



# Monana

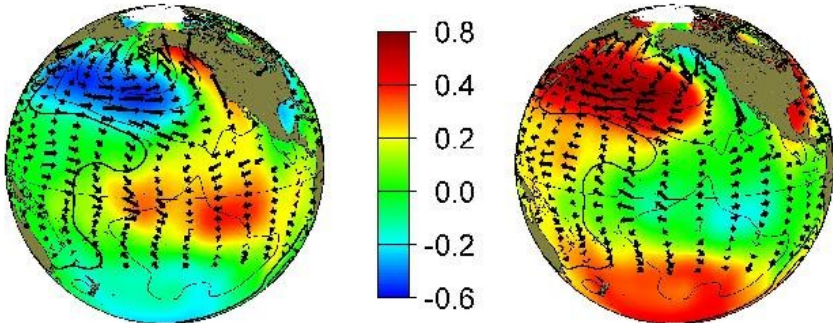
THE OFFICIAL PUBLICATION OF THE AUSTRALIAN  
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June 2016

## Climate variability and change in South Australia

Australia is well known as a continent of climatic extremes and variability. Patterns of variability in surrounding oceans impact on year to year, and even decade to decade timescales. And there are significant trends emerging from climate change impacts. So what does this all mean for Australia, and South Australia over coming decades?

El Niño Southern Oscillation or ENSO, is the pattern of variability in the Pacific Ocean year to year. This can see, in any one year, an El Niño event occurring, with warmer equatorial ocean temperatures moving away from Australia leading to hotter and drier conditions through winter and spring for Australia, or the opposite La Niña events with warmer water gathering around northern Australia, and cooler ocean temperatures along the equator in the Pacific Ocean, leading to increased cloud and rainfall, and cooler, wetter winter and spring- and to some degree for South Australia- summer conditions. Both occur on average every 4 - 7 years, interspersed with neutral or average conditions.

Less well known is the variability observed over 20-30 year timeframes in the occurrence of ENSO events and general ocean temperature patterns. The Pacific Ocean is observed to move through periods where ocean temperatures tend to be more El Niño like for 20-30 year periods, and El Niño events occur more frequently, or periods of background conditions where more La Niña like conditions prevail,



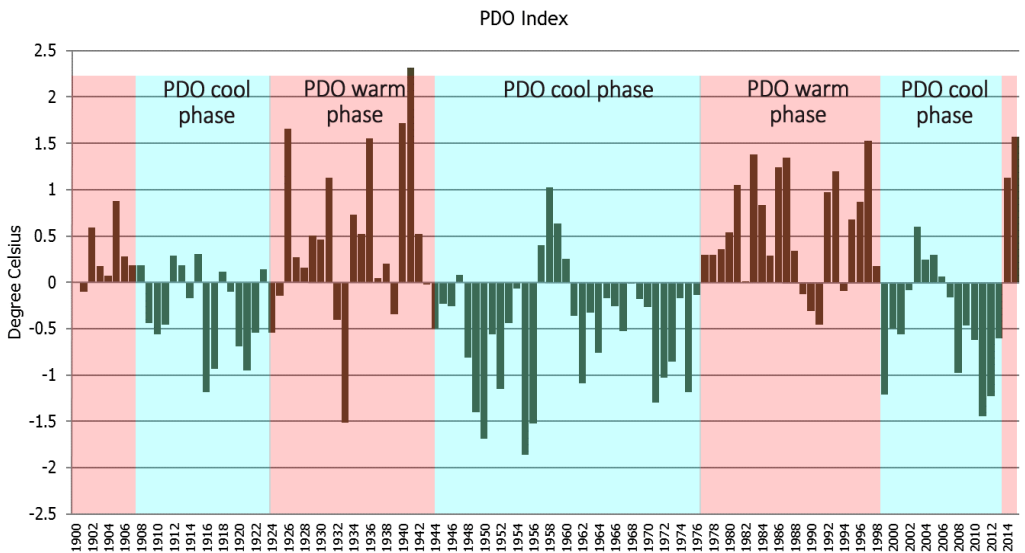
Ocean temperature patterns in:

Warm phase (positive PDO/IPO)

Cool phase (negative PDO/IPO)

with El Niño events less likely, and when they occur, more likely to be followed by a La Niña event. This variability, when looking across the northern Pacific Ocean, is called the Pacific Decadal Oscillation (PDO), or when looking across the whole Pacific Ocean, the Inter-decadal Pacific Oscillation (IPO).

Both the Federation Drought period and the 1930's to 1950's in Australia saw the warm phase, or positive PDO/IPO values, with more frequent El Niño events. After the cool, negative phase since the mid-1990's, the last 2 years has seen a shift towards the warm phase, and this has been reflected by hotter, and drier El Niño conditions over that time.



Climate change has also impacted Australian climate over recent decades through more persistent high pressure systems over southern Australia- related to tropical expansion from warming due to increased greenhouse gases. More detail can be seen in Chapter 4 of the Technical Report of:

<http://www.climatechangeinaustralia.gov.au/en/publications-library/>

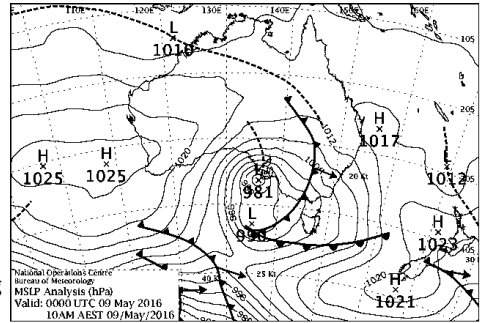
Of concern, and something to watch over coming years, is Australia may, for the first time, be entering a period over coming decades where climate change shifts to hotter and drier conditions across southern Australia, and the hotter, drier positive phase from natural variability are acting in concert for the first time. This could lead to significant increases in bush-fire risk, and impacts on water availability in coming years.

Darren Ray , Senior Climatologist, Bureau of Meteorology- South Australian office.

