

Special Climate Statement 78

Prolonged heatwave conditions in south-west Western Australia in November 2023

2 February 2024





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Summary

- In November 2023, south-west Western Australia, including Perth, experienced a heatwave exceptional for the time of the year.
- The heatwave was notable for its duration, with many locations setting records for consecutive hot days.
- Weather patterns in mid-November included a near stationary low-pressure trough off the west coast of Western Australia and slow moving high-pressure systems to the south in the Indian Ocean.
- The weather patterns combined to bring very warm air from the interior over south-west Western Australia over a sustained period.
- A period of high fire danger occurred due to antecedent dry conditions, hot daily temperatures and strong winds.
- The Bureau of Meteorology issued Fire Weather Warnings between 21 and 26 November, and Heatwave warnings across south-west Western Australia were current on all days from 17 to 28 November.
- Emergency management agencies attended multiple fires, including in Perth's northern suburbs.
- Record high temperature records were set, with daily maximum temperatures 8–14 °C and daily minimum temperatures 6–12 °C above the 1961–1990 average for November.
- Greater Perth, the surrounding areas and parts of the south-west coast exceeded previous 7-day mean temperature records for November.
- Numerous locations recorded their warmest November in terms of mean maximum, mean minimum, and overall mean temperature (since 1910).
- The preceding months were warmer and drier than average, with August to October temperatures very much above average.
- South-west Western Australia experienced severe rainfall deficiencies for the cool season from April to October 2023, with May being exceptionally dry.
- Soil moisture was generally below average in November, with large areas very much below average.
- Climate factors contributing to the heatwave conditions included record warm global sea surface temperatures, El Niño in the Pacific Ocean, a positive Indian Ocean Dipole and a positive Southern Annular Mode.
- The likelihood of the record warm spring 2023 in Western Australia exceeding the previous record in the current climate compared to a world without climate change was at least 50 times greater.



Introduction

The Bureau of Meteorology Special Climate Statements provide a detailed summary of significant weather and climate in Australia. They are produced on an occasional basis, when the weather or climate is unusual in the context of the climatology of the impacted region. Special Climate Statements serve as a historical record, and can help the community and decision makers to understand climate conditions around significant weather events.

An exceptional [heatwave](#) for the time of year affected large parts of south-west Western Australia, including Perth, during November 2023.

Many November temperatures records were set across the south-west during this time. Daily maximum temperatures were 8 to 14 °C above the 1961–1990 November average and daily minimum temperatures were often 6 to 12 °C above average. As a result, numerous locations had their warmest November on record in terms of mean maximum temperature, mean minimum temperature and mean temperature.

Low-intensity or Severe intensity heatwave warnings were issued by the Bureau commencing 20 November. Severe heatwave conditions peaked on the 23rd and continued over parts of the Lower West and South West districts during the following days. A broad strip of the west coast was affected by the heatwave during the week, including an area extending from south of Geraldton in the Central West District to the Leeuwin coast.

Hot, dry conditions and strong winds resulted in elevated fire dangers from the 21st. Much of south-west Western Australia had the potential to experience Extreme fire danger conditions, with small areas of Catastrophic fire danger. Numerous fires were attended by emergency services, including in the northern suburbs of Perth.

The positive Indian Ocean Dipole, El Niño, and southern hemisphere atmospheric circulation in November 2023 set up the conditions for the heatwave over south-west Western Australia. This occurred against the background of record warm global mean temperature. The likelihood of the record warm spring 2023 in Western Australia exceeding the previous record in the current climate compared to a world without climate change was at least 50 times greater.



1. Antecedent conditions

- Monthly mean maximum temperatures for south-west Western Australia for each month from August to October 2023 were in their respective 4 warmest on record since 1910.
- Much of south-west Western Australia experienced serious rainfall deficiencies (lowest 10% of all years since 1900) for the cool season (April to October 2023).
- Soil moisture content was very much below average (lowest 10% of all years since 1911) for much of south-west Western Australia in November 2023.

1.1. Temperature

Conditions leading up to November 2023 were hotter and drier than usual in south-west Western Australia. Monthly mean maximum temperatures for August, September and October 2023 were very much above average (warmest 10% of all years since 1910) or warmest on record for much of the region (Figure 1). Mean maximum temperatures for September were the highest on record for most parts of Western Australia south of the tropics and away from the west coast, whereas in October the most unusually warm maximum temperatures were near the west coast, with records set from Perth north to Karratha on the Pilbara coast.

For the south-west Western Australian region as a whole, area-average¹ monthly maximum temperatures were more than 2 °C above the 1961–1990 average for each of August to October (Table 1), and in their respective 4 warmest months on record since 1910.

Many locations across the southern and western half of Western Australia had repeated significant early-season daytime hot temperatures in September and October, notably:

- **Perth** (composite of Perth Metro and Regional Office, 126 years of data)
 - 34.3 °C on 27 September, a new record for September.
 - Reached 34 °C three times by 7 October, this had only previously been reached twice on or before that date.
 - Hottest day ever so early in spring three times: 34.3 °C on 27 September, 34.8 °C on 7 October and 36.5 °C on 16 October.
- **Geraldton** (composite of Airport and town sites, 117 years of data)
 - 39.0 °C on 27 September, a new record for September.
 - 41.3 °C on 16 October, a new record for October.

¹ Area averages for south-west Western Australia are calculated for the region south-west of the line joining 30°S, 115°E and 35°S, 120°E (approximately Jurien Bay to Bremer Bay), see http://www.bom.gov.au/climate/change/about/temp_timeseries.shtml

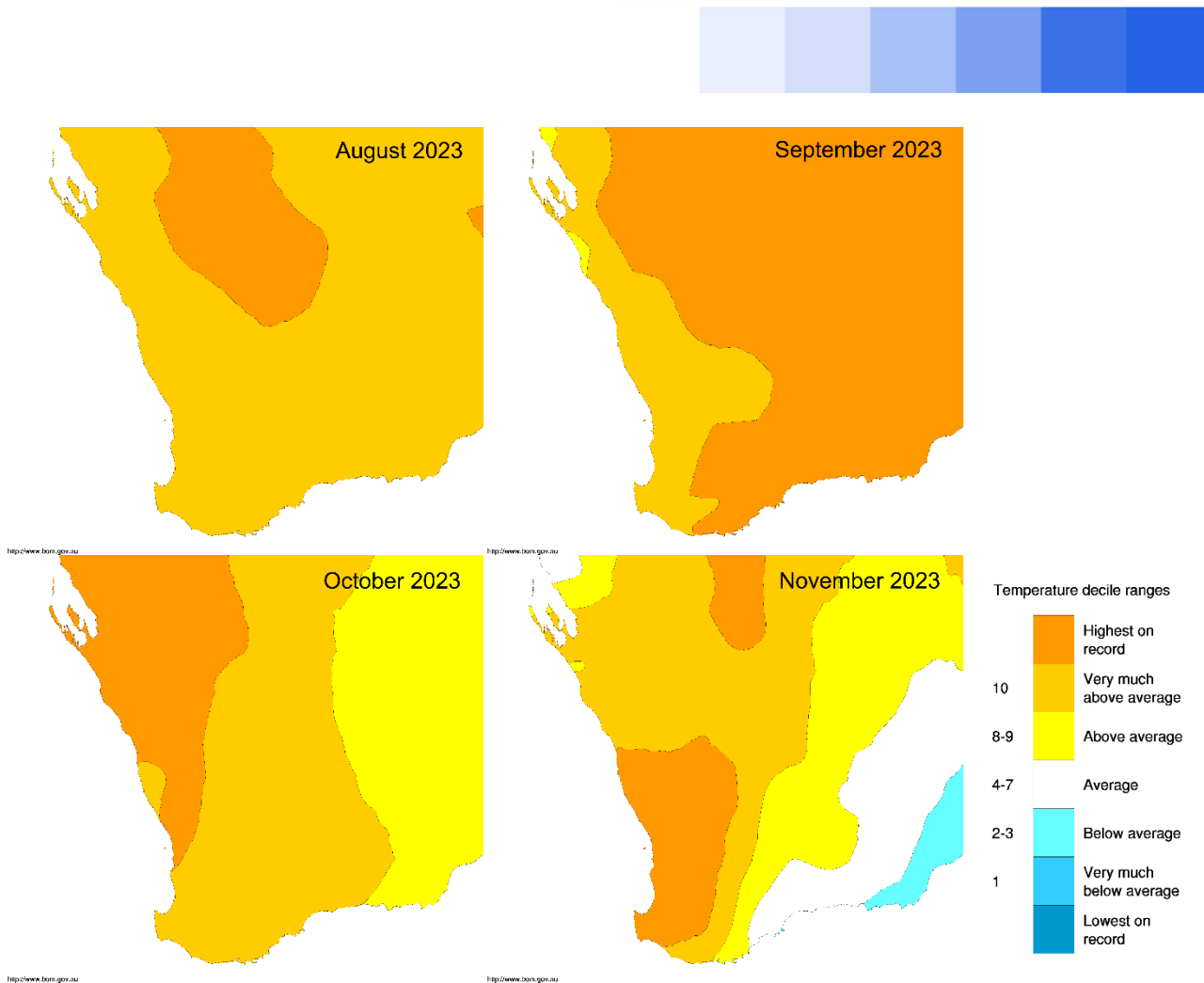


Figure 1. Observed monthly mean maximum temperature relative to all years since 1910 ([deciles](#)), for south-west Western Australia for August (top left), September (top right), October (bottom left) and November 2023 (bottom right).

