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METEOROLOGICAL ASSOCIATION INC**

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ADVANCES IN WEATHER FORECASTING AND WARNING SERVICES BY:



PAUL LAINIO, SENIOR METEOROLOGIST, MEDIA AND COMMUNITY RELATIONS AT THE BUREAU OF METEOROLOGY

At our February meeting Paul Lainio treated members to an informative presentation on advances in meteorology through time, culminating in a brief description of the Bureau's new weather services system. We also toured the regional forecasting office and observations enclosure and were given a demonstration of the tornado machine.

Weather impacts on most aspects of our lives. Some of the historic meteorological milestones include Aristotle's treatise on meteorology dating back to 30BC, the Tower of the Winds - built prior to 2 BC, and in modern times, Torricelli's barometer - developed in 1643 and enabling the *systematic* measurement of atmospheric pressure .

Severe weather related naval losses during the Crimean War gave considerable impetus to the development of weather forecasting services in Europe and England in the mid 1850's. It was apparent the low pressure system and its destructive winds which caused the devastation had tracked overland and if the fleet had known it was approaching - evasive action could have been possible. With the invention of morse code and the rapidly expanding telegraph network across Europe and Britain in the 1850s a means of communicating weather observations in real-time was now possible. This would enable ships in port to have access to weather information beyond their local surrounds and plan accordingly.

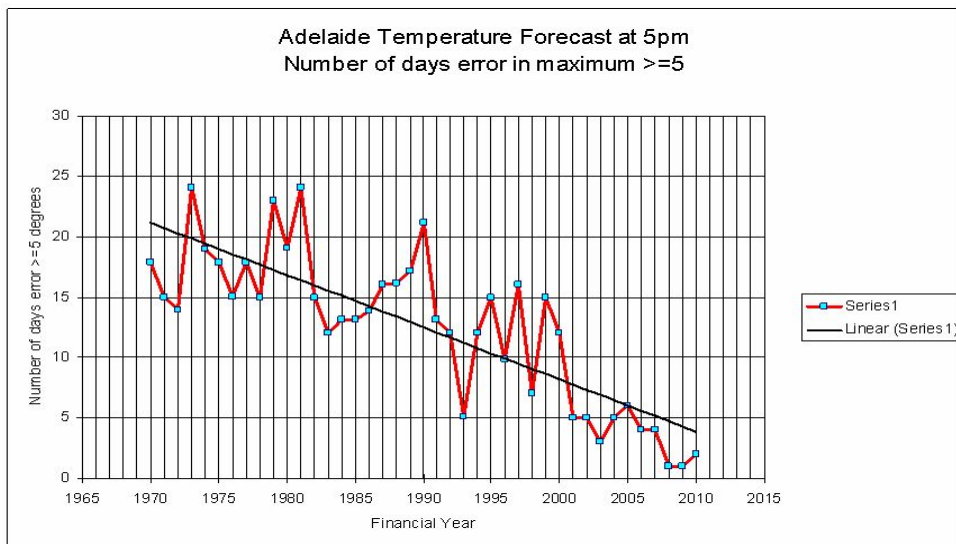
Locally, Charles Todd was appointed the South Australian Postmaster General and Government Astronomer (including responsibility for meteorology) in 1858 . Under his direction the Overland Telegraph linking Adelaide and Darwin was completed in 1872. Extending the existing telegraph network between the colonies, it was a significant step for meteorology across Australia, as one of the duties of Todd's telegraph operators was to send daily weather observations to the Adelaide GPO. Daily weather charts drawn by Todd, date back to 1879, and his first newspaper forecast dates to 15 November 1888.

Today the benefit of weather forecast and warning services to the community is estimated to be around 30 to 40 times the cost of the service. To deliver these, national weather services like the Bureau, are reliant on the global exchange of observational data and computer model output, under the framework of the World Meteorological Organization.

Observations come from surface stations, aircraft, ships, weather balloons, ocean buoys etc. Global observations were enhanced considerably in the 19 60's with the introduction of satellite data, and while weather radar introduced during World War II could provide qualitative rainfall information on a limited basis to the forecaster, the Doppler radar of today can provide quantitative rainfall data on a continuous basis – valuable information for realtime forecasting of flash flooding and hail events.

In the 1970's, prior to serious numerical weather prediction, forecasting was limited to 24 hours ahead – for just a few localities . Since then, ever increasing computing power, satellite observations and significant advances in weather modelling, have significantly improved forecasting accuracy. Several global modelling centres around the world can now provide 5 to 7 day forecasting charts. But models are not perfect – each has its strengths and weaknesses and in complex situations, or over longer timeframes, predictions can vary significantly from one model to another. The usefulness of model output is enhanced by skilled input from regional forecasters – ie by choosing output from the model with the best skill in a given situation , and by injecting information on local features such as gully winds and sea breezes, which operate on a scale smaller than the computer's gridded output.

Until late 2011, while some warnings were provided in map format, all forecasting services for South Australian land areas were in a restricted written format. And while a seven day forecast was available for Adelaide, forecasts for the rest of the state were limited out to one or two days. For most of the state these were general forecasts – only the more significant towns were afforded detailed forecasts including forecast maximum and minimum temperatures. In October 2011, the Next Generation Forecasting and Warning Service was launched . Regional forecasters using a Graphical Forecast Editor are now able to generate computer formulated forecasts based on fine resolution (time and space) model output. Most population centres now have access to published seven day forecasts – and from March 2012 users are able to access this same detailed forecast for any 6km gridded square – merely by moving the cursor over a map. Check out the '**Forecast Explorer for South Australia**' at www.bom.gov.au for the new graphical displays and forecast information.



ADELAIDE AND HILLS REGION WEATHER SUMMARY

JANUARY 2012

Summary

- Temperatures up to 3°C warmer than average, with Adelaide recording 11 consecutive days above 30°C through January.
- Average rainfall across the Plains and Hills.

Rainfall

Rainfall totals were typically average to slight above average across the Adelaide plains, generally about 20% above average, with totals of between 15 to 30 mm being reported at most locations. Rainfall across the Hills tended above average, where some locations received twice the January average with totals ranging from 20 to 60 mm. The highest rainfall total in the Adelaide and Hills region for January 2012 was 65mm, reported at Birdwood (Cromer Road) in the Mount Lofty Ranges. Much of the month's rainfall occurred between the 8th and 11th of January as a low pressure trough followed by a southwesterly airstream and a weak cold frontal system moved across southern parts of the State.