## May 9<sup>th</sup> 2016 low pressure system and storm surge event

Early May 2016 saw the passage across southern South Australia of an intense low pressure system that saw significant impacts on South Australia. The low pressure system produced record lowest May mean sea level pressure readings at several sites, intense winds with gusts exceeding 100 km/h at many sites, and record highest sea levels recorded at many sites along the South Australia coast. Tides were driven up well above the usual astronomical tide by onshore winds, low air pressure, and water pushed up into the gulfs. Several locations saw tides more than a metre above what would have occurred without the weather systems influence. Outer Harbor at Port Adelaide saw tides reaching 3.8m, compared to the 2.7m forecast from astronomical influences alone. Importantly, without the ~20cm of observed background sea level rise over the last 100 years along South Australia coastlines, these records would not have occurred.

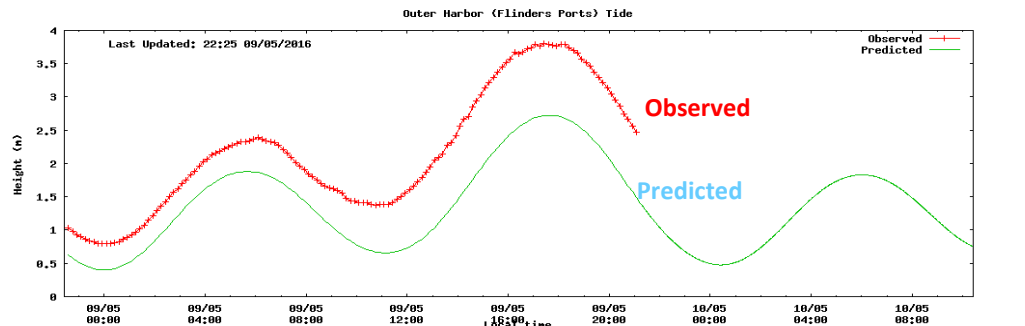
### MSLP Analysis (Manual) 9 May 2016



## Adelaide, South Australia May 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			9 am					3 pm				
		Min	Max				Dir	Spd	Time	Temp	RH	Cld	Dir	Spd	MSLP	Temp	RH	Cld	Dir
		°C	°C	mm	mm	hours	km/h	local	°C	%	g <sup>th</sup>	km/h	hPa	°C	%	g <sup>th</sup>	km/h	hPa	
1	Su	12.9	18.3	1.6			WNW	50	05:59	14.3	69	WSW	11	1016.9	17.7	36	SSW	9	1017.1
2	Mo	12.4	19.8	0			WNW	43	15:23	14.3	63	N	13	1014.8	19.2	57	WNW	19	1011.5
3	Tu	14.3	19.6	0.8			WNW	54	13:35	16.2	87	NW	15	1007.7	17.2	86	W	20	1008.0
4	We	11.1	18.5	5.2			SW	28	00:25	14.1	82	NNE	7	1017.4	17.6	67	NW	11	1015.7
5	Th	12.9	24.5	0			NW	39	13:35	17.7	57	NNE	11	1016.2	24.2	38	NW	13	1012.2
6	Fr	12.1	25.0	0			N	20	11:49	17.6	65	NE	7	1016.0	23.0	52	WNW	7	1013.1
7	Sa	12.0	24.3	0			NNE	48	23:22	16.5	70	Calm		1013.4	20.5	52	N	11	1011.0
8	Su	16.4	19.7	0.4			NNE	39	02:02	17.9	78	NE	11	1002.0	18.0	92	NNW	11	998.6
9	Mo	13.1	18.1	0.8			WNW	65	13:29	14.6	75	N	22	993.2	18.0	75	NW	28	992.7
10	Tu	14.1	18.3	16.0			WSW	48	01:13	15.2	68	SW	17	1016.2	17.6	50	WSW	13	1019.2
11	We	12.2	16.0	0.6			W	42	00:00	15.9	60	W	10	1024.2	16.6	76	WNW	11	1016.6



Links: <http://www.bom.gov.au/climate/dwo/201605/html/IDCJDW5002.201605.shtml>  
<http://www.bom.gov.au/climate/dwo/IDCJDW0500.shtml>  
 Tide gauge data: <http://www.bom.gov.au/oceanography/projects/ntc/monthly/>

## SA Governor Hieu Van Le AC visits AMetA Volunteer Unit on 9 May 2016



The Governor visited the Volunteer Unit at the Bureau of Meteorology South Australian office, in his role as Patron of Volunteers.



Presentations to Rainfall Observers, who have continued 100 years of rainfall observations in South Australia

## Adelaide in April 2016: Rainfall below average; warm days

Rainfall during April was well below average, with just 6 days of any measurable rainfall. Maximum temperatures were well above average, nights were also warmer than normal.

- Driest April since 2005
- Warmest April days since 2005
- 29 days of at least 20°C, highest since 1923

Rainfall was very much below average at all locations in the metropolitan area, with some locations having their driest April in several years. Adelaide (Kent Town) had its driest April since 2005, with only 6 days totalling 9.6 mm, almost half of which was observed in the 24 hours to 9 am on the 6th, well below the average of 40.3 mm, and the 57.4 mm recorded in April 2015. Only light rainfall totals were recorded across the city and hills region during the last 3 weeks of the month.

Maximum temperatures were well above average across the city. The mean maximum temperature at Adelaide (Kent Town) was 2.2 °C above the long-term April average, the warmest since 2005. Minimum temperatures were also above average for the month, across most of the region, though cooler than normal nights were recorded in the northern suburbs. The first week of April saw much warmer than average daily maximum temperatures recorded at all metropolitan locations. Days became milder between the 6th and 13th, before warming up again from the 14th. Adelaide (Kent Town) recorded 30.1 °C on the 19th, and on the 26th; the latest in April that such a daily maximum has been recorded since 2005. The city also had 29 days this month where the maximum temperature reached at least 20°C. The last time this happened was in 1923 when there were 30 days of 20°C or more.

There were warmer than usual overnight temperatures recorded in the first week of April but minimum temperatures were generally cooler than normal throughout the middle of the month. However, during the last week of April, fresh northerly winds ahead of a trough of low pressure resulted in minimum temperatures that were in excess of 6 °C above average.