1.2. Rainfall

Much of south-west Western Australia experienced severe to serious rainfall deficiencies (totals in the lowest 5% and 5 to 10% relative to all years since 1900) for the cool season (April to October 2023) leading up to November (Figure 2). With the exception of June, rainfall in south-west areas of Western Australia was below average in every month between May and November 2023.

May 2023, the start of the crop-sowing season, was Western Australia's driest May on record, and the south-west's third-driest May on record (Table 2). Low rainfall totals at the start of the cropping season, compounded by very warm conditions (the second-warmest October maximum temperature on record), cut the season short. Crop yields were generally either poor or average.

1.3. Soil moisture

The effects of rainfall can be seen in soil moisture conditions. Extended periods of below average rainfall act to dry the soil. Modelled root-zone soil moisture (moisture in the top 1 metre of soil) for November 2023 was generally below average (Figure 3). Large areas were modelled as being very much below average – in the lowest 10% of root-zone soil moisture for this time of year, relative to all years since 1911.



Rainfall deficiencies

April to October 2023

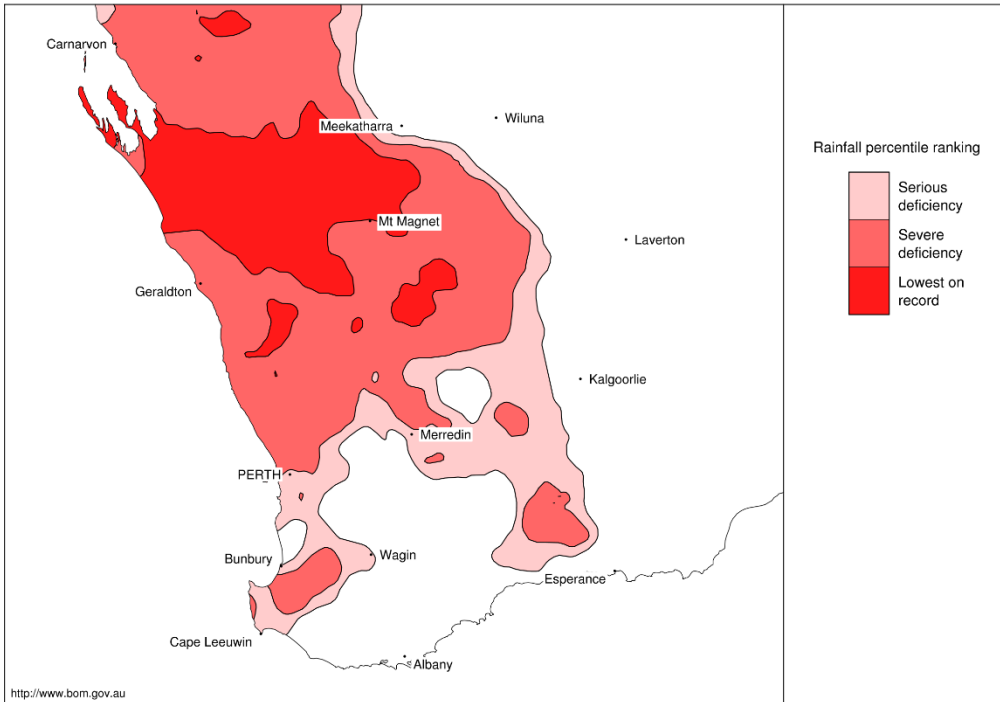


Figure 2. Rainfall deficiencies, relative to all years since 1900, for south-west Western Australia for the 2023 cool season (April to October). Serious rainfall deficiency means in the driest 5–10% of all years, and severe deficiency in the driest 5% of all years.

Root-zone soil moisture deciles
 November 2023
 Based on AWRA-L v7.0 gridded data

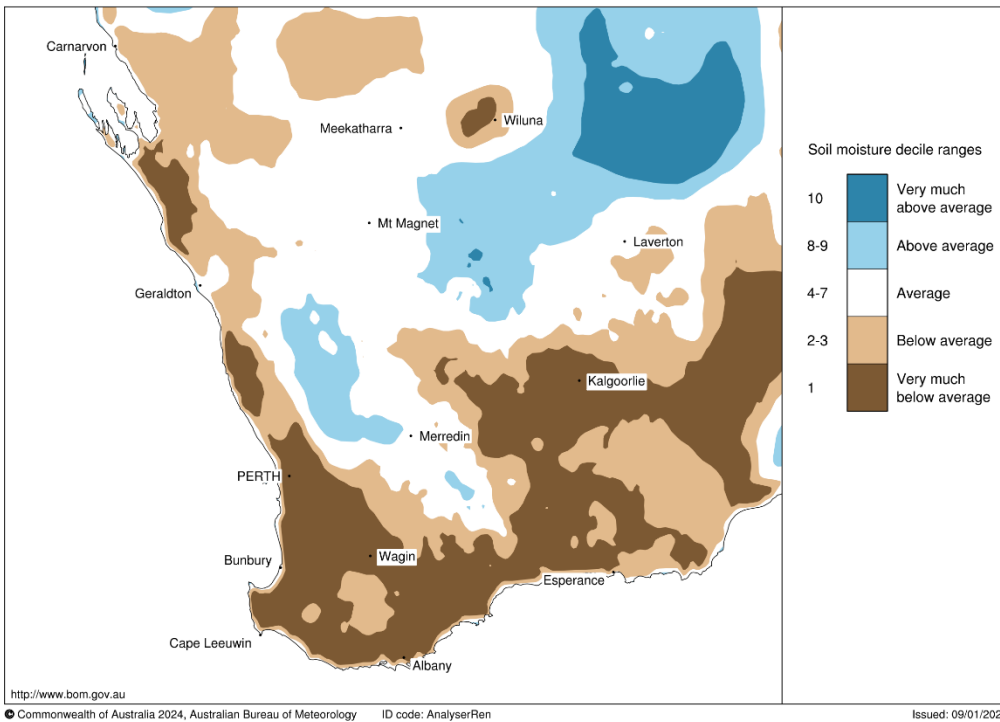


Figure 3. Modelled root zone soil moisture (moisture in the top 1 metre of soil) distribution, relative to all years since 1911 (deciles), for south-west Western Australia in November 2023.



2. Synoptic conditions

- A near-stationary low pressure trough off the west coast of Western Australia persisted for 11 days in November 2023.
- The low pressure trough combined with slow moving high pressure systems in the Indian Ocean to bring very warm air from the interior over south-west Western Australia over a sustained period.
- Heatwave and extreme fire danger warnings were issued across south-west Western Australia from 17 to 28 November 2023.

On 15, 16 and 17 November 2023, a surface low pressure trough across the continent linked with the trough off the Western Australia coast (Figure 4). The trough near the west coast then became near-stationary during the following 11 days.

From the 15th to the 21st, a slow moving high pressure system was located to the south-west of Western Australia, extending into the Great Australian Bight. In combination, these 2 weather systems dragged hot easterly winds and a very warm air mass from the interior of the continent over south-west Western Australia.

The hot, dry conditions and strong winds across south-west Western Australia resulted in high to extreme fire dangers. Fire Weather Warnings for parts of western and south-western Western Australia were current between the 21st and the 26th. Heatwave Warnings were current for parts of Central West, Lower West and South West districts on all days from the 17th to the 28th.

Severe heatwave conditions first peaked on the 21st around Greater Perth and the Central West district, as the high pressure system moved into the Great Australia Bight (Figure 4). Heatwave conditions persisted over parts of Western Australia's Lower West and South West districts during the following days. These reached a second peak on the 25th with a passage of a second high pressure system (Figure 4), before easing from the 27th.

