Weather in the Tallong region - 2024

The weather in the Tallong Region will be analysed from a small network of rainfall observation stations as well as recording weather stations in Tallong and the south Marulan area associated the Boral quarry operations. Statistics of monthly and annual rainfall will highlight geographic influences as well as observations of significant rainfall events. These and temperature data will be used to compare with the Bureau of Meteorology (BOM) summaries for 2024.

The BOM assessment of Australia's climate in 2024

Temperature

- Australia's second-warmest year since national records began in 1910, with the national annual average temperature 1.46 °C warmer than the long-term (1961–1990) average.
- The national average maximum temperature was 1.48 °C above the long-term average, the fourth-warmest on record. The national average minimum temperature was 1.43 °C above the long-term average, and the warmest on record.
- Warmth was persistent throughout the year. Nationally, summer 2023–24 was the third-warmest on record, winter
 was the second-warmest on record and spring was the warmest on record.
- Low-to-severe intensity heatwave conditions affected large parts of Australia during early 2024 and from September to December.

Rainfall

- Nationally-averaged rainfall was 596 mm, 28% above the 1961–1990 average, making it the eighth-wettest year since national records began in 1900.
- Rainfall was above average for the Northern Territory, northern and inland areas of Western Australia, large parts of Queensland, northern and inland areas of New South Wales and western and north-eastern parts of South Australia.
- Rainfall across northern Australia as a whole (north of 26° S) was 42% above average, making it the fifth-wettest year on record, and the wettest since 2011.
- Rainfall was below average to very much below average for small parts of Queensland, south-eastern New South
 Wales, Victoria, western Tasmania, southern South Australia, and some coastal parts of Western Australia.

The Tallong Analyses

The current network of observations stations is shown in Table 1 together with their geographic co-ordinates and length of observation records. Their locations are also shown in Figure 1. Compared to previous years we have lost one observer (Mrs Darda from May onwards) and gained another station in the Tallong Park Estate.

Rainfall

The monthly and annual rainfall data from all the stations are shown in Table 2; the Peppertree and Limestone data are from the automatic weather stations whereas the other data are the manual readings. There were three months of high rainfall (February, April and June), several of which will be discussed below in terms of the significant daily rainfall. This year the significant geographic effect of being closer to the coast was not obvious with the Black data similar if not lower

on a monthly basis to the inland Leese and Botticchio stations. The annual totals had these three stations with similar totals also. Tallong Park was higher than Clark by nearly 100 mm annually. This suggests that the higher daily rainfall totals may have been caused by thunderstorm activity which frequently develops along inland low pressure trough lines. Over all stations, given their different record lengths the annual totals were only the 4th or 5th highest. All stations recorded 2024 annual totals above the long-term averages.

There are also interesting local effects between the stations in Tallong Park (the Estate and Clark). Anecdotally It has been observed that it can be raining near to the front gate of Tallong Park Estate but over the hills to Clark, the area can be dry. This is most evident in difference in the February and May data although there is one day in June when this is most pronounced and will be discussed below. Similarly there are sometimes significant differences between the Peppertree and Limestone data even though they are only 2.141 km apart. Peppertree had significantly higher rainfall in February but in June Limestone-New was significantly higher.

Significant Weather Events in 2024

The significant rainfall events during 2024 are shown in Table 3. Some of the days with very significant rain will be discussed in relation to the surface synoptic scale weather/pressure maps although availability of the rainfall radar data over the region is limited due to BOM expenses. This limits the interpretations.

February 4 to 6

There was only one weather radar image during this period. A plot of the rainfall data from the 467 Mulwaree Drive and the Peppertree weather stations indicates when the significant rainfall was observed (Figure 2). For the rain recorded at 0900 AEDT on February 5 most rain occurred between 0315 and 0815 AEDT with slight delays between the stations. At 0500 AEDT the synoptic pattern (Figure 3) indicated an inland trough. There was a dramatic difference across the network (Table 3) with the two South Marulan weather stations recording almost twice the totals of the Tallong stations (about 46.5 to 49.6 mm vs 18.5 to 24.0mm). This suggests a local thunderstorm associated with the trough. The data recorded at 0900 AEDT on February 6 fell between about 0000 and 0800 AEDT. The synoptic pattern at 2300 AEDT February 5 in Figure 3 indicated an interaction between an inland trough and cold front to the south-east which moved further out into the Tasman Sea by 0500 AEDT (Figure 4). The weather radar image showed a broad pattern of rainfall through the region during this period. Observations were more uniform between 31.5 and a high of 42.6 mm at the Limestone New station; this was due to the remnants of Cyclone Kirrily moving down from the north. The Limestone New station was 6 mm higher than the nearby Peppertree station.

February 18-19

The weather radar images with a plot of the data from 467 Mulwaree Drive on February 18, 2024 are seen in Figure 5. These show a series of thunderstorm echoes in the first image at 1415 AEDT oriented in a NW axis with one centred over Marulan and 467 Mulwaree Drive. However the second radar image at 1639 AEDT coincided with the large spike in the rainfall rate at 467 Mulwaree Drive in the third image in Figure 5. A 15 minute rainfall amount of 24.2 mm was recorded with an astonishing rate of 217.4 mm/hr! Two movies will be attached to this report showing the intensity of this rain event. The synoptic conditions leading to this significant rain are shown in Figure 6. There were two trough lines, one inland and another parallel to the coast which caused the significant vertical movement of the air associated with development of these intense thunderstorms.

In terms of impact on the Tallong region, Table 3 indicates the thunderstorms were fairly narrow with totals nearer the coast (Black and Darda) only 19 to 27 mm whereas further inland 40-80 mm were recorded. The difference of over 50 mm between the Peppertree and Limestone New stations is very surprising.

April 4 to 6

No weather radar are available for this period. The 0900 AEDT observations on April 5 indicated a band of high readings between Leese and Clark (48.7 to 59 mm) with much lower readings towards the coast and in South Marulan (15 to 29 mm) [Table 3]. The prevailing synoptic conditions are shown in Figure 7. These show an inland trough persisted between 5pm on April 4 to 5 am on April 5 when there was regular rain observed at 467 Mulwaree Drive, Tallong (Figure 9).

