



# Monana

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## Meteorology and Soaring Flight.

### Richard Geytenbeek



Richard Geytenbeek has 45 years of soaring experience including long distance and competition flying in a wide range weather conditions. He is a qualified instructor and inspector.

Using his collection of apposite photographs, Richard provided us with an insight into his magnificent obsession and an overview of cross-country soaring, sources of lift and how they are used, high performance sailplanes and instrumentation, and sailplanes for atmospheric research. Richard has many years experience in long distance and competition flying in a wide range of weather conditions.

The photo at below shows the Arcus craft. Note the curved wings which Richard says are beginning to emulate those of an albatross; the wing tips – a design feature which began in gliders and has since moved to airliners – and the fold-down propeller. The propeller provides additional range and safety and a self-launching capability. An interesting feature of modern high performance craft is that they can carry water

ballast within the wings: the additional weight providing faster glide speeds when conditions or objectives suit.

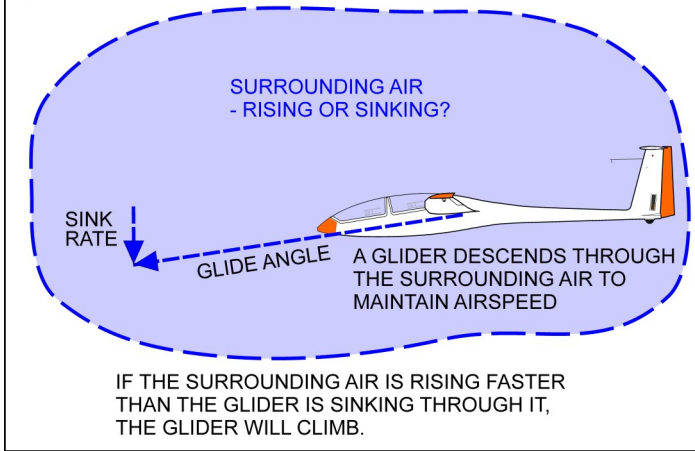
We were treated to explanations as to how a glider works – see the diagram below for the very basic concept – and then how the pilot continually seeks and finds 'lift'.

There are different types of lift occurring with thermals, wind shear, waves, even hydraulic jumps, (ridge) topography and clouds and the regions adjacent to clouds.



**Arcus craft**

## CLIMB RATE ?

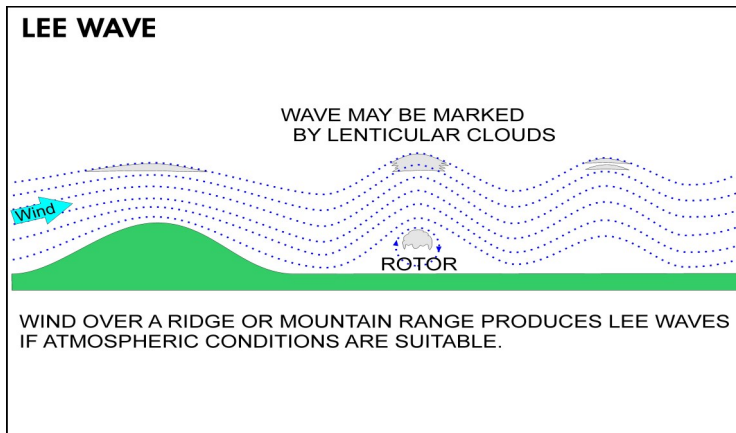


Then followed a rundown of the instruments and controls – all we lacked were a few multimillion dollar simulators for audience participation.

Quickly followed by a series of diagrams and photos illustrating visual cues to the existence and location of the all-important lift. A cheater's method which appeals to your scribe is to follow other successful pilots

and even to barge in on eagles. A caveat on this second approach - the eagles are sometimes rather territorial about their thermal.

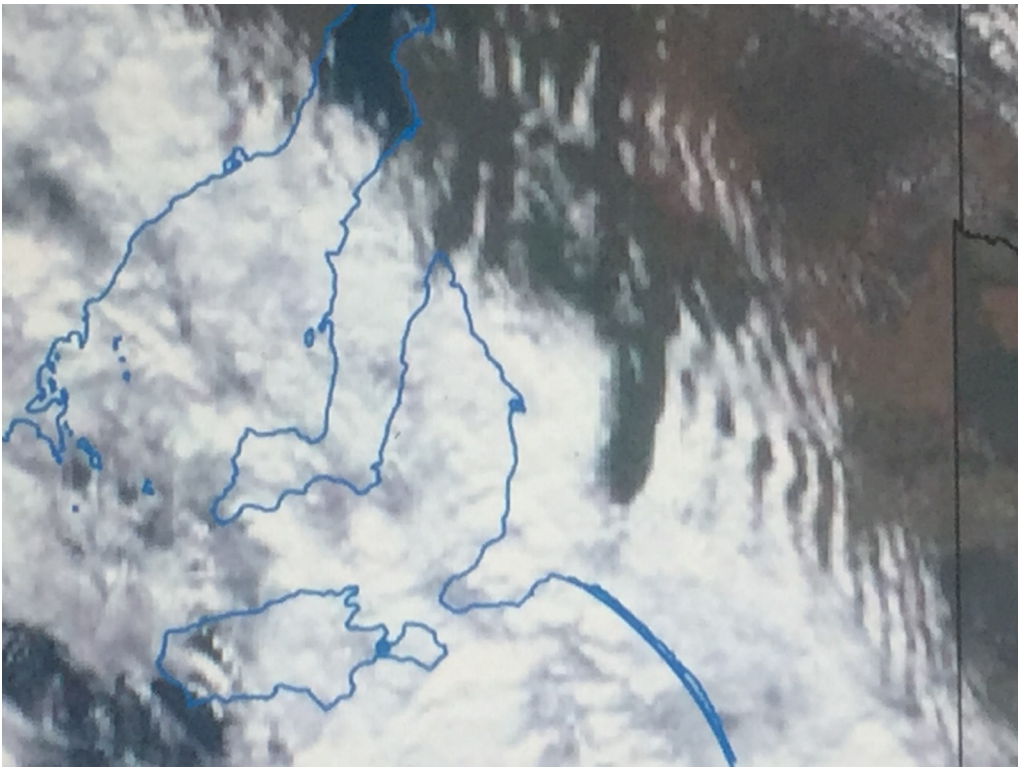
Space prevents a full rundown of all the types of lift but a superb illustration of lift due to waves (one of the easier-to-visualise types of lift) was found on the Himawari satellite imagery by Richard. See the schematic of lee wave formation below.