### Extremes in April 2016

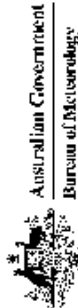
Hottest day	30.9 °C at Parafield Airport on the 26 <sup>th</sup>
Warmest days on average	25.1 °C at Parafield Airport
Coollest days on average	18.9 °C at Mount Lofty
Coldest day	13.6 °C at Mount Lofty on the 22 <sup>nd</sup>
Coldest night	3.8 °C at Mount Barker on the 18 <sup>th</sup>
Coollest nights on average	9.9 °C at Mount Barker
Warmest nights on average	13.9 °C at Noarlunga
Warmest night	22.5 °C at Noarlunga on the 27 <sup>th</sup>
Warmest on average overall	18.7 °C at Adelaide (Kent Town)
Coollest on average overall	14.8 °C at Mount Lofty
Wettest overall	20.4 mm at Heathfield Works Depot
Wettest day	9.4 mm at Lenswood Research Centre on the 29 <sup>th</sup>
Strongest wind gust	76 km/h at Adelaide Airport on the 30 <sup>th</sup> 76 km/h at Mount Crawford AWS on the 30 <sup>th</sup>

**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.



# Adelaide, South Australia April 2016 Daily Weather Observations

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



Date	Temps		Rain mm	Evap mm	Sun hours	Max wind gust			9am					3pm						
	Min	Max				Dirn	Spd km/h	Time local	Temp °C	RH %	Cld eighths	Dirn	Spd km/h	MSLP hPa	Temp °C	RH %	Cld eighths	Dirn	Spd km/h	MSLP hPa
	°C	°C																		
1	Fi	13.9	28.7	0		NW	33	10:48	19.0	43	NNE	9	1015.1	28.3	25	NW	13	1012.1		
2	Sa	15.9	23.8	0		WSW	33	13:14	18.7	89	S	9	1020.4	22.3	47	WSW	19	1021.8		
3	Su	11.6	23.3	0		E	26	08:23	17.4	41	E	11	1027.9	20.6	41	WSW	13	1024.2		
4	Mo	10.5	27.6	0		N	24	10:07	18.6	45	NNW	2	1021.4	27.6	25	W	9	1016.0		
5	Tu	14.5	28.2	0		WSW	33	17:34	22.5	30	NNE	9	1013.2	22.7	55	SW	15	1012.1		
6	We	13.5	20.1	4.8		SW	39	11:29	14.6	82	SSW	6	1020.6	18.3	51	SW	15	1021.7		
7	Th	8.8	19.9	0.2		WSW	22	15:03	13.9	71	SSW	6	1027.2	18.2	49	SW	13	1023.6		
8	Fr	8.7	20.5	0		SSW	24	13:38	13.4	66	Calim	1026.1	18.9	54	SW	11	1023.9			
9	Sa	10.4	22.4	0		SW	20	14:51	15.9	76	Calim	1024.8	21.5	50	SW	9	1022.4			
10	Su	13.0	22.6	0		SW	28	14:31	16.6	84	ENE	2	1024.7	21.2	58	SW	17	1023.2		
11	Mo	15.0	22.6	0.4		WSW	35	15:38	18.1	77	SSW	9	1026.4	22.0	58	WSW	19	1024.3		
12	Tu	11.0	24.0	0		WSW	35	14:50	17.2	65	S	7	1028.3	21.7	53	SW	20	1024.7		
13	We	10.4	24.1	0		WSW	24	14:48	17.9	59	ENE	6	1027.8	22.7	48	WSW	13	1024.2		
14	Th	11.6	27.0	0		WNW	20	14:20	17.7	59	Calm	1025.3	26.0	27	NW	9	1022.7			
15	Fr	11.9	29.1	0		WSW	26	16:38	22.1	36	NE	7	1022.1	27.6	25	WSW	11	1018.3		
16	Sa	11.9	21.4	0		ESE	30	15:32	19.2	66	SSE	9	1023.5	20.5	57	SSE	13	1022.6		
17	Su	11.9	21.6	0		SSE	26	10:09	15.2	49	ESE	9	1025.7	21.2	30	E	7	1020.6		
18	Mo	7.8	25.6	0		W	24	14:13	19.2	34	NE	11	1018.7	24.1	32	WNW	9	1015.3		
19	Tu	12.0	30.1	0		N	24	10:45	21.5	41	N	6	1016.9	28.8	25	SW	9	1014.3		
20	We	18.2	29.7	0		ENE	30	04:45	25.6	27	NNE	9	1015.5	25.9	41	SW	11	1015.7		
21	Th	16.0	23.5	0.2		WSW	30	13:56	19.1	72	SSW	13	1022.5	22.9	58	SW	9	1021.9		
22	Fr	12.7	20.2	0.2		SSE	30	16:58	15.6	70	S	9	1030.4	18.9	42	SSE	11	1028.3		
23	Sa	9.1	20.3	0		ENE	26	09:35	15.0	49	N	9	1032.0	20.0	35	ESE	9	1028.3		
24	Su	10.3	25.3	0		E	26	10:56	17.7	52	N	9	1029.3	24.7	21	NE	9	1025.4		
25	Mo	9.1	28.1	0		N	26	11:22	21.7	31	NNE	9	1026.7	27.3	21	SW	6	1023.6		
26	Tu	12.8	30.1	0		WNW	33	12:42	24.2	28	NNE	7	1023.1	26.4	15	N	15	1017.8		
27	We	19.9	27.6	0		N	44	05:15	24.6	24	NNE	15	1014.7	26.8	24	NNW	15	1012.5		
28	Th	16.4	26.9	0		NNE	28	23:50	17.3	84	NE	4	1018.0	26.2	40	N	7	1012.4		
29	Fr	16.5	24.2	4.0		N	33	02:26	17.8	82	NNE	6	1013.0	23.4	56	NW	9	1011.1		
30	Sa	12.4	26.3	0		WNW	46	22:50	19.4	53	NNE	9	1013.0	25.8	18	NW	19	1007.5		
Statistics for April 2016																				
Mean		12.6	24.8						18.6	55		6	1022.9	23.5	39		12	1019.8		
Lowest		7.8	19.9						13.4	24		Calim	1013.0	18.2	15		SW	6	1007.5	
Highest		19.9	30.1	4.6					25.6	84		NNE	15	1032.0	29.4	58		SW	20	1028.3
Total				9.0																

Observations were drawn from Adelaide (Kent Town) (station 023059)

DCDJWS002.201604 Prepared at 16:05 GMT on 2 Jun 2016  
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accepted the conditions described in the notes at  
<http://www.bom.gov.au/dmfs/dw/IDC/DJWS0000.pdf>

## South Australia in April 2016: Rainfall below average, persistent warmth

Most of South Australia recorded a warmer and drier than normal April. Daytime and night time temperatures were above average in the first half of the month, particularly across the pastoral areas. Rainfall was below average across most of the State, especially across northern and eastern districts.