Presumably this trough spawned local thunderstorms causing the differences between stations. Later on April 5 a complex low system formed in SE NSW which persisted through to April 6 and moved slowly SW (Figure 8). This brought widespread heavy rains across the region varying between 91 mm in South Marulan to 116.6 mm at Black nearer to the coast.

June 5 to 7

Over the two-day period totals ranged from 147.5 mm at Black to 114.4 mm at Limestone New station (Table 3). The 467 Mulwaree Drive station indicated most rain occurred between Midnight on June 5 and 1630 AEST on June 6 (Figure 10). The synoptic influences on this occasion were a low pressure trough parallel to the coast at 10 pm which slowly moved off shore by 4pm on June 6 but still directed onshore flow. Thus the station closer to the coast (Black) observed higher totals due to the uplifting of the maritime air mass over the escarpment. By the time it moved further inland totals were lower.

Rainfall Summary

Rainfall through the Tallong Region is influenced by inland low pressure troughs which generate thunderstorms that can have random movements causing local heavy falls. With onshore movement of the moist air masses it is usual that stations closer to the coast record the higher totals. Onshore flows can be due to troughs sitting off the coast or cold fronts moving up from the south-east.

Temperatures

Temperature data are recorded every 15 minutes at three stations in the region: 467 Mulwaree Drive Tallong and at the Peppertree and Limestone New quarries in South Marulan. It is interesting to contrast the data from each station with the more general observations from the BOM on the 2024 weather described above.

For information, the temperatures from 467 Mulwaree Drive Tallong are shown in Table 4 as a function of month and time of day. The annual average temperatures from all three stations are shown in Table 5; it should be noted that data up to and including 2022 were recorded at the original South Marulan site but from January 30, 2023 at the Limestone New site. Also, from June 2019 the Peppertree station was moved to a new location. In all cases over the thirteen-year period, 2024 was the warmest by 0.9°C in Tallong to 1.4°C at the Peppertree Quarry. Over a much longer record the BOM recorded 1.46°C higher. There is no obvious warming trend from the 13-year records in annual average temperatures observed through the region as seen in Figure 12.

On a seasonal basis the variations of the minimum temperatures are shown in Table 6. Summer in Tallong and the Limestone New sites was the highest on record at 1.3°C above the long-term average. In autumn temperatures were closer to the long-term averages with 2024 lower at the Peppertree site. At both Tallong and the Limestone New sites the minimum temperatures were highest and well above the long-term values both during Winter and Spring. By contrast Peppertree was much closer. The seasonal variation of the maximum temperatures is shown in Table 7. Maximum temperatures at all sites were much closer to the long-term averages. Winter (0.9°C) and Spring (1.3°C) in Tallong were higher but at the other stations only higher by up to 0.4°C across all seasons. Even though the BOM found Spring to be highest on record, this was only the case for minimum temperatures in our region, except for maximum temperatures at the Tallong station

Geoffrey Clark

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Acknowledgements

Through the continued dedication of the network of rainfall and weather observers in the Tallong region, this report has been able to describe the unique geographic features and variations of Tallong's weather. I would also like to again acknowledge Ijeoma Ehighibe from Boral, Peppertree Quarry and Crystal Perry from Boral, Limestone New for allowing access to the detailed weather station data at the Peppertree and the Limestone/South Marulan quarry sites. Many thanks to all concerned.

Station Name			Rain gauge			Observation	Data Type
	Geographic o	o-ordinates	Altitude m	UTM Co-	ordinates m	Duration	
Black	150.14853	-34.79079	627	239100.7	6146450.4	2004 to 2024	Daily rainfall
Tallong Park	150.08223	-34.71642	611	226647.2	6149450.4	2024 onwards	Daily rainfall
Clark	150.01950	-34.69582	634	226978.1	6156644.2	2006 to 2024	T,RH,Dew,u,θ,Rain, Daily rain
Botticchio	150.10233	-34.71478	629	234628.3	6154761.6	1998 to 2024	Daily rainfall
Leese	150.10872	-34.72306	685	235240.3	6153860.8	2001 to 2024	Daily rainfall
Boral Peppertree	150.02472	-34.74641	607	227623.0	6151046.0	2012 to 2024	T ,RH,u, θ , σ_{θ} ,Rain,Radiation, Evaporation
Limestone -New	150.01346	-34.76331	613	226647.2	6149139.9	Feb. 2023 onwards	T,RH,u,θ,σ _θ ,Rain, Radiation, Evaporation

Where Т RH θ Rain $\sigma_{\scriptscriptstyle{\theta}}$ Radiation u Wind Wind Rain Wind direction Solar Radiation Temperature Relative Humidity Speed Direction Standard Deviation

Table 1

Location	Jan	Feb	Mar	Apr	May	June	July	August	Sept	Oct	Nov	Dec	Total	Highest
Black	102.7	123.9	51.9	165.0	142.7	203.7	43.8	35.0	26.6	29.9	77.3	77.1	1079.6	4th
Leese	111.0	138.5	46.0	189.0	147.0	190.0	48.0	32.0	23.5	21.0	76.5	60.0	1082.5	4th
Botticchio	110.5	142.0	47.0	194.0	130.5	185.5	51.5	32.5	27.0	17.0	62.5	65.5	1077.0	4th
Tallong Park	101.0	154.5	45.5	173.5	124.0	178.0	43.5	38.5	25.5	12.5	98.0	34.5	1029.0	
Clark	94.6	120.1	46.6	166.2	101.1	173.2	42.6	33.2	24.2	10.4	66.0	53.0	931.2	5th
Limestone-New	91.2	157.4	50.6	131.0	101.4	152.8	28.6	33.6	23.0	12.4	51.8	63.0	896.8	5th
Peppertree	92.5	193.5	46.5	137.5	95.0	65.0	15.0	35.5	24.0	12.5	57.5	51.0	825.5	5th

