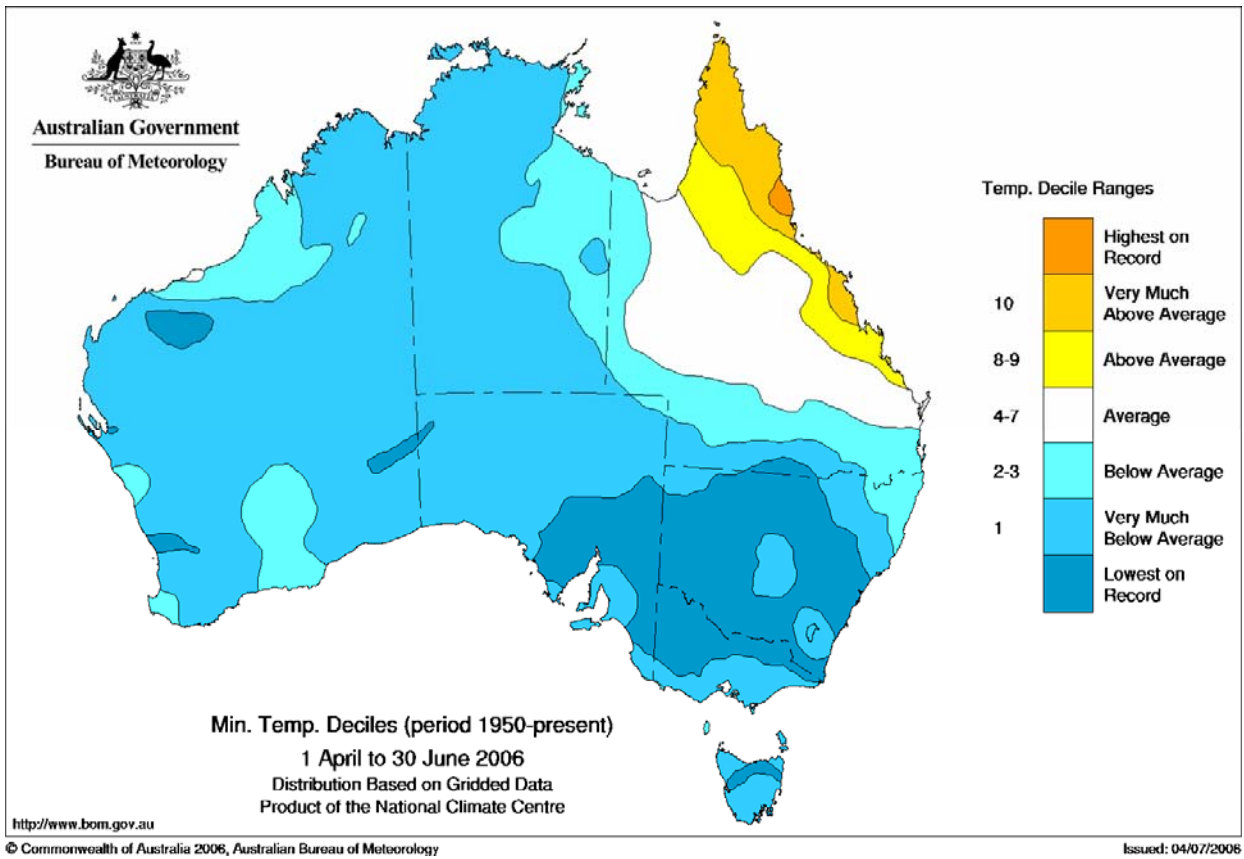


Figure 4. Minimum temperature deciles for the period 1 April to 30 June 2006.