Earlier in the evening Darren Ray had briefed us on the features of the Himawari satellite imagery available via the BoM's website. It was when he was delving into the imagery (a day or two after the meeting) that Richard found this superb example of lee waves formed

behind the Mt Lofty / Lower Flinders Ranges – see figure on the next page.

On a research note, it is anticipated that gliders in design will reach altitudes (60,000feet and more) well beyond the reach of (conventional) powered aircraft. This capability opens the potential for a new era in research opportunities for the future.



Warwick Grace  
AMETA Committee

### **A new training module on using seasonal outlooks**

The COMET meteorology training website is a valuable source of information and training packages on weather, climate, hydrology and meteorology. It is free to register, and self-paced, and in the last few weeks a new package has been added, developed by Bureau of Meteorology staff, on using seasonal outlook information. Well worth a look at :

<http://www.bom.gov.au/climate/ahead/> and the 'About-outlooks and influences' tab

## Adelaide in June 2016

Rainfall was above average across Adelaide in June, with warm nights generally at the beginning of the month. Daytime temperatures were generally close to average throughout the month, though a vigorous cold front saw a chilly end to the month and the city had its coldest day since last winter.

### Above average rainfall

- Heavy rainfall on several days during the month
- Several suburbs recorded more than 20 days of rainfall for June
- Wettest day was on the 24th, with several suburbs recording daily totals of more than 30 mm

### Warmer than average nights

- June began with warmer than average days and nights
- Warm spell in mid-June saw temperatures about five degrees above average around Adelaide
- Cool spell during the last week of the month
- Adelaide's (Kent Town) coldest day for the month was 12.6 °C on the 23rd, its coldest day since last winter

### Strong winds

- Strong winds on the 24th as a cold front crossed the city
- Kuitpo, Mount Crawford and Adelaide Airport all recorded wind gusts of 80 km/h or more on the 24th
- Mount Crawford recorded five days with wind gusts of 80 km/h or more for the month (on the 6th, 8th, 9th, 24th and 30th)

### Extremes in June 2016

Hottest day	21.8 °C at Parafield Airport on the 14th
Warmest days on average	16.2 °C at Parafield Airport
Coollest days on average	10.4 °C at Mount Lofty
Coldest day	7.0 °C at Mount Lofty on the 29th
Coldest night	0.5 °C at Mount Barker on the 13th
Coollest nights on average	6.1 °C at Mount Lofty
Warmest nights on average	9.7 °C at Noarlunga
Warmest night	13.7 °C at Adelaide Airport on the 17th
Warmest on average overall	12.7 °C at Adelaide Airport 12.7 °C at Noarlunga
Coollest on average overall	8.3 °C at Mount Lofty
Wettest overall	223.2 mm at Piccadilly (Woodhouse)
Driest overall	52.4 mm at Parafield Airport
Wettest day	42.8 mm at Lenswood Research Centre on the 24th
Strongest wind gust	83 km/h at Kuitpo Forest Reserve on the 24th 83 km/h at Mount Crawford AWS on the 30 <sup>th</sup>

***For more information on June's temperatures and rainfall plus a summary of statistics please see:***

<http://www.bom.gov.au/climate/current/month/sa/archive/201606.adelaide.shtml>

# Adelaide, South Australia June 2016 Daily Weather Observations

Observations are from Kent Town, about 2 km east of the city centre.