- Warmest April since 2013
- Below average rainfall, especially in the east
- Warmer days across the State
- Warmer nights across northern districts

Following a wetter March, April was a dry month for most of South Australia, with little rainfall activity being reported across the State. The wettest period was on the 6th as a cold front crossed southern coastal regions, though highest totals were generally below 10 mm following the passage of the front. Rainfall totals for the month generally ranged from 10-25 mm across southern coasts, decreasing to less than 10 mm in northern parts of the agricultural areas. Almost the whole of the pastoral areas recorded little or no rainfall during the month.

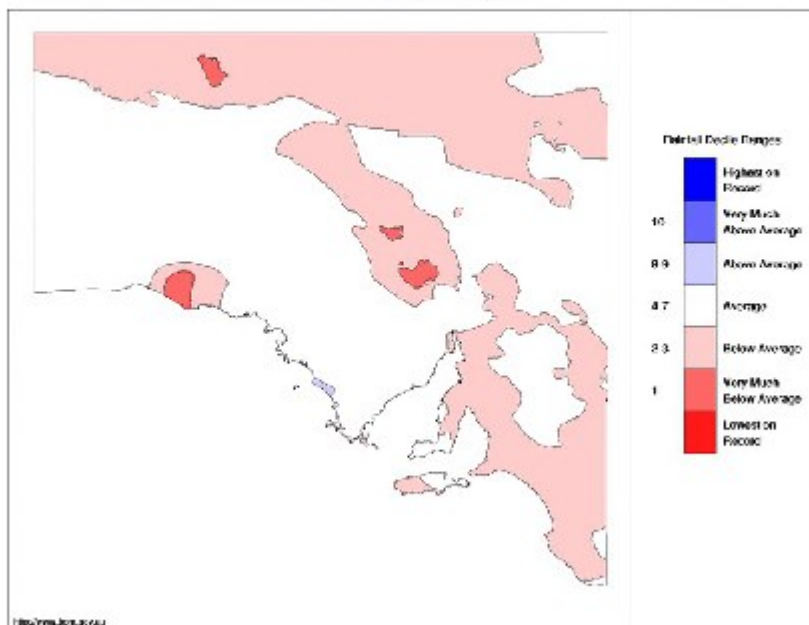
South Australia had a warm April. Both the statewide mean maximum and mean minimum temperatures were above the historical average, with day time temperatures in the highest 10% of records across much of the northern and eastern districts. Overall, April 2016 was the warmest April since 2013.

During the first week of the month, warm days occurred across most districts. Maximum temperatures became milder following the passage of a cold frontal system and the establishment of a ridge of high pressure in the Great Australian Bight, during the second week of the month. Warm northwesterly winds during much of the second half of the month resulted in above average daytime temperatures persisting across large areas of the State, with especially warm periods between the 18th and 21st and from the 25th to the 30th.

Nights were warmer than average for northern districts, but generally mild, tending cooler than average across most other areas of South Australia during the first few days of April. The second half of the month saw nights become warmer than average across most areas of the State. The passage of a low pressure trough on the 27th resulted in much of the southern half of the State reporting minimum temperatures in excess of 6 °C above average.

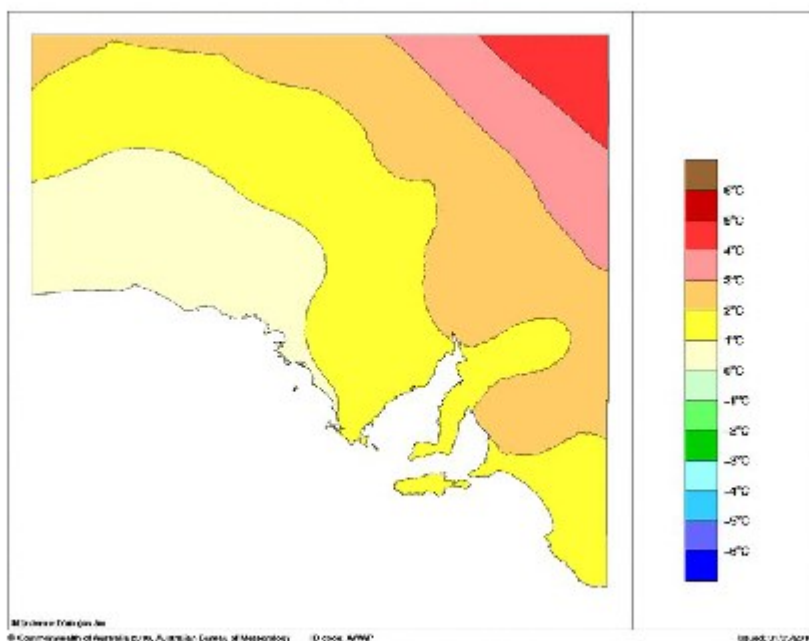
### Extremes in April 2016

Hottest day	36.7 °C at Coober Pedy Airport on the 5 <sup>th</sup>
Warmest days on average	32.2 °C at Moomba Airport
Coollest days on average	18.9 °C at Mount Lofty
Coldest day	13.6 °C at Mount Lofty on the 22 <sup>nd</sup>
Coldest night	0.0 °C at Yunta Airstrip on the 24 <sup>th</sup>
Coollest nights on average	8.6 °C at Gluepot Reserve (Gluepot)
	8.6 °C at Padthaway South
Warmest nights on average	17.4 °C at Moomba Airport
Warmest night	22.5 °C at Noarlunga on the 27 <sup>th</sup>
Warmest on average overall	24.8 °C at Moomba Airport
Coollest on average overall	14.8 °C at Mount Lofty
Wettest overall	44.0 mm at Mount Schank (Jethia)
Wettest day	22.6 mm at Mount Hope (Fairview) on the 29 <sup>th</sup>
Strongest wind gust	93 km/h at Coultla (Coles Point) on the 30 <sup>th</sup>



Maximum Temperature Anomaly (°C) April 2016

Australian Bureau of Meteorology





## **Adelaide in May 2016: Warm nights; heavy rainfall days**

Heavy rainfall resulted in the wettest May in more than 20 years at several locations. Maximum temperatures were above average at the start of the month, but the month saw a cooler finish. Warmer than average nights through the month.