Maximum temperatures were 8 to 14 °C above the 1961–1990 average during 18–26 November 2023 (Figure 5), particularly along the west coast of Western Australia including Greater Perth.

Minimum temperature anomalies (Figure 6) were less extreme than for maximum temperature. However, minimum temperatures still peaked at 8 to 12 °C above average around the 22nd.

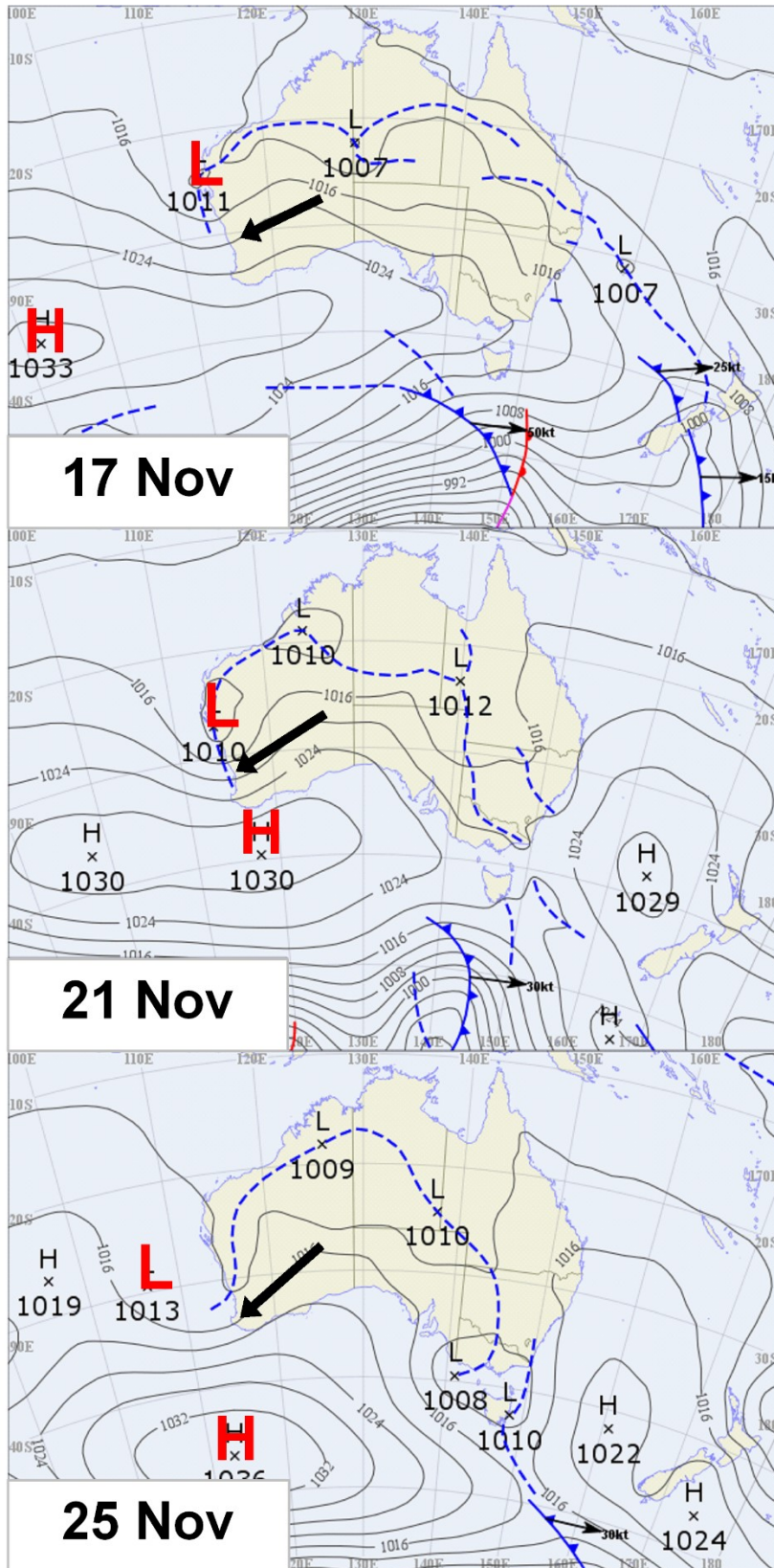


Figure 4. Bureau of Meteorology mean sea level pressure (MSLP) analyses for 0800 AWST 17, 21 and 25 November 2023. The red "L" and "H" respectively denote the centre of the low pressure trough off the west coast of Western Australia and a large high pressure system to the south. Together, these directed hot air from the interior of the continent over south-west Western Australia, indicated by the black arrows. More closely spaced contour lines on the 21st and 25th indicate the presence of stronger winds, resulting in more intense heatwave and fire weather conditions.

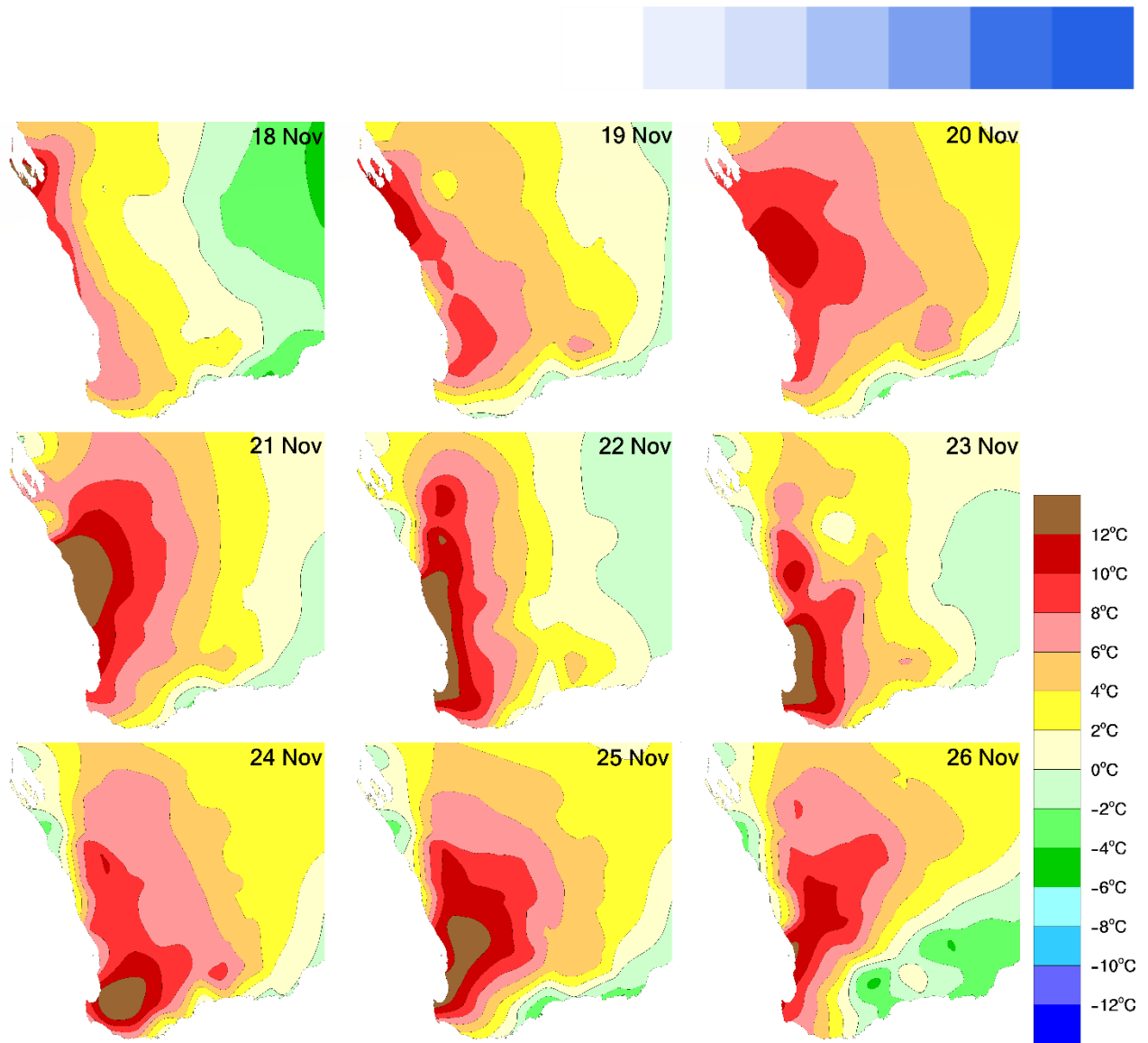


Figure 5. Daily maximum temperature differences from average (anomalies), relative to 1961–1990, for south-west Western Australia each day from 18 November to 26 November 2023 inclusive, based on AWAP gridded analyses.