Date	Day	Temps		Rain	Evap	Sun	Max wind gust				3am				3pm						
		Min	Max				Dirn	Spd	Time	Temp	RH	Cid	Dirn	Spd	MSLP	Temp	RH	Cid	Dirn	Spd	MSLP
		°C	°C																		
1	We	9.5	20.0	0.2			NNE	20	12:56	14.8	70	NE	6	1025.7	19.3	49	N	7	1023.0		
2	Th	9.6	19.0	0.2			NNE	20	13:36	14.3	67	NE	4	1024.4	12.7	93		Calim	1022.4		
3	Fr	6.7	17.9	18.4			E	28	15:48	12.4	83		Calim	1023.2	17.3	59	WNW	7	1020.0		
4	Sa	5.7	16.7	0			WSW	24	16:03	10.3	82		Calim	1018.8	15.7	65	WSW	13	1013.8		
5	Su	9.7	15.8	0.2			W	44	23:32	11.6	85	N	11	1007.7	15.1	66	WSW	20	1005.5		
6	Mo	10.8	15.9	11.4			W	50	03:47	12.6	93	W	13	1006.8	15.3	66	SW	20	1007.2		
7	Tu	12.0	17.0	1.6			SW	30	09:21	14.3	71	WSW	13	1011.8	15.4	63	WSW	13	1009.9		
8	We	11.6	18.0	3.8			N	50	23:47	12.3	93	NE	13	1002.4	17.8	65	NNW	17	998.5		
9	Th	11.6	15.7	5.2			SSW	50	14:17	14.4	88	SW	15	1005.6	14.7	65	SW	19	1013.9		
10	Fr	12.3	16.2	2.4			NW	39	15:32	13.7	74	WNW	9	1021.7	15.5	70	WNW	17	1021.7		
11	Sa	7.6	16.1	1.8			SW	35	11:49	12.3	77		Calim	1030.6	15.4	57	S	9	1031.2		
12	Su	5.8	15.4	0			ESE	20	10:06	10.5	75		Calim	1038.3	14.7	42	NNE	9	1035.2		
13	Mo	3.6	14.7	0			NNE	30	11:31	8.6	58	NE	9	1034.2	13.7	40	NNE	9	1030.6		
14	Tu	5.3	20.8	0			NNE	19	01:10	12.7	71		Calim	1083.4	20.1	47	SW	9	1030.9		
15	We	9.0	20.3	0			NNE	30	23:36	13.6	56	NNE	4	1029.9	20.0	41	N	13	1024.5		
16	Th	13.4	16.0	2.4			NE	33	00:56	15.3	77	NNE	9	1015.4	15.1	82	N	9	1010.1		
17	Fr	13.6	17.1	4.0			S	20	15:36	14.6	96		Calim	1013.3	16.4	71	SSE	7	1012.9		
18	Sa	11.0	15.4	0			E	28	11:49	12.9	58	SSE	7	1019.7	14.8	53	E	11	1018.4		
19	Su	7.0	15.1	0			S	20	12:52	11.4	78		Calim	1019.1	14.3	56	SSE	7	1015.1		
20	Mo	6.2	15.0	0.6			WNW	26	14:42	10.5	92	NNW	4	1013.1	12.7	86	W	11	1009.8		
21	Tu	9.7	14.2	3.8			WNW	39	16:46	11.1	87	N	11	1003.2	13.5	94	NW	9	1001.4		
22	We	10.2	16.5	11.8			WNW	39	12:44	13.5	67	W	9	1010.3	15.5	63	WNW	17	1010.0		
23	Th	10.8	12.6	2.6			NNW	48	10:35	11.6	76	N	17	1005.1	10.1	95	WSW	17	1002.6		
24	Fr	7.5	12.8	20.0			WSW	63	01:57	10.1	61	SW	22	1015.0	12.6	58	SW	19	1018.2		
25	Sa	4.2	13.6	0.6			N	22	11:48	8.8	84	ENE	2	1025.5	12.5	60	N	9	1022.4		
26	Su	8.8	14.3	0			W	30	14:53	10.5	64	N	9	1019.1	12.6	63	NW	17	1016.0		
27	Mo	8.5	15.4	2.6			SW	24	12:26	10.4	94	NE	2	1021.2	14.9	54	SW	9	1021.4		
28	Tu	8.9	16.2	0			WNW	28	14:10	10.5	76	N	9	1027.5	15.6	56	NW	11	1026.2		
29	We	6.2	13.2	0			NNW	50	15:48	11.2	62	N	11	1025.1	13.0	54	N	22	1019.2		
30	Th	9.9	14.4	1.6			W	50	14:05	12.1	87	NW	17	1012.9	13.2	53	WSW	24	1014.9		
<b>Statistics for June 2016</b>																					
Mean		8.9	16.0							12.1	76			1018.7	15.0	62			12	1016.9	
Lowest		3.6	12.6							8.6	96			1008.4	10.1	40			Calim	998.5	
Highest		13.6	20.8	20.0			WSW	63		15.3	96	SW	22	1038.3	20.1	95			WSW	24	1035.2
Total				95.2																	

Observations were drawn from Adelaide (Kent Town) (station 023080)

IPCJW5002.201606 - Prepared at 13:06 GMT on 21 Jul 2016  
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Users of this product are deemed to have read the information and accepted the conditions described in the forecast at <http://www.bom.gov.au/climate/dew/IPCJW5000.pdf>

## **South Australia in June 2016: above average rainfall and warm nights**

Most of South Australia recorded a wetter than average June. Rainfall was above average across most of the State, especially across northern and western districts. Night time temperatures were above average across the most of South Australia, particularly across the northern districts. Daytime temperatures were cooler than average in the State's west and northeast.

### **Rainfall above average**

- Above average rainfall for much of the north and west of the State
- Wettest June for South Australia since 2001
- Rainfall totals up to four times the June average in the northwest and around Woomera
- Rainfall was close to average in the southeast
- Whyalla and Mount Gambier had their wettest June on record
- Some sites had their highest total June rainfall for at least 20 years
- Some sites in agricultural and southern districts had their highest June daily rainfall on record

### **Cool days and warm nights**

- Very much above average minimum temperatures for northern districts
- Night time temperatures were more than three degrees above average across the State's north
- Warmest June mean minimum temperature for South Australia since 1996
- Daytime temperatures were generally cooler than average for most of South Australia
- Mean maximum temperatures were more than one degree below average in western districts
- Several sites in outback South Australia had their highest June mean daily minimum temperature for at least 20 years

### **Strong winds**

- Strong winds were recorded on the 23rd and 24th as a cold front crossed the State
- Cape Willoughby and Neptune Island each recorded wind gusts of 111 km/h on the 23rd

### **Extremes in June 2016**

Hottest day	26.4 °C at Moomba Airport on the 8th
Warmest days on average	19.1 °C at Oodnadatta Airport
Coollest days on average	10.4 °C at Mount Lofty
Coldest day	7.0 °C at Mount Lofty on the 29th
Coldest night	-4.2 °C at Yunta Airstrip on the 13th
Coollest nights on average	5.0 °C at Gluepot Reserve (Gluepot) and Yongala
Warmest nights on average	12.4 °C at Neptune Island
Warmest night	16.3 °C at Oodnadatta Airport on the 16th
Warmest on average overall	14.3 °C at Oodnadatta Airport
Coollest on average overall	8.3 °C at Mount Lofty
Wettest overall	315.8 mm at Bridgewater
Driest overall	8.6 mm at Cameron Corner (Lindon)
Wettest day	99.0 mm at Whyalla (Mullaquana) on the 18th
Strongest wind gust	111 km/h at Cape Willoughby on the 23rd 111 km/h at Neptune Island on the 23rd