2024 rainfall data

Table 2

15 16 February 5 6 19 24 March 15 April 5 6 May	3.5 16.5 43.6 18.5 37.4 19.2 3.5	4.0 20.5 31.0 53.0 27.0 0.0	7.5 15.0 22.0 16.0 20.0 31.5 51.0 5.0	9.0 20.0 22.0 16.0 24.0 32.0 67.0 4.0	12.3 15.1 20.5 14.0 23.3 31.5 44.0 6.5	7.0 23.0 35.0 1.5 67.5 60.0 5.5	9.5 21.5 18.5 9.5 46.5 36.5 79.5 5.0	10.2 22.0 15.4 12.2 49.6 42.6 26.0 9.0
9 15 16 February 5 6 19 24 March 15 April 5 6 May	16.5 43.6 18.5 37.4 19.2 3.5	20.5 31.0 53.0 27.0 0.0	15.0 22.0 16.0 20.0 31.5 51.0 5.0	20.0 22.0 16.0 24.0 32.0 67.0 4.0	15.1 20.5 14.0 23.3 31.5 44.0 6.5	23.0 35.0 1.5 67.5 60.0 5.5	21.5 18.5 9.5 46.5 36.5 79.5 5.0	22.0 15.4 12.2 49.6 42.6 26.0 9.0
15 16 February 5 6 19 24 March 15 April 5 6 May	43.6 18.5 37.4 19.2 3.5	53.0 27.0 0.0	22.0 16.0 20.0 31.5 51.0 5.0	22.0 16.0 24.0 32.0 67.0 4.0	20.5 14.0 23.3 31.5 44.0 6.5	35.0 1.5 67.5 60.0 5.5	18.5 9.5 46.5 36.5 79.5 5.0	15.4 12.2 49.6 42.6 26.0 9.0
16 February 5 6 19 24 March 15 April 5 6 May	18.5 37.4 19.2 3.5	53.0 27.0 0.0	20.0 31.5 51.0 5.0	24.0 32.0 67.0 4.0	23.3 31.5 44.0 6.5	67.5 60.0 5.5	9.5 46.5 36.5 79.5 5.0	49.6 42.6 26.0 9.0
February 5 6 19 24 March 15 April 5 6 May	18.5 37.4 19.2 3.5	53.0 27.0 0.0	20.0 31.5 51.0 5.0	24.0 32.0 67.0 4.0	23.3 31.5 44.0 6.5	67.5 60.0 5.5	46.5 36.5 79.5 5.0	49.6 42.6 26.0 9.0
5 6 19 24 March 15 April 5 6	37.4 19.2 3.5	27.0 0.0	31.5 51.0 5.0	32.0 67.0 4.0	31.5 44.0 6.5	60.0 5.5	36.5 79.5 5.0	42.6 26.0 9.0
5 6 19 24 March 15 April 5 6	37.4 19.2 3.5	27.0 0.0	31.5 51.0 5.0	32.0 67.0 4.0	31.5 44.0 6.5	60.0 5.5	36.5 79.5 5.0	42.6 26.0 9.0
6 19 24 March 15 April 5 6 May	37.4 19.2 3.5	27.0 0.0	31.5 51.0 5.0	32.0 67.0 4.0	31.5 44.0 6.5	60.0 5.5	36.5 79.5 5.0	42.6 26.0 9.0
19 24 March 15 April 5 6 May	19.2 3.5 20.8	27.0 0.0	51.0 5.0	67.0 4.0	44.0 6.5	60.0 5.5	79.5 5.0	26.0 9.0
March 15 April 5 6	20.8	0.0	5.0	4.0	6.5	5.5	5.0	9.0
March 15 April 5 6	20.8			ı		ı		
April 5 6 May		19.5	17.5	18.0	16.7	12.0	19.5	28.6
April 5 6 May		19.5	17.5	18.0	16.7	12.0	19.5	28.6
April 5 6 May		19.5	17.5	18.0	16.7	12.0	19.5	28.6
5 6 May	24.0			T T				
5 6 May	24.0					•		
6 May	24.0							
May	-	29.0	54.0	59.0	48.7	39.0	20.5	15
	116.6	101.0	114.0	116.0	99.0	109.0	91	91
5	<u> </u>			<u> </u>	1			
	21.0	25.0	17.1	17.5	13.2		13.5	14.0
	24.0	12.5	23.0	23.0	18.6	45.5	15.5	14.6
12	24.1	47.0	28.5	28.5	20.0	22.0	20	25.4
June								
	72.5		122.0	70.0	66.0	40.0		F2.0
	73.5		122.0	70.0	66.0	40.0	- 40.0	53.0
-	74.0		26.0	62.0	58.3	85.0	40.0	58.4
8	30.0		26.0	25.0	22.5	29.0	15.5	22.8
				<u> </u>				
August								
13			23.0	24.0	24.5	25.0	27.0	25.4

November							
14	11.0	14.5	25.0	13.5	15.5	3.5	2.4
18	25.0	21.5	?	17.5	23.0	21.5	17.0
30	32.0	31.5	31.0	30.5		27.0	28.2
December							
1	22.0		28.0	23.5	56.0	19.0	14.8
7	40.8		21.0	13.8	25.5	23.0	39.8

Table 3 Significant rainfall events during 2024

Tallong at 1.2m Dates :010124 to 311224 Dry Bulb Temperature (deg.c) Time (EST.)