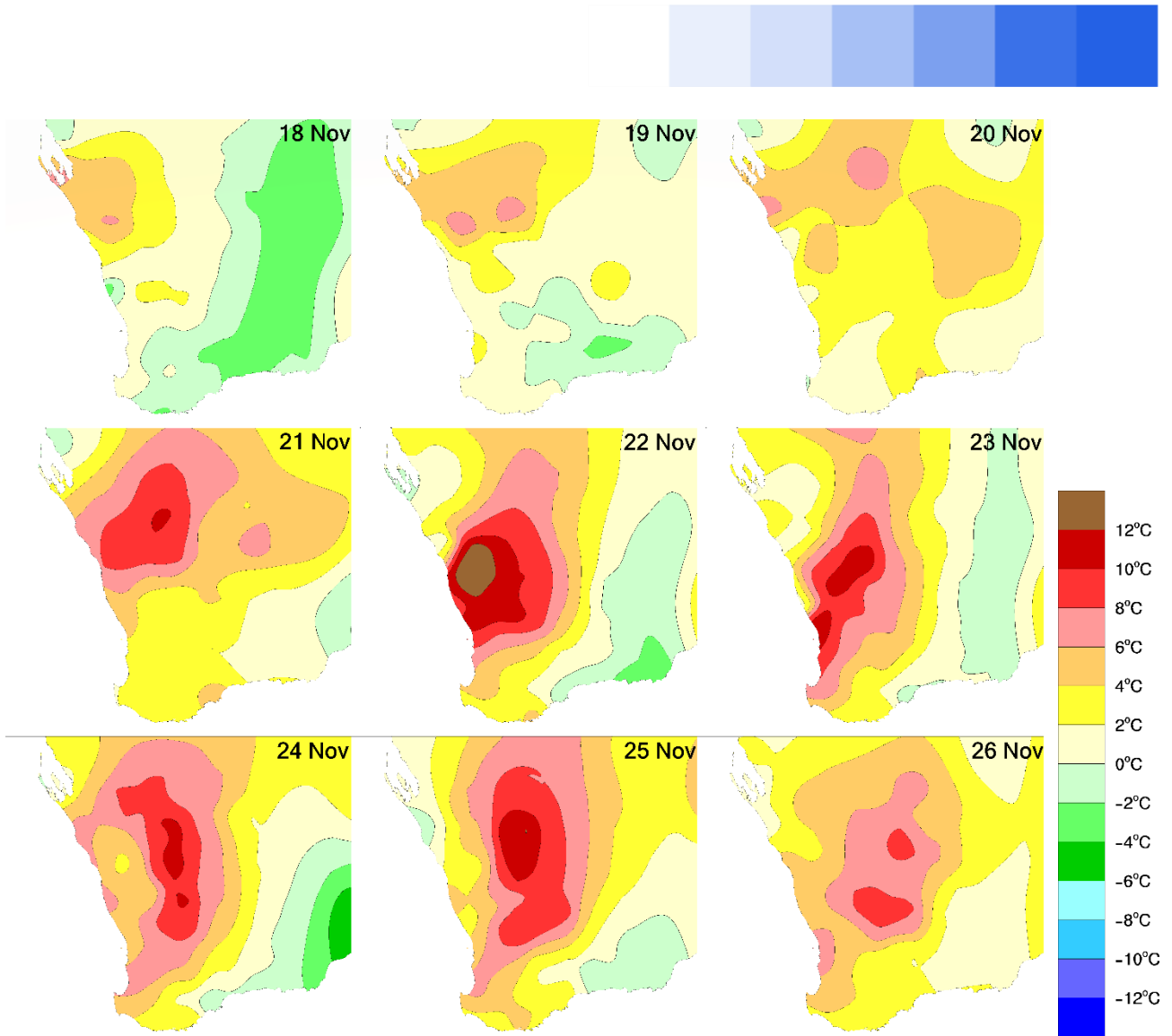


Figure 6. Daily minimum temperature differences from average (anomalies), relative to 1961–1990, for south-west Western Australia each day from 18 November to 26 November 2023 inclusive, based on AWAP gridded analyses.



3. Temperature records

- Parts of south-west Western Australia including Greater Perth, surrounding areas, and the south-west coast had their highest November 7-day mean temperature on record since 1910.
- Many stations across south-west Western Australia set November records for the number of consecutive days with maximum temperatures above a given threshold.
- November and spring mean maximum temperatures were highest on record (since 1910) for much of south-west Western Australia, with many stations setting monthly and seasonal temperature records.

3.1. Daily temperature

From 21 November, heatwave conditions extended over south-west Western Australia. High daily maximum and minimum temperature records were broken at long-term weather stations each day from the 21st to the 25th inclusive (see Table Table 3 and Table 4). A few stations, including Jarrahwood and Cape Naturaliste in the far south-west of the state, exceeded their previous November record on 2 or 3 occasions during November 2023.

As a result of the prolonged heatwave conditions, parts of south-west Western Australia including Greater Perth, surrounding areas, and the south-west coast had their highest November 7-day mean temperature on record since 1910 (Figure 7).

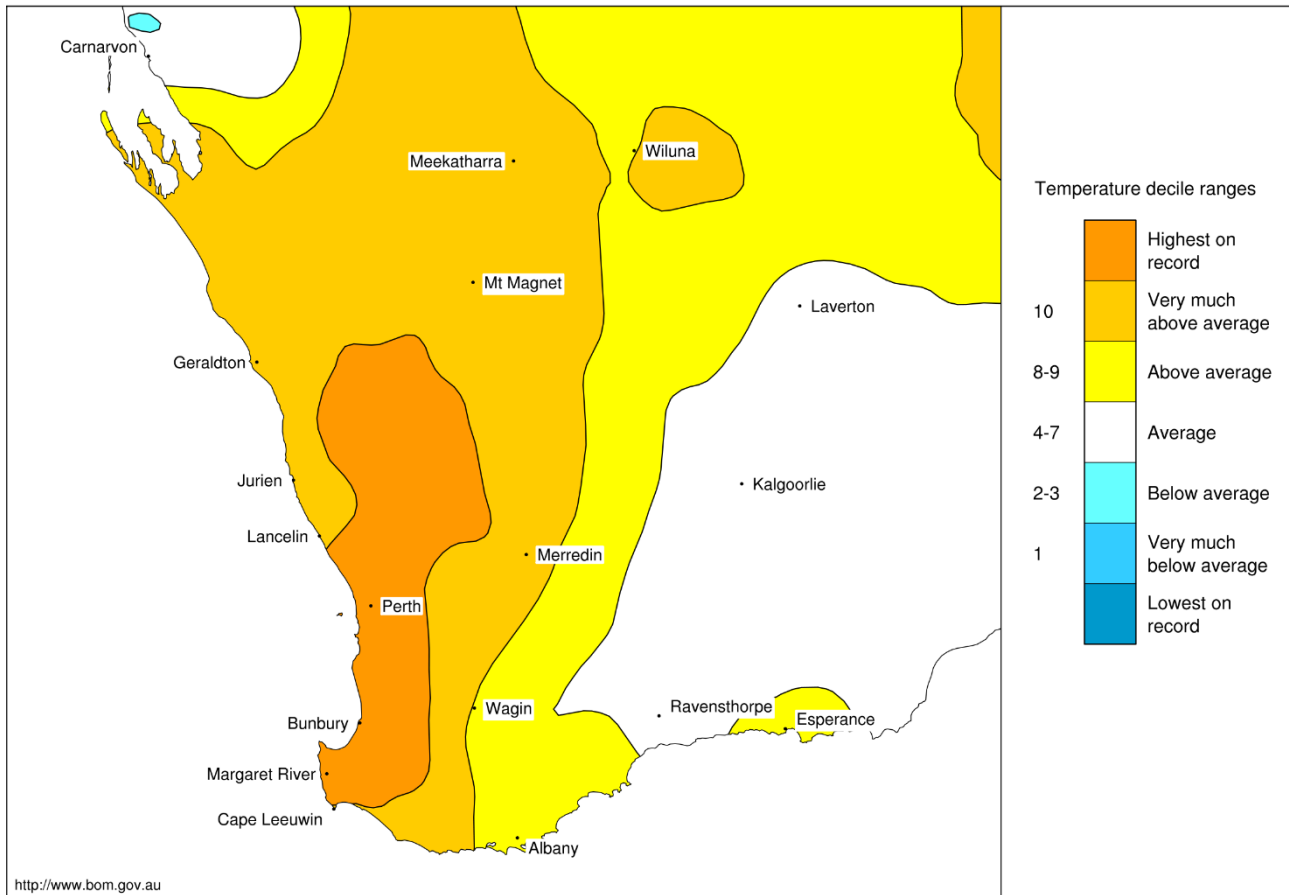
The most significant aspect of the heatwave was its duration. Many stations across south-west Western Australia set November records for the number of consecutive days with maximum temperatures above a given threshold. A selection of station records is given in Table 5. The most notable duration records were set in the Greater Perth area, including:

- **Perth** (composite of Perth Metro and Regional Office, 126 years of data)
 - 10 consecutive days of 30 °C or higher (17–26 November). Previous record was 8 consecutive days (22–29 November 1915).
- **Perth Airport** (80 years of data)
 - 9 consecutive days of 32.0 °C or higher (18–26 November). Previous record was 5 days (23–27 November 2016).
- **Jandakot Aero** (34 years of data)
 - 10 consecutive days of 30 °C or higher (17–26 November). Previous record was 8 consecutive days (5–12 November 2017).