A total of 18.0 mm of rainfall was recorded on 5 rain days at Adelaide (Kent Town) during January 2012, only 1.3 mm below the long term January average with a median of 20.6 mm on 4 rain days.

With this January rainfall, the total rainfall for summer 2011/2012 so far is 36.2mm, recorded on 10 days. During the same period last summer 104.4mm was recorded on 16 days. The average rainfall for Adelaide (Kent Town) for summer as a whole is 59.7mm.

Temperature

The first 3 days of 2012 were very hot across the Adelaide region as a high pressure system, located in the Tasman Sea, directed a hot northeasterly to northerly airstream over the State. The maximum temperature in Adelaide on January 1st reached 41.6 °C, making it the warmest start to the year since 1900. Much of the month remained relatively warm, with a spell of hot conditions occurring through the last 2 weeks of the month. Adelaide (Kent Town) recorded 11 consecutive days of maximum temperatures above 30°C from the 19th through to 29th, of which, there were 4 consecutive days above 35°C from the 22nd through 25th.

Maximum temperatures were generally about 2.0°C above average for January 2012 across the Adelaide metropolitan and Hills area. The January 2012 average maximum temperature at Adelaide (Kent Town) was 31.3°C which is 2.3°C above the long-term average of 29.2°C. In comparison, January 2011 saw average maximum temperatures of 30.6°C at Adelaide (Kent Town). January 2001 was the warmest on record for this site, when maximum temperatures averaged 33.7°C.

The hottest day for January 2012 in the Adelaide region was on the 2nd, when 42.1°C was recorded at Edinburgh RAAF aerodrome. Parafield Airport recorded the warmest days on average, with maximum temperatures averaging 32.5°C for the month.

Meteorological Observations at Adelaide Regional Office, January 2012



DATE	DAILY MAX. TEMP. (°C)	DAILY MIN. TEMP. (°C)	9am TEMP. (°C)	3pm TEMP. (°C)	RELATIVE HUMIDITY (Percent)	BRIGHT SUNSHINE (hours)	RAINFALL to 9am (mm)	EVAPORATION to 9am (mm)	WIND at 9am (km/h)	RECORDED WIND at 3pm (km/h)	MAXIMUM WIND GUST (km/h)	TIME OF MAX WIND GUST			
1	41.6	25.1	31.8	41.1	26	8	13.2		SW	5	WSW	13	WNW	35	12:42
2	40.6	29.2	34.7	35.2	13	18	11.4		N	17	SW	17	NNW	55	11:55
3	35.9	25.3	26.8	35.0	60	22	10.4	35.0	SW	9	SW	15	SW	44	16:07
4	26.4	17.5	20.5	26.3	100	31	13.3	9.4	S	17	SSE	17	SSE	41	17:50
5	27.9	15.5	19.9	26.5	43	26	13.6	8.6	SE	13	ESE	18	SE	50	16:55
6	33.1	15.2	19.1	30.4	37	16	12.5	8.4	ENE	18	N	15	E	50	5:38
7	33.1	19.1	31.1	29.7	17	50	0.9	8.4	N	13	NNW	18	NW	61	11:18
8	22.2	17.9	20.3	18.9	65	40	4.3	7.8	WNW	24	WSW	22	WSW	56	15:47
9	22.5	14.1	17.6	21.4	47	45	5.6	16.0	SW	21	WSW	21	WSW	48	1:35
10	22.1	15.7	18.1	21.3	66	40	9.7	4.2	SW	17	SW	19	SW	39	11:10
11	22.8	15.8	17.3	21.1	51	37	9.6	6.2	SW	21	SW	22	SW	52	3:11
12	25.6	14.4	15.6	23.6	55	34	8.2	6.0	SE	9	E	15	SSE	35	18:23
13	26.8	15.6	19.4	26.6	56	29	9.3	5.6	NW	4	SE	18	SSE	39	18:45
14	25.3	14.4	17.8	24.0	50	31	13.5	8.0	ESE	9	SSE	21	ESE	42	4:20
15	30.0	14.4	19.4	27.2	48	35	13.5	20.0	NW	9	WSW	21	ESE	33	0:46
16	37.4	15.1	28.1	36.3	24	18	13.5	10.4	NE	11	W	15	WNW	33	15:08
17	39.2	21.6	31.7	34.3	26	22	6.0	10.4	NNE	17	WNW	18	NNW	55	9:55
18	28.9	20.8	23.0	27.6	57	41	13.2	8.0	SE	11	S	17	SSE	33	17:13
19	32.3	16.0	22.0	31.0	31	28	12.5	8.0	NNW	8	SSE	17	SSE	42	15:56
20	32.0	19.0	21.6	31.4	57	30	10.9	8.8	SSW	8	S	15	SSE	33	13:53
21	32.2	16.5	20.8	30.2	50	32	13.4	8.8	NNE	5	ESE	11	ESE	30	0:49
22	36.8	20.8	29.9	36.2	37	25	13.3	26.8	NE	5	WSW	17	ENE	42	19:04
23	38.0	27.6	30.9	37.5	32	24	13.2	10.0	NNE	11	SW	22	NE	42	3:24
24	37.3	24.3	30.3	36.3	37	25	13.2	11.2	N	8	SW	17	SE	42	22:50
25	35.8	22.4	26.1	35.1	49	30	13.2	11.2	ESE	8	S	13	ESE	42	23:52
26	32.0	19.2	22.8	31.6	49	37	13.1	18.8	SSE	13	SE	21	SE	42	14:58
27	34.2	19.8	23.9	32.8	48	27	13.1	18.8	ESE	9	SE	15	ESE	52	1:24
28	35.1	22.9	29.2	33.5	49	34	11.3	4.2	ENE	13	ENE	11	E	63	18:31
29	31.3	23.4	25.2	30.3	68	49	7.6	25.6	NE	13	ENE	17	NE	33	23:13
30	24.8	19.9	20.3	23.0	73	47	10.1	7.4	SW	21	SW	31	SW	61	13:27
31	22.3	15.1	17.2	20.5	44	36	7.8	7.4	S	13	SE	21	SE	54	22:40
TOTAL	965.5	593.6	732.4	915.9	1465	987	334.4	254.4	18.0 on 5 days						
MEAN	31.1	19.1	23.6	29.5	47	32	10.8	12.7							
AVG**	28.3	17.1	21.7	27.7	52	36	10.5	18.7 on 4 days							