Month	0000-0300	0300-0600	0600-0900	0900-1200	1200-1500	1500-1800	1800-2100	2100-2400	Ave	rage	Extrei	me
									Minimum	Maximum	Minimum	Maximum
January	16.8	16.6	18.5	22.4	24.2	22.8	19.3	17.6	15.6	25.7	12.4	33.4
	2.2	2.5	3.2	4.1	4.5	4.6	3.2	2.2	standard	deviations		
	372	372	372	372	372	372	372	372	number	of	observations	
February	16.1	15.4	17.3	22.5	24.4	22.8	19.2	17.1	14.2	26.3	8.7	35.9
	2.9	2.8	3.5	4.7	5.3	5.5	4.1	2.9	standard	deviations		
	348	348	348	347	348	348	348	348	number	of	observations	
March	14.4	13.6	15.1	21.4	24.1	22	17.5	15.5	12.2	25.4	4.3	33.6
	2.7	3.1	3.4	3.7	4.4	4.7	3.3	2.5	standard	deviations		
	372	372	372	372	372	372	372	372	number	of	observations	
April	9.7	9.2	10.2	16.2	18.8	17	12.5	10.4	7.2	20	1.0	29.7
	3.6	4.0	4.0	3.3	3.8	3.9	2.8	3.1	standard	deviations		
	360	360	360	360	360	360	360	360	number	of	observations	
May	7.7	7.0	7.1	12.2	14.9	13.2	9.6	8.3	5.6	15.9	-1.3	19.8
	3.9	4.4	4.4	2.6	2.4	2.6	2.3	3.2	standard	deviations		
	372	372	372	372	372	372	372	372	number	of	observations	
June	4.5	4.0	4.4	9.3	11.4	9.7	6.6	5.3	2.1	12.3	-2.9	16.2
	3.4	3.5	3.4	2.3	2.2	2.4	2.9	3.3	standard	deviations		
	360	360	360	360	360	360	360	360	number	of	observations	
July	5.2	4.6	4.8	8.8	11.1	9.5	6.8	5.9	3.2	12.1	-2.9	18.3
_	2.8	3.0	2.9	2.5	2.6	2.7	2.3	2.4	standard	deviations		
	372	372	372	372	372	372	372	372	number	of	observations	
August	7.6	7.2	7.7	12.9	15.6	13.9	10.1	8.6	5.4	16.5	-2.3	22.6
	4.2	4.2	4.4	3.6	2.6	2.8	3.2	3.9	standard	deviations		
	372	372	372	372	372	372	372	372	number	of	observations	
September	8.1	7.2	9.1	14.8	17.0	15.4	11.4	9.4	5.2	18.0	-4.3	23.9
•	4.3	4.7	4.6	3.6	3.7	3.6	3.2	3.7	standard	deviations		
	360	360	360	360	360	360	360	360	number	of	observations	
October	9.5	8.5	11.8	18.0	19.9	17.4	13.2	11.0	7.1	21.1	-0.1	27.9
	3.2	3.7	3.9	4.3	4.7	4.4	3.1	2.9	standard	deviations		
	372	372	372	372	372	372	372	372	number	of	observations	

November	14.5	13.8	17.4	22.4	23.6	21.2	17.8	15.9	12.8	25.0	9.0	32.7
	2.7	3.0	4.6	5.2	6.4	5.1	4.1	3.1	standard	deviations		
	360	360	360	360	360	360	360	360	number	of	observations	
December	15.1	14.5	18.7	25.0	27.1	23.9	18.9	16.3	13.1	28.6	7.2	35.3
	3.0	3.6	4.1	4.0	4.0	4.5	3.6	2.9	standard	deviations		
	372	372	372	372	372	372	372	372	number	of	observations	

Table 4: Temperatures at 467 Mulwaree Drive for 2024

467 M	ulwaree Dr Tallong	ive,								
Ann	ual averag	ie								
	nperatures									
Year	Average	No.								
2012	12.3	35135								
2013 13.5 33252										
2014 13.3 35040										
2015 12.8 34942										
2016 13.5 35131										
2017	13.2	35037								
2018	13.3	35040								
2019	13.7	34379								
2020	13.0	35126								
2021	12.1	34989								
2022	13.0	40694								
2023	13.2	34007								
2024	14.0	35135								
Average	13.1									

Donn	ortros Ouo	WW3.7								
	ertree Qua ual averag									
	nperatures									
Year	Average	No.								
2012	2012 12.8 35121									
2013 13.7 34997										
2014 14.1 32179										
2015 13.4 35036										
2016	2016 14.1 35136									
2017	13.9	35040								
2018	14.0	35040								
2019	14.3	35026								
2020	13.4	35136								
2021	12.5	35035								
2022	13.2	35040								
2023	13.6	35023								
2024	15.1	34600								
Average	13.7									

South	Marulan/N	ew								
	ual average	е								
	peratures	T								
Year	Average	No.								
2012	12.5	8760								
2013 13.6 8760										
2014 13.6 8757										
2015 13.0 8784										
2016 13.9 8760										
2017 13.6 8760										
2018	13.7	8759								
2019	14.1	8760								
2020	13.4	8760								
2021	12.5	8760								
2022	12.5	8760								
2023	13.5	8030								
2024	14.1	8688								
Average	13.4									

Table 5: Annual average temperatures for 467 Mulwaree Drive, Tallong, Peppertree Quarry and South Marulan/Limestone New

