



Monana

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METEOROLOGICAL ASSOCIATION INC
June 2015

Choosing, installing and making online a personal weather station

Mark Seaborn:



Mark Seaborn, Technical Officer (Electronics) with the SA BoM, gave us an engaging perspective on operating your own weather station. Mark laid out how he had obtained, assembled, installed a weather station (on his children's cubby house) and then connected it to the Web. And all for a few hundred dollars!

The revolution that is the fusion of Sensing, Computing and Communications means that performance of sensors (for wind, temperature, humidity, pressure, rainfall, and sunshine) has increased as size and costs have fallen.

Automatic weather stations vary widely in sophistication and cost, with Davis stations being a popular choice. These cost between about \$500-\$2000. Cheaper Chinese made weather stations are available for \$100-\$300. Mark purchased a Chinese automatic weather station on eBay for ~\$120. Jaycar Electronics have the same model available in Adelaide stores for ~\$150.

<http://www.jaycar.com.au/Outdoors-%26-Auto-Products/Weather-Forecasting/Outdoor-Weather-Stations/Touch-Screen-Wireless-Weather-Station-with-USB/p/XC0348>

These stations record air temperature and humidity, wind speed and direction, air pressure and rainfall from an electronic high frequency gauge. Setup is simple, using telephone style connectors and cabling, and the stations are solar

powered so do not need power cabling to be setup, and wirelessly send a signal to a receiver display screen that can be located up to 50m away from the station.

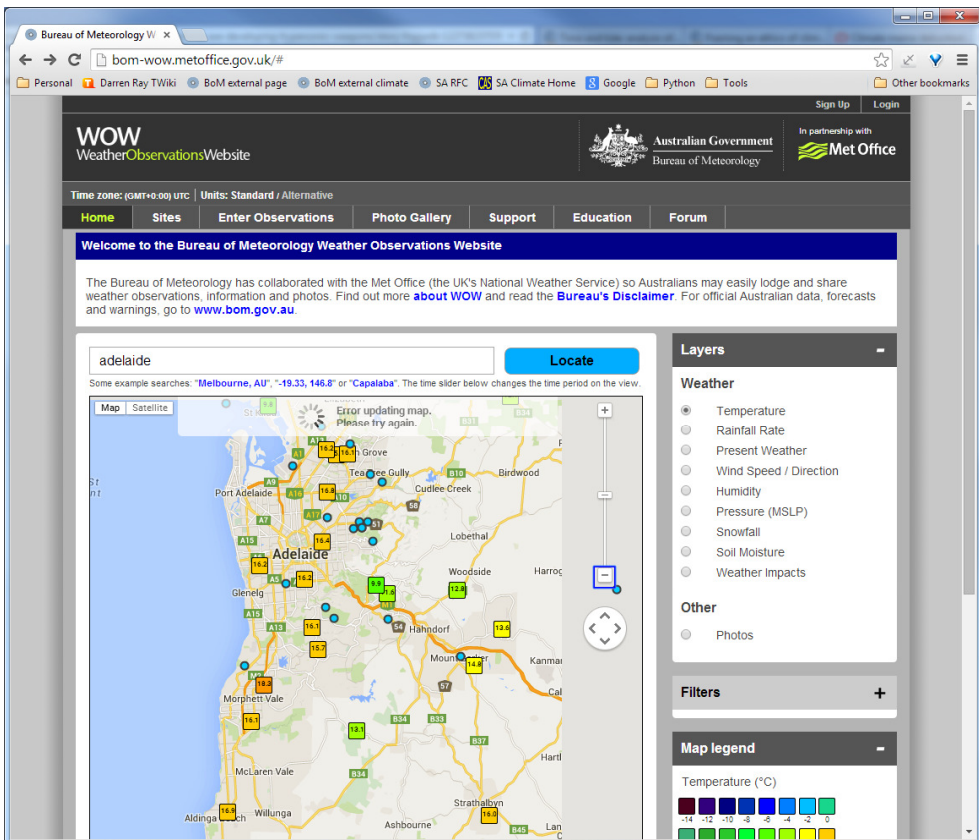


Mark's station setup on the kids cubby house!!

While many stations wirelessly send data through to a screen for display inside, purchasing one with a USB connection in the display screen, as in the model above, allows the screen to be connected to a personal computer or laptop, or even a Raspberry Pi, a cheap computer card about the size of a box of cigarettes that costs ~\$50. Once connected to a computer, the data from the automatic weather station can be setup to go onto to a website such as the Bureau's Weather on the Web, a joint project with the UK Met Office (<http://bom-wow.metoffice.gov.uk/>) or can even be sent through to a Twitter feed. This makes your local weather information available worldwide, and is even monitored by Bureau of Meteorology forecasters providing extra information about current conditions.