- Wettest May in 16 years for Adelaide
- Warmest nights since 1975
- Warm days at the start of the month

Rainfall was above average across the metropolitan and Hills areas, with several locations having their wettest May in several years. Adelaide (Kent Town) recorded its wettest May since 2000. The passage of a deep low pressure system across southern parts of South Australia on the 9th and 10th saw Lenswood report its highest daily rainfall for May on record. Severe wind gusts in excess of 100 km/h, and record high sea level readings in St Vincent and Spencer Gulfs, were reported with this weather system. Towards the end of the month, the passage of a cold front saw rainfall totals of 20 to 35 mm across the city and hills in the 24 hours to 9am on the 26th which saw Owen have its wettest May day on record while Adelaide (Kent Town) recorded its wettest day in just over 12 months. The heavy rainfall throughout the month resulted in Mount Crawford, located in the Adelaide Hills, having its wettest May on record, while several other locations observed their wettest May in more than 25 years.

Maximum temperatures were well above average across the city. The first week of May saw much warmer than average daily maximum temperatures recorded at all metropolitan locations. Days became milder between the 9th and 12th, before warming up again from the 13th. The mean maximum temperature at Adelaide (Kent Town) was 0.8 °C above the long-term May average.

Overnight temperatures were above average throughout much of May. At Adelaide (Kent Town) the mean minimum temperature for May was 12.4 °C, 2.1 °C above the long term average, the warmest May nights observed in the city at the Kent Town location. May nights during 2016 rank as 6th warmest on record and the warmest since 1975 when comparing observations from both the Kent Town and West Terrace locations.

The persistent warm nights, owing to increased cloud cover, and above average rainfall throughout the month resulted in some locations having their highest May mean daily minimum temperature on record. From the 25th, nights tended to be cooler than average across the region as a cold front followed by south to south westerly airstream was directed over the region.

### **Extremes in May 2016**

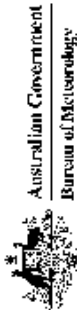
Hottest day	25.7 °C at Edinburgh RAAF on the 5 <sup>th</sup>
Warmest days on average	20.2 °C at Parafield Airport
Coollest days on average	13.8 °C at Mount Lofty
Coldest day	9.2 °C at Mount Lofty on the 27 <sup>th</sup>
Coldest night	4.1 °C at Mount Barker on the 29 <sup>th</sup>
Coollest nights on average	8.8 °C at Mount Lofty
Warmest nights on average	13.3 °C at Noarlunga
Warmest night	17.7 °C at Adelaide (Kent Town) on the 22 <sup>nd</sup>
Warmest on average overall	16.2 °C at Noarlunga
Coollest on average overall	11.3 °C at Mount Lofty
Wettest overall	229.6 mm at Lenswood Research Centre
Wettest day	88.0 mm at Lenswood Research Centre on the 10 <sup>th</sup>
Strongest wind gust	96 km/h at Mount Crawford AWS on the 9 <sup>th</sup>

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

*<http://www.bom.gov.au/climate/current/month/sa/archive/201605.adelaide.shtml>*

# Adelaide, South Australia May 2016 Daily Weather Observations

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



Date	Day	Temps		Rain mm	Evap mm	Sun hours	Max wind gust				9am				3pm								
		Min	Max				Dirn	Spd	Time	Temp	RH	Cld	Dirn	Spd	MSLP	Temp	RH	Cld	Dirn	Spd	MSLP		
		°C	°C					km/h	local	°C	%	eghts		km/h	hPa	°C	%	eghts		km/h	hPa		
1	Su	12.9	18.3	1.6			WSW	43	05:39	14.3	69		WSW	11	1016.9	17.7	36		SSW	9	1017.1		
2	Mo	12.4	19.8	0			WNW	54	13:35	16.2	87		NW	15	1007.7	17.2	86		WNW	19	1011.5		
3	Tu	14.3	19.6	0.8			SW	28	00:25	14.1	82		NNE	7	1017.4	17.2	86		NW	20	1008.0		
4	We	11.1	18.5	5.2			NW	39	13:35	17.7	57		NNE	11	1016.2	24.2	38		NW	13	1015.7		
5	Th	12.9	24.5	0			N	20	11:49	17.6	65		NE	7	1016.0	23.0	52		WNW	7	1013.1		
6	Fr	12.1	25.0	0			NNE	48	23:22	16.5	70		NE	10	1013.4	20.5	52		N	11	1011.0		
7	Sa	12.0	24.3	0			NNE	39	02:02	17.9	78		NE	11	1002.0	18.0	92		NNW	11	998.6		
8	Su	16.4	19.7	0.4			WNW	65	13:29	14.6	75		N	22	993.2	18.0	75		NW	28	992.7		
9	Mo	13.1	18.1	0.9			WSW	48	01:13	15.2	68		SW	17	1016.2	17.6	50		WSW	13	1019.2		
10	Tu	14.1	18.3	16.0			W	43	09:08	15.8	69		W	19	1021.2	16.6	76		NNW	11	1016.6		
11	We	13.3	19.0	0.6			WNW	33	10:18	16.7	83		WNW	9	1021.3	17.9	75		WNW	15	1020.4		
12	Th	15.3	18.7	4.6			WNW	24	13:22	14.5	84		NNE	9	1024.0	21.0	43		NNW	11	1020.9		
13	Fr	10.6	21.4	0.4			NNW	31	13:22	16.7	55		NNE	11	1021.1	22.3	32		NNW	15	1017.3		
14	Sa	11.1	23.1	0			WSW	20	12:12	16.8	82		SE	2	1019.8	20.4	59		SW	9	1018.2		
15	Su	13.2	21.0	0			N	33	14:40	14.3	83		NNE	11	1017.2	21.8	47		NW	17	1013.8		
16	Mo	10.1	22.4	0.6			W	28	09:08	16.9	54		WSW	13	1020.9	18.8	48		NNW	6	1019.2		
17	Tu	14.2	19.8	0.2			WSW	28	17:20	13.6	70		NE	9	1021.0	19.7	47		W	11	1018.8		
18	We	9.1	20.1	0			WSW	31	16:39	15.1	79		NNW	7	1021.0	17.9	63		WNW	15	1019.3		
19	Th	13.0	18.5	0			NW	17	12:18	15.7	87		Calim	1024.0	18.5	64		NNE	2	1021.6			
20	Fr	14.0	18.9	0.2			N	33	12:59	17.7	50		NNE	9	1020.8	23.4	34		NW	11	1015.6		
21	Sa	13.9	24.3	0			NNW	57	23:27	20.5	38		NNE	13	1008.3	17.1	69		N	13	1010.2		
22	Su	17.7	23.2	0			W	35	00:55	15.9	63		W	13	1023.2	18.1	59		NW	11	1022.7		
23	Mo	10.8	19.0	7.2			N	28	14:14	14.5	82		NNE	6	1023.7	20.8	37		N	11	1017.7		
24	Tu	10.6	21.0	0.4			N	30	03:44	11.7	85		NE	7	1013.0	14.2	92		NNE	6	1007.7		
25	We	11.2	14.5	3.4			SW	28	14:02	13.1	89		Calim	1008.7	16.4	54		WSW	13	1009.8			
26	Th	11.4	17.0	24.2			SW	48	19:54	13.8	82		WNW	13	1008.9	12.9	71		W	19	1006.8		
27	Fr	10.2	16.3	2.8			SW	26	00:36	12.8	63		SSW	9	1016.3	15.7	54		SSW	7	1016.6		
28	Sa	9.1	17.0	17.0			W	26	12:32	12.9	52		NE	9	1019.6	15.5	55		NE	7	1017.7		
29	Su	8.9	16.3	0			NNE	26	12:32	12.9	52		NE	7	1019.7	17.3	57		NNE	11	1018.5		
30	Mo	11.8	17.8	1.2			N	33	14:22	13.3	74		NE	7	1019.7	17.3	57		NNE	11	1018.5		
31	Tu	13.3	18.2	0.4			NNE	26	10:31	15.9	55		NE	9	1023.8	16.8	66		NNE	4	1022.0		
Statistics for May 2016																							
Mean		12.4	19.8							15.4	71				9	1016.6	18.6	58			11	1014.6	
Lowest		8.9	14.5							11.7	38				Calim	993.2	12.9	32			NNE	2	992.7
Highest		17.7	25.0	24.2			WNW	65		20.5	83		N	22	1024.0	24.2	92			NW	28	1022.7	
TOTAL				88.0																			