Summary

Actual
 Rain (mm) 18.0
 Year to date 36.2
 Summer to date 62.3
 Raindays 5
 Year to date 10
 Summer to date 15
 Extremes for West Terrace and Kent Town
 January Daily Extremes
 Highest maximum (°C) 46.1
 Lowest maximum (°C) 17.1
 Lowest minimum (°C) 8.8
 Highest minimum (°C) 33.9
 Highest 24 hour rainfall (mm) 58.4
 Strongest wind gust (km/h) NNW 116
 7th 1942
 Extreme
 Date 12th 1939
 3rd 1970
 21st 1924
 28th 2009
 2nd 1889
 7th 1942
 January Monthly Extremes
 Lowest mean maximum (°C) 34.3
 Lowest mean minimum (°C) 24.9
 Highest mean maximum (°C) 1865
 Highest mean minimum (°C) 13.7
 Highest rainfall (mm) 84.0
 Lowest rainfall (mm) Nil
 Comments: January 2012
 Mean monthly temperature (Max+Min/2) 25.1
 Highest wind gust during the month E 63 on 28th

* Maximum temperatures are taken from 9am to 9am. **Long term average, currently 34 years in 2012
 Climate Services Centre, Adelaide, South Australia. Phone 08 8366 2664 Fax 08 8366 2693

The coldest January day in 2012 at Adelaide (Kent Town) was on the 10th with the maximum reaching 22.1°C. The coldest maximum temperature recorded in the Adelaide and Hills area was on the 8th at Mount Lofty with 15.0°C. The coolest days on average were recorded at Mount Lofty, where maximum temperatures averaged 25.3 °C.

Minimum temperatures this January were up to 3°C warmer than average across the Adelaide region. The average minimum temperature for January 2012 at Adelaide (Kent Town) was 19.1°C, which is 2.0C above the long-term mean minimum temperature. In January 2011 the minimum temperature at Adelaide (Kent Town) averaged 18.3°C. The coolest January at this site was in 1987 where the average for the month was only 14.1°C.

The coolest nights on average in January 2012 were recorded at Mount Lofty, where minimum temperatures averaged 13.2 °C. The coldest minimum temperature recorded for the month in the Adelaide and hills area was 7.5°C on the 6th at Mount Lofty, whilst the warmest night was 29.2°C at Adelaide (Kent Town) on the 2nd.

SOUTH AUSTRALIA'S WEATHER SUMMARY

JANUARY 2012

SUMMARY

- Maximum and minimum temperatures up to 3°C above average at several locations across southern parts of South Australia.
- Rainfall was mostly average across the State, though dry and hot in the Southeast.

RAINFALL

January rainfall across South Australia was mostly average to above average, though several locations received very much above average monthly totals. The wettest periods for much of South Australia were between the 8th and 10th and between the 28th and 30th. Many locations recorded most of January's rainfall in the earlier period, as a low pressure system and trough located to the south of the State extended over western and central districts.

The highest January total rainfall in the State was observed at Melrose where 91.2 mm was recorded. The highest daily rainfall total observed during January was recorded at Wilmington where 69.6 mm of rain was recorded to 9 am on the 30th.

Pastoral Districts

Rainfall for January 2012 was mostly average across areas of the Pastorals, though tending to above average in the Northeast and the Northwest districts. Rainfall totals of 20 to 40 mm were reported across the Northwest and Far North, while in the Northeast some locations recorded totals of more than 50 mm.

Agricultural Districts

Rainfall totals over southern parts of the Eyre and Yorke Peninsulas, Flinders and Mount Lofty Ranges and Murray Valley districts was average to below average for January 2012. Rainfall totals generally ranged between 20 to 40mm, though several locations recorded totals in excess of 60 mm. Rainfall was generally near average across the Adelaide Plains, while across parts of the Southeast of the State rainfall was below tending to very below average, where totals ranged between 10 to 20mm.

TEMPERATURE

The average temperature (the average of the daily maximum and daily minimum temperatures) for South Australia as a whole in January 2012 was 1.1 °C above than the long-term January average. The above average temperatures across the State are due mainly to an extended period of hot conditions in the last 2 weeks of January. In comparison, January 2011 was 2.7 °C warmer than average. Mean temperatures for January 2012 ranged from 19.2°C at Mount Lofty to 31.7°C at Oodnadatta Airport.

Maximum Temperature

The area-averaged mean maximum temperature of 35.3°C was 0.6°C above the long-term January average for South Australia as a whole. January 2001 is the warmest January on record with a mean maximum temperature of 38.9°C.

Average January maximum temperatures were close to 2°C above average across most of the Northeast and Central parts of the State, and up to 3°C warmer than average in the Southeast of the State. Average maximum temperatures for the month ranged from 23.4 °C at Neptune Island to 38.3°C at Oodnadatta Airport and Marree comparison in the Far North district.

The hottest day of the month for any location was recorded at Ceduna AMO on the 1st where the maximum temperature reached 46.2 °C. Mount Lofty had the coldest day on the 15th with a maximum of 15.0°C.

Minimum Temperature

Average minimum temperatures were generally up to 2°C warmer than average across most of the State though tending to 3°C above average across parts of the Western Agricultural, Far North and Southeast districts. Average minimum temperatures across the State ranged from 13.1°C at Mount

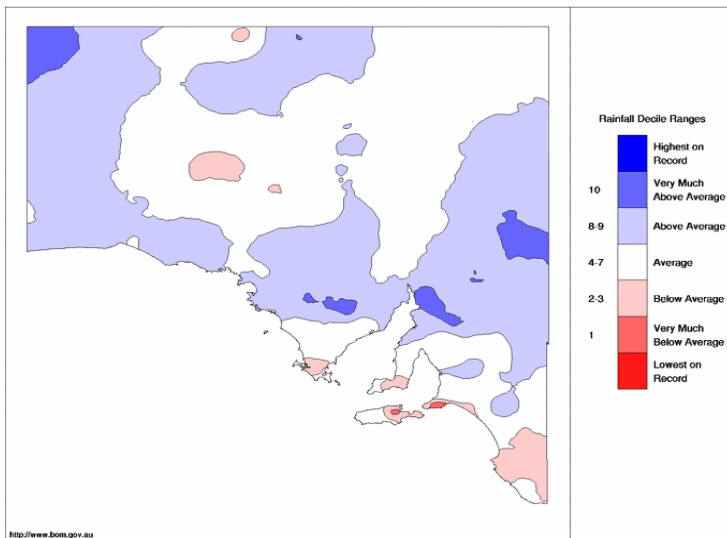
Lofty to 24.9 °C at Oodnadatta Airport.