The kit comes with software to display and chart on your computer, but you need to download free software, such as *Cumulus* or *Pywws* to connect and download to the web.

Mark provided the appreciative audience with a two-page set of instructions and tips on completing the whole procedure. A copy of the instructions will be available on the AMETA website at ameta.org.au .



Weather on the Web (WOW) featuring Adelaide region stations. The location of Mark's station is visible just north of Morphett Vale.

Notice of Annual General Meeting and AMETA Committee elections

Please note that the Annual General Meeting in August 2015 is an Election AGM where positions on the AMETA Committee become vacant and nominations sought, and elections held to fill 2 year terms for President, Vice President, Secretary, and Treasurer. For those interested in assisting more generally, up to a further five general Committee positions are available to be filled.

The AGM and elections for these positions will be held at the Bureau of Meteorology office (level 4 corner South Terrace and King William St, Adelaide) at 5:30pm **Tuesday 25th** August 2015, and the positions so filled will be valid until the AGM to be held in August 2017.

Bureau of Meteorology office move

For over 30 years the Bureau of Meteorology South Australian Regional Office has been located in Kent Town, and through the generous support of the Bureau, has provided a venue for AMETA meetings.

The Bureau of Meteorology SA office is in the process of relocating into the Adelaide CBD, on level 4 on the corner of South Terrace and King William St (Optus building), and will be located there from the end of June 2015.

The final AMETA meeting in the Kent Town office will be the upcoming meeting on Monday 15th June, with the subsequent August AGM being held in the new office.

The current Kent Town observation site will remain in place for at least several more years, with a new automatic weather station site being established behind Adelaide High School, near the old West Terrace site in the second half of 2015.

Adelaide in April 2015: Coolest April days in 19 years

Daytime temperatures across Adelaide were generally below average through April, with the monthly mean maximum temperature of 20.5 °C the city recorded its coolest April days since 1996 (with 19.7 °C), 19 years ago. There were 17 days at or below 20 °C this April which is the highest number of April days where the maximum temperature has been below 20 °C since 1996 when 21 days of below 20 °C were recorded. Similarly, April nights were the coolest since 1999 (16 years). The city recorded 15 nights with a minimum of 10 °C or below. There were 18 nights of 10 °C or below in 1999. The city recorded 57.4 mm of rainfall for the month, with the heaviest falls being recorded at the end of the first week of the month, then again on the 17th and on the 25th. The wet days result in Adelaide having its wettest April since 2009, when a monthly rainfall total of 73.6 mm was recorded.

- Coolest April days in 19 years (since 1996)
- Coolest April nights in 16 years (since 1999)
- Adelaide's wettest April in 6 years
- Above average rainfall for most locations

Extremes in April 2015 (Adelaide)

Hottest day 38.6 °C at Moomba Airport on the 15th

Warmest days on average 27.1 °C at Moomba Airport / 27.1 °C at Oodnadatta Airport

Coolest days on average 14.6 °C at Mount Lofty

Coldest day 9.9 °C at Mount Lofty on the 25th

Coldest night -1.6 °C at Padthaway South on the 20th

Coolest nights on average 5.8 °C at Coonawarra / 5.8 °C at Naracoorte Aerodrome

Warmest nights on average 14.1 °C at Neptune Island

Warmest night 23.7 °C at Marree Aero on the 15th / 23.7 °C at Marree Aero on the 16th

Warmest on average overall 20.5 °C at Moomba Airport

Coolest on average overall 11.2 °C at Mount Lofty

Wettest overall 150.0 mm at Mount Compass

Wettest day 112.4 mm at Quorn on the 17th

Strongest wind gust 109 km/h at Neptune Island on the 24th

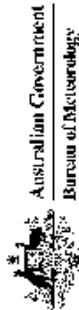
All the detail you could possibly want is available on the BoM website:

Visit www.bom.gov.au/climate and wander through the various archived climate reports and summaries, which are available in both text and graphical forms.