Observations were drawn from Adelaide (Kent Town) (station 023696)

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accept the conditions described in the notes at  
<http://www.bom.gov.au/australia/obs/doc/023696000.pdf>

## South Australia in May 2016: Warm, with above average rainfall

Most of South Australia recorded a warmer and wetter than average May. Daytime and night time temperatures were above average across the entire state, particularly across the pastoral areas. Rainfall was above average across most of the State, especially across northern districts, but rainfall tended closer to average across southern districts.

- Well above temperatures at the start of the month
- Very warm nights across northern and southern districts
- Very warm days in the east
- Rainfall was above average
- Very wet in the northeast

Following a generally dry April, May was a wet month for most of South Australia, with heavy rainfall activity resulting in several locations reporting their highest total May rainfall on record or their wettest May for at least 20 years. The wettest periods were between the 8th and 9th, and later on the 26th to 28th. Rainfall totals for the month were generally in the range of 50-100 mm across southern coasts and the Mount Lofty Ranges decreasing to less than 25 mm in southern parts of the pastoral areas. Northern pastoral areas recorded three to four times the long term May average during the month. The passage of an extensive cloud band, with embedded thunderstorms associated with an upper level trough that tracked across northern parts of South Australia between the 8th and 9th resulted in some locations reporting their highest May daily rainfall on record. Extensive shower activity associated with the passage of a cold front affected agricultural areas on the 26th, with the highest falls occurring in northern Adelaide and the Hills, areas in the Mid North, Riverland, and the Lower Eyre Peninsula and Yorke Peninsula.

SA had a warm start to May. Both the statewide mean maximum and mean minimum temperatures were well above the historical average at the beginning of the month, with well above normal temperatures occurring across much of the northern and eastern districts.

The first week of the month saw very warm days across most districts. Maximum temperatures became milder during the second week of the month following the passage of a deep low pressure system and the establishment of a ridge of high pressure over the north of the State. Warm northwesterly winds occurring from mid-month resulted in above average daytime temperatures across large areas of the State, with especially warm periods between the 14th and 17th and on the 21st and 22nd. The above average temperatures resulted in Edithburgh, on the southern Yorke Peninsula reporting its highest May mean daily maximum temperature on record. Overall, the statewide mean temperature for May 2016 was the ninth-warmest on record.

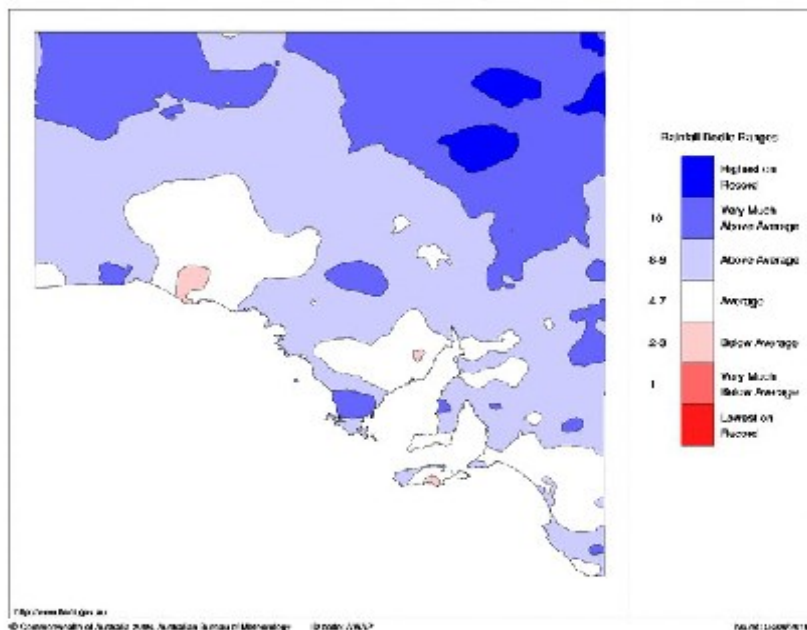
Nights were warmer than average for most of South Australia with several locations reporting their warmest May mean daily minimum temperature on record. Particularly warm nights occurred in the first week of the month with a northwesterly airstream resulting in Moomba observing its warmest May night on record. The last week of May saw cooler than average nights, particularly across southern districts.