	467 Mulwa	ree Drive,	Tallong			Peppe	ertree Qua	rry		South Marulan/New					
Av	erage Mini	mum Tem	perature	s	Av	erage Mini	mum Tem	perature	s	Average Minimum Temperatures					
Season	Summer	Autumn	Winter	Spring	Season	Summer	Autumn	Winter	Spring	Season	Summer	Autumn	Winter	Spring	
2012	12.7	7.4	2.1	6.7	2012	12.8	7.9	2.5	7.1	2012	12.7	7.8	2.5	6.8	
2013	13.3	8.8	3.4	7.2	2013	13.4	8.3	3.8	7.7	2013	13.1	8.0	3.6	7.4	
2014	13.2	8.9	2.8	8.0	2014	13.5	10.2	3.3	8.3	2014	13.0	9.2	3.2	7.8	
2015	13.2	8.4	1.6	8.4	2015	13.8	8.8	2.4	9.0	2015	13.1	8.2	1.7	8.4	
2016	14.0	9.8	3.7	7.3	2016	14.5	10.6	4.6	8.0	2016	13.9	9.8	4.1	7.5	
2017	14.8	8.2	1.8	7.5	2017	15.0	9.0	2.6	8.2	2017	14.4	7.4	1.7	7.3	
2018	13.6	8.8	2.3	7.2	2018	14.4	9.7	2.9	8.2	2018	13.6	8.7	2.0	7.4	
2019	14.1	9.4	2.3	6.8	2019	14.6	9.8	2.9	6.8	2019	13.9	8.6	2.3	6.6	
2020	14.0	8.2	3.1	8.8	2020	13.5	8.3	3.3	8.7	2020	14.0	8.2	3.0	8.9	
2021	12.8	7.5	2.8	7.4	2021	12.6	7.4	3.0	7.2	2021	12.8	7.4	2.8	7.4	
2022	13.4	9.8	3.3	7.6	2022	12.4	9.7	3.6	7.6	2022	12.7	9.8	3.5	7.6	
2023	13.5	8.7	3.4	7.7	2023	13.3	8.0	3.4	7.6	2023	14.2	9.1	4.6	8.8	
2024	15.0	9.2	4.4	9.1	2024	14.1	8.1	3.5	8.3	2024	14.9	9.2	4.8	9.3	
Average	13.7	8.7	2.8	7.7	Average	13.7	8.9	3.2	7.9	Average	13.6	8.6	3.1	7.8	

Table 6: Average minimum temperatures for 467 Mulwaree Drive, Tallong, Peppertree Quarry and South Marulan/Limestone New

4	67 Mulwar	ee Drive,	Tallong			Peppe	rtree Quai	rry		South Marulan/New					
Ave	rage Maxii	mum Tem	perature	es	Ave	rage Maxi	Average Maximum Temperatures								
Season	Summer	Autumn	Winter	Spring	Season	Summer	Autumn	Winter	Spring	Season	Summer	Autumn	Winter	Spring	
2012	20.6	15.0	9.2	16.7	2012	24.1	18.3	12.3	20.4	2012	23.6	17.8	11.7	19.7	
2013	22.6	16.9	10.1	17.1	2013	26.2	19.1	12.8	20.3	2013	26.0	19.0	12.7	20.1	
2014	22.3	16.3	9.6	17.5	2014	26.0	19.4	12.3	21.3	2014	25.8	19.1	12.2	20.9	
2015	21.6	15.5	8.7	17.1	2015	24.9	18.5	12.0	20.5	2015	24.7	18.2	11.6	20.3	
2016	22.7	17.9	9.8	15.7	2016	26.2	21.0	12.4	18.6	2016	26.0	20.9	12.2	18.3	
2017	23.8	15.5	9.5	16.7	2017	27.5	18.6	12.8	20.3	2017	27.4	18.4	12.7	20.1	
2018	23.4	17.1	9.3	15.9	2018	27.4	20.7	12.4	19.5	2018	27.3	20.6	12.3	19.5	
2019	24.0	17.1	9.6	17.4	2019	28.2	20.3	12.6	21.3	2019	28.2	20.1	12.6	21.4	
2020	21.6	15.1	9.4	16.9	2020	25.0	17.8	12.1	19.9	2020	24.8	17.8	12.1	20.1	
2021	20.2	14.9	9.3	15.0	2021	23.5	18.1	12.1	17.8	2021	23.2	18.0	12.1	17.7	
2022	20.1	15.1	9.0	14.2	2022	22.9	17.7	11.7	17.0	2022	22.7	17.5	11.6	16.8	
2023	21.8	15.7	10.4	17.9	2023	24.8	18.7	13.9	21.4	2023	24.4	18.1	13.4	20.7	
2024	22.8	16.5	10.5	17.9	2024	25.5	19.3	12.8	20.2	2024	24.9	18.9	12.5	19.5	
Average	22.1	16.0	9.6	16.6	Average	25.6	19.0	12.5	19.9	Average	25.3	18.8	12.3	19.6	

Table 7: Average maximum temperatures for 467 Mulwaree Drive, Tallong, Peppertree Quarry and South Marulan/Limestone New