Adelaide, South Australia

April 2015 Daily Weather Observations

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



Date	Temps		Rain	Evap	Sun	Max wind gust			Sam			3pm							
	Min	Max				Dirn	Spd	Time	Temp	RH	Cld	Dirn	Spd	MSLP	Temp	RH	Cld	Dirn	Spd
	°C	°C	mm	mm	hours	Dirn	Spd	Time	Temp	RH	Dirn	Spd	MSLP	Temp	%	Dirn	Spd	MSLP	
							km/h	local	°C	%	Dirn	km/h	hPa	°C	%	Dirn	km/h	hPa	
1	We	17.2	30.4	0	5.2	NNW	44	11:43	23.1	29	NE	7	1016.1	28.2	30	WNW	15	1014.1	
2	Th	13.3	21.2	0.8	4.4	SE	39	08:32	14.6	56	SSE	13	1024.9	20.8	32	SE	19	1022.9	
3	Fr	12.1	23.0	0		ESE	52	01:05	13.1	46	E	15	1024.2	22.6	24	NE	9	1020.5	
4	Sa	9.8	24.3	0		SW	28	17:47	14.0	58	SW	28	1019.4	23.8	27	W	15	1016.2	
5	Su	14.0	22.0	0		WSW	39	15:35	16.9	56	WSW	39	1015.1	20.1	43	WSW	22	1012.2	
6	Mo	11.8	18.2	11.8		SSW	63	13:55	14.0	72	SSW	20	1010.7	12.8	57	SW	31	1011.7	
7	Tu	9.7	16.7	12.8	19.0	S	41	08:44	13.6	70	S	17	1021.6	15.7	47	S	20	1022.7	
8	We	9.9	19.9	0	2.2	SE	31	17:30	15.4	61	SW	9	1028.8	19.3	52	SW	15	1026.2	
9	Th	8.8	18.4	0	1.6	SSE	28	17:59	15.0	66	NNW	6	1028.3	18.2	50	SSE	11	1025.4	
10	Fr	8.8	21.4	0	2.0	WNW	20	12:17	15.9	85	NNW	6	1028.2	20.5	51	WSW	11	1022.1	
11	Sa	8.9	25.6	0		NW	20	13:40	18.4	55	SW	13	1018.7	18.2	74	WNW	9	1018.1	
12	Su	13.9	24.0	0		E	22	16:40	17.0	68	E	22	1021.0	22.9	34	ESE	13	1018.5	
13	Mo	15.0	27.0	0	7.4	N	30	18:55	21.3	40	NNE	11	1018.9	25.2	29	E	2	1015.8	
14	Tu	15.7	29.7	0	3.2	N	41	10:43	24.2	23	NNE	13	1013.6	29.2	25	NW	15	1011.3	
15	We	13.9	23.6	0	2.4	ENE	19	13:07	17.0	75	NW	7	1020.7	17.1	88	ESE	2	1024.9	
16	Th	15.2	19.0	0	2.8	SE	17	15:44	13.8	88	SSW	4	1020.9	16.3	73	ESE	6	1016.0	
17	Fr	13.1	16.9	11.0	1.4	WNW	37	11:34	16.2	66	WNW	13	1018.7	18.2	74	WNW	17	1016.7	
18	Sa	12.7	19.2	0.2		SSE	39	15:23	13.5	58	S	13	1032.8	15.1	44	SE	17	1033.8	
19	Su	8.1	16.6	4.8		SE	31	13:04	12.3	42	E	9	1039.2	16.2	38	SE	15	1035.5	
20	Mo	8.0	16.9	0.4	3.8	ENE	33	10:50	14.1	54	ESE	7	1034.7	18.1	40	SSE	13	1029.3	
21	Tu	9.0	18.5	0	2.8	S	20	18:42	14.5	61	ESE	2	1027.1	20.8	45	WNW	6	1022.5	
22	We	8.1	21.2	0	2.6	W	19	16:10	13.3	81	W	19	1019.5	19.7	57	WSW	9	1014.4	
23	Th	10.3	20.0	0	2.2	WSW	52	10:46	13.8	83	N	13	1008.3	16.1	53	WSW	17	1007.4	
24	Fr	13.0	16.6	1.6	1.0	SW	37	12:36	12.9	77	WSW	9	1013.5	14.8	86	SSW	15	1015.4	
25	Sa	8.5	16.4	13.0		WSW	35	12:38	13.7	73	SSW	4	1025.0	16.1	52	SSW	11	1024.4	
26	Su	10.6	17.6	0	5.0	SW	35	12:38	14.6	59	S	9	1028.3	16.2	62	WSW	15	1027.1	
27	Mo	8.7	16.7	0	1.6	SE	22	16:39	14.1	68	ESE	7	1030.8	16.0	46	ESE	9	1028.4	
28	Tu	8.5	17.7	0	1.8	SE	30	17:36	14.5	49	ESE	7	1031.2	15.8	39	W	4	1028.4	
29	We	8.5	17.7	0	1.8	S	28	13:36	16.3	42	ENE	9	1028.7	19.6	35	E	11	1025.5	
30	Th	9.0	21.9	0	1.8														
Statistics for April 2015																			
Mean		11.1	20.5		3.7				15.7	60		7	1023.2	19.3	46		12	1020.9	
Lowest		8.0	16.2		1.0				12.3	23		Calm	1008.3	12.8	24	#	2	1007.4	
Highest		17.2	30.4	13.0	19.0				24.2	93		SSW	20	1039.2	29.2	86	SW	31	1035.5
Total				57.4	74.2														