The coldest nights for many locations was between the 7th and 11th as a cold frontal system followed by a southwesterly airstream crossed the State. Robe Airfield had the coldest night, recorded on the 5th with a minimum temperature of 4.4 °C.

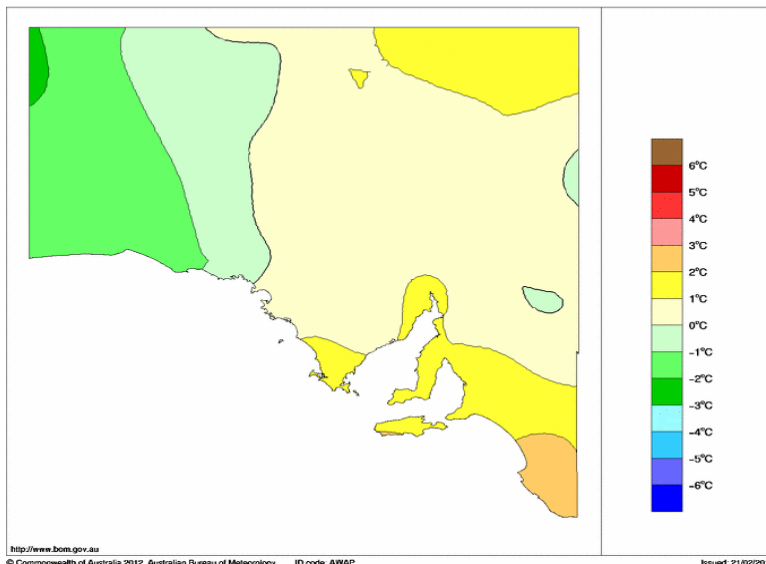
The warmest nights for many locations was around the 1st and 3rd and again during the last 2 weeks of January; both of these periods were associated with warm to hot east to northeasterly winds being directed over much of the State. Oodnadatta Airport recorded the warmest night of the month on the 20th with a minimum of 31.1°C.

South Australian Rainfall Deciles January 2012

Distribution Based on Gridded Data
Product of the National Climate Centre



Maximum Temperature Anomaly (°C) January 2012
Product of the National Climate Centre



ADELAIDE AND HILLS REGION WEATHER SUMMARY

FEBRUARY 2012

SUMMARY

- Near average to slightly above average rainfall across the greater Adelaide area.
- A very cool first half of the month resulting in below average monthly temperature.
- Summer end with the coldest February day in 18 years

RAINFALL

The February 2012 rainfall total at Adelaide (Kent Town) was 25.0mm on 8 days. This is compared to the long-term average of 13.2mm on 4 days, with the median rainfall being 8.4mm. Last year, 43.2mm was recorded on 5 days, with 5.6 mm recorded in February on 3 days in 2010.

Most of the month's rainfall for the Adelaide area occurred in the first two weeks, with little rainfall after that as moisture infeeds from the tropics became focussed in the Pacific Ocean, rather than from northern Australia. Rainfall totals across the region were typically 15 to 25mm across the Adelaide Plains, with higher totals in the 20 to 30mm range in the Adelaide Hills. The highest total recorded was 44.0mm at the Crafers (Mount Lofty) site.

TEMPERATURE

Most of the first half of the month saw well below average temperatures, up to 9°C cooler than average. The second half of the month saw bursts of hotter conditions. Despite this, temperatures averaged across the month as a whole came in generally about a degree below average for maximum temperatures, with minimums closer to average.

The mean February maximum temperature recorded at the Adelaide (Kent Town) for February 2012 was 28.2°C which is 1.2°C below the long-term mean maximum temperature of 29.4°C. In comparison, February 2011 saw average maximum temperatures of 29.1°C at Adelaide (Kent Town). The record highest February mean maximum in Adelaide is 33.0°C set more than 100 years ago in 1906 at the West Terrace site.

During this month, only 4 days recorded a maximum temperature above 35°C at Kent Town against the average of 6 days. One day exceeded 40°C, reaching 40.3°C, this being the hottest day at Adelaide (Kent Town) in the month, though 40.4 was recorded at Edinburgh Airport as the highest temperature across the region. The coldest was on the 29th when only 18.7°C was recorded, the coldest February day at Adelaide since 1993 when 18.3°C.

Mean minimum temperatures were generally within a degree of the average this February. Several locations on the Adelaide Plains were slightly cooler than average, while Mount Barker was 1.7°C above average, owing to above average cloud cover and higher than average humidity levels. Most of the first two weeks of the month saw below average minimum temperatures, with a run of nights above 20°C in the second half of the month.

The mean minimum temperature for February 2012 at Adelaide (Kent Town) was 17.2°C, which is exactly the average February mean minimum. The highest average February minimum for Adelaide is 20.3°C recorded in 2000. In February 2011 the mean minimum was 18.6°C.

The coldest minimum temperature recorded in the Adelaide and hills area was 6.7°C on the 1st at Mt Lofty, whilst the warmest night was 29.6°C at Noarlunga on the 26th.