Highest 7-day mean temperature deciles November 2023

Distribution based on gridded data
Australian Bureau of Meteorology



http://www.bom.gov.au © Commonwealth of Australia 2024, Australian Bureau of Meteorology ID code: AnalyserRen Issued: 30/01/2024

Figure 7. Highest 7-day mean temperature in November 2023 relative to the highest in all Novembers since 1910 (deciles) for south-west Western Australia.

3.2. Monthly temperature

Area-average maximum, minimum and mean temperatures for November 2023 were higher than for any November since 1910 in south-west Western Australia (Table 1).

Most of south-west Western Australia experienced maximum temperatures in the hottest 10% of all records for each of August, September, October and November 2023 (Figure 1), including some areas of hottest on record. In terms of maximum temperatures, August 2023 was the fourth-hottest August, September 2023 was the third-hottest September, October 2023 was the second-hottest October, and November 2023 was the hottest November on record for this area (Table 1).

Many Western Australian stations with at least 30 years of observations set records in November 2023 for both high November mean maximum and minimum temperature (Supplementary Information² (SI) Tables 1 and 2 respectively).

² See: [Supplementary Information PDF](#)



3.3. Seasonal temperature

For large parts of south-west Western Australia, mean maximum temperatures for spring 2023 were the warmest on record (Figure 8). Spring 2023 was the warmest spring on average for south-west Western Australia (Table 1) and for Western Australia overall.

Many Western Australian stations with at least 30 years of observations set records in spring 2023 for both high spring mean maximum and minimum temperature (SI Tables 3 and 4 respectively).

Maximum temperature deciles Spring 2023

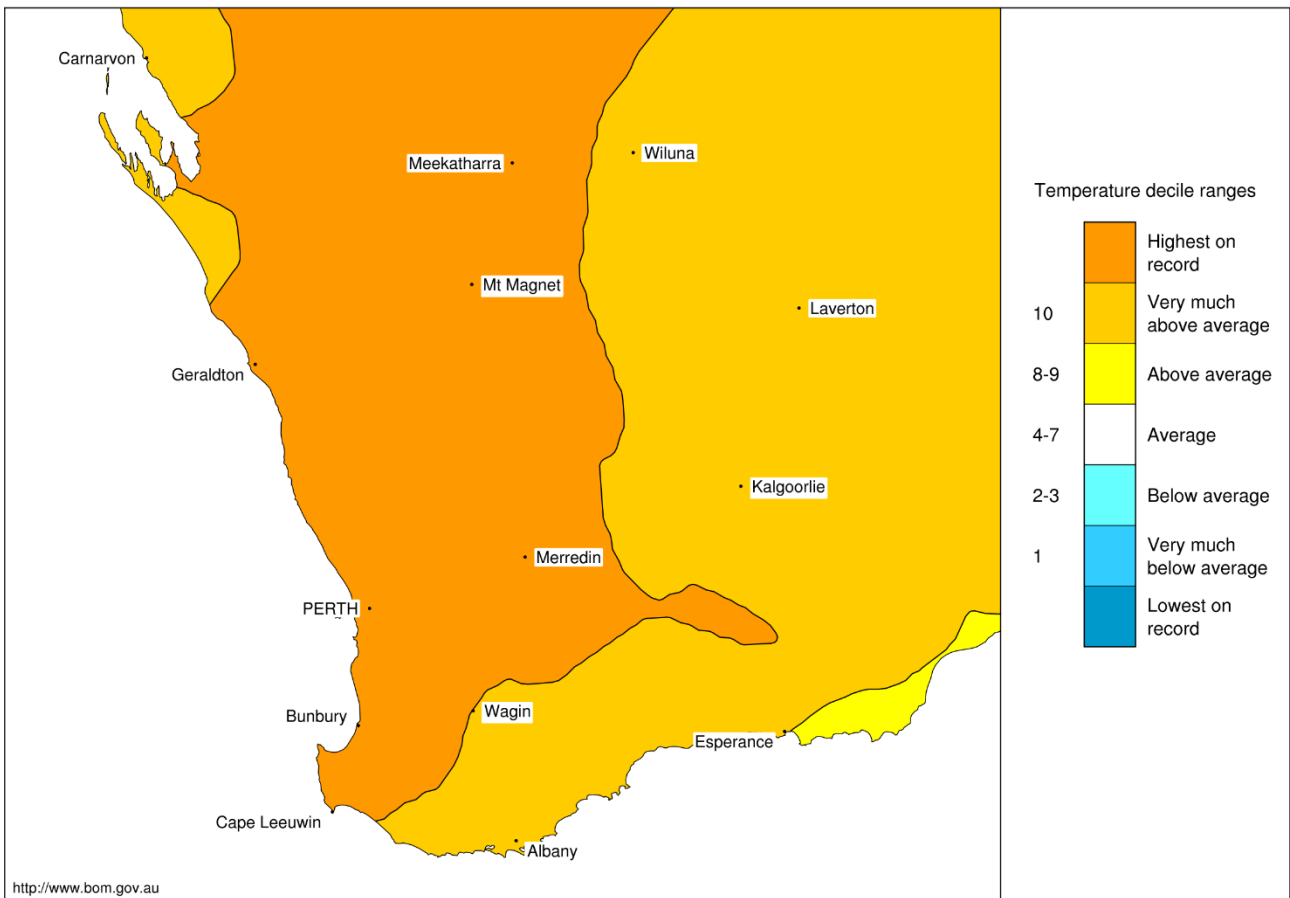


Figure 8. Mean maximum temperature for spring 2023 relative to all years since 1910 (deciles) for south-west Western Australia.



4. Impacts

- Much of south-west Western Australia experienced low intensity heatwave conditions over 17–28 November 2023, reaching severe heatwave intensity along a coastal strip from north of Perth to Cape Leeuwin and parts of the Central West and the southern Gascoyne.
- Peak Australian Fire Danger Rating Systems (AFDRS) ratings across south-west Western Australia reached Extreme levels, with small areas of Catastrophic fire danger.
- The Bureau of Meteorology issued Fire Weather Warnings between 21 and 26 November, and Heatwave warnings across south-west Western Australia were current on all days from 17 to 28 November.

4.1. Heatwave conditions

Low-intensity heatwave warnings covered large parts of south-west Western Australia during late November 2023, with severe heatwave warnings issued for parts of the Central West and Gascoyne and a coastal strip from north of Perth to Cape Leeuwin (Figure 9).

Heatwave conditions have rarely occurred in November in south-west Western Australia. For the period 17–28 November 2023, much of south-west Western Australia experienced heatwave conditions to low intensity levels, with conditions reaching severe heatwave intensity along a coastal strip from north of Perth to Cape Leeuwin and parts of the Central West and the southern Gascoyne (Figure 9). The heatwave conditions lasted for 3 to 5 days along coast from Perth to Cape Leeuwin (Figure 10). The Bureau issued heatwave warnings across the 17–28 November period.

Heatwave conditions can be challenging for vulnerable people, including very young children, older people, people with disability and those with medical conditions. On 24 November, Western Australia's Department of Health published a warning for amoebic meningitis³ triggered by hot weather, along with a list of precautions to keep people safe. Amoebic meningitis is caused by a type of organism called *Naegleria fowleri* amoeba, which grows in freshwater bodies in temperatures above 28 °C. Even with medical attention, the illness can be fatal. Heatwave warnings also led to park closures around Perth.