Observations were drawn from Adelaide (Kent Town) (station 023093)

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 accepted the conditions described in the notes at
http://www.bom.gov.au/sdmxfile/dwo/IDC_IDW0000.pdf

South Australia in April 2015: Heavy rain, cool days, cool nights

South Australia recorded above average rainfall during April. Rainfall totals for the month were above average across eastern, central and western agricultural districts, particularly across southern parts of the central and northeast pastoral districts. Rainfall totals were average tending below average in the southeast agricultural and across some northwest pastoral areas. The heaviest rainfall occurred between the 16th and 18th when an upper level trough moved over central and eastern parts of the State. The resulting rainband produced locally heavy falls of greater than 60 mm, with some stations in the Flinders districts having their [highest April daily rainfall on record on the 17th](#), while broad areas of the northern agricultural and the southern pastoral districts received more than 80% of the monthly total rainfall in just one day. Some stations recorded two to three times their long-term April average, resulting in their [highest total April rainfall on record](#).

Daytime temperatures were below average during April, particularly across the southern half of the State, resulting in the statewide average to be the coolest April days in 32 years (since 1983). Daytime temperatures were particularly cold in the second half of the month associated with the passage of a cold front and high pressure systems located deep in the Great Australian Bight which directed persistent southerly to south-westerly airstreams across the State. Night-time minimum temperatures for April were also cooler than average, particularly across central and southeast parts of the State. Statewide, minimum temperatures were the coolest in 16 years (since 1999). The lower southeast of the State saw minimum temperatures 1 to 2 °C below average, but elsewhere across the State, minimum temperatures were within 1 °C of the long-term April average.

- Record April daily rainfall totals in the Flinders Ranges
- Coolest April maximum temperatures in 32 years (since 1983) for South Australia
- Coolest April minimum temperatures in 16 years (since 1999) for South Australia

Extremes in April 2015 (South Australia)

Hottest day 38.6 °C at Moomba Airport on the 15th

Warmest days on average 27.1 °C at Moomba Airport / 27.1 °C at Oodnadatta Airport

Coolest days on average 14.6 °C at Mount Lofty

Coldest day 9.9 °C at Mount Lofty on the 25th

Warmest nights on average 14.1 °C at Neptune Island

Warmest night 23.7 °C at Marree Aero on the 15th / 23.7 °C at Marree Aero on the 16th

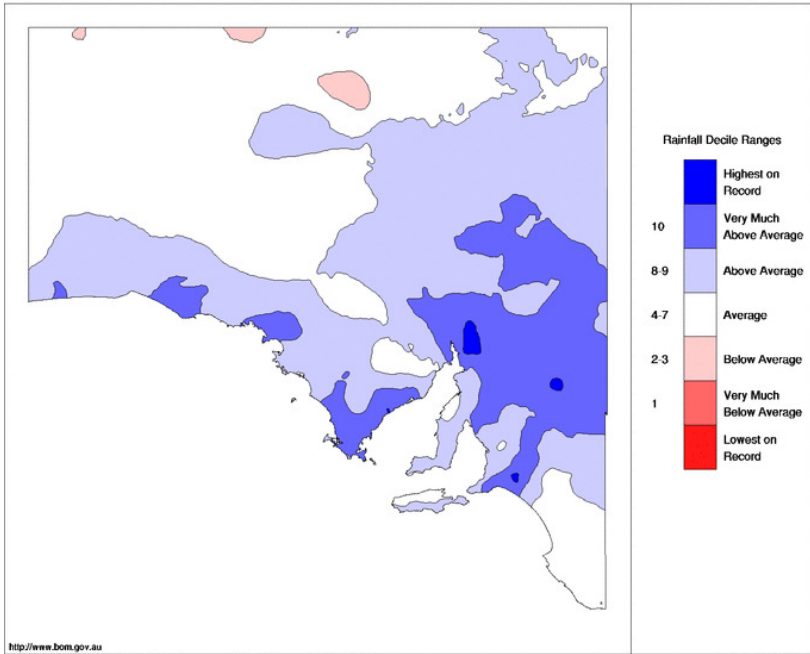
Wettest overall 150.0 mm at Mount Compass