## Record highest June daily rainfall

	New record (mm)	Old record	Years of record
Nonning	35.2 on the 16th	33.0 on the 6th in 1921	107
Penong	31.4 on the 18th	28.4 on the 20th in 1968	109
Mount Gambier	50.0 on the 23rd	39.0 on the 25th in 1990	75
Broadview Station	45.4 on the 18th	35.0 on the 6th in 1994	76
Moonaree	28.4 on the 16th	27.0 on the 16th in 1995	31
Mullaquana	99.0 on the 18th	45.0 on the 6th in 2001	99

## Record highest June total rainfall

	New record (mm)	Old record	Years of record	June Average
Mullaquana	152.2	82.8 in 2013	100	26.3
Mount Gambier	163.0	160.0 in 2004	75	84.9
Whyalla	82.0	78.2 in 1991	75	25.4

## Highest June total rainfall for at least 20 years

	Observed (mm)	Most recent higher	June Average
Woomera	68.2	69.5 in 1951*	14.7
Mount Dare	38.8	54.8 in 1978*	11.0
Ceduna	72.6	73.4 in 1981	36.1
Darke Peak	102.0	129.6 in 1981	48.9
Penong	72.4	84.6 in 1981	42.6
Bridgewater	315.8	337.3 in 1981*	152.7
Buckleboo	66.0	86.8 in 1991	36.8
Kimba	82.2	110.2 in 1991	40.7
Nonning	72.4	80.2 in 1991	27.1
Wirrulla	70.6	95.6 in 1991*	38.5
Nullarbor	74.6	76.0 in 1995	30.5

\* note: there are gaps in the historical record at this site, so it is possible a higher value has gone unreported.

**For more information on June's temperatures and rainfall plus a summary of statistics please see:**

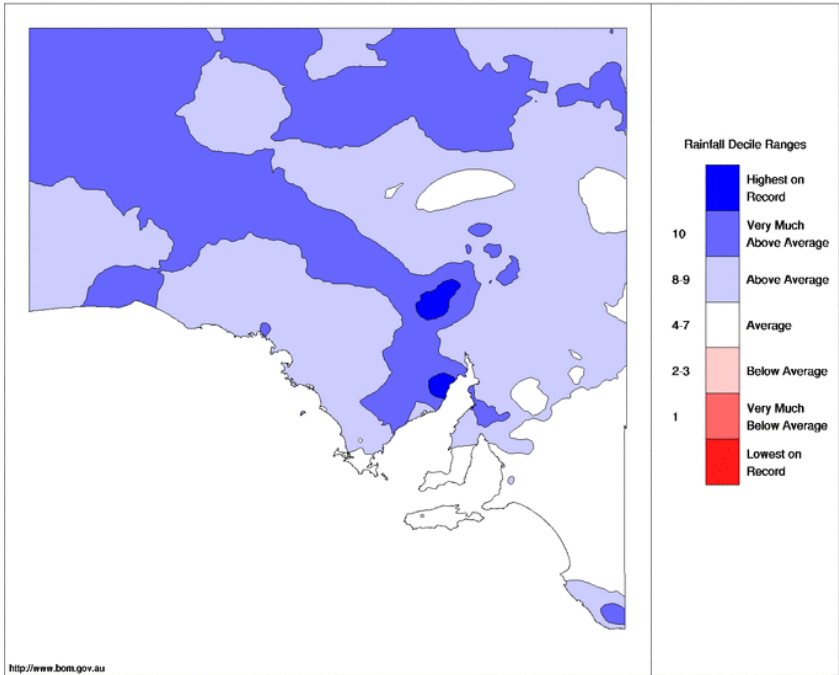
<http://www.bom.gov.au/climate/current/month/sa/archive/201606.summary.shtml>

**All the detail you could possibly want and more is available on the BoM website.**

Visit <http://www.bom.gov.au/climate> and wander through the various archived climate reports and summaries which are available in text and graphical forms.



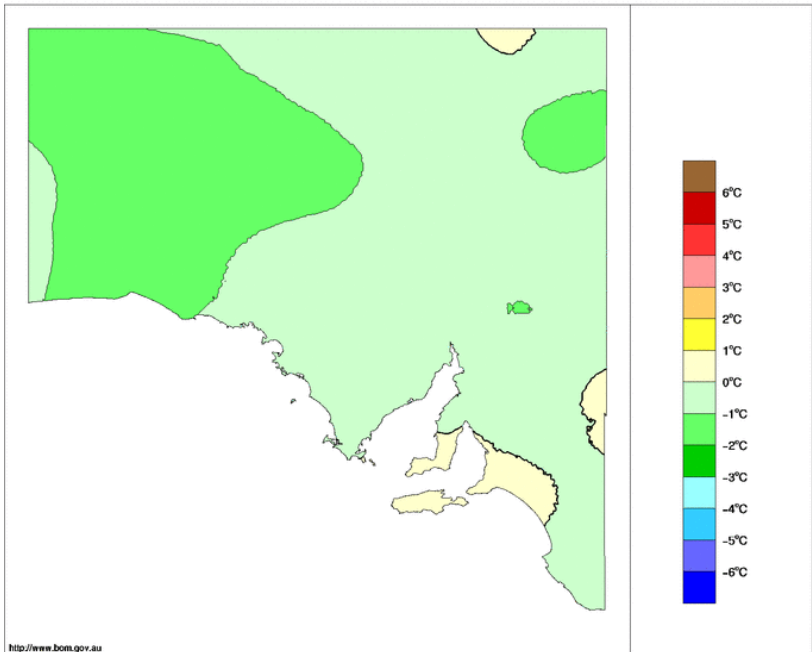
South Australian Rainfall Deciles June 2016  
 Distribution Based on Gridded Data  
 Australian Bureau of Meteorology