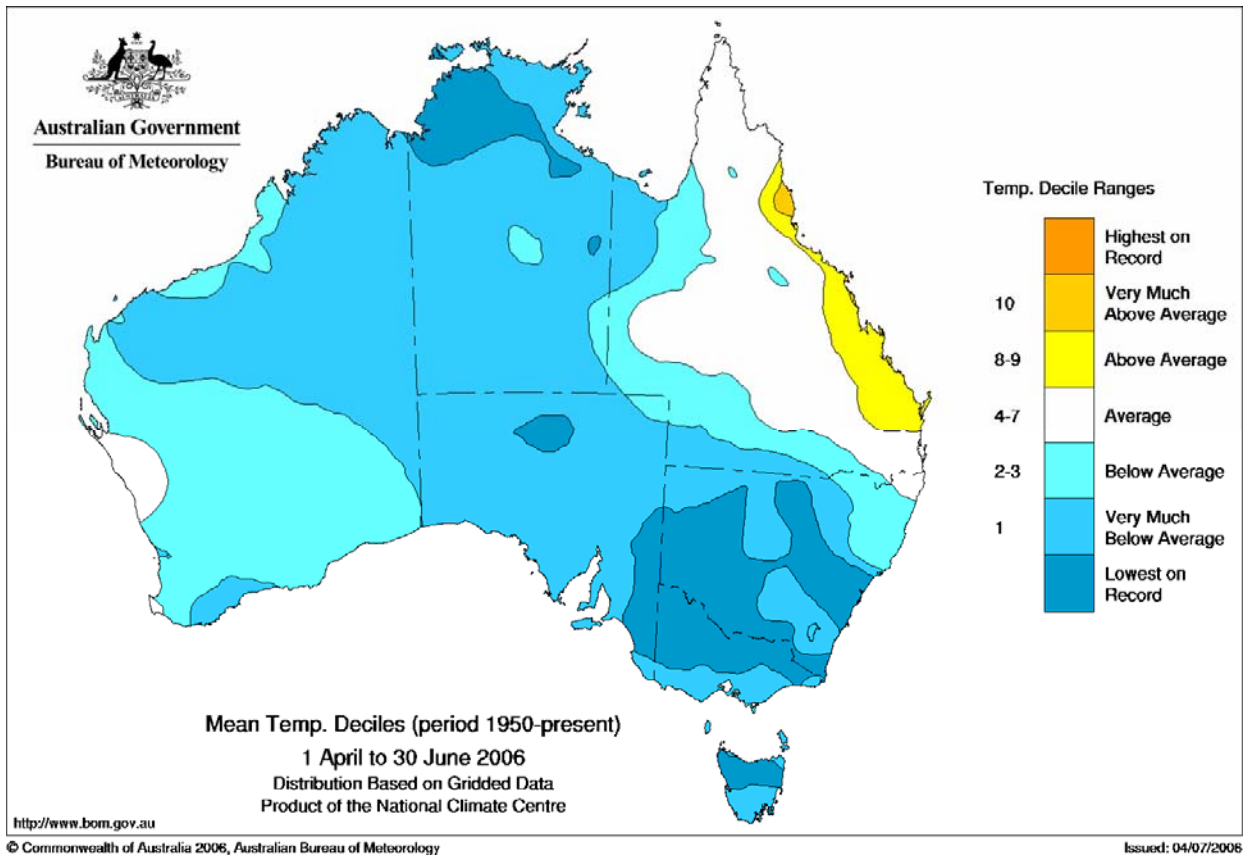


Figure 5. Mean temperature deciles for the period 1 April to 30 June 2006.

Tables

REGION	AVERAGE RAINFALL (mm)	RANKING/COMMENT (since 1900)
WA	3.9	Lowest, previous 5.9 in 1976
Southwest WA	30.5	Lowest, previous 37.8 in 2001
Southern Australia	16.6	3 rd lowest, record 12.3 in 1944
VIC	22.0	3 rd lowest, record 21.6 in 1914
Australia	11.8	5 th lowest, record 8.0 in 1940
TAS	48.1	6 th lowest, record 35.9 in 1930
Southeast Australia	30.9	7 th lowest, record 20.9 in 1944

Table 1. Spatial summaries of notably low June rainfall.