Wettest day 112.4 mm at Quorn on the 17th

Strongest wind gust 109 km/h at Neptune Island on the 24th

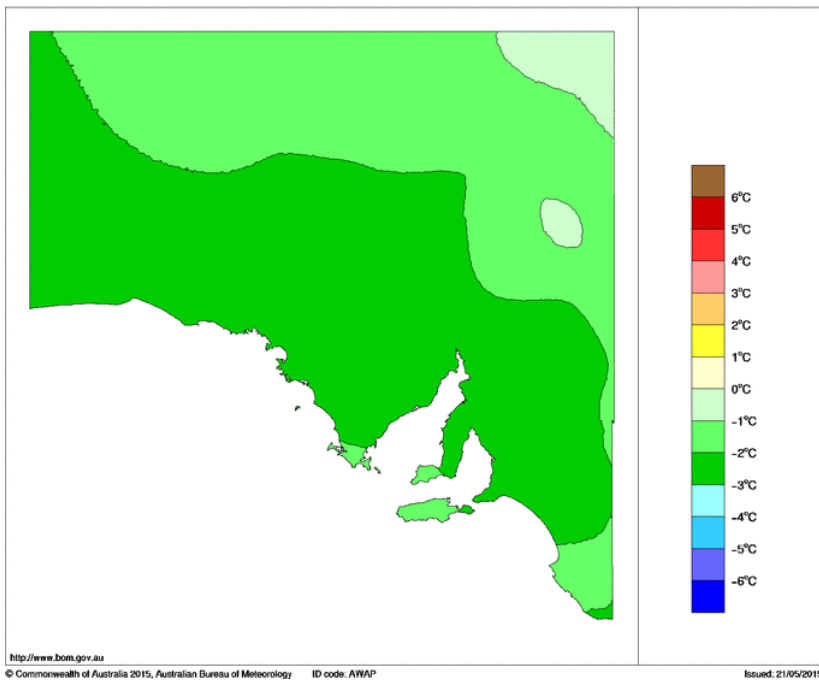
South Australian Rainfall Deciles April 2015

Distribution Based on Gridded Data
Australian Bureau of Meteorology



Maximum Temperature Anomaly (°C) April 2015

Australian Bureau of Meteorology



Adelaide in May 2015: Cooler days and nights with above average rainfall

Both day and night temperatures cooler than average. Rainfall was above average with 9 consecutive days of rainfall early in the month.

- Cool days and cool nights
- Adelaide's wettest May in 14 years
- Adelaide's wettest May day since 1999

Rainfall across the Adelaide region was above average during May with the first half of the month being particularly wet as the Kent Town site observed 9 consecutive rainfall days between the 5th and 13th. The city recorded 72.2 mm in total for the month, nearly half of which was recorded in the 24 hour period to 9am on the 19th, which was Adelaide's wettest May day in 16 years.

Despite a generally warm start to the month, both monthly mean maximum and minimum temperatures were below average for May. Day time temperatures were particularly cool between the 5th and 16th under a persistent southwesterly airstream. Minimum temperatures were mostly above average throughout the first half of the month due to increased cloud cover. Nights were generally cooler than average during the second half of the month, which resulted in Adelaide coolest May nights since 2012.

Extremes in May 2015 (Adelaide)

Hottest day 28.4 °C at Edinburgh RAAF on the 4th

Warmest days on average 18.5 °C at Adelaide (Kent Town)/18.5 °C at Parafield Airport

Coollest days on average 12.1 °C at Mount Lofty

Coldest day 8.4 °C at Mount Lofty on the 21st

Coldest night 1.4 °C at Mount Barker on the 23rd

Coollest nights on average 7.1 °C at Mount Lofty

Warmest nights on average 10.9 °C at Noarlunga

Warmest night 15.4 °C at Noarlunga on the 2nd

Warmest on average overall 14.2 °C at Adelaide (Kent Town)/14.2 °C at Noarlunga

Coollest on average overall 9.6 °C at Mount Lofty

Wettest overall 195.8 mm at Heathfield Works Depot

Driest overall 8.6 mm at Adelaide (Morphett Vale)

Wettest day 39.2 mm at Verdun on the 19th

Strongest wind gust 135 km/h at Mount Crawford (Mt Crawford AWS) on the 5th

South Australia in May 2015: Cool with a wet finish across the Pastorals

Cooler days and generally below average rainfall for most of the month across northern parts of the state, but the month ended with above average rainfall from a stream of moisture across the northern parts of the state originating in the Indian Ocean.