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Issued: 27/07/2016

Maximum Temperature Anomaly (°C) June 2016  
 Australian Bureau of Meteorology



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Issued: 21/07/2016



## **Adelaide in July 2016: wet and windy with warmer than average nights**

Rainfall was above average across the Adelaide region in July, with particularly heavy rain occurring in the first week. Daytime temperatures were generally cooler than average throughout the month, though a warm spell in the third week saw daily maximum temperatures up to 7 degrees above average. Nights were generally warmer than average, especially in the second half of the month.

### **Heavy rain days and squally cold fronts**

- A vigorous southerly airstream on the 5th in the wake of a strong low pressure system, brought highest July daily rainfall totals on record for several locations
- Further rain and cold outbreaks later in the month resulted in some sites having their highest total rainfall for July in at least 20 years and it was the wettest July on record at Burnside
- Adelaide (Kent Town) recorded 20 days with rain and a monthly total of 112.0 mm, about a third of which (37.6 mm) was recorded in the 24 hour period to 9am on the 5th
- Adelaide's wettest month since July 2013, and seventh wettest July recorded at the Kent Town site

### **Cool days, mild nights**

- A squally cold front resulted in Mount Crawford reporting its lowest maximum temperature in more than 20 years
- A warm northwest airstream brought warmer days in the third week on July
- Adelaide recorded it's warmest July day in 14 years on the 21st, while Mount Crawford observed it's warmest July day in more than 20 years

### **Strong winds, hail and snow flurries**

- July was unusually windy, with winds typically about 30% above average over the month
- Cold fronts produced damaging winds on several occasions with record wind gusts for July
- The strongest for the month in the Adelaide region was a gust of 120 km/h at Mount Crawford on the 12th
- Sleet and snow flurries were also observed at Mount Lofty

### **Extremes in July 2016**

Hottest day	22.9 °C at Parafield Airport on the 21st
Warmest days on average	15.3 °C at Adelaide (Kent Town)
Coollest days on average	9.3 °C at Mount Lofty
Coldest day	4.6 °C at Mount Lofty on the 12th
Coldest night	-0.2 °C at Parafield Airport on the 16th
Coollest nights on average	5.0 °C at Mount Lofty
Warmest nights on average	9.0 °C at Noarlunga
Warmest night	14.0 °C at Adelaide (Kent Town) on the 22nd
	14.0 °C at Adelaide Airport on the 22nd
Warmest on average overall	11.8 °C at Noarlunga
Coollest on average overall	7.2 °C at Mount Lofty
Wettest overall	252.2 mm at Uraidla

<b>Record highest July daily rainfall</b>			
	<b>New record (mm)</b>	<b>Old record</b>	<b>Years of record</b>
Mallala	38.8 on the 5th	31.8 on the 6th in 1891	133
Burnside	55.6 on the 5th	33.5 on the 21st in 1920	38
Brighton	43.2 on the 5th	36.3 on the 14th in 1941	73
Uraidla	61.8 on the 5th	61.7 on the 14th in 1955	126
Morphett Vale	56.0 on the 5th	40.0 on the 31st in 1975	112
Blackwood	50.8 on the 5th	48.9 on the 4th in 1986	38
Happy Valley	62.6 on the 5th	56.4 on the 8th in 1993	125
Owen	40.0 on the 5th	37.4 on the 8th in 1993	91
Kent Town	37.6 on the 5th	32.8 on the 8th in 1993	40
Hope Valley	41.2 on the 5th	36.2 on the 28th in 1998	38
McLaren Vale	46.4 on the 5th	28.0 on the 28th in 1998	23

<b>Record highest July total rainfall</b>				
	<b>New record</b>	<b>Old record</b>	<b>Years of record</b>	<b>July Average</b>
Burnside	139.6	129.8 in 2013	38	79.8

<b>Highest July total rainfall for at least 20 years</b>			
	<b>Observed</b>	<b>Most recent higher</b>	<b>July Average</b>
Morphett Vale	156.4	161.2 in 1890*	76.3
Mallala	92.0	106.9 in 1951	45.7
Owen	107.2	118.7 in 1951*	51.2
Brighton	126.8	136.5 in 1951*	64.9
Woodside	218.0	301.5 in 1964*	118.1
Happy Valley	161.8	170.0 in 1995	86.6
Heathfield	241.1	306.4 in 1995	158.3
Mount Bold	206.2	239.6 in 1995	116.8
Blackwood	151.0	172.4 in 1995*	109.1
Nairne	172.0	212.0 in 1995*	93.5

\* note: there are gaps in the historical record at this site, so it is possible a higher value has gone unreported.

<b>Record highest and lowest July temperatures</b>				
	<b>New record (°C)</b>	<b>Old record</b>	<b>Years of record</b>	<b>July Average</b>
Mount Crawford	18.7 on the 21st	18.6 on the 27th in 2002	23	10.9
Mount Crawford	5.5 on the 12th	5.7 on the 14th in 2006	23	10.9

For more information on June's temperatures and rainfall plus a summary of statistics please see:  
<http://www.bom.gov.au/climate/current/month/sa/archive/201607.adelaide.shtml>

# Adelaide, South Australia July 2016 Daily Weather Observations

Observations are from Kent Town, about 2 km east of the city centre.



