Monana

THE OFFICIAL PUBLICATION OF THE AUSTRALIAN METEOROLOGICAL ASSOCIATION INC
February 2020

Remembering Terry Keen 1939-2019

Our October presentation was a dedication by then retiring president and current vice–president, Beth Walton, to one of AMETA's longest serving members, Terry Keen. Terry had a great love of flying and in her presentation Beth covered many aspects of meteorology that affect aviation. Her long career in relevant divisions of the bureau meant that she was able to talk to this subject from personal experience, while spicing it up with historical background

Terry joined AMETA in its first year of operation (1969) when he was teaching at Scotch College. He was quickly seconded to the Committee and became the inaugural Editor of the Association's publication, Monana, a position be maintained until 2010. In recognition of his significant editorial role, and the contribution he made as a Committee member over this time, he was awarded life membership of AMetA in 2013.

Terry's interest in meteorology stemmed from his passion for flying. He gained his private pilot licence in 1966 and a commercial licence in 1967. He combined his love for teaching and flying in 1983 when he became a lecturer in civil aviation (including aviation meteorology) at the University of South Australia and retired the Program Director of the Bachelor of Applied Science (Civil Aviation) in 2011.

Below is an excerpt from a talk he gave to AMetA in November 2012.

' Lecturing gave me a great deal of pleasure, especially when I hear of past students who are now flying large passenger aircraft – Boeing 747's and the like.
Over many years I have had some magnificent and varied experiences – some very exciting and others not so exciting. I remember well my first solo flight – looking at the now empty seat where the instructor usually sat watching my every move. It was a very proud moment for me.

I was very fortunate to have had such a variety of types of flying experiences.
Charter flying to such places as Mt Gambier, Pt Lincoln and Birdsville along with many other places was most interesting and exciting. I took an ABC television crew to the Birdsville races – a weekend I will never forget. A night freight run to Melbourne was also a great buzz.

Aerial photography was a fascinating type of flying. The passenger side door was

removed for this exercise which made flying very noisy and breezy. I did a number of flights around South Australia with a famous photographer of the time, D Darian Smith with his Hasselblad cameras. Another exercise requiring a door off the aircraft was dropping a parachutist over the Royal Adelaide Show – a remarkable sight watching someone jumping out into open space.

I was chief pilot for the Scout Association for a number of years taking many joy flights up and down the Murray River from Armstrong Airfield near Blanchetown. Along with the joy flights I also did some glider towing using the Cessna aircraft to tow the glider aloft to a safe height then release, leaving the glider to find a thermal or two. While with the Scout Association I visited the Scout airfield in Lasham just south of Basingstoke UK and was treated with a hot air balloon trip across the south of England which I thoroughly enjoyed. The accommodation at Lasham Field was a retired Comet aircraft – just magnificent! During the time there I did some paragliding and also had a flight in an autogyro – again a great experience.

I suppose the most interesting flight occurred when I had almost completed my night flying exercises required for the commercial pilot licence. I had flown several solo night circuits earlier that night, then decided to do a couple more take-offs and landings. The first of these circuits started well enough until I reached the first turn at 500 feet. I was half way around the turn at 550 feet when the aircraft developed a very severe vibration. I thought that the engine was going to shake itself to pieces. I found out later that the shaking was caused by the fact that part of one blade of the propeller had broken off producing an enormous imbalance in a propeller rotating at 2400 rpm. I throttled down to idle and turned the aircraft back towards the airfield at the same time giving the mayday call. Having checked the instruments and completing some other checks I turned the engine off to stop the violent vibration and concentrated on the task of landing the aircraft. I was told later that if I had not been so quick to reduce power to idle and then to switch off the engine it would probably have been ripped from it's mountings and separated from the aircraft significantly altering the centre of gravity. At this stage all the lights in the aircraft failed so it was not possible to ascertain my speed as well as to enable other aircraft in the circuit to pinpoint my position. I could not land on the actual runway because there were two other aircraft on their final approach and one had just taken off behind me which meant that I had to land to one side of the duty runway. It was a very difficult landing without instruments and power, not being able to see exactly how close I was to the ground prior to touchdown while being aware of the night time spatial awareness illusions which can occur. Fortunately I managed to land the aircraft safely without further incident and received a letter of commendation for my handling of the emergency. I was very thankful for the excellent flying training which I had received from the training institution that enabled me to carry out a successful forced landing.

Weather was always a very important factor in every flight undertaken. Information on such things as cloud, turbulence, fog and wind was routinely obtained from the Bureau's aviation weather reports and forecasts, which, may I say, were very accurate and helpful.

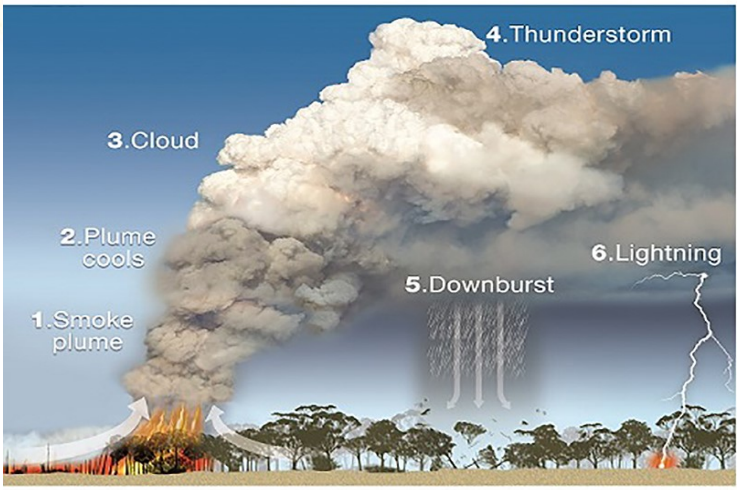
There are so many more events experienced over 50 years associated with aviation that have made it so rewarding and stimulating, but time does not permit me to write about those here. '

The Personal Weather Station (PWS) Group Ramps Up

2020 is the year that the AMetA ramps up its