- Cool days and nights
- Below average rainfall across parts agricultural districts
- Above average totals at end of month in pastoral areas

May saw a return of mostly dry conditions across large areas of the pastoral districts after a wet [April](#), however a broad rainband that extended across the northern half of the State at the end the month produced above average totals for several locations in southern parts of the pastoral districts as well as eastern and central parts of the state.

Both maximum and minimum temperatures tended below average across South Australia throughout the month, particularly across some western parts of the state where temperatures were 1 to 2 degrees below the low term average for this time of year.

Extremes in May 2015 (South Australia)

Hottest day 33.5 °C at Coober Pedy Airport on the 4th

Warmest days on average 22.7 °C at Oodnadatta Airport

Coollest days on average 12.1 °C at Mount Lofty

Coldest day 8.4 °C at Mount Lofty on the 21st

Coldest night -0.7 °C at Renmark Aero on the 24th

Coollest nights on average 6.6 °C at Yongala

Warmest nights on average 13.3 °C at Neptune Island

Warmest night 16.9 °C at Ernabella (Pukatja) on the 28th

Warmest on average overall 16.7 °C at Moomba Airport

Coollest on average overall 9.6 °C at Mount Lofty

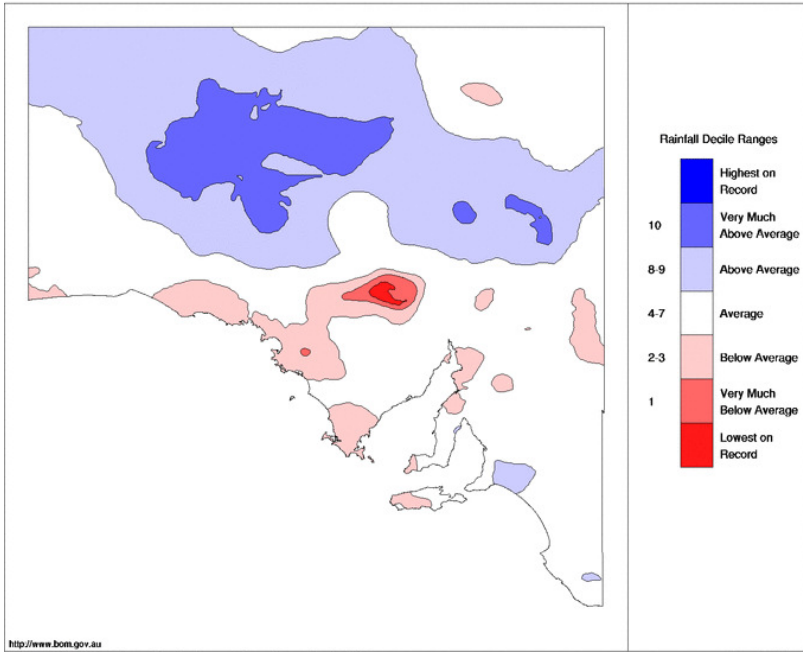
Wettest overall 195.8 mm at Heathfield Works Depot

Driest overall 0.2 mm at Woomera Aerodrome

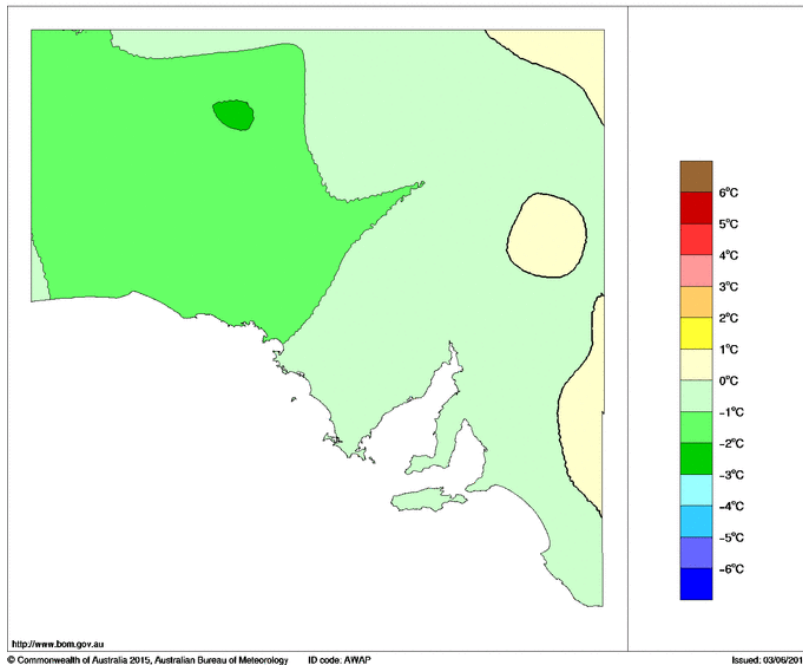
Wettest day 39.2 mm at Verdun on the 19th