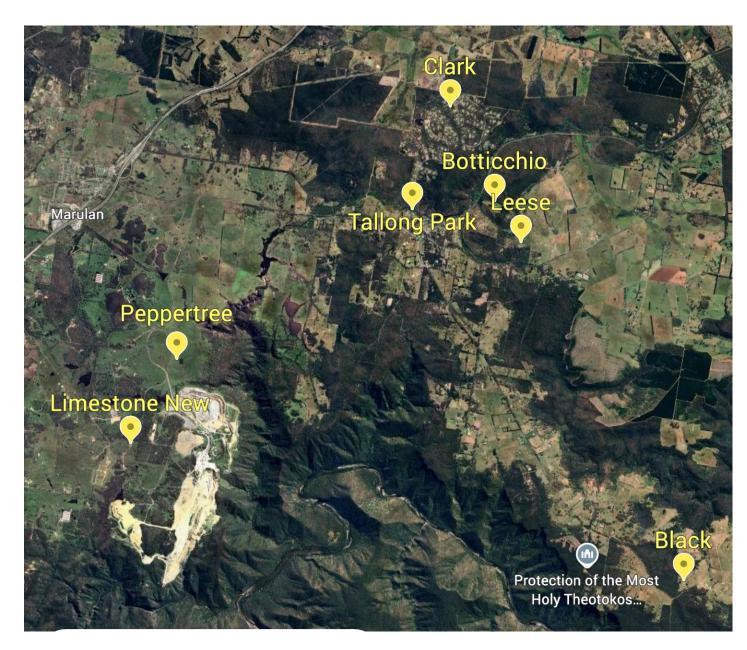


Figure 1: Google Earth image of the Tallong region weather stations

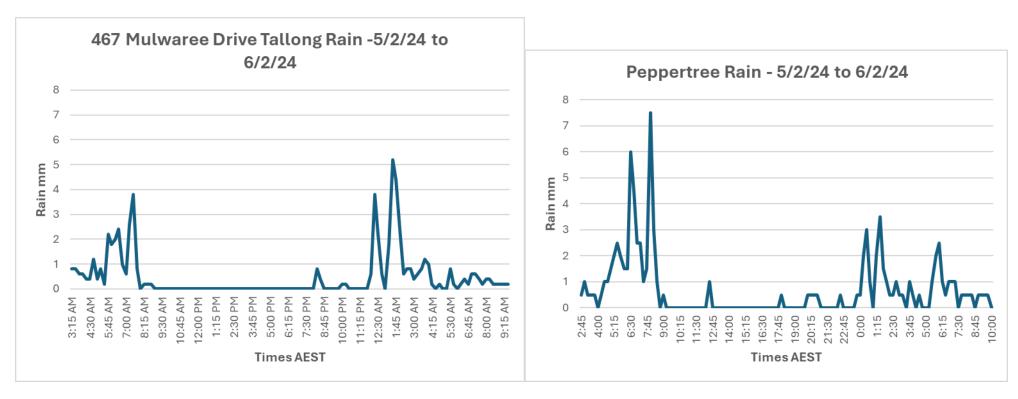


Figure 2: Plot of the rainfall from the 467 Mulwaree Drive and Peppertree weather stations February 5 to 6, 2024

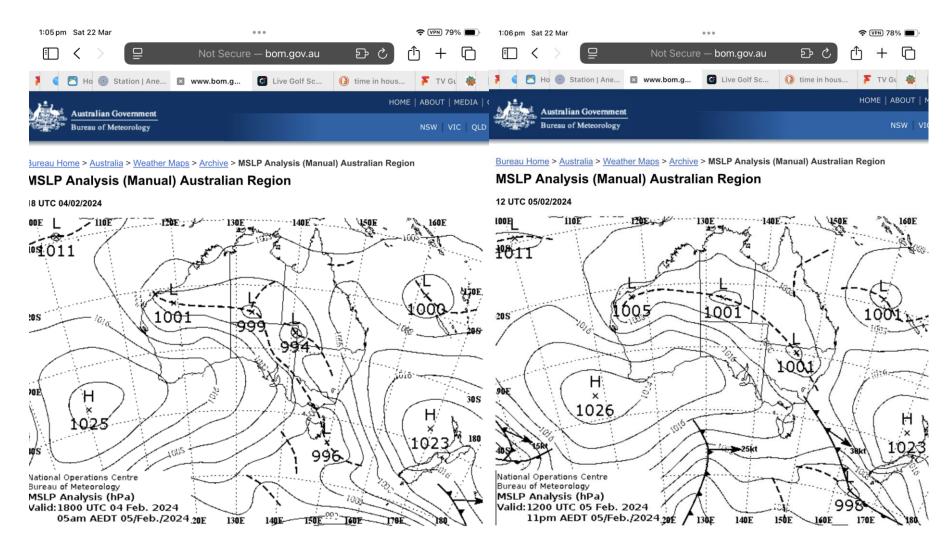


Figure 3: Synoptic maps from the BOM for February 5 at 0500 AEDT and at 2300 AEDT

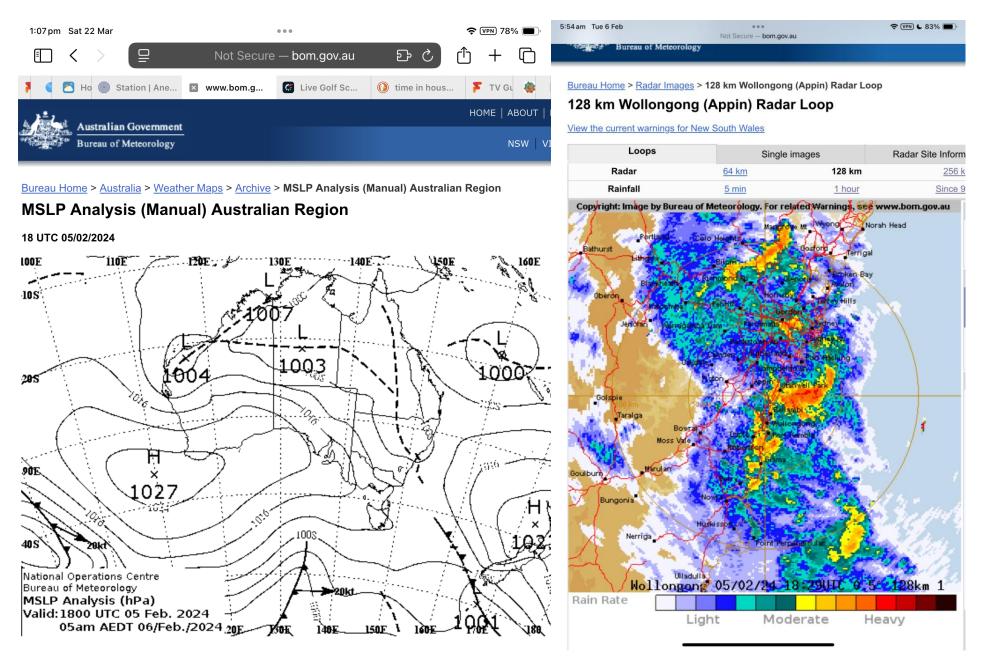


Figure 4: Synoptic map from the BOM at 0500 AEDT and weather radar image at 0429 AEST for February 6