Meteorological Observations at Adelaide Regional Office, February 2012

DATE	DAILY TEMP.		3pm TEMP. (°C)	RELATIVE HUMIDITY (Percent)	BRIGHT SUNSHINE (hours)	RAINFALL to 9am (mm)	EVAPO-RATION to 9am (mm)	WIND RECORDED at 9am (km/h)	WIND RECORDED at 3pm (km/h)	MAXIMUM WIND GUST (km/h)	TIME OF MAX WIND GUST	Summary		
	MAX. (°C)	MIN. (°C)										Actual	Average	
1	23.9	13.6	16.5	50	29	12.4	7.0	ESE 13	SSE 17	ESE 65	1:29	Rain (mm)	43.0	
2	29.0	15.0	18.9	27.7	55	30	6.0	NW 5	W 24	WSW 46	15:51	Year to date	62.3	
3	27.7	14.3	19.1	26.8	55	31	8.8	NW 5	WSW 15	WSW 30	15:00	Summer to date	61.2	
4	30.4	14.9	20.6	28.4	56	30	5.9	NNW 2	NW 5	WSW 24	11:15	Raindays	8	
5	20.5	14.2	16.2	18.6	85	54	14.6	W 19	SW 24	WSW 57	10:39	Year to date	13	
6	22.4	14.0	16.8	21.6	52	44	1.4	SW 15	WSW 17	W 41	15:47	Summer to date	18	
7	21.7	13.9	17.1	21.3	61	4	0.8	S 9	SW 15	SSW 37	14:21	Extremes for West Terrace and Kent Town	15	
8	21.1	13.3	16.1	20.7	54	39	5.0	ESE 9	SW 11	SW 28	14:06	February Daily Extremes	Extreme	
9	22.5	12.6	16.5	20.7	48	40	2.2	SE 8	SW 15	SE 33	19:50	Highest maximum (°C)	44.3	
10	20.2	14.3	16.3	18.2	67	75	2.4	SSW 11	SW 18	SSW 39	15:51	Lowest maximum (°C)	14th 2004	
11	23.8	15.1	17.1	21.8	76	43	6.8	SSE 13	SSE 13	SSE 35	17:07	Lowest maximum (°C)	15.8	
12	24.1	12.0	17.6	22.9	62	43	12.7	SE 8	SW 17	SSE 42	23:58	Lowest minimum (°C)	7.8	
13	30.1	14.2	20.6	29.6	55	24	12.4	SW 4	W 2	N/A		Highest minimum (°C)	32.9	
14	35.3	17.9	26.9	34.1	22	13	7.2	NE 17	W 15	NNW 39	11:45	Highest 24 hour rainfall (mm)	141.5	
15	28.3	23.6	25.3	27.1	58	45	7.8	SW 4	W 13	NNW 33	16:03	Strongest wind gust (km/h)	ESE 105	
16	29.2	17.0	20.3	26.0	68	45	4.6	WNW 9	WSW 22	SSW 35	12:48	February Monthly Extremes	36.2	
17	31.6	15.1	18.8	29.9	61	31	9.2	ESE 5	WSW 17	WNW 30	12:59	Lowest mean maximum (°C)	19.5	
18	35.9	18.8	26.0	33.9	42	23	11.1	ENE 8	SW 13	ESE 39	2:44	Highest mean minimum (°C)	1857	
19	32.7	22.4	26.1	32.0	47	21	5.0	NNW 7	WSW 20	WSW 32	14:06	Highest rainfall (mm)	154.7	
20	28.0	18.7	21.6	26.8	62	37	12.1	SE 13	SSE 18	S 39	18:16	Lowest rainfall (mm)	Nil	
21	27.4	16.0	18.9	25.3	65	38	11.6	E 9	S 13	SE 35	2:17	Comments: February 2012	22.7	
22	30.0	15.1	20.0	29.3	59	30	12.1	WSW 4	W 15	SW 35	16:09	Mean monthly temperature (Max+Min/2)	22.7	
23	34.8	15.4	22.5	33.5	48	16	12.4	CALM	W 13	WANW 26	13:51	Highest wind gust during the month	ESE 65 on 1st	
24	39.2	22.2	30.9	38.4	16	10	12.4	NNE 11	WSW 15	N 41	9:40			
25	40.3	25.4	32.6	39.7	23	17	12.0	NNE 17	W 15	N 37	8:40			
26	33.1	30.7	34.2	36	2	6	2.6	NNE 15	SW 15	N 48	9:11			
27	32.3	23.0	23.3	31.8	69	39	6.0	SE 11	WSW 13	SE 32	17:20			
28	23.5	19.0	19.1	22.7	61	44	0.9	ESE 11	SE 15	SE 37	14:52			
29	19.1	18.6	18.7	15.5	78	84	0.4	S 4	SSE 17	SE 33	9:30			
30														
31														
TOTAL	818.1	497.7	611.1	778.5	1577	1065	228.7	25.0 on 8 days	168.4					
MEAN	28.2	17.2	21.1	26.8	54	36	8.2	13.2 on 4 days	7.0					
AVG**	28.4	17.2	21.4	27.8	53	36	10.0							

* Maximum temperatures are taken from 9am to 9am. ** Long term average, currently 34 years in 2012
Climate Services Centre, Adelaide, South Australia. Phone 08 8366 2664. Fax 08 8366 2693

SOUTH AUSTRALIA'S WEATHER SUMMARY

FEBRUARY 2012

SUMMARY

- Cooler than average temperatures for most of South Australia this February.
- Rainfall was above average across most of the State, with high totals in the North and Northeast, though drier than average in the Southeast.
- Record highest February total and daily rainfall total for February at some locations in the pastoral districts.

RAINFALL

Rainfall during February 2012 was generally slightly above average across South Australia as a whole, though several locations in central South Australia received monthly totals significantly above average. The southeast though tended to be drier than average this month.

The wettest periods during February were between the 5th and 11th and later between the 26th and 29th. Many locations reported most of February's rainfall in the earlier period as a high pressure system directed an unstable southwest airstream across the State in the wake of the passage of a low pressure trough. A low pressure surface trough combined with an upper level trough over the northeast of the State in the latter period resulting in heavy rainfall being reported across eastern districts. Arkaroola reported the highest overall rainfall total for February; 184.6 mm was observed for the month, 106.6mm of which was recorded to 9 am on the 29th making it the wettest day in February 2012 day for any location in the State.

Pastoral Districts

Rainfall for February 2012 was highly variable across areas of the Pastorals, with totals between 20 and 50 mm being reported across the Northwest and Northeast, while in the far North several locations recorded totals of more than 100 mm. Leigh Creek Airport, Kalamurina and Beltana all reported record highest February daily rainfall total. At Leigh Creek, 57.4mm was observed on the 29th resulting in a record highest February rainfall total of 119.6mm for this location across a 26 year record. Rainfall totals for February 2012 over the Yorke Peninsula, Flinders and Mount Lofty Ranges and Murray Valley districts were average tending to below average in the far west and lower Southeast of the State. Rainfall totals generally ranged between 10 to 30mm, though several locations recorded totals in excess of 60 mm. Rainfall totals in the Southeast of the State ranged between 5 to 10mm.

TEMPERATURE

The average temperature (the average of the daily maximum and daily minimum temperatures) for South Australia as a whole in February 2012 was 0.65 °C below the long-term February average. In comparison, February 2011 was 0.1°C warmer than average, and Feb 2010 0.8°C warmer than average. All parts of the State, apart from the southeast and a small area in the far southwest, saw below average temperatures in February 2012, mainly due to an extended period of cool conditions during the first two weeks of February.