Station	State	Rainfall (mm)	Previous Record (mm)	Year	Years of Record
Barnong	WA	2.3	8.0	1922	105
Northampton	WA	8.2	27.4	2001	124
Denham	WA	0.8	3.9	1922	106
Tamala	WA	3.0	11.7	1938	105
Yalgoo	WA	0.8	3.9	1999	106
Carnamah	WA	10.0	13.0	1984	120
Nabawa	WA	2.2	28.3	1938	101
Dongara	WA	11.4	22.6	1902	121
Geraldton Port	WA	3.8	19.0	1976	112
Mullewa	WA	3.0	13.0	1896	109
Watheroo	WA	12.6	15.2	2001	107
Armadale	WA	13.2	44.2	2001	105
Gingin	WA	1.5	28.0	2001	118
Bannister	WA	20.0	20.4	2001	122
Bridgetown	WA	32.0	41.9	1893	120
Cape Naturaliste	WA	53.2	68.8	1990	103
Denmark	WA	58.2	60.4	1986	106
Donnybrook	WA	33.8	40.6	2001	107
Greenbushes	WA	40.0	53.0	2001	114
Hopetoun	WA	6.4	12.5	1914	106
Kendenup	WA	24.0	29.0	1987	106
Nannup	WA	46.6	53.7	1993	107
Pinjarra	WA	36.2	50.5	1893	127
Westbourne	WA	8.0	39.2	2001	104
Wilgarrup	WA	13.0	42.9	1993	106
Nungarin	WA	7.8	9.4	1954	102
Cranbrook	WA	14.5	27.0	1987	114
Katanning	WA	18.0	21.3	1958	115
Williams	WA	17.4	18.4	2001	122
Cleve	SA	7.8	8.8	1913	111
Port Elliot	SA	9.2	10.4	1967	140
Frances	SA	4.8	6.9	1914	117
Lucindale	SA	9.6	16.5	1930	127
Culgoa	VIC	2.0	2.5	1914	107

Quambatook	VIC	zero	2.4	1975	105
Yanac North	VIC	1.4	2.3	1913	113
Kaniva	VIC	2.2	2.3	1913	124
Edenhope	VIC	5.2	9.6	1930	117
Natimuk	VIC	2.6	4.4	1930	109
Canary Island	VIC	1.2	1.8	1984	119
Jindivick	VIC	13.2	27.3	1972	105
Prahran	VIC	10.2	13.1	1972	111
Meredith	VIC	4.4	18.0	1969	107
Mount Buninyong	VIC	10.8	18.8	1967	150
Marysville	VIC	12.2	35.2	1930	102
Beeac	VIC	4.2	12.0	1937	102
Koroit	VIC	13.2	18.1	1969	118
Winchelsea	VIC	7.4	9.1	1914	108
Lilydale	TAS	16.8	17.3	1930	104
Avoca	TAS	7.0	10.2	1944	110
St Marys	TAS	6.2	6.6	1940	109
Mangalore	TAS	4.8	7.1	1966	105
Sorell	TAS	5.8	6.3	1966	119

Table 2. Stations with record low June rainfall (at least 100 years of record).

REGION	DEPARTURE FROM AVERAGE (°C)	RANKING/COMMENT (since 1950)
SA	-2.77	Lowest, previous -2.13 in 1982
Southwest WA	-2.18	Lowest, previous -2.02 in 1955
WA	-2.14	Lowest, previous -1.54 in 2000
Southeast Australia	-2.02	Lowest, previous -1.87 in 1982
NT	-2.25	2 nd lowest, record -2.30 in 1977
VIC	-2.13	2 nd lowest, record -2.26 in 1972
Southern Australia	-1.94	2 nd lowest, record -1.99 in 1982
NSW	-1.74	2 nd lowest, record -2.11 in 1982
Australia	-1.65	2 nd lowest, record -2.02 in 1982
Murray-Darling	-1.55	3 rd lowest, record -2.43 in 1982

Table 3. Spatial summaries of notably low June Average Minimum Temperatures.

REGION	DEPARTURE FROM AVERAGE (°C)	RANKING/COMMENT (since 1950)
SA	-1.85	Lowest, previous -1.51 in 1982
Southeast Australia	-1.03	Equal 2 nd lowest, record -1.32 in 1982
NT	-1.84	3 rd lowest, record -1.97 in 1985
VIC	-1.09	3 rd lowest, record -1.39 in 1982
NSW	-0.95	3 rd lowest, record -1.45 in 1982

Table 4. Spatial summaries of notably low June Mean Temperatures.