Strongest wind gust 135 km/h at Mount Crawford (Mt Crawford AWS) on the 5th

South Australian Rainfall Deciles May 2015
 Distribution Based on Gridded Data
 Australian Bureau of Meteorology



Maximum Temperature Anomaly (°C) May 2015
 Australian Bureau of Meteorology



Adelaide in autumn 2015: Cool with average rainfall

Cooler days and nights with average rainfall across the city.

- Coolest autumn days in 16 years
- Coolest autumn nights in 14 years
- Dry start, but season finished with above average rainfall

Despite a very dry start to the season during March, the autumn total rainfall for Adelaide was very close to the long term average, predominantly owing to a very wet April and average rainfall in May.

Overall, the season was cooler than average, with both maximum and minimum temperatures tending below average across the region. At Kent Town, daytime temperatures averaged 21.5°C, resulting in the coolest autumn days since 1999. Night time minimum temperatures averaged 11.9 °C across the season which resulted in the coolest autumn nights since 2001.

Extremes in autumn 2015

Hottest day 34.2 °C at Edinburgh RAAF on 16 Mar

Warmest days on average 21.7 °C at Parafield Airport

Coolest days on average 15.5 °C at Mount Lofty

Coldest day 8.4 °C at Mount Lofty on 21 May

Coldest night 1.4 °C at Mount Barker on 23 May

Coolest nights on average 8.3 °C at Mount Lofty

Warmest nights on average 12.4 °C at Noarlunga

Warmest night 20.5 °C at Adelaide Airport on 17 Mar

Warmest on average overall 16.7 °C at Adelaide (Kent Town)

Coolest on average overall 11.9 °C at Mount Lofty

Wettest overall 313.0 mm at Uraidla

Driest overall 75.2 mm at Bellevue Heights

Wettest day 46.0 mm at Kuitpo Forest Reserve on 7 Apr

Strongest wind gust 135 km/h at Mount Crawford (Mt Crawford AWS) on 5 May

South Australia in autumn 2015: Cool with average rainfall

Cooler temperatures across most districts, with average to above average rainfall across some central and eastern districts.

- Both day and night temperatures cooler than average
- Above average rainfall across some eastern districts
- Wet April results in above average autumn totals for some locations

Overall, both maximum and minimum temperatures tended below average for autumn. Agricultural areas experienced the coolest days, with daytime temperatures tending 1 to 2 degrees below the long term average while some locations had their coolest autumn days in 20 years. The South Australian statewide average rainfall during autumn was below the long-term average, owing to a particularly [dry March](#). A widespread rainfall event in the middle of April produced highest [April daily rainfall on record](#) for locations across central and eastern districts. [May](#) saw a return of mostly dry conditions across large areas of the pastoral districts while southern parts of the state had average rainfall for the end of the season, however a broad rainband that extended across the northern half of the State at the end of May brought totals for the season closer to average

Extremes in autumn 2015 (South Australia)