Maximum Temperature

The area-averaged mean maximum temperature was 0.3°C below the long-term February average for South Australia as a whole. February 2007 was the warmest February on record with a mean maximum temperature of 37.4°C.

Maximum temperatures for the month were close to 2°C below average across most of the Eyre Peninsula, and 1°C below average through central and eastern parts of the State. The Lower Southeast and western parts saw slightly above average maximum temperatures. Average maximum temperatures for the month ranged from 21.9 °C at Cape Willoughby on Kangaroo Island to 36.4°C at Moomba Airport Far Northeast of the State.

The hottest day of the month for any location was recorded at Marree Comparison on the 19th where the maximum temperature reached 45.2 °C. Mount Lofty had the coldest day on the 5th with a maximum of 13.9°C.

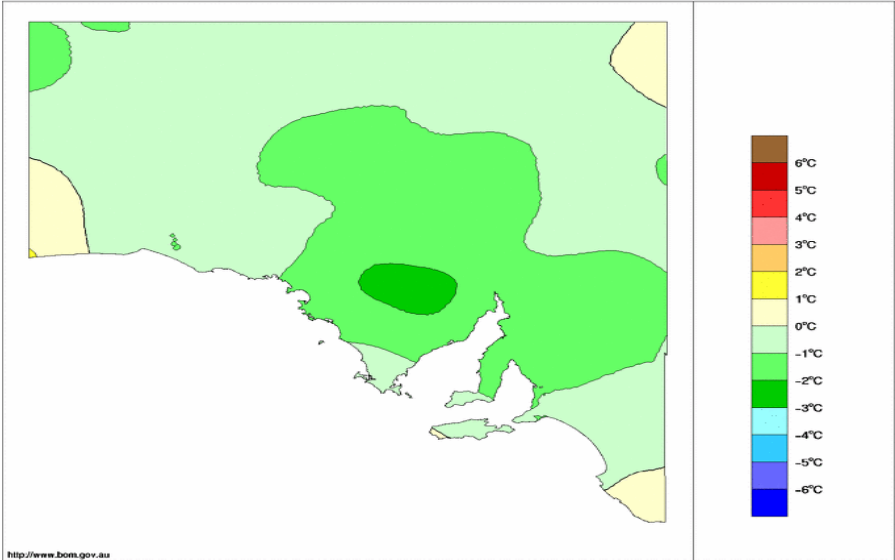
Minimum Temperature

Minimum temperatures for the month were generally 2°C cooler than average across most of South Australia, tending to 3°C below average across northern parts of the State, although slightly above average in the lower Southeast districts. Values across the State ranged from 11.9°C at Keith (Munkora) to 21.2 °C at Moomba Airport.

The coldest nights of the month for many locations was between the 6th and 10th as a high pressure system directed a southwesterly airstream across the State. Keith (Munkora) had the coldest night during this period, recorded on the 8th with a minimum temperature of only 3.3 °C.

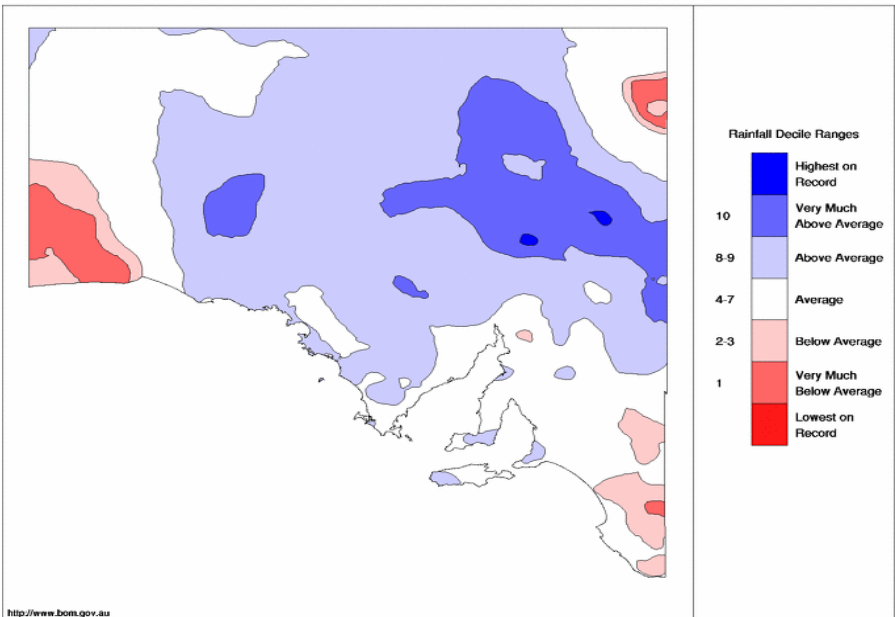
The warmest nights for many locations was between the 24th and 27th as a warm to hot north to northwesterly winds were being directed over much of the State ahead of a low pressure surface trough. Noarlunga recorded the warmest night of the month during this period, on the 26th with a minimum of 29.6°C.

Maximum Temperature Anomaly (°C) February 2012
Product of the National Climate Centre



Issued: 21/03/2012

South Australian Rainfall Deciles February 2012
Distribution Based on Gridded Data
Product of the National Climate Centre



Issued: 21/03/2012

ADELAIDE AND HILLS REGION WEATHER SUMMARY

SUMMER 2011/12

SUMMARY

- Near average summer rainfall, though with significant dry periods occurring through the season.
- A warmer than average summer, despite a cool February, and the last day of summer being the coldest of the season with only 18.7°C.

RAINFALL

Rainfall totals were generally close to average in summer 2011/2012 if tending slightly above average in some locations, particularly in the Adelaide Hills. Rainfall totals on the Adelaide plains typically ranged from 50 to 80mm, with totals in the Adelaide Hills typically in the 80 to 100mm range. Through the season, much of the December rainfall came in a large event mid month, though December ended up below average generally for the Adelaide area. The end of the first week in January saw the next significant rainfall totals, with little rainfall then occurring in the second half of both January and February. The wettest location in the Adelaide metropolitan and hills area saw 145.4 mm recorded at Chain of Ponds in the Adelaide Hills.