³ See: <https://www.health.wa.gov.au/Media-releases/2023/November/Hot-weather-triggers-amoebic-meningitis-warning>



Highest 3-day heatwave category 17-28 November 2023

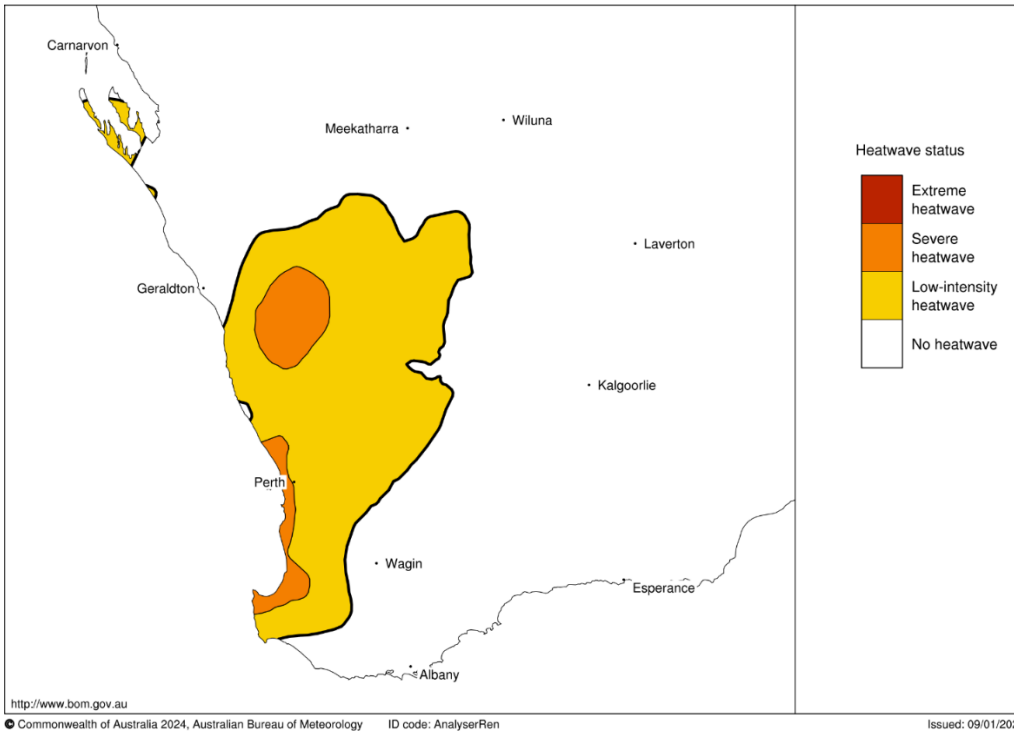


Figure 9. Map of south-west Western Australia showing the highest 3-day heatwave category for 17–28 November 2023.

Count of days with heatwave conditions 17-28 November 2023

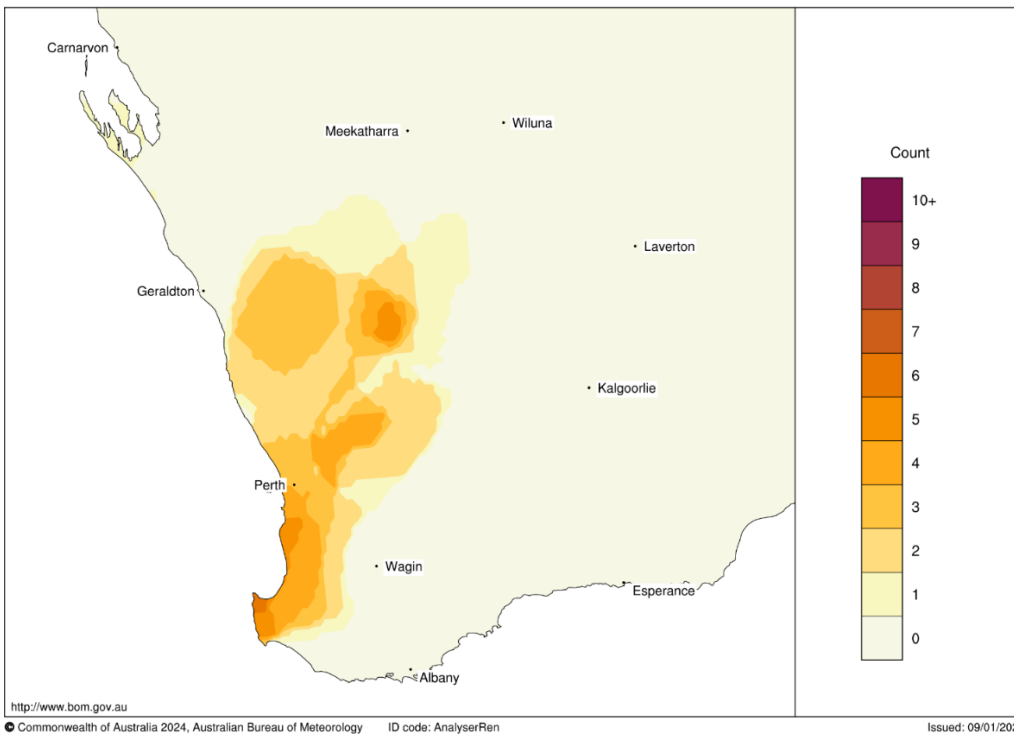


Figure 10: Map of south-west Western Australia showing the number of days that experienced heatwave conditions for 17–28 November 2023.



4.2. Fire weather conditions

Two measures of fire danger across south-west Western Australia were unusually high during November 2023. The Forest Fire Danger Index (FFDI) is a historical measure of fire danger, combining observed vegetation dryness with air temperature, wind speed and humidity. Coastal areas of south-west Western Australia experienced their highest November daily FFDI on record (Figure 11), with FFDI analyses starting in 1950.

The use of the Australian Fire Danger Rating System (AFDRS) for fire weather forecasts began on 1 September 2022. AFDRS Fire danger ratings describe the potential difficulty of suppressing a potential bushfire, based on an index value. In the lead up to November 2023 long-range forecasts of AFDRS showed widespread increased chances of above median fire danger for much of southern Western Australia.

Peak AFDRS fire danger ratings for November indicate that bushfire was a risk for large parts of south-west Western Australia (Figure 12). Much of south-west Western Australia had the potential to experience Extreme fire danger conditions, with small areas of Catastrophic fire danger.

Hot, dry conditions and strong winds resulted in elevated fire dangers from 21 November. Extreme fire danger ratings were forecast for areas of western and southern Western Australia on the 21st and 22nd. By 7.00 am AWST 23 November, several fires had affected the northern suburbs of Perth. Fire weather conditions eased on 24 November. The Department of Fire and Emergency Services issued Watch and Act advice from the 25th, including for parts of Wanneroo and Swan.