Hottest day 45.4 °C at Moomba Airport on 19 Mar

Warmest days on average 28.0 °C at Moomba Airport

Coolest days on average 15.5 °C at Mount Lofty

Coldest day 8.4 °C at Mount Lofty on 21 May

Coldest night -1.6 °C at Padthaway South on 20 Apr

Coolest nights on average 7.0 °C at Coonawarra

Warmest nights on average 15.0 °C at Moomba Airport

Warmest night 27.8 °C at Moomba Airport on 20 Mar

Warmest on average overall 21.5 °C at Moomba Airport

Coolest on average overall 11.9 °C at Mount Lofty

Wettest overall 313.0 mm at Uraidla

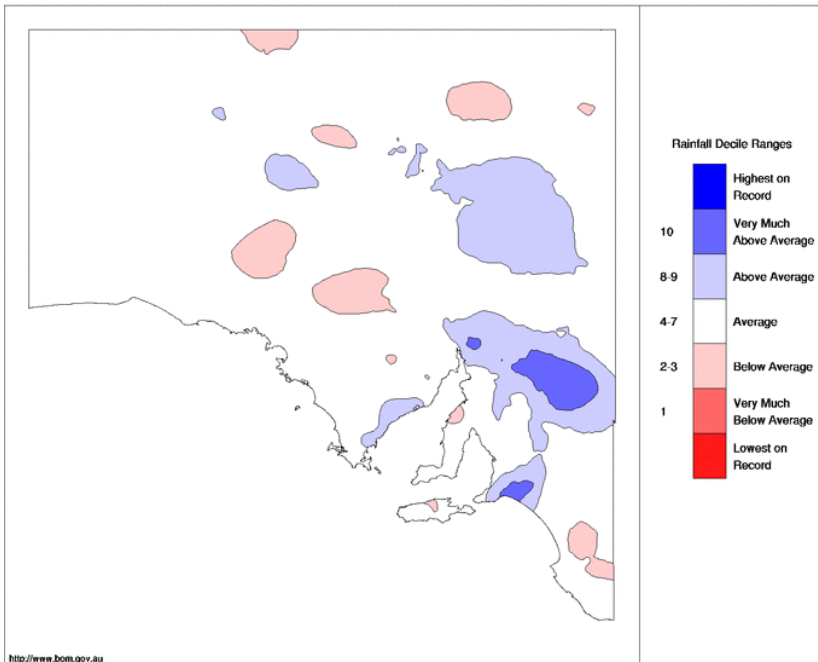
Driest overall 8.2 mm at Tieyon

Wettest day 112.4 mm at Quorn on 17 Apr

Strongest wind gust 135 km/h at Mount Crawford (Mt Crawford AWS) on 5 May

South Australian Rainfall Deciles 1 March to 31 May 2015

Distribution Based on Gridded Data
Australian Bureau of Meteorology

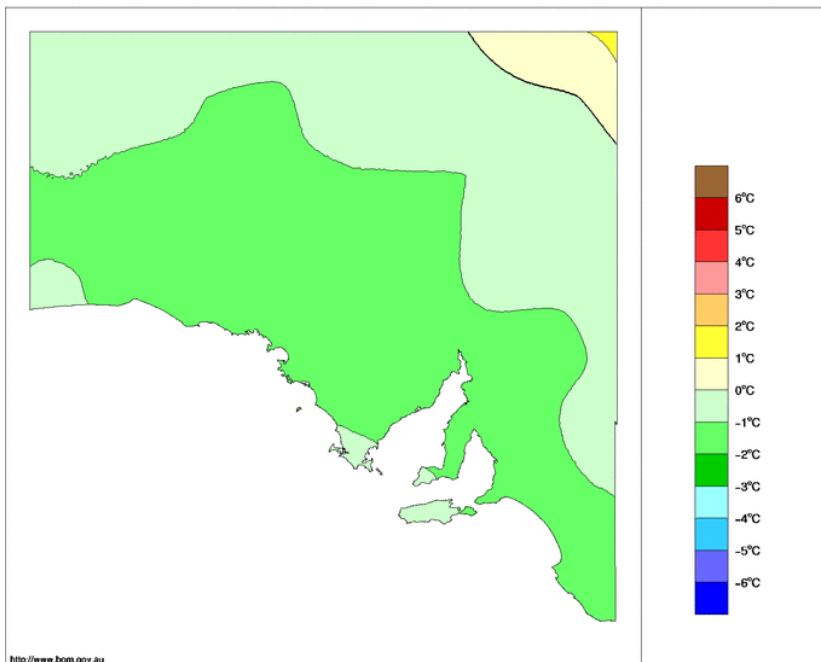


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Maximum Temperature Anomaly (°C) 1 March to 31 May 2015

Australian Bureau of Meteorology



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

NEXT MEETING

5.30 PM MONDAY 15 June 2015

Conference room, Bureau of Meteorology 25 College Road, Kent Town

Subject: European settlement in tropical regions; a 20th Century view of possibilities and limitations

Speaker: Cécile Cutler, PhD candidate, School of the Environment, Flinders University

Cecile Cutler, AMETA member and Flinders University PhD student, will be presenting on her research on work done early in the 20th century on the settlement of Europeans into tropical regions of the world by people such as Sir Archibald Grenfell Price, Adelaide geographer, historian and educationalist. This is of particular relevance today as population pressures in many regions of the world lead to more settlement in tropical regions.

*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.