Date	Day	Temps		Rain	Evap	Sun	Max wind gust			9am			3pm						
		Min °C	Max °C				Dirn	Spd km/h	Time local	Temp °C	RH %	Cld eighths	Dirn	Spd km/h	MSLP hPa	Temp °C	RH %	Cld eighths	Dirn
1	Fr	6.1	14.2	2.6			WNW	24	20:01	9.1	90	NNE	6	1026.1	14.2	69	W	7	1025.8
2	Sa	9.1	15.7	1.4			W	30	14:24	11.8	94	N	6	1030.2	15.5	63	NW	11	1028.6
3	Su	10.2	15.8	0			NNW	28	13:14	11.0	75	N	11	1027.1	15.3	55	NNW	11	1022.1
4	Mo	9.6	11.5	0.2			W	43	07:40	10.0	86	N	9	1015.0	10.1	90	SW	19	1010.0
5	Tu	6.2	14.0	37.6			SSW	57	02:48	10.2	95	SW	7	1016.8	12.1	85	SW	17	1018.8
6	We	6.2	14.5	2.4			SW	24	15:23	9.0	97	SW	Calm	1024.7	13.7	75	S	7	1023.4
7	Th	5.4	14.7	1.6			W	22	15:28	7.7	93	SW	Calm	1024.8	13.4	65	WNW	9	1021.6
8	Fr	3.1	14.4	0			WNW	17	12:10	7.6	81	NE	Calm	1023.6	13.3	66	W	6	1022.5
9	Sa	4.7	14.4	0			NNE	37	20:15	10.7	65	NE	7	1023.8	13.7	55	NE	11	1018.1
10	Su	10.7	15.9	6.6			NNE	46	02:32	13.5	64	NNE	17	1008.6	15.0	67	N	20	1004.6
11	Mo	10.4	15.8	1.4			NNW	44	11:48	11.7	64	NNW	19	1005.5	15.1	66	NW	20	1003.8
12	Tu	8.0	11.0	6.0			SW	70	12:12	9.8	62	W	22	1006.7	9.4	60	W	30	1011.0
13	We	6.4	13.8	7.0			W	48	00:22	11.0	61	SW	15	1026.9	13.2	54	WSW	17	1028.9
14	Th	6.0	13.7	0.6			NNW	26	12:20	8.3	88	NNE	6	1034.5	13.3	58	W	15	1032.3
15	Fr	7.3	14.3	0.2			WNW	22	12:19	10.2	58	NNE	6	1034.7	13.8	46	WNW	6	1032.0
16	Sa	2.0	16.1	0			N	20	11:44	7.4	73	NNE	7	1026.1	16.2	40	NNW	6	1028.4
17	Su	2.8	16.9	0			NE	28	12:12	10.5	65	NNE	7	1026.1	16.2	36	NW	15	1021.6
18	Mo	8.8	19.9	0			N	26	12:41	13.9	66	NNE	6	1021.5	18.3	47	W	15	1019.3
19	Tu	8.7	20.2	0			WSW	19	14:21	11.5	83	W	Calm	1021.7	17.9	58	SW	9	1019.4
20	We	11.4	18.5	5.0			NE	22	14:14	15.6	76	NE	4	1020.4	17.3	70	E	11	1018.5
21	Th	13.0	22.7	0			WNW	37	23:15	16.8	73	NE	7	1014.1	21.8	61	N	15	1008.6
22	Fr	14.0	15.7	0.6			W	72	18:31	14.2	81	NW	15	1004.4	13.1	85	NW	17	1000.8
23	Sa	9.2	13.9	4.2			W	41	00:44	10.2	77	SSW	4	1014.3	13.2	49	W	13	1015.1
24	Su	6.2	13.1	0			W	65	13:16	10.0	73	N	17	1008.6	12.3	65	W	20	1008.5
25	Mo	7.4	12.7	11.4			WSW	46	20:36	12.0	75	WNW	15	1015.8	12.4	87	NW	20	1012.2
26	Tu	8.1	11.8	8.8			NNW	46	17:44	9.4	82	N	7	1016.0	10.6	82	NNW	13	1010.5
27	We	9.1	14.1	10.4			SW	39	04:52	11.3	68	SSW	9	1022.7	13.2	57	WSW	13	1025.3
28	Th	10.4	14.2	0.2			W	24	13:55	12.4	82	NW	9	1029.5	13.7	63	NW	11	1027.5
29	Fr	9.7	16.1	0			NW	20	12:57	10.5	78	N	Calm	1026.5	14.9	61	NW	9	1023.2
30	Sa	9.2	17.4	0			NW	44	11:17	14.0	48	N	17	1018.6	16.1	57	NW	13	1013.8
31	Su	12.0	16.8	3.8			N	26	15:14	13.5	87	NNE	9	1016.9	16.4	74	N	13	1012.5
Statistics for July 2016		Mean	8.1	15.3						11.1	76		8	1020.6	14.3	63		13	1018.3
		Lowest	2.0	11.0						7.4	48		Calm	1004.4	9.4	36	#	6	1000.8
		Highest	14.0	22.7						16.8	97		22	1034.7	21.8	90		30	1032.3
		Total																	

Observations were drawn from Adelaide (Kent Town) (station 023050)

ICDC/DW5002\_201607 Prepared at 07:15 GMT on 1 Aug 2016

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## South Australia in July 2016

Parts of coastal and southeast areas of South Australia recorded a wetter than average July, with several locations in the southern Mount Lofty Ranges and the Lower Murray Valley reporting their wettest July on record. Rainfall tended closer to average across most other areas of the State. Night time temperatures were above average across the most of South Australia, particularly across the northern districts. Daytime temperatures were cooler than average in the west.