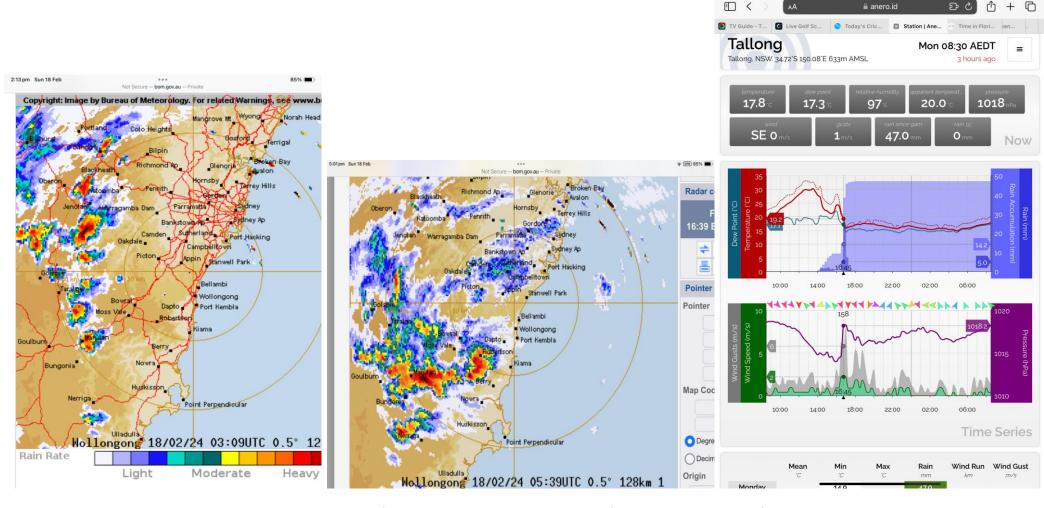


Figure 5: Weather radar images from the BOM and the Anero.id display of 467 Mulwaree Drive data from February 18, 2024