Station	State	Average Minimum Temperature (°C)	Previous Record (°C)	Year	Years of Record
Mardie	WA	10.8	11.0	2000	50
Wittenoom	WA	10.1	10.5	1971	53
Wongan Hills	WA	5.3	5.5	1990	38
Bridgetown	WA	1.8	2.0	1931	106
Dwellingup	WA	3.5	3.9	1960	70
Pemberton	WA	5.9	6.3	1956	60
Albany	WA	6.0	6.8	1973	42
Kellerberrin	WA	0.7	3.4	1971	94
Beverley	WA	2.0	3.0	1990	37
Corrigin	WA	1.8	2.7	1990	58
Hyden	WA	2.2	3.2	2001	34
Katanning	WA	3.0	3.6	1931	112
Lake Grace	WA	4.6	4.8	1960	51
Narembeen	WA	3.6	4.6	1984	35
Narrogin	WA	3.3	4.8	1960	39
Ongerup	WA	4.4	5.6	1990	39
Pingelly	WA	4.0	4.2	1990	35
Ravensthorpe	WA	5.8	6.4	1966	45
Wagin	WA	3.6	4.2	1990	32
Balladonia	WA	3.2	3.7	1984	78
Eyre	WA	3.2	4.0	2001	45
Leonora	WA	4.2	5.1	1981	57
Norseman	WA	3.1	3.7	1960	56
Salmon Gums	WA	2.2	3.7	1946	59
Warburton	WA	3.6	3.9	2000	31
Andamooka	SA	4.0	4.8	1982	37
Marree	SA	3.2	3.3	1982	67
Oodnadatta	SA	3.3	3.5	1940	58
Ceduna	SA	2.8	2.9	1975	65
Kyancutta	SA	1.0	1.7	1975	77
Elliston	SA	4.5	6.1	1972	44
Hawker	SA	1.1	2.4	1985	39
Yongala	SA	-1.9	-0.9	1972	81
Warooka	SA	6.7	6.8	1956	48
Parafield	SA	3.3	4.6	1982	50
Edinburgh	SA	3.5	4.5	1982	34
Rosedale	SA	2.4	3.9	1975	44
Eudunda	SA	3.6	3.7	1982	42
Perisher Valley	NSW	-5.5	-5.2	1982	30
Tumbarumba	NSW	-2.6	-2.5	1972	40
Wagga Wagga	NSW	1.1	1.1	1982	65
Tocumwal	NSW	1.3	1.3	1982	36
Hillston	NSW	1.9	2.3	1965	74
Ouyen	VIC	2.2	2.2	1982	70
Nhill	VIC	0.4	0.4	1972	107
Echuca	VIC	0.9	1.3	1982	124
Tatura	VIC	0.2	0.8	1982	42

Benalla	VIC	0.5	0.7	1982	103
Rutherglen	VIC	-2.4	-0.4	1927	92
Strathbogrie	VIC	-1.3	-1.1	1982	30
Lake Eildon	VIC	1.1	1.6	1972	37
Ballarat	VIC	1.8	1.8	1937	98
Launceston	TAS	0.2	0.8	1973	68
Bicheno	TAS	5.1	5.3	1986	32
Flinders Island	TAS	4.6	5.4	1995	44

Table 5. Stations with record low June Average Minimum Temperature (at least 30 years of record).

Station	State	Minimum Temperature (°C)	Date	Previous Record (°C)	Date	Years of Record
Perth Airport	WA	-1.3	17	-1.1	27 June 1946	63
Pearce	WA	-2.9	17	-0.9	2 June 1964	46
Bridgetown	WA	-5.7	17	-4.4	15 July 1956	99
Jarrahood	WA	-4.4	17	-4.1	23 June 1981	26
Goomalling	WA	-1.5	16	-1.2	11 July 1969	29
Kellerberrin	WA	-5.2	16	-4.5	12 Sept 2004	97
Beverley	WA	-3.6	16	-2.6	20 July 1997	38
Katanning	WA	-3.0	17	-2.2	29 Aug 1925	99
Eyre	WA	-5.9	14	-5.1	7 Aug 2002	21
Parafield	SA	-2.3	15	-2.2	8 June 1982	50
Edinburgh	SA	-2.0	15	-1.8	7 June 1982	34
Monto	QLD	-6.1	1	-4.5	7 July 1982	34
Grenfell	NSW	-6.5	15	-5.0	27 July 1986	42
Corowa	NSW	-5.0	14	-4.5	18 June 1998	36
Benalla	VIC	-4.5	14	-4.4	26 June 1965	50
Rutherglen	VIC	-7.5	14	-6.6	15 July 1984	42

