



Australian Government
Bureau of Meteorology

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SPECIAL CLIMATE STATEMENT 31

Wettest March on record in Australia

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Introduction

During March 2011, Australia recorded an average rainfall of 133.3 mm, the wettest March in 112 years of record. This was also the sixth wettest month of any month on record, following the wet February which was the fourth wettest month on record for any month. Rainfall was above average over most of Australia during March, with almost half the country recording rainfall in the top 10% of years, with monthly rainfall records broken at several sites, particularly in South Australia and Queensland (Table 1). Rainfall was particularly heavy in the tropical north associated with a very active monsoon trough, with the wet season to date (October – March) already the second wettest on record for Northern Australia. However, below average rainfall was experienced over parts of western WA, particularly in the southwest of the state (Figure 1).

The very heavy rainfall was associated with the decaying La Niña event in the Pacific Ocean, which brought near-record rainfall to Australia between July 2010 and March 2011, as discussed in recent Special Climate Statements. In addition, this was the coldest March on record for average maximum temperatures in Australia, in part related to the increased cloud cover and rainfall during the month.

Heavy rainfall across the country

Both the Northern Territory and Queensland recorded their wettest March on record in 2011, the former breaking its previous record by more than 20 mm. Southwest Queensland was particularly wet, with stations such as Bedourie and Glengyle recording more than double their previous March records set in 2010. Western Australia also recorded its fifth wettest March on record, despite drier than normal conditions in the south of the state, due to near-record rainfall in the Kimberly and northern parts of the state. Stations at Warmun and the Gibb River broke their long-term rainfall records by more than 200 mm.

Dry conditions were rare, although very much below average rainfall (Figure 2) was recorded in parts of northern NSW and western WA. Southwest WA in particular was dry, recording its tenth driest March on record and its driest since 1994. This has resulted in continuation of the severe rainfall deficiencies which have persisted over the last 14 months in the area.

The highest rainfall totals during the month were recorded over the northern half of Australia (Figure 3) as a result of a very active monsoonal trough, with several embedded low pressure systems bringing intense rain to several locations, especially the Kimberley, southwest Queensland and the southern Gulf coast. This was despite the lack of any named tropical cyclones in the Australian region during the month.

The most significant of these events occurred early in the month, when a tropical low pressure system caused falls of over 200 mm in the southern Gulf coast of Queensland on the 2nd before moving southward through the state producing more heavy falls. Notable daily falls from this system included 477 mm at Mornington Island on the 1st and 319 mm at Bedourie on the 6th. Both were records for their districts, and the Bedourie fall is the second-highest daily rainfall on record in central Australia.

Warmun, in the east Kimberley, recorded a daily rainfall total of 181 mm on the 14th; the highest daily rainfall on record at this site for any month. Very heavy rainfall also occurred on the north coast of Queensland towards the end of the month, with two consecutive days exceeding 200 mm at Prosperpine on the 29th and 30th, triggering landslides in the Mackay region, with a Natural Disaster declared in Hydeaway Bay.

The very high monthly totals recorded in the northern half of the country were partly due to the persistent rainfall during March 2011, with each day during the month experiencing rainfall above 25 mm at one or more stations in the Northern Territory. Several stations experienced record breaking numbers of rain days during the month, including Alice Springs, while only two dry days were recorded in Darwin during the month.

In addition to the consistently heavy rainfall in northern Australia, a progression of strong low pressure troughs caused substantial rainfall in southern parts of Australia. This brought very heavy rainfall to SA, which recorded its fourth wettest March on record, while the western parts of NSW and Victoria recorded more than four times their March average rainfall during the month. This was largely due to two low pressure trough systems on the 10th and 21st.

The south coast of NSW and eastern Victoria also experienced very heavy rainfall due to a low pressure system embedded in a coastal trough which affected the area between the 20th and 22nd with daily falls of 398 mm recorded at Mt Darragh west of Merimbula in southern NSW. This system also brought very heavy rainfall to northern Tasmania on the 24th, with daily rainfall of up to 327 mm at Gray on the 24th, the third highest rainfall on record in the state. This event caused the majority of March rainfall in these regions, with Tasmania consequently recording its 12th wettest March on record. For more information on the heavy rainfall event in northern Tasmania please see Special Climate Statement 30.

Whilst flooding associated with the heavy rains in March was not as destructive as that experienced in earlier months, there was still substantial river flooding, particularly in the Kimberley, far western Queensland and northern Tasmania. Flash flooding also occurred at various stages during the month, most significantly in the Wilsons Promontory National Park (Victoria) on the 22nd.

The wet March in parts of Victoria and South Australia has contributed to those two states recording their wettest starts to the year on record, with Australia as a whole recording its second wettest start (Figure 4). The rainfall received in March follows similar rainfall patterns in January and February, with over 150 stations recording their wettest start to any year in 2011 (Table 4) including 398 mm at Broken Hill between January and March, 75 mm higher than the previous record and 441.8 at Mildura, more than double its previous record. Furthermore, Mildura has also experienced a record-breaking five consecutive months exceeding 100 mm, after having only had one month exceeding 100 mm in the 30 years prior to November 2010, and has already had its fifth-wettest calendar year on record with nine months of the year still remaining.