### Extremes in May 2016:

Hottest day	32.8 °C at Oodnadatta Airport on the 22 <sup>nd</sup> .
Warmest days on average	25.1 °C at Oodnadatta Airport
Coolest days on average	13.8 °C at Mount Lofty.
Coldest day	9.2 °C at Mount Lofty on the 27 <sup>th</sup> .
Coldest night	0.4 °C at Yunta Airstrip on the 24 <sup>th</sup>
Coolest nights on average	6.4 °C at Yongala
Warmest nights on average	14.6 °C at Neptune Island
Warmest night	19.9 °C at Moomba Airport on the 7 <sup>th</sup>
Warmest on average overall	19.2 °C at Moomba Airport
Coolest on average overall	11.3 °C at Mount Lofty
Wettest overall	229.6 mm at Lenswood Research Centre
Wettest day	88.0 mm at Lenswood Research Centre on the 10 <sup>th</sup>
Strongest wind gust	111 km/h at Neptune Island on the 27 <sup>th</sup>

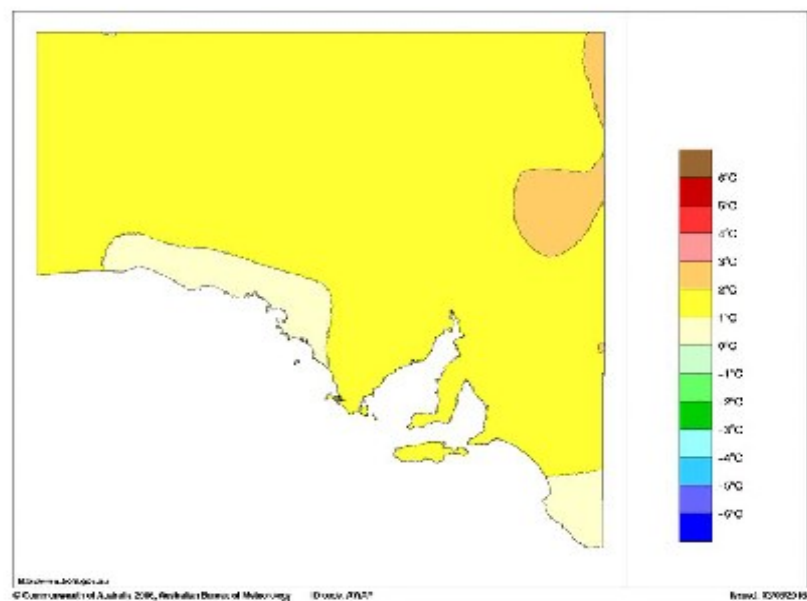
### South Australian Rainfall Index: May 2016

Distribution Based on Gridded Data  
Australian Bureau of Meteorology



### Maximum Temperature Anomaly (°C) May 2016

Australian Bureau of Meteorology





## Adelaide in autumn 2016: Warm with above average rainfall

Heavy rainfall in March and May resulted in average to above average seasonal totals. Autumn maximum and minimum temperatures were warmer than normal across Adelaide for most of the season.

- Above average rainfall in March and May
- Adelaide's autumn mean temperature fourth-warmest on record
- Adelaide's fifth-warmest autumn days on record
- Adelaide's ninth-warmest autumn nights on record

Most locations in the Adelaide region reported average to above average rainfall during autumn. The wettest periods during the autumn season were observed in early March and late May. Ashton, located in the Adelaide Hills, was the wettest station overall with an autumn total of 292.0 mm. Rainfall was very much below average in April, but heavy falls during May saw several locations report their wettest May in several years. In the city, heavy rainfall in the last week of autumn saw Adelaide (Kent Town) recorded its wettest day in just over 12 months as a cold front delivered 24.2 mm of rainfall in the 24 hours to 9am on 26 May.

Average maximum temperatures for Adelaide were 1.7 °C above normal, fifth-highest on record when comparing seasonal mean temperatures from both Kent Town and the old West Terrace location. High temperatures occurred early in the autumn period, particularly through March. Daytime temperatures were persistently warmer than average through April and May. All stations across the Adelaide region recorded mean maximum temperatures that were 1 °C warmer than the long-term autumn average. Minimum temperatures were also in excess of 1 °C warmer than average.

### Extremes in autumn 2016

Hottest day	39.8 °C at Parafield Airport on 6 Mar
Warmest days on average	24.7 °C at Parafield Airport
Coollest days on average	18.6 °C at Mount Lofty
Coldest day	9.2 °C at Mount Lofty on 27 May
Coldest night	3.8 °C at Mount Barker on 18 Apr
Coollest nights on average	10.7 °C at Mount Lofty
Warmest nights on average	14.6 °C at Noarlunga
Warmest night	23.5 °C at Noarlunga on 17 Mar
Warmest on average overall	19.2 °C at Adelaide (Kent Town)
Coollest on average overall	14.6 °C at Mount Lofty
Wettest overall	295.4 mm at Lenswood Research Centre
Wettest day	88.0 mm at Lenswood Research Centre on 10 May
Strongest wind gust	96 km/h at Mount Crawford AWS on 9 May

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

*<http://www.bom.gov.au/climate/current/season/sa/archive/201605.adelaide.shtml>*



## South Australia in autumn 2016: Warm days and nights, with heavy rain throughout

South Australia recorded a wetter and warmer than average autumn in 2016. South Australian had its equal fourth warmest autumn on record. Autumn rainfall was generally well above average across the State resulting from heavy rainfall recorded in early March and late May.

- Fifth-warmest autumn
- Third-warmest autumn nights
- Eighth-warmest autumn days
- Wettest autumn since 1989.

Overall, autumn rainfall for South Australia was above average, owing to particularly heavy rainfall events in March and May. While parts of southern agricultural areas and some coastal areas recorded average to below average rainfall, very much above average rainfall was recorded in northern pastoral areas. A slow moving trough tracked across South Australia in early March, bringing heavy rainfall to central districts, resulting in some locations recording their wettest autumn day on record. Several sites had their highest total autumn rainfall on record. April saw generally below average rainfall across much of the State, but a wetter May resulted in some sites having their highest total autumn rainfall for at least 20 years, with large areas of the pastoral districts recording more than double the long term seasonal average.