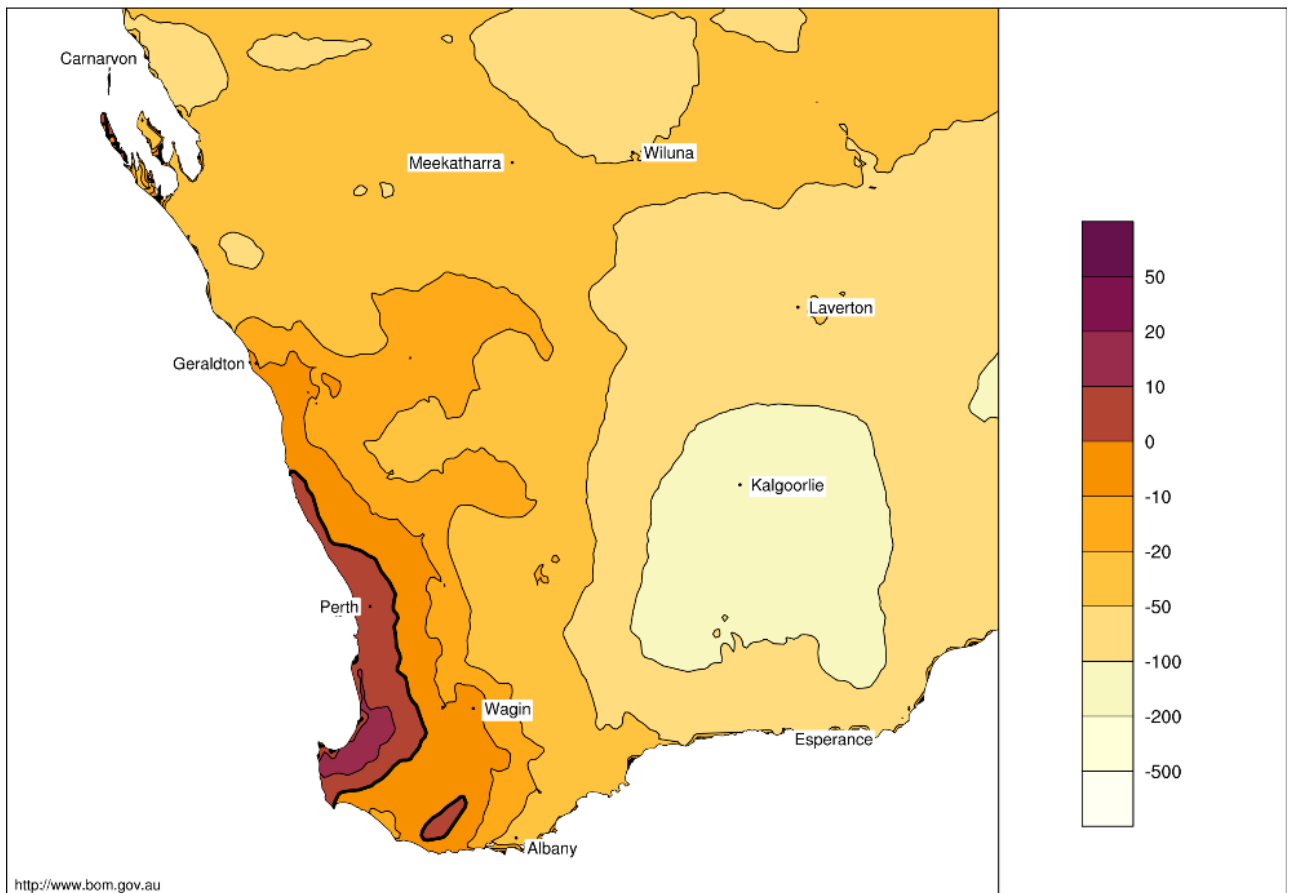


Figure 11: Map of south-west Western Australia showing the highest daily Forest Fire Danger Index (FFDI) during 1–26 November 2023 compared to the previous highest on record for November from 1950–2022. Dark brown areas had their highest daily FFDI on record in November since 1950.

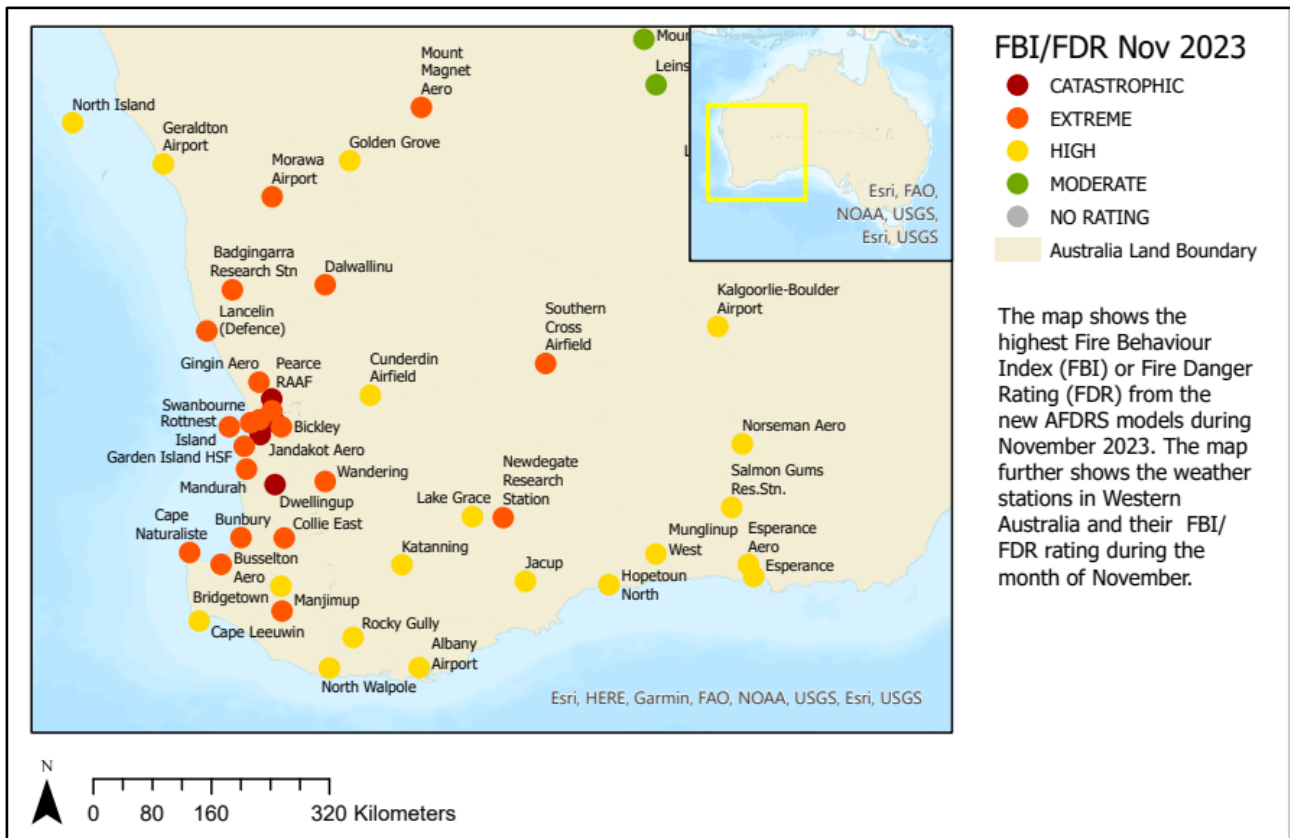


Figure 12. Map of highest Fire Danger Rating (FDR) from the Australian Fire Danger Rating System (AFDRS) models during November 2023.

5. Climate context

- The tropical Indo-Pacific oceans were in a state conducive to warm temperatures across Western Australia throughout spring 2023, with an active El Niño and positive Indian Ocean Dipole respectively.
- Southern hemisphere mid-latitude circulation in the Australian region in November 2023 supported easterly winds across south-west Western Australia, bringing hot air from the interior of the continent to that region.
- The likelihood of the record warm spring 2023 in Western Australia exceeding the previous record in the current climate compared to a world without climate change was at least 50 times greater.

5.1. Historical events

There are not many precedents for comparable heatwaves in south-west Western Australia in November. The most recent event was in 2019, where peak temperatures were similar to those observed in south-west Western Australia in 2023, but the duration was much shorter. In 2019, Perth experienced 4 consecutive days above 35 °C from 13 to 16 November, with a peak of 40.4 °C on the 16th (compared with a peak of 39.0 °C on 23 November 2023), but in 2019 the longest period of consecutive days of 30 °C or above was 5, compared with 10 in 2023.



5.2. Tropics

During spring 2023, the tropical large-scale modes of climate variability were all in phases linked to warm and dry conditions in Western Australia. The tropical Indian Ocean saw a strong positive Indian Ocean Dipole (IOD). The eastern pole of the IOD (closest to Australia) had unusually strong cold ocean temperature anomalies off Java and Sumatra that extended far into the central Indian Ocean. In spring seasons with a moderate-to-strong positive IOD, most of Western Australia is usually much warmer than average (SI Figure 1).

Spring 2023 also saw a El Niño in the tropical Pacific. In spring seasons when a positive IOD and El Niño occur together, south-west Western Australia is usually dry (SI Figure 2). However, each year is different and variability in the atmosphere to the south of Australia can also influence the temperature and rainfall of south-west Western Australia.

5.3. Southern Hemisphere mid-latitudes

There were positive mean sea-level pressure (MSLP) anomalies throughout November 2023 to the south of Australia. This set-up of the southern hemisphere mid-latitude circulation resulted in easterly wind flow from the hot interior of the continent to south-west Western Australia (Figure 4).

The [Southern Annular Mode \(SAM\)](#) is the non-seasonal north–south movement of the strong westerly winds that blow almost continuously in the mid- to high-latitudes of the southern hemisphere. While there was considerable geographic variation in the southern hemisphere circulation in November 2023, conditions south of Australia and in the central and western South Pacific were consistent with those expected in a strong positive phase of SAM. This resulted in a subtropical ridge which was well south of its usual position over Australia, along with a southerly shift in the strong westerly winds.

The positive phase SAM in late spring 2023 is likely linked to a stronger-than-usual stratospheric polar vortex⁴. The combination of positive phase SAM with El Niño is unusual, and both are typically linked to dry and warm conditions for south-west Western Australia.