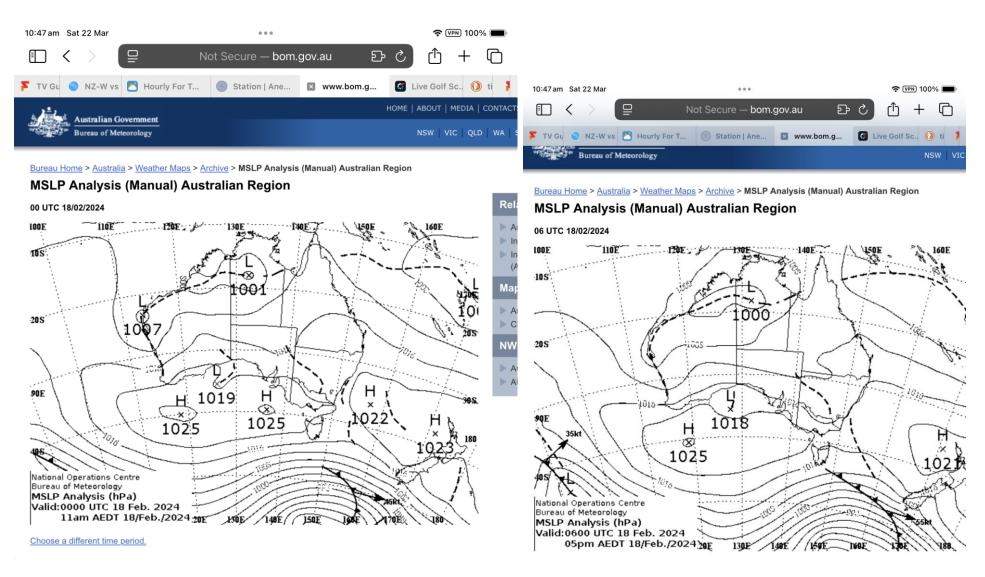


Figure 6: Synoptic maps from the BOM - February 18,2024

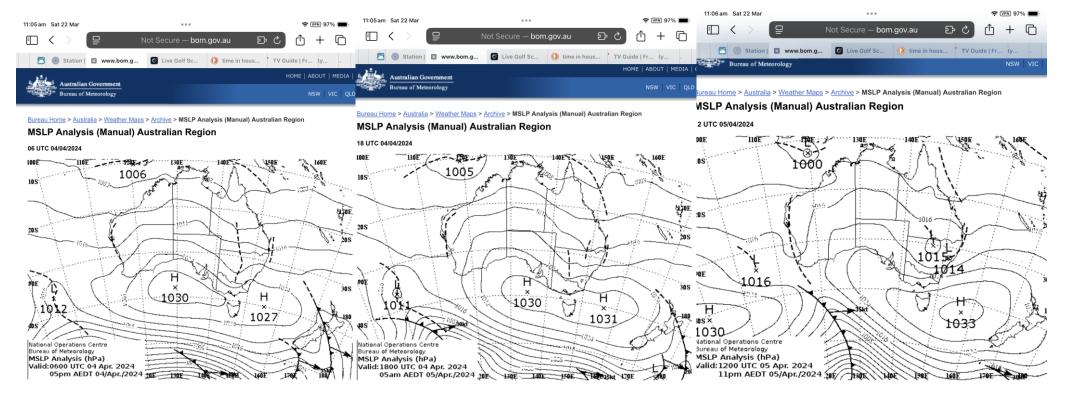


Figure 7: Synoptic maps from the BOM for April 4 to April 6

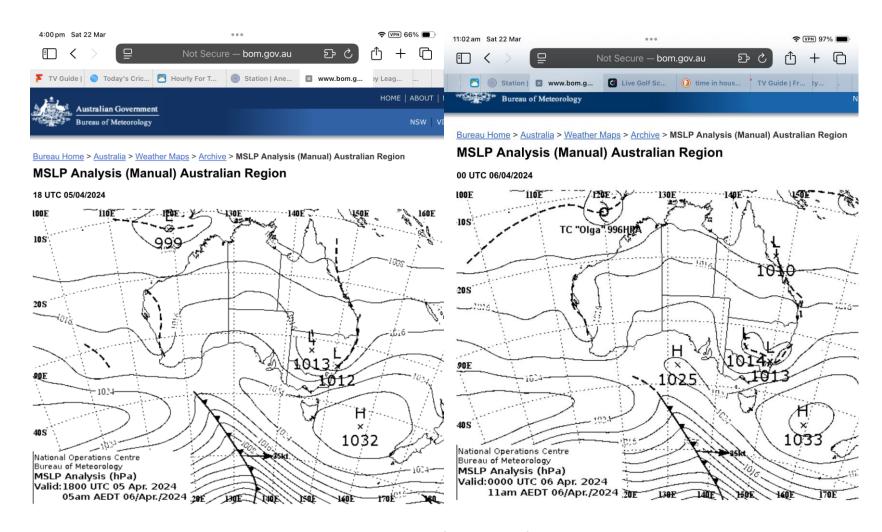


Figure 8: Synoptic maps from the BOM for April 6

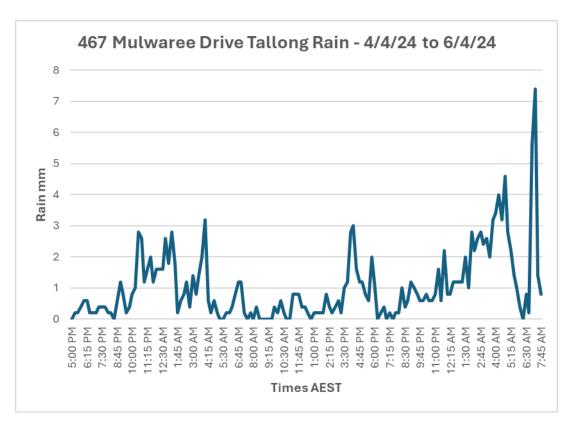


Figure 9: Rainfall data from 467 Mulwaree Drive, Tallong April 4 to 6.

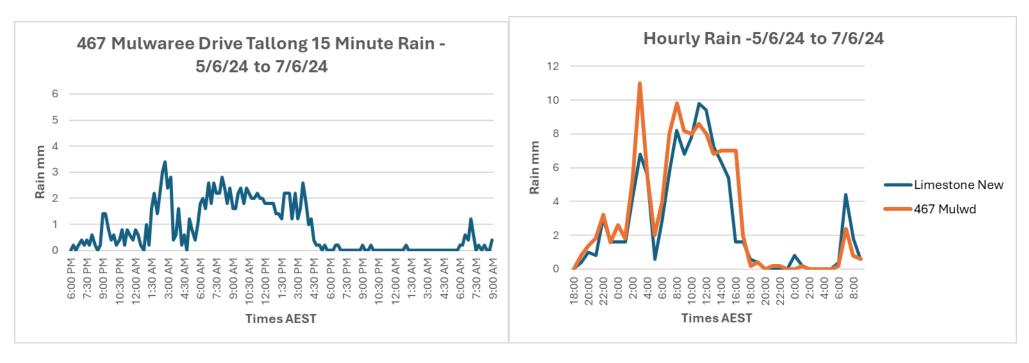


Figure 10: Rainfall data from 467 Mulwaree Drive, Tallong and Limestone New June 5 to 7.

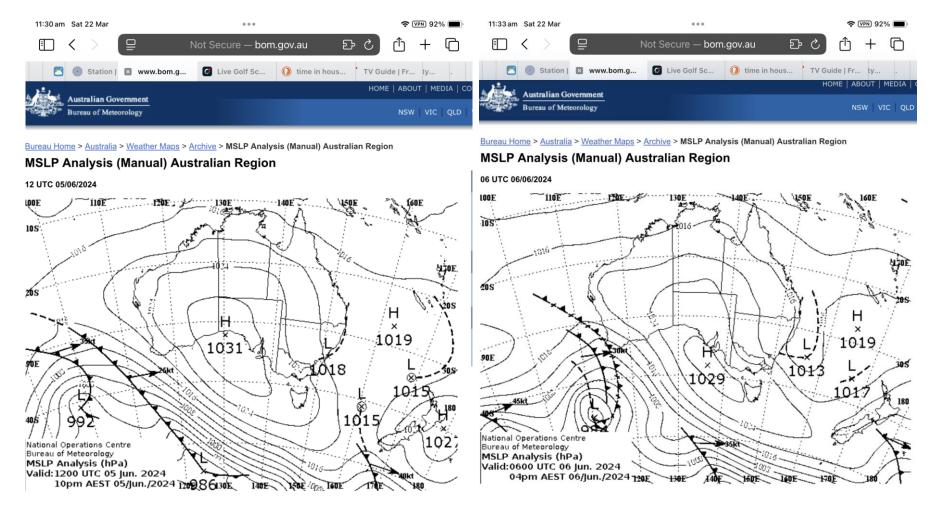


Figure 11: Synoptic maps from BOM – June 5, 2024 10pm AEST

June 6, 4 pm AEST

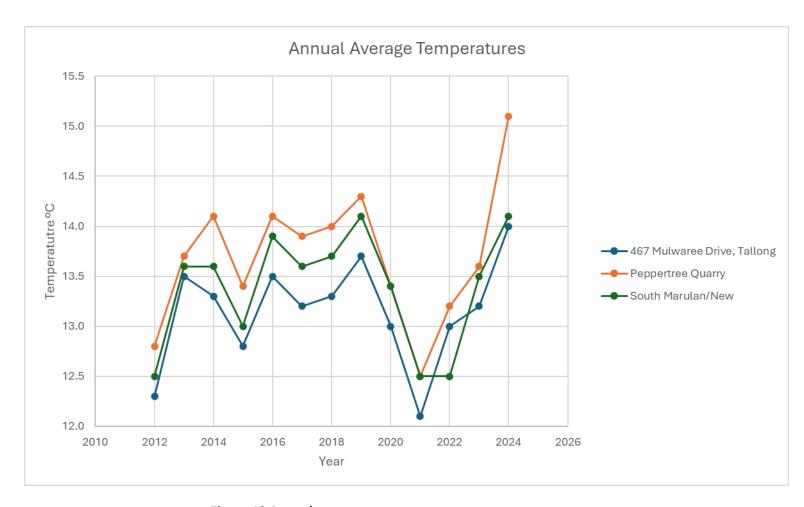


Figure 12 Annual average temperatures