South Australia's overall mean temperature for autumn was more than 1.5 °C above the long-term average, coming in equal-fourth highest in 107 years of observations, with some sites having their highest autumn mean temperature on record.

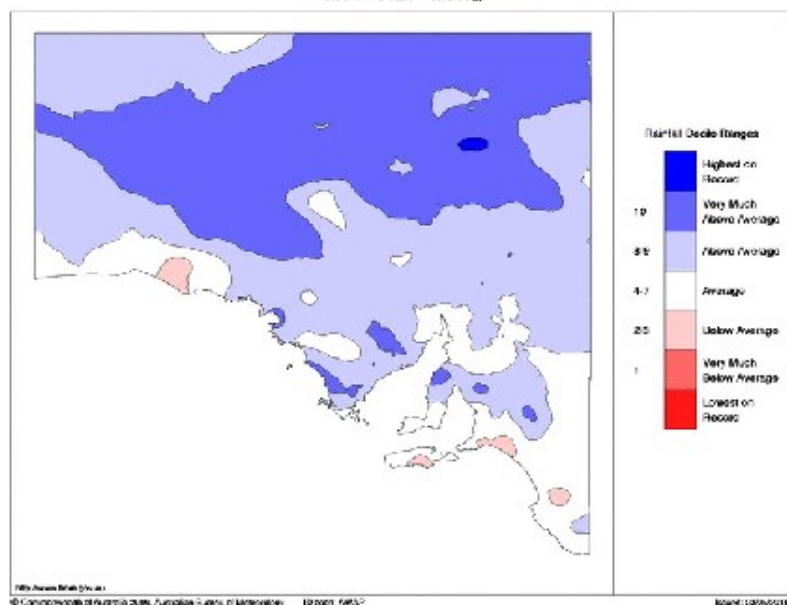
Average maximum temperatures for South Australia were more than 1.4 °C above normal and seventh highest on record. High temperatures occurred early in the autumn period, particularly through March, and some locations observed their highest autumn temperature on record. Warm daytime temperatures persisted through April and May. More information about the autumn warmth can be found in Special Climate Statement 56 - Australia's warmest autumn on record.

Autumn nights across South Australia were notably warmer than average as a whole, with the season starting off with Moomba, in the far northeast pastoral district, observing its warmest autumn night on record. Warmer than average nights persisted throughout much of the season, resulting in several locations recording their warmest autumn mean minimum temperature on record or their warmest autumn nights in more than 20 years. Minimum temperatures were highest on record in areas of the State's northeast and northern pastoral districts and were very much above average for most of the rest of South Australia. Extended periods of heat, and relatively few intrusions of colder air from the south meant that temperatures remained above average for much of the season. Average minimum temperatures for South Australia as a whole were third warmest on record coming in at more than 1.7 °C above average.

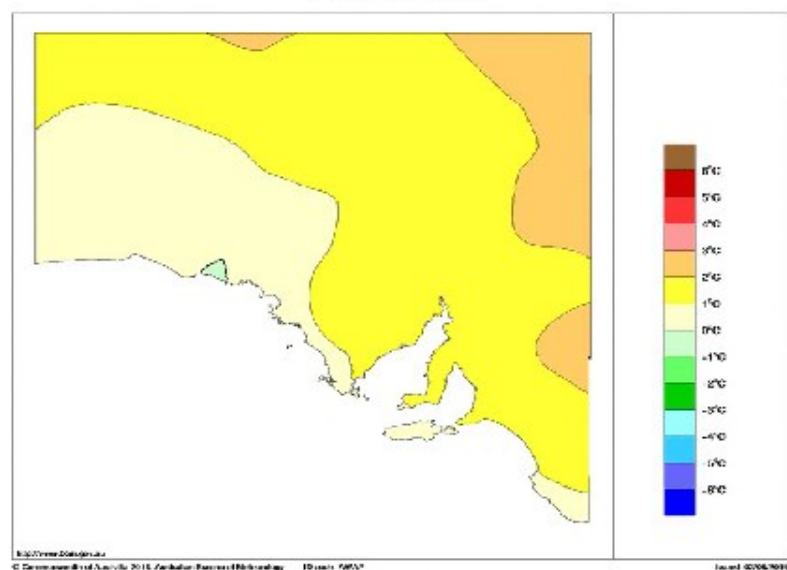
### Extremes in autumn 2016

Hottest day	43.9 °C at Oodnadatta Airport on 2 Mar
Warmest days on average	30.6 °C at Moomba Airport
Coollest days on average	18.6 °C at Mount Lofty
Coldest day	9.2 °C at Mount Lofty on 27 May
Coldest night	0.0 °C at Yunta Airstrip on 24 Apr
Coollest nights on average	10.2 °C at Padthaway South
Warmest nights on average	17.8 °C at Moomba Airport
Warmest night	30.6 °C at Moomba Airport on 2 Mar
Warmest on average overall	24.2 °C at Moomba Airport
Coollest on average overall	14.6 °C at Mount Lofty
Wettest overall	295.4 mm at Lenswood Research Centre
Wettest day	88.0 mm at Lenswood Research Centre on 10 May
Strongest wind gust	111 km/h at Neptune Island on 27 May

South Australian Rainfall deciles Autumn 2016  
 Distribution Based on Gridded Data  
 Australian Bureau of Meteorology



Maximum Temperature Anomaly (°C) 1 March to 31 May 2016  
 Australian Bureau of Meteorology





Australian Meteorological Association Inc (AMetA)  
www.ameta.org.au

## **NEXT MEETING**

**6.00 PM TUESDAY 21 June 2016**

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

*Please meet in the ground floor lobby to be let upstairs*

**Subject: Meteorology and Soaring Flight**

**Speaker: Richard Geytenbeck, an experienced glider pilot  
and qualified instructor**

The talk will give an overview of cross-country soaring including pre-flight weather briefings, sources of lift and how they are used, the high performance sailplane 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.

Convenient free street parking is usually available nearby.

*Try South Terrace, for example.*

*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.*