Adelaide (Kent Town) recorded a summer total of 61.0mm, only 1.3mm below the summer average of 62.3mm. Last year the summer rainfall total at Kent Town was 147.6 mm, the wettest summer at the Kent Town site, though the highest summer rainfall for Adelaide was 172.8mm in the summer of 1925 recorded at the West Terrace site.

Temperature

Despite perceptions that this summer was mild, temperatures for December and January were above average, and, despite February being cooler than average, summer as a whole was ~1 °C warmer than average for the Adelaide region. A burst of hotter conditions at the end of December and into early January, and through the second half of January were close to, but not quite reaching heatwave criteria, and these hotter periods alternated with much cooler conditions, through the remainder of the season.

With maximum temperatures ending up warmer than average, the mean maximum temperature recorded at Adelaide (Kent Town), for summer 2011/2012 was 29.1°C, which is 0.6°C above the average summer mean maximum temperature of 28.5°C. The highest mean maximum temperature on record for summer in Adelaide (Kent Town) is 31.2°C in 2000. The mean maximum temperature for summer 2010/2011 was 28.8°C.

The hottest day for Adelaide was 41.6°C on the 1st January 2012, though the hottest day in the Adelaide region during summer was recorded at Edinburgh RAAF with 42.1°C on the 2nd of January 2012. Mount Lofty, in the Adelaide hills, recorded the coolest day during summer with 13.9°C on the 5th of February 2012. The summer finished with only 18.7 °C recorded in Adelaide, the lowest summer maximum temperature recorded at Adelaide since December 2010.

Parafield Airport recorded the warmest days on average in the Adelaide region with 30.1°C, with the coolest days on average of 23.4°C at Mount Lofty.

Average minimum temperatures were also close to 1°C above normal across the Adelaide metro and hills area. The mean minimum temperature for summer 2011/2012 at Adelaide (Kent Town) was 17.5°C, which is 0.9°C above the summer mean minimum temperature of 16.6°C. For summer 2010/2011 the mean minimum temperature was 17.7°C.

The coldest night during summer was recorded at Mount Lofty with 4.7°C on the 5th of December 2011. Noarlunga recorded the warmest night during summer with 29.6°C on the 26th of February 2012.

The coolest nights on average were at Mount Lofty with 12.4°C, whilst the warmest nights on average were at Adelaide (Kent Town) with 17.5°C.

The 23rd March 2012 saw the release of the new Forecast Explorer for South Australia, allowing a week ahead forecast anywhere in the state on a 6km grid, by a simple mouse click.

For more details and to see this major advance in weather forecasting see <http://www.bom.gov.au/forecasts/graphical/public/sa/>

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Forecast Explorer

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Temperature (°C) for 12 pm Mon Apr 02 2012 CST

-6	-3	0	3	6	9	12	15	18	21	24	27	30	33	36	39	42	45
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Overview | Adjacent areas

Day | Weekly | Loop

View forecasts with mouse-click mouse-over

Today | <-12Hrs | +12Hrs >

Max / Min	Max			
Temp	6 am	9 am	12 pm	3 pm
Apparent Temp	6 am	9 am	12 pm	3 pm
Relative Humidity	6 am	9 am	12 pm	3 pm
Chance of any rain	24 hr			
Likely rainfall	24 hr			
Possible higher rainfall	24 hr			
Weather	6 am	9 am	12 pm	3 pm
Wind (km/h)	6 am	9 am	12 pm	3 pm

Give feedback

Explore temperature, rainfall, weather, wave and wind forecasts produced and quality controlled by Bureau of Meteorology forecasters. The maps are updated routinely at around 6am and 6pm local time, and currently available in Vic, NSW/ACT, SA and Tas.

SOUTH AUSTRALIA'S WEATHER SUMMARY

SUMMER 2011/12

SUMMARY

- Higher than average rainfall through central and northern South Australia, below average in the southeast.
- Cooler than average summer days in the north, with warmer than average temperatures elsewhere.

RAINFALL

Summer 2011/12 rainfall was average to above average across most parts of South Australia; parts of the northwest and parts of the northeast received well above average rainfall while rainfall totals tended to be below average in the southeast.

Several severe thunderstorms and heavy rainfall events were experienced over the summer period resulting in flash flooding for a number of locations around the State. A low pressure system and associated trough which had tracked across the State on December 17th caused flooding at several locations on the Yorke Peninsula. Flash flooding also occurred with thunderstorms about Eastern Eyre Peninsula on January 7th as a prefrontal trough moved across in a moist, unstable environment. Later in January, two gust fronts from thunderstorms converged over southern South Australia on January 28 causing damage to property and felling trees. An extensive rain band over the northeast of the State in the last week of February resulted in daily rainfall totals well in excess of 100mm, resulting in flooding and road closures in the State's northeast including Arkaroola, Copley, Yunta and Parachilna.

Pastoral Districts

Summer rainfall was average to well above average across the Pastoral districts. Rainfall totals generally varied between 50 to 80mm, with some locations recording larger totals in isolated thunderstorm events. The highest summer rainfall total in the pastoral districts was at Arkaroola, in the Northeast, which recorded 273.3 mm, 106.6mm of which was recorded on February 29. Leigh Creek Airport received a record highest total summer rainfall of 169.4mm.

Agricultural Districts

Rainfall was average across most agricultural parts, though tending to well below average through parts of the Southeast districts of South Australia. These districts generally received only about 30-50% of average summer rainfall. Rainfall totals were highly variable, typically 30 to 100mm throughout agricultural districts for the summer season, though tending higher between 80 to 120mm around the Mount Lofty and Flinders Ranges.

TEMPERATURE

Temperatures across South Australia were near average during summer 2011/12. Averaged across the State as whole, the summer daily average temperature for South Australia was 0.2 °C warmer than the long term summer average. By comparison, summer 2010/11 was 0.8°C warmer than average. The warmest summer for South Australia was recorded in 2006 where temperatures were 2.7 °C above the long term average.

Maximum

Maximum temperatures were slightly above average this summer, with temperatures generally up to 1°C above average across most of the agricultural areas, while pastoral areas had maximum temperatures for the month as a whole about 0.5°C below normal. Maximum temperatures were slightly cooler than average in the far northwest of the state. Maximum temperatures for the month as a whole for individual stations ranged from 17.9 °C at Mount Lofty to 31.2 °C at Moomba Airport in the far Northeast of the State.