### Heavy rain days across southern districts

- A vigorous southerly airstream, in the wake of a low pressure system brought the highest July daily rainfall totals on record for many locations on the 5th
- Further rain and cold outbreaks resulted in some sites having highest total July rainfall for at least 20 years, with some others having their wettest July on record.

### Cooler days, nights generally mild

- A squally cold front crossed the State on the 12th resulting in some sites having their coldest July day in more than 20 years and Neptune Island recording it's coldest July night on record
- Well above average temperatures across the State in the third week of the month, due to northerly winds ahead of an approaching front, resulted in several locations having their warmest July day or warmest July night on record
- The statewide average minimum temperature was more than 0.5 °C above average, with notable warmer than average nights in the north and east

### Strong winds, hail and snow flurries on the 12th

- A deep low pressure system centred south of Tasmania produced a vigorous west to southwesterly airstream over the south of the State, directing cold Antarctic air across south central and southeast districts
- July was unusually windy, with winds typically about 30% above average over the month and some locations recording the windiest for July in about 20 years
- Damaging winds were recorded across about southern coasts and ranges
- The strongest gusts included 120 km/h at Mount Crawford, 113 km/h at Port Lincoln, 111 km/h at Kingscote and Cape Jaffa, and 109 km/h at Hindmarsh Island and Minlaton
- Hail, sleet and snow flurries were also observed about elevated areas in the ranges and in Southeast districts

### Extremes in July 2016

Hottest day	29.6 °C at Moomba Airport on the 22nd
Warmest days on average	19.4 °C at Moomba Airport and Oodnadatta Airport
Coollest days on average	9.3 °C at Mount Lofty
Coldest day	4.6 °C at Mount Lofty on the 12th
Coldest night	-5.0 °C at Yunta Airstrip on the 16th
Coollest nights on average	3.4 °C at Yongala
Warmest nights on average	11.1 °C at Neptune Island
Warmest night	16.6 °C at Marree Aero on the 22nd
Warmest on average overall	13.4 °C at Moomba Airport
Coollest on average overall	7.2 °C at Mount Lofty
Wettest overall	269.8 mm at Aldgate
Wettest day	84.0 mm at Myponga on the 5th
Strongest wind gust	139 km/h at Cape Willoughby and Neptune Is on the 12th

Some notable statistics for July were:

<b>Record highest July total rainfall</b>				
	<b>New record (mm)</b>	<b>Old record</b>	<b>Years of record</b>	<b>July Average</b>
Strathalbyn	169.2	133.2 in 1986	155	64.7
Callington	113.6	103.0 in 1886	134	44.1
Tarlee	129.8	115.4 in 1909	134	55.2
Macclesfield	217.4	208.0 in 1986	131	101.4
Stockport	136.0	114.6 in 1995	56	56.2
Burnside	139.6	129.8 in 2013	38	79.8
Strathalbyn Racecourse	143.0	100.4 in 2013	21	55.9

<b>Record lowest July daily maximum temperature</b>				
	<b>New record (°C)</b>	<b>Old record</b>	<b>Years of record</b>	<b>July Average</b>
Kingscote	9.3 on the 12th	10.7 on the 28th in 1998	23	15.4
Mount Crawford	5.5 on the 12th	5.7 on the 14th in 2006	23	10.9
Parawa	7.0 on the 12th	= 7.0 on the 28th in 1998	23	11.6

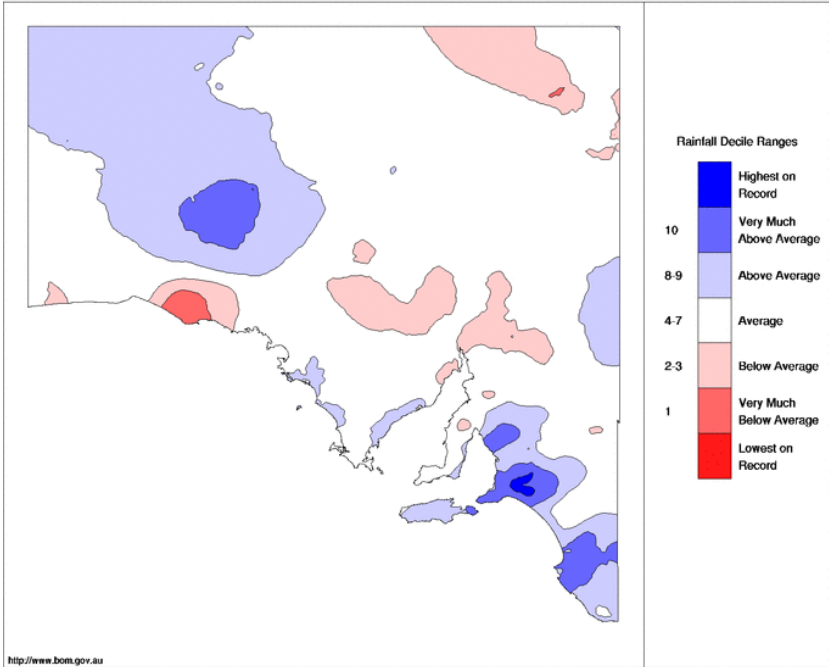
<b>Record highest July daily minimum temperature</b>				
	<b>New record (°C)</b>	<b>Old record</b>	<b>Years of record</b>	<b>July Average</b>
Elliston	15.3 on the 22nd	15.0 on the 29th in 2011	55	7.8
Andamooka	15.6 on the 22nd	14.4 on the 30th in 1993	47	6.0
Hawker	13.5 on the 22nd	13.4 on the 30th in 1975	43	3.7
Edithburgh	13.4 on the 22nd	13.2 on the 1st in 2011	26	7.5
Renmark	13.0 on the 22nd	= 13.0 on the 14th in 2013	21	3.7
Ernabella	15.3 on the 22nd	= 15.3 on the 3rd in 2007	20	4.3