Table 6. Stations with record low Daily Minimum Temperature for All Months (at least 20 years of record).

Station	State	Minimum Temperature (°C)	Date	Previous Record (°C)	Date	Years of Record
Wittenoom	WA	4.0	30	4.2	26 June 1982	48
Kalbarri	WA	1.1	13	2.1	27 June 2000	36
Donnybrook	WA	-2.5	17	-2.2	17 June 1938	100
Dwellingup	WA	-3.0	17	-2.8	1 June 1964	50
Ravensthorpe	WA	-0.5	15	0.0	19 June 1966	44
Balladonia	WA	-2.2	14	-1.8	29 June 1997	40
Salmon Gums	WA	-5.7	15	-5.4	22 June 1956	70
Maningrida	NT	9.8	6	10.4	28 June 1994	39
Elliston	SA	-0.8	14	0.0	29 June 2002	45
Warooka	SA	2.1	13	3.0	23 June 1972	42
Balranald	NSW	-3.3	15	-3.0	21 June 1984	40
Peak Hill	NSW	-2.5	15	-2.3	25 June 1971	39
Bathurst Ag.	NSW	-8.2	15	-7.1	23 June 1984	41
Parkes	NSW	-4.0	15	-2.6	19 June 1998	50

Mildura	VIC	-3.7	15	-3.3	8 June 1982	60
Dartmouth Res.	VIC	-5.0	12	-4.5	23 June 1995	32

Table 7. Stations with record low June Daily Minimum Temperature (at least 30 years of record).

REGION	AVERAGE RAINFALL (mm)	RANKING/COMMENT (since 1900)
NT	123.3	5 th Highest, record 150.1 in 1968
Southwest WA	96.9	Lowest, previous 130.5 in 2001
South Coastal Aus.	94.1	Lowest, previous 101.6 in 1914
Southern Australia	56.6	5 th lowest, record 48.5 in 1902

Table 8. Spatial summaries of noteworthy April to June rainfall.

REGION	DEPARTURE FROM AVERAGE (°C)	RANKING/COMMENT (since 1950)
NSW	-2.23	Lowest, previous -1.48 in 1965
Southeast Australia	-2.01	Lowest, previous -1.23 in 1965
VIC	-1.87	Lowest, previous -1.40 in 1972
Southern Australia	-1.63	Lowest, previous -1.30 in 1960
SA	-1.73	2 nd lowest, record -1.89 in 1976
NT	-1.50	2 nd lowest, record -2.33 in 1976
WA	-1.42	2 nd lowest, record -1.44 in 2000
Australia	-1.28	2 nd lowest, record -1.44 in 1976
Southwest WA	-1.43	3 rd lowest, record -2.05 in 1954

Table 9. Spatial summaries of notably low April to June Average Minimum Temperature.

REGION	DEPARTURE FROM AVERAGE (°C)	RANKING/COMMENT (since 1950)
VIC	-1.43	Lowest, previous -1.09 in 1960
Southeast Australia	-1.38	Lowest, previous -1.10 in 1960
TAS	-1.25	Lowest, previous -1.22 in 1963
NSW	-1.24	Lowest, previous -1.07 in 1960
SA	-1.38	2 nd lowest, record -1.67 in 1960
Australia	-1.00	2 nd lowest, record -1.23 in 1960
NT	-1.46	3 rd lowest, record -1.67 in 2000
Southern Australia	-1.05	3 rd lowest, record -1.51 in 1960

Table 10. Spatial summaries of notably low April to June Mean Temperature.