Coldest March maximum temperatures on record

In addition to the exceptional rainfall, Australia recorded its coldest March maximum temperature on record with average maximum temperatures of 29.82°C, 2.19°C below average. This was partly due to increased cloudiness across most of the country associated with the above average rainfall recorded throughout the month. Temperatures were coolest in central parts of Australia where rainfall was most abnormal, with maximum temperatures more than 5°C below average over a large area in eastern WA (Figure 5). All states in mainland Australia experienced maximum temperatures in the ten coldest years on record during March 2011 (Figure 6). Both the Northern Territory and South Australia broke their previous records for average statewide maximum temperature by more than half a degree and Victoria recorded its third coldest March on record and Western Australia its fifth coldest.

Temperatures were consistently cool throughout the month, particularly in the northern parts of Australia, although few records were broken for low daily maximum temperatures. The highest

temperature in Australia for the month was 41.1°C at Roebourne (WA) on the 19th, the lowest such value in March in at least the last 50 years, whilst locations such as Tennant Creek, Mount Isa and Halls Creek had below-average maximum temperatures on all 31 days of the month.

Above average maximum temperatures were only recorded on the east and west coasts, influenced by the very warm sea surface temperatures off both these coasts, and only southwest WA was substantially warmer than normal, particularly near the coast where high sea surface temperatures inhibited seabreeze development. Interestingly, while parts of southwest WA experienced their warmest March on record, parts of southeastern WA recorded their coldest March on record, with numerous records broken for individual stations in both areas of WA.

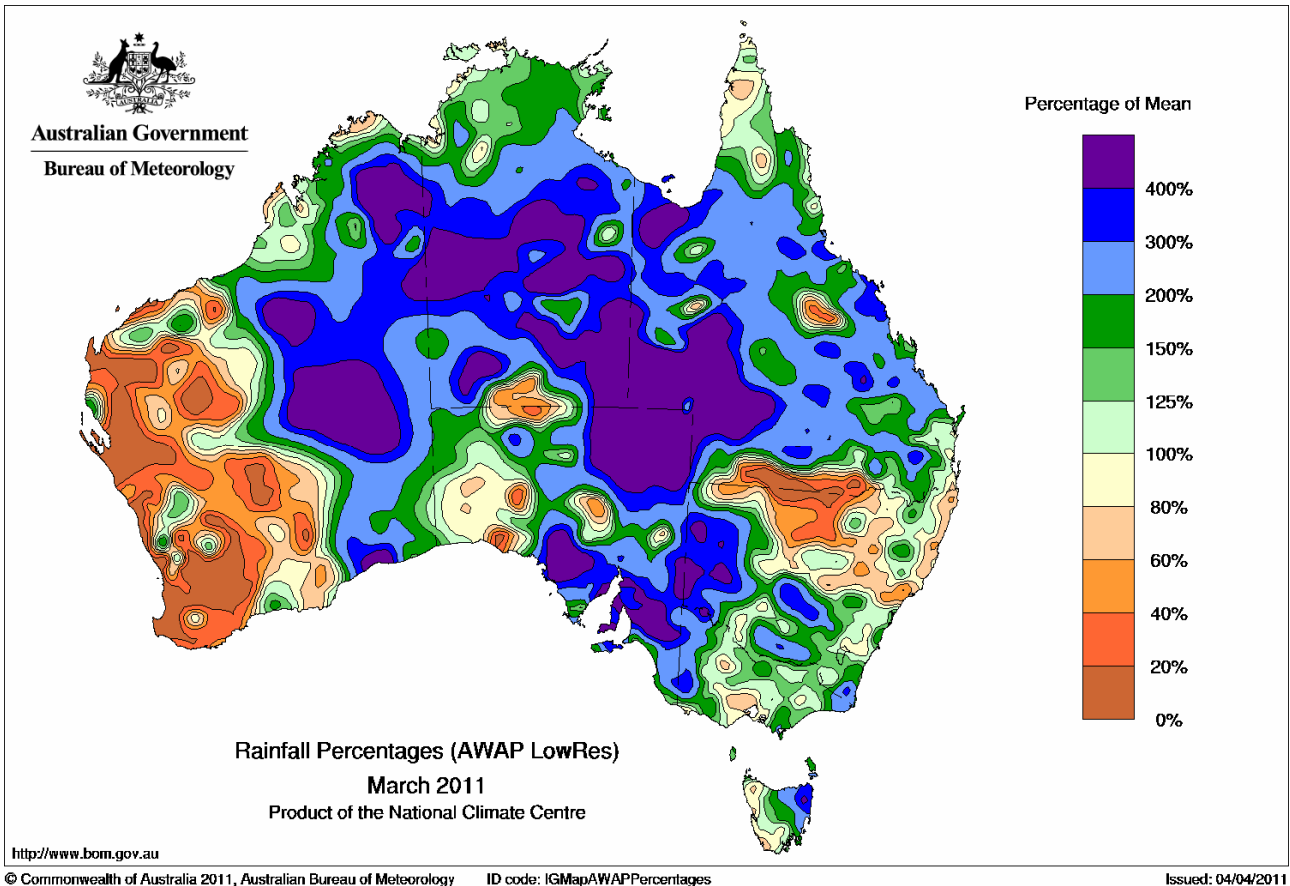


Figure 1. Rainfall in March 2011 as a percentage of the historical average for March

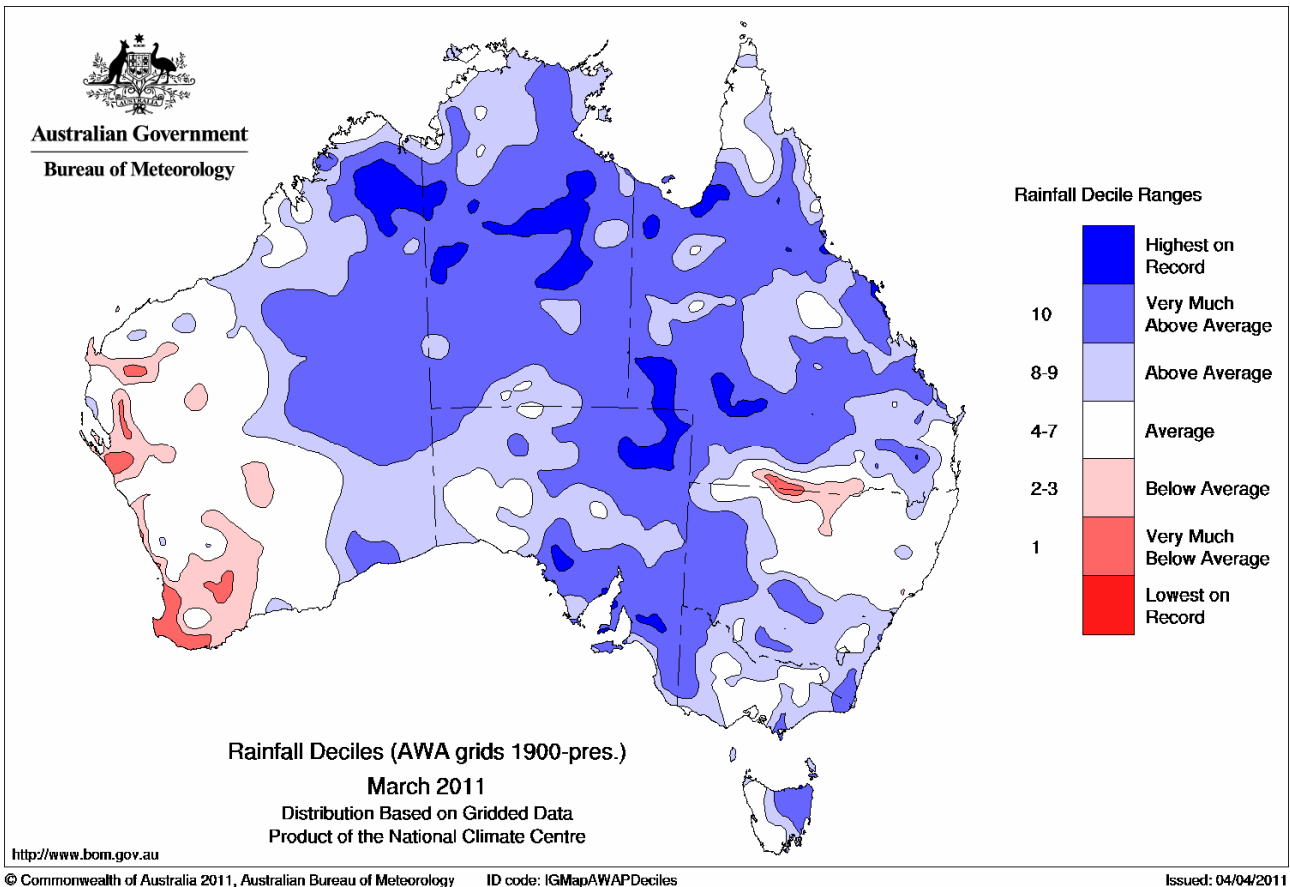


Figure 2. Rainfall deciles for Australia during March 2011

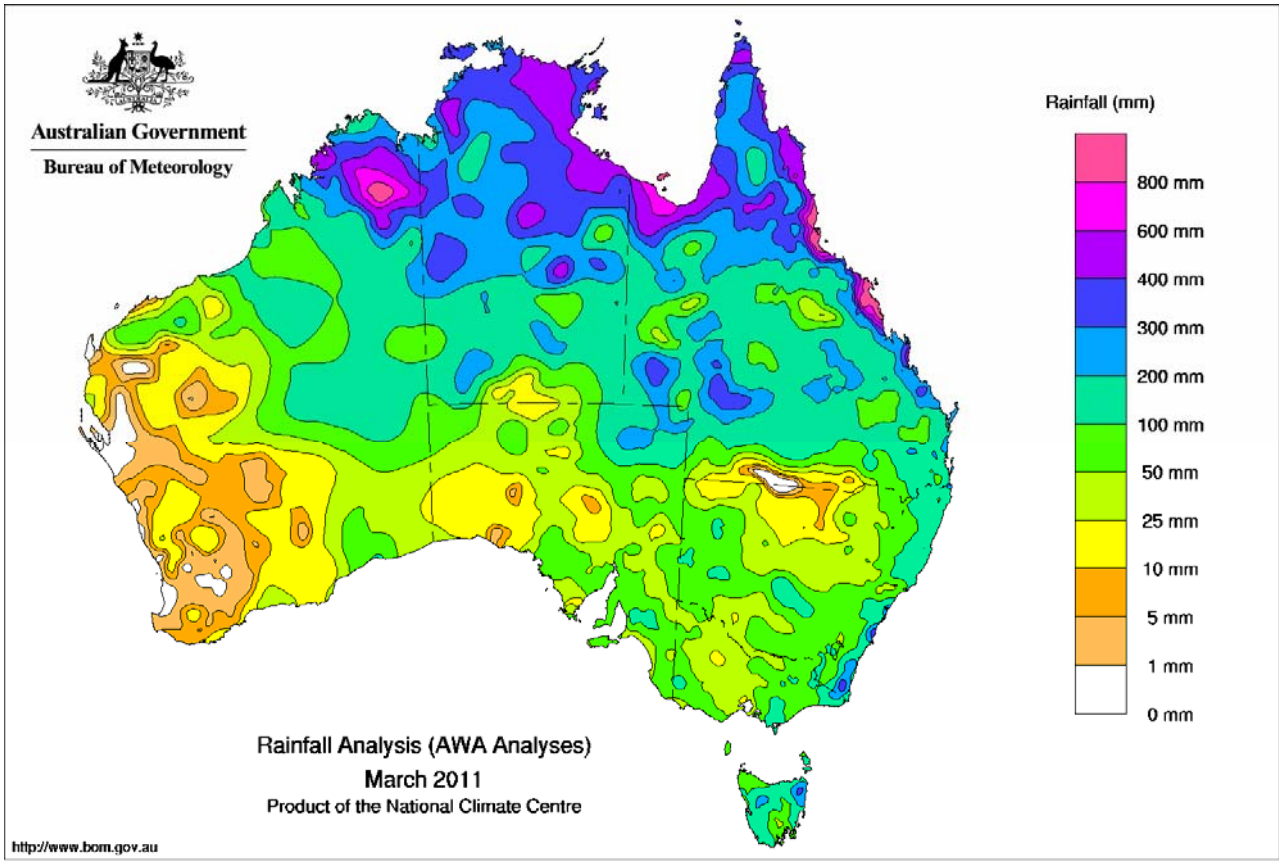


Figure 3: Rainfall totals for Australia during March 2011.

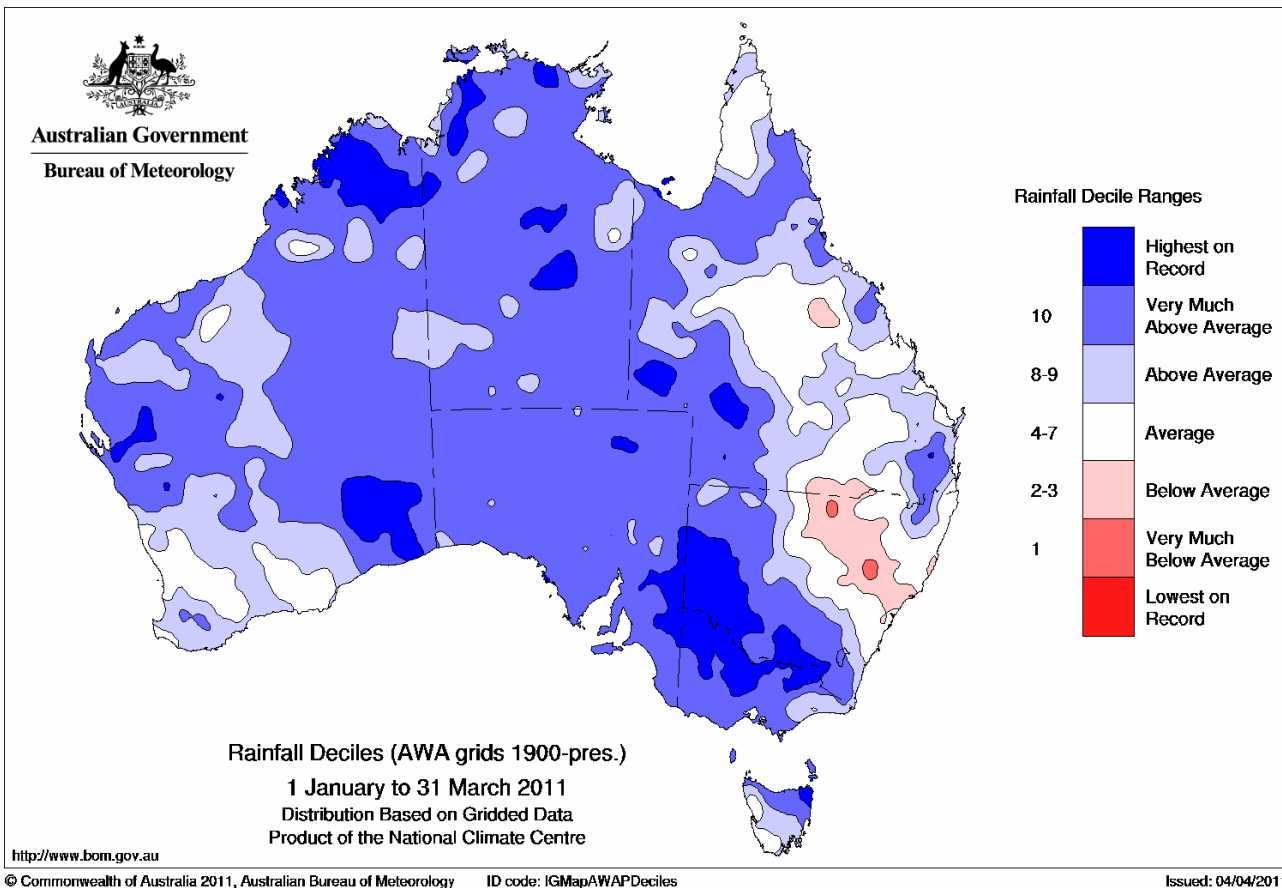


Figure 4. Rainfall deciles for Australia during January to March 2011

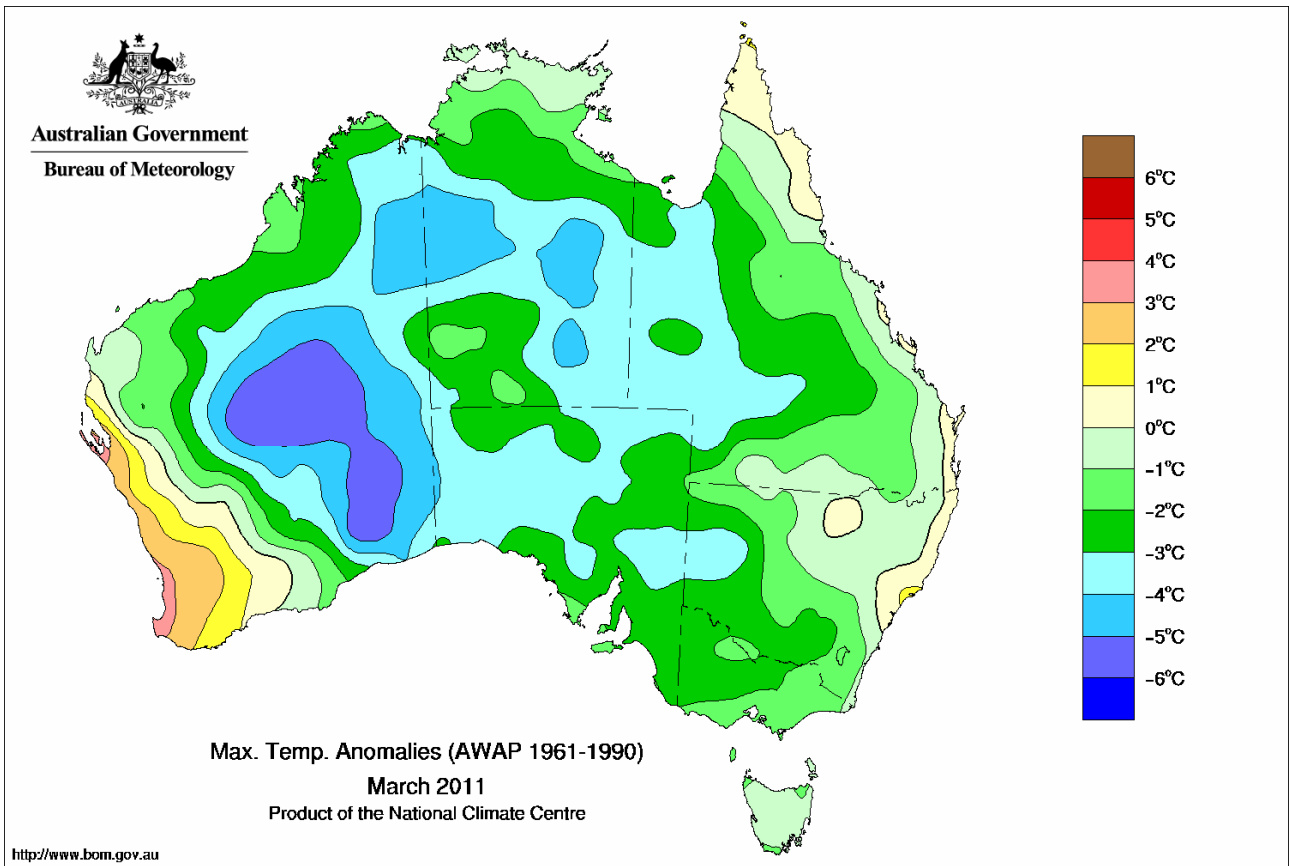


Figure 5. Maximum temperature anomalies during March 2011

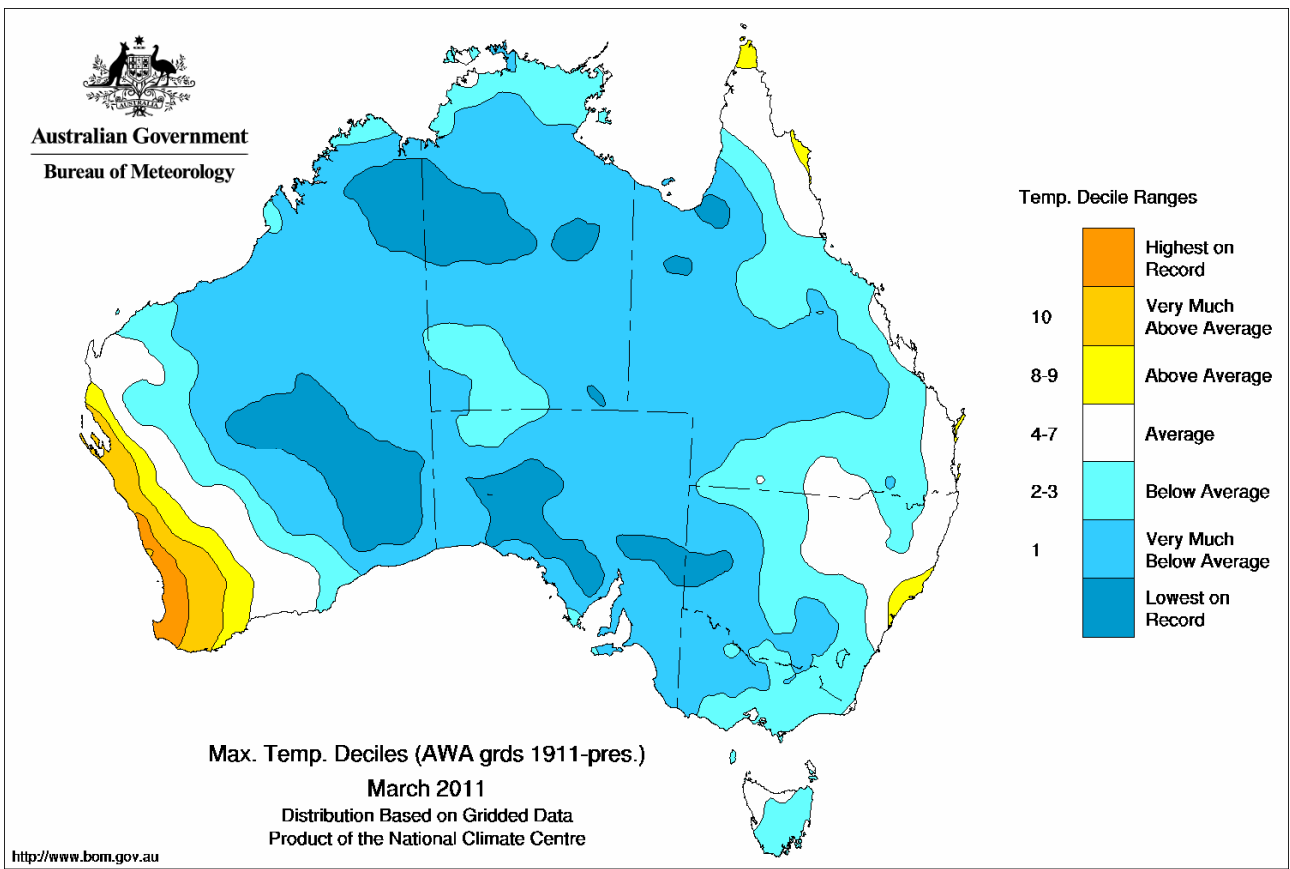


Figure 6. Maximum temperature deciles during March 2011

Station Name	Number	State	March 2011 (mm)	Previous record (mm)	Years of record
Gibb River	2009	WA	754	418.8 mm in Mar 1989	83
Mount Amhurst	2021	WA	448.8	285.8 mm in Mar 2007	55
Ruby Plains	2026	WA	323.6	219.3 mm in Mar 2001	69
Warmun	2032	WA	694.7	453.4 mm in Mar 2007	103
Helen Springs	15015	NT	388.2	348 mm in Mar 1949	66
Brunette Downs	15085	NT	319.4	317.9 mm in Mar 1941	118
Kurundi	15537	NT	474.1	203.4 mm in Mar 1941	58
Yardea	16055	SA	107.5	88.9 mm in Mar 1908	135
Whyalla (Mullaquana)	18058	SA	77.4	75.6 mm in Mar 1989	93
Ardrossan	22000	SA	105.2	100.3 mm in Mar 1921	132
Price	22015	SA	91.8	73.5 mm in Mar 1947	68
Warooka	22018	SA	91.6	85.8 mm in Mar 1983	140
Yorke town	22023	SA	84.2	79.5 mm in Mar 1910	132
American River	22800	SA	103.2	66.8 mm in Mar 1992	110
Smithfield	23025	SA	127	126.1 mm in Mar 1947	114
Two Wells	23028	SA	117.8	95.4 mm in Mar 1906	130
Lyndoch	23309	SA	112.2	83.4 mm in Mar 1947	125
Stockport (Clifton)	23370	SA	70.6	67.5 mm in Mar 1985	50
Birdwood	23705	SA	132.8	123.3 mm in Mar 1947	124
Cudlee Creek (Millbrook)	23731	SA	188	136.4 mm in Mar 1981	97
Mount Pleasant	23737	SA	179.6	119.6 mm in Mar 1877	134
Williamstown	23752	SA	169.8	93.4 mm in Mar 1910	131
Palmer	24525	SA	187.8	122.6 mm in Mar 1910	110
Swan Reach	24535	SA	116	98.3 mm in Mar 1921	113
Peebinga	25023	SA	56.6	51.8 mm in Mar 1983	56
Augustus Downs Station	29001	QLD	425	368.9 mm in Mar 1901	113
Miranda Downs Station	29037	QLD	403.5	378 mm in Mar 2006	102
Mornington Island	29039	QLD	1054.8	812.7 mm in Mar 1928	87
Bambaroo	32001	QLD	1300.6	1100 mm in Mar 1950	89
Upper Stone Exelby	32043	QLD	1085.8	850.8 mm in Mar 1950	71
Victoria Sugar Mill	32045	QLD	1239.6	1223.7 mm in Mar 1950	114
Plane Creek Sugar Mill	33059	QLD	995.2	841.4 mm in Mar 1979	102
Hecate	33158	QLD	767.8	553.6 mm in Mar 1990	51
Bedourie Police Station	38000	QLD	474.3	194.4 mm in Mar 2010	65
Cluny	38005	QLD	247	165.6 mm in Mar 2010	71
Glengyle	38009	QLD	385.4	171.6 mm in Mar 2010	89
Roseberth Station	38020	QLD	343.3	186 mm in Mar 1950	98
Bombala (Therry Street)	70005	NSW	241.4	204.2 mm in Mar 1906	127
Gladstone (Old Post Office)	92011	TAS	262.4	253.6 mm in Mar 1931	83
Orford (Aubin Court)	92027	TAS	142.8	123.9 mm in Mar 1970	58
Pyengana (Forest Lodge Road)	92051	TAS	431.6	269.1 mm in Mar 1970	50

Table 1. Record monthly rainfall totals during March 2011 at key stations with at least 50 years of record.

Station Name	Number	State	March 2011 (°C)	Previous record (°C)	Years of record
Troughton Island	1007	WA	30.4	30.5C Mar 1965	33
Halls Creek Airport	2012	WA	30.7	31.8C Mar 2001	66
Warmun	2032	WA	32.3	33.1C Mar 1974	49
Wiluna	13012	WA	29.2	29.8C Mar 1995	107
Wave Hill	14840	NT	31.3	32.4C Mar 1974	38
Timber Creek	14850	NT	32.7	32.9C Mar 1989	31
Brunette Downs	15085	NT	30.8	32.3C Mar 1974	48
Tennant Creek Airport	15135	NT	30.3	31.2C Mar 2001	42
Jervois	15602	NT	30.6	31.2C Mar 1982	43
Nonning	16032	SA	26.4	26.7C Mar 1981	40
Arkaroola	17099	SA	25.7	25.9C Mar 1987	34
Cleve	18014	SA	22.7	23.1C Mar 1997	71
Kimba	18040	SA	24.2	24.7C Mar 1981	44
Kyancutta	18044	SA	25.9	26.1C Mar 1981	82
Hawker	19017	SA	26.1	27.1C Mar 1981	38
Maitland	22008	SA	23.5	24.0C Mar 1969	30
Warooka	22018	SA	22.5	22.7C Mar 1981	52
Cape Willoughby	22803	SA	18.7	19.3C Mar 1997	44
Mornington Island	29039	QLD	30.0	30.3C Mar 1994	37
Mount Isa Aero	29127	QLD	30.2	31.0C Mar 1971	45
Longreach Aero	36031	QLD	31.6	31.7C Mar 2010	46
Menindee Post Office	47019	NSW	26.7	27.1C Mar 1950	98
Scottsdale (West Minstone Road)	91219	TAS	19.2	19.3C Mar 1975	40
Orford (Aubin Court)	92027	TAS	18.8	18.9C Mar 2005	43

Table 2. Record cold monthly average maximum temperatures in March 2011 at stations with 30 or more years of record

Station Name	Number	State	March 2011 (°C)	Previous record (°C)	Years of record
Eneabba	8225	WA	36.9	36.2C Mar 2010	37
Perth Airport	9021	WA	32.8	32.0C Mar 1978	67
Karnet	9111	WA	30.9	30.7C Mar 1995	46
Jurien Bay	9131	WA	32.5	32.0C Mar 1983	42
Bridgetown Comparison	9510	WA	30.6	30.3C Mar 1978	111
Cape Leeuwin	9518	WA	25.4	24.8C Mar 1983	115
Cape Naturaliste	9519	WA	27.9	27.4C Mar 2003	108
Donnybrook	9534	WA	31.3	31.2C Mar 1978	108
Dwellingup	9538	WA	30.6	29.6C Mar 1995	74
Pemberton	9592	WA	27.8	27.6C Mar 1948	68
Jarrahood	9842	WA	30.6	29.8C Mar 1995	30

Table 3. Record warm monthly average maximum temperatures in March 2011 at key stations with 30 or more years of record

Location	Stn No	District	Jan-Mar 2011(mm)	Previous Record (mm)	Years of Record
Gibb River	2009	WA	1535.2	1001.2 in 1969	83
Mount Amhurst	2021	WA	810	724 in 2001	55
Warmun	2032	WA	1202	891.7 in 2000	103
Napier Downs	3019	WA	996.5	913.4 in 1976	83
Mooloo Downs	6106	WA	437.5	265.4 in 1933	51
Milly Milly	7130	WA	412.8	328.9 in 1948	110
Mundrabilla Station	11008	WA	247.6	234.4 in 2000	97
Darwin Airport	14015	NT	1972.8	1954.1 in 1977	71
Waterloo	14815	NT	930.7	889.3 in 1982	91
Kurundi	15537	NT	876.3	583.6 in 1967	59
Tarcoola (Mulgathing)	16031	SA	223.6	163.2 in 1989	78
Smoky Bay	18077	SA	166.2	152 in 1968	98
Yongala	19062	SA	227.6	223.2 in 1946	131
Mutooroo	20017	SA	319.4	284 in 1950	123
Yunta (Paratoo)	20021	SA	300.4	226.8 in 1973	126
Hallett	21023	SA	255.4	208.8 in 1974	131
Whyte Yarcowie	21055	SA	253.8	212.9 in 1946	135
Tanunda	23318	SA	221.5	200.9 in 1877	144
Williamstown	23752	SA	236	208.7 in 1946	130
Taldra	24017	SA	208.6	152 in 1974	94
Swan Reach	24535	SA	239.3	195 in 1921	113
Alawoona	25000	SA	267.4	202.8 in 1974	90
Parilla	25013	SA	270.8	223.1 in 1974	99
Mornington Island	29039	QLD	2120	1791.7 in 1967	87
Bedourie	38000	QLD	557.5	356.9 in 1977	65
Glengyle	38009	QLD	491.8	322 in 2010	90
Yarraman	40258	QLD	727.2	701.7 in 1950	96
Upper Tenthill	40388	QLD	492.2	476.4 in 1976	51
Mt Whitestone	40397	QLD	521.4	496.6 in 1956	60
Broken Hill (Patton Street)	47007	NSW	397.8	323 in 1974	116
Cockburn (Burta)	47008	NSW	383.1	271.5 in 1950	123
Menindee	47019	NSW	358.6	265 in 1974	132
Pooncarie Mail Agency	47029	NSW	386.5	213 in 2000	128
Wentworth (Wamberra Station)	47040	NSW	327.6	210.9 in 1911	85
Wentworth Post Office	47053	NSW	300	280.3 in 1911	144
Balranald (Rsl)	49002	NSW	293.9	268.6 in 1974	133
Oxley (Walmer Downs)	49055	NSW	365.8	334 in 1974	86
Ivanhoe (Kilfera)	49063	NSW	274	241.4 in 1894	95
Emmaville (Ben Vale)	56140	NSW	516.8	483 in 1996	50
Holbrook (Rsl)	72022	NSW	497.8	329.7 in 1911	127
Hume Reservoir	72023	NSW	393.9	378.8 in 1984	90
Wymah (Gwandallen)	72050	NSW	405	351.4 in 1993	105
Henty Post Office	74053	NSW	514.1	389.4 in 1928	111
Jerilderie Treatment Works	74055	NSW	320.6	267.6 in 1956	123
Urana Post Office	74110	NSW	339.6	299.9 in 1956	139
Culcairn Bowling Club	74188	NSW	423.6	333.5 in 1928	100
Hay (Miller Street)	75031	NSW	386.5	333.8 in 1969	132
Maude	75042	NSW	363.4	229.7 in 1969	117
Annuello	76000	VIC	352.4	221.5 in 1969	83
Irymple (Arlington)	76015	VIC	345.4	209 in 1950	102

Mildura Airport	76031	VIC	441.8	197.4 in 1969	65
Nyah (Yarraby Tank)	76046	VIC	311.6	278.2 in 1911	115
Red Cliffs	76052	VIC	455.8	210.4 in 1950	71
Narraport	77030	VIC	264.6	253.2 in 1911	125
Jeparit	78086	VIC	271.8	215.6 in 1973	112
Redbank	79039	VIC	333.5	303.1 in 1946	114
St Arnaud	79040	VIC	337.4	278.6 in 1973	131
Horsham	79082	VIC	241.4	192.2 in 1973	52
Boort	80002	VIC	328.8	247.3 in 1928	113
Canary Island	80004	VIC	391.1	309.8 in 1928	123
Wedderburn	80061	VIC	359.4	222.9 in 1950	128
Inglewood	81020	VIC	411	266.8 in 1974	123
Bridgewater	81058	VIC	361.6	268.4 in 1973	116
Dunolly	81085	VIC	365.4	274.2 in 1928	130
Barnawartha	82000	VIC	355.4	310.2 in 1939	106
Koetong	82024	VIC	501.6	431.7 in 1887	95
Dartmouth Reservoir	82076	VIC	472.4	420.6 in 1939	59
Eurobin	83010	VIC	521.8	457.3 in 1946	90
Whitlands	83032	VIC	608.6	533.3 in 1973	82
Lancefield	87029	VIC	384.4	338.6 in 1949	123
Heathcote	88029	VIC	349.8	328.1 in 1928	134
Maryborough	88043	VIC	350.7	305.4 in 1973	133
Addington	89106	VIC	434.4	322.8 in 1973	54
Frankford (Rossville)	91033	TAS	407.8	378.8 in 1946	118
Mole Creek	91065	TAS	451.8	432.8 in 1996	96
Pioneer (Main Road)	92030	TAS	562.3	468.6 in 1907	107
Deal Island	99001	TAS	346.5	332.1 in 1946	140

Table 4. Record monthly rainfall totals during January to March 2011 at selected stations with at least 50 years of record.

Contacts for further information

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General notes

This statement is based on information as of 4th April 2011. This is preliminary data, and may change as further observations are obtained and quality assurance is undertaken.

Maximum temperatures prior to 1910 have not been considered for inclusion unless they are known to have been measured in a standard Stevenson screen or similar.