**Many other rainfall & temperature records were also set in July. For more information plus a summary of statistics please see:**

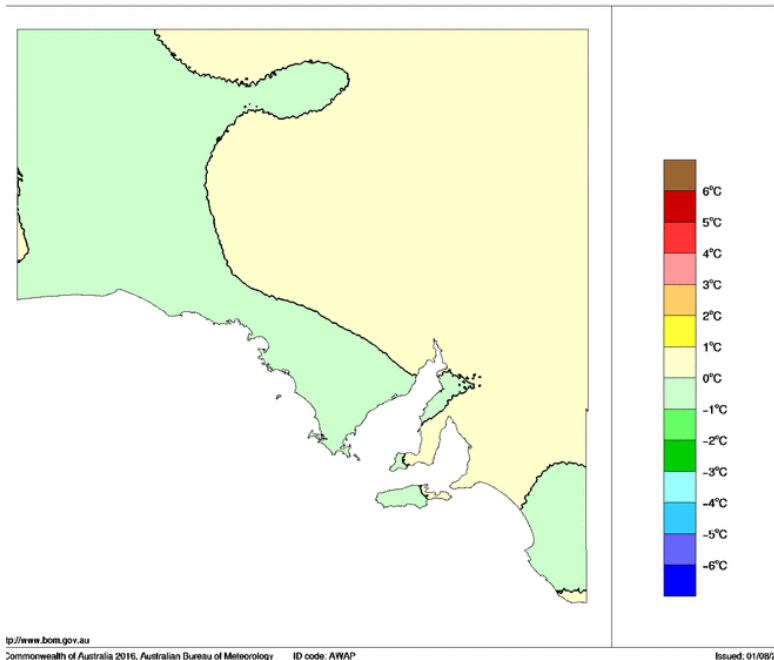
<http://www.bom.gov.au/climate/current/month/sa/archive/201607.summary.shtml>

South Australian Rainfall Deciles July 2016

Distribution Based on Gridded Data  
Australian Bureau of Meteorology



Maximum Temperature Anomaly (°C) July 2016  
Australian Bureau of Meteorology

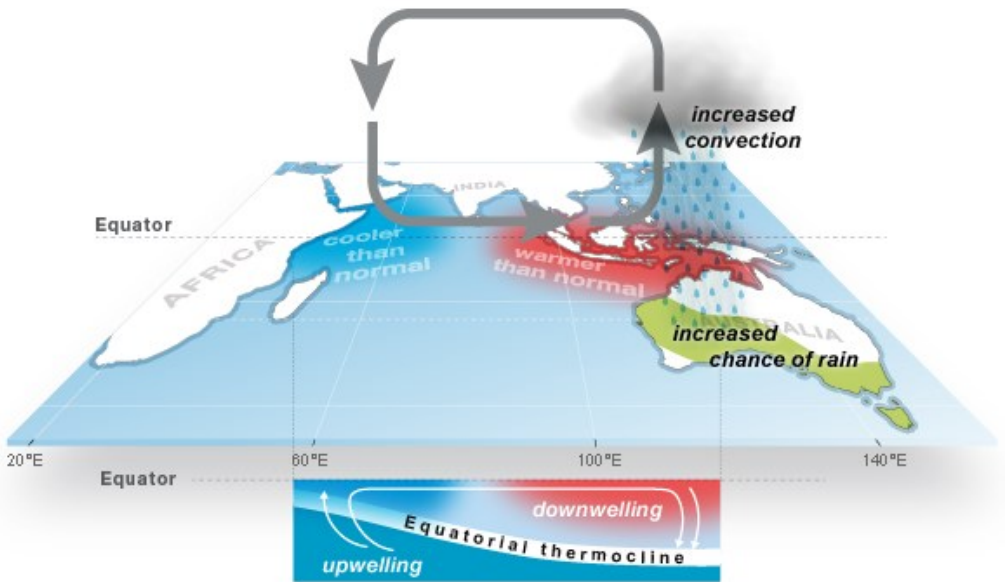


## Understanding the IOD

Australia is currently being impacted by a major climate influence called the Indian Ocean Dipole or IOD. This sees variations in the northern Indian Ocean year to year, which influence moisture feeds across the continent, as well as the atmospheric circulation. The first scientific paper on this pattern of variability only came out in 1999, so it is relatively new.

A new information page explores what the IOD is, and impacts on Australia. The current wetter, negative phase is expected to persist into spring 2016.

<http://www.bom.gov.au/climate/iod/>



Indian Ocean Dipole (IOD): **Negative phase**

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## **NEXT MEETING**

**6.00 PM TUESDAY 16 August 2015**

*Bureau of Meteorology offices, Level 4, corner of South Terrace & King  
William Street, Adelaide.*

*Please also note that the August meeting is the 2016 AGM ( a non-  
election AGM) and subscriptions for 2016/2017 (\$15) are now due.*

**Subject:**      ***Effects of Weather on Insects***

**Speaker:**      ***Dr Maryam Yazdani***

Dr Maryam Yazdani is an entomologist with University of Adelaide with a background in biological control and ecology, and research on insect natural enemies and their role in biological control of insect pests.

Her talk will look at how weather conditions can affect pest outbreaks and insect populations.

***Convenient free street parking is usually available nearby (e.g. South Tce.)***

*We look forward to seeing you.*

*For further information contact*

<i>Secretary:</i>	<i>Darren Ray</i>
<i>Phone:</i>	<i>8366 2664</i>
<i>Fax:</i>	<i>8366 2693</i>

*Inquiries or suggestions, please contact the Secretary on the phone number listed above.*