5.4. Global warming

Global sea surface temperatures (SSTs) were highest on record for their respective months during April to November 2023, and global mean temperatures for the period from January to November 2023 were higher than those for the same period in any previous year.

Australia's climate has warmed on average by 1.48 ± 0.23 °C between 1910, when national records began, and 2022, with most of the warming occurring since 1950. Warming trends in south-west Western Australia are similar to those over Australia as a whole. This has seen an earlier start to the fire season in south-west Western Australia since 1950, with dangerous fire weather conditions occurring earlier in the fire year (July to June).

The Western Australian average temperature in spring 2023 was 0.20 °C warmer than the previous record set in 2019. Based on information from global climate models, following the

⁴ For more information on the link between the stratosphere polar vortex and SAM see: <https://nosp2climate.com.au/resource/the-southern-annular-mode-and-large-scale-circulations/>.



method of Lewis et. al. (2014), the likelihood of exceeding the previous record in the current climate compared to a world without climate change was at least 50 times greater.

The long-term drying trend in the cool season (April to October) in south-west Western Australia has been attributed to climate change (e.g., Rauniyar et. al. 2023). Variations in rainfall and daily maximum temperatures are inversely related. Lower rainfall totals are linked to warmer daytime temperatures in most places across Australia, including south-west Western Australia (Hope and Watterson 2018). Climate change therefore increased the likelihood of dry and warm conditions in south-west Western Australia leading up to November.

The positive Indian Ocean Dipole, El Niño, and southern hemisphere atmospheric circulation in November 2023 set up the conditions for the heatwave over south-west Western Australia. But it is climate change that was the background for the dry and warm antecedent conditions, and greatly increased the likelihood of record warm temperatures as a result.



Tables

Table 1: Temperature differences from average (relative to 1961–1990).

(Area-averaged mean maximum, mean minimum and mean temperature anomalies and ranks, relative to all years since 1910, for the south-west West Australian region for the months August to November 2023, and spring 2023.)

Month	Maximum temperature		Minimum temperature		Mean temperature	
	Anomaly	Rank	Anomaly	Rank	Anomaly	Rank
August 2023	+2.21 °C	4	+0.22 °C	55	+1.22 °C	12
September 2023	+2.83 °C	3	+1.94 °C	2	+2.39 °C	1
October 2023	+3.88 °C	2	+1.23 °C	12	+2.56 °C	3
November 2023	+3.80 °C	1	+2.95 °C	1	+3.38 °C	1
Season						
Spring 2023	+3.50 °C	1	+2.04 °C	1	+2.78 °C	1

Table 2: Rainfall differences from average (relative to 1961–1990).

(Area-averaged rainfall for the south-west West Australian region as a percentage relative to the 1961–1990 average for the months April to November 2023, winter (June to August), spring (September to November), and the cool season (April to October). Ranks, where quoted, are relative to all years since 1900.)

Month	Anomaly	Note
April 2023	+41%	
May 2023	-70%	Third-lowest on record
June 2023	+10%	Highest since 2009
July 2023	-28%	
August 2023	-30%	Lowest since 2010
September 2023	-3%	
October 2023	-75%	Third-lowest on record, lowest since 2000
November 2023	-56%	
Season		
Winter 2023	-14%	
Spring 2023	-39%	12th-lowest on record
Cool season 2023	-22%	



Table 3: Daily maximum temperature records.

(Stations with at least 30 years of observations that set November high daily maximum temperature records during 18–26 November 2023.)

Bureau Station number	Station name	New daily record (°C)	Date of new record	Previous record (°C)	Date of previous record	Years of data
8025	Carnamah	43.2	2023-11-21	43.1	2003-11-11	82
8095	Mullewa	44.0	2023-11-21	43.5	2019-11-16	79
9131	Jurien Bay	41.6	2023-11-21(*)	40.5	2007-11-11	55
9193	Rottnest Island	38.4	2023-11-23(*)	36.6	1997-11-03	35
9519	Cape Naturaliste	36.7	2023-11-23(*)	35.2	2019-11-09	67
9842	Jarrahwood	38.5	2023-11-24(*)	37.5	2010-11-19	45
9977	Mandurah	39.6	2023-11-25	39.3	1982-11-10	55(^)

(*) The previous record was exceeded more than once during November 2023. The date of the new record is for the highest temperature during November 2023.

(^) Composite record, combining data from 2 or more nearby stations.

Table 4: Daily minimum temperature records.

(Stations with at least 30 years of observations that set November high daily minimum temperature records during 18–26 November 2023)

Station number	Station name	New daily record (°C)	Date of new record	Previous record (°C)	Date of previous record	Years of data
7139	Paynes Find	27.2	2023-11-26	26.6	1998-11-21	45
7600	Mount Magnet Aero	28.4	2023-11-25	28.1	2006-11-28	58(^)
8025	Carnamah	27.0	2023-11-22	26.2	2015-11-13	82
9193	Rottnest Island	24.9	2023-11-23(*)	22.2	2015-11-22 ⁵	35
9215	Swanbourne	25.6	2023-11-23	24.3	2022-11-30	31

(*) The previous record at Rottnest Island was exceeded more than once during November 2023. The date of the new record is for the highest temperature during November 2023.

(^) Composite record, combining data from 2 or more nearby stations.

⁵ The former Rottnest Island Lighthouse (Bureau station number 9038) has a November record minimum and maximum temperature, on 1978-11-22, of 22.2 °C and 38.5 °C respectively.



Table 5: Daily records for consecutive days in November above temperature thresholds.

(Selected stations with at least 30 years of data that set or equalled November records for consecutive days with daily maximum temperatures above the given threshold.)

Station number	Station name	Threshold (°C)	New record (days)	Dates of new record run	Previous record (days)	Dates of previous record	Years of daily data
6099	Murchison	38	8	2023-11-19/26	7(*)	2019-11-13/19	32
8296	Morawa Airport	38	8	2023-11-19/26	6(*)	2019-11-13/18	99(^)
8297	Dalwallinu	35	8	2023-11-19/26	7(*)	1972-11-21/27	67(^)
8315	Geraldton Airport	35	5	2023-11-17/21	4(*)	2021-11-25/28	83(^)
9021	Perth Airport	32	9	2023-11-18/26	5(*)	2016-11-23/27	79
9037	Badgingarra Research Stn	38	4	2023-11-20/23	3(*)	2019-11-14/16	55
9053	Pearce RAAF	35	8	2023-11-19/26	4(*)	2019-11-13/16	63
9172	Jandakot Aero	30	10	2023-11-17/26	8	2017-11-5/12	34
9225	Perth Metro	30	10	2023-11-17/26	8	1915-11-22/29	126(^)
9240	Bickley	35	4	2023-11-22/25	3	2019-11-14/16	30
9538	Dwellingup	35	4	2023-11-22/25	3	2019-11-14/16	66
9842	Jarrahood	30	8	2023-11-19/26	6	2019-11-13/18	45
10111	Northam	35	8	2023-11-19/26	6(*)	2019-11-13/18	116
10286	Cunderdin Airfield	35	8	2023-11-19/26	6(*)	2019-11-13/18	74(^)
10311	York	35	8	2023-11-19/26	6(*)	2019-11-13/18	90(^)
10515	Beverley	35	8	2023-11-19/26	6	1999-11-24/29	54
10614	Narrogin	32	8	2023-11-19/26	6(*)	2019-11-13/18	106
10911	Lake Grace	30	8	2023-11-18/25	7(*)	2019-11-13/19	67(^)
10917	Wandering	30	9	2023-11-18/26	= 9	1972-11-21/29	123(^)

(^) Composite record, combining data from two or more sites.

(*) The previous record was set on 2 or more occasions. The date list is the most recent occurrence.



Further information

This Statement covers information available as of 22 December 2023.

National gridded rainfall analyses are for the period since 1900 and national gridded temperature analyses are for the period since 1910. Climatological averages use a 1961–1990 base period unless otherwise stated.

In general, only temperatures measured since the introduction of standard instrument shelters (Stevenson screens) are considered in this statement. This is generally around 1910.

Links

- Climate information:
 - <http://www.bom.gov.au/climate/>
- Australian Temperature Analyses:
 - <http://www.bom.gov.au/jsp/awap/temp/index.jsp>
- Climate Data Services:
 - <http://www.bom.gov.au/climate/data-services/>
- Monthly, seasonal, and annual Climate Summaries:
 - http://www.bom.gov.au/climate/current/statement_archives.shtml
- Australia's Changing Climate:
 - <http://www.bom.gov.au/state-of-the-climate/2022>

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