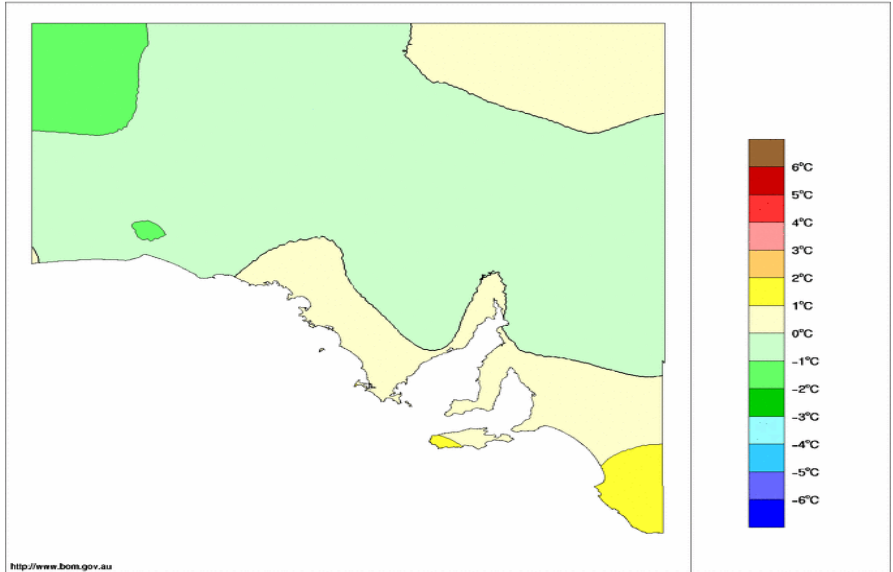
The hottest summer daily maximum temperature was 46.2°C recorded at Ceduna AMO in the State's west on the 1st of January. The coldest daily maximum was 12.8 °C at Mount Lofty on the 29th of February.

Minimum

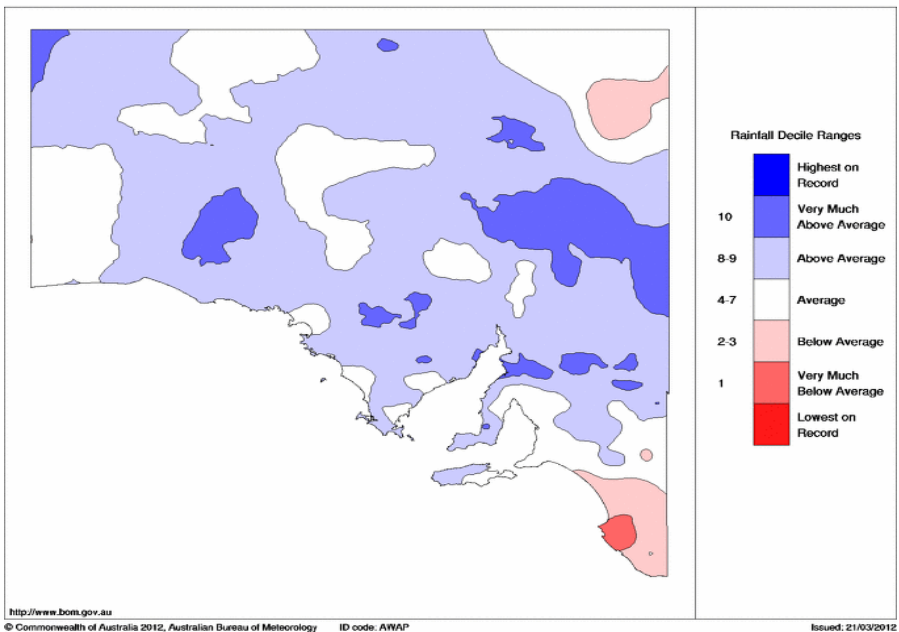
Minimum temperatures were above the long-term average this summer. All but the far northwest and northeastern areas of the State had average minimum temperatures close to 1°C above the long term summer minimum average. Mean minimum temperatures for the whole season ranged from 6.9°C at Keith (Munkora) in the Southeast to 15.9 °C at Oodnadatta Airport in the states north.

The lowest overnight summer minimum temperature recorded was 2.4 °C at Naracoorte Aerodrome on the 5th of December. The highest minimum temperature recorded was 31.1°C at Oodnadatta Airport on the 20th of January.

Maximum Temperature Anomaly (°C) 1 December 2011 to 29 February 2012
Product of the National Climate Centre



South Australian Rainfall Deciles 1 December 2011 to 29 February 2012
Distribution Based on Gridded Data
Product of the National Climate Centre





March 2012 saw the release of 'State of the Climate 2012', a report by the CSIRO and the Bureau of Meteorology on Australian climate observations and trends, including the latest information on measurements of greenhouse gas levels in the atmosphere, temperature trends and sea level rise measurements.

See <http://www.csiro.au/Outcomes/Climate/Understanding/State-of-the-Climate-2012.aspx>

- Climate change is continuing
- Warming has been measured around Australia and globally during recent decades
- 2010 Global temperatures were the warmest on record (slightly higher than 2005 and 1998)
- Australia experienced record rainfalls and the coolest temperatures since 2001 due to a very strong La Niña event in 2010 and 2011
- Concentrations of long-lived greenhouse gases in the atmosphere reached a new high in 2011
- Australian temperatures are projected to increase in coming decades
- Rising CO₂ emissions from the burning of fossil fuels has affected global temperature much more than natural climate variability during the past century.



Australian Meteorological Association Inc (AMETA)
25 College Road, Kent Town, SA, 5071
Hon Sec - Email: d.ray@bom.gov.au

NEXT MEETING

5.30pm Monday 16th April 2012
(A joint AMETA/AMOS Event)

Venue: *South Australian Regional Office of the Bureau of Meteorology 25 College Road Kent Town 5:30pm*

Subject: *'The Australian Climate Observations Reference Network - Surface Air Temperature review'*

ACORN- SAT is a complete re-analysis of the Australian long term air temperature record, recently launched on World Meteorological Day in March 2012. This daily timescale database dates back to 1910, and has undergone a major review process. This talk presents the review process, methodology and results, particularly as to how they relate to temperature trends in South Australia.

Friends are welcome so please feel free to invite others along.

Presented by:

Karl Braganza, Manager of Climate Monitoring , Bureau of Meteorology

We look forward to seeing you.
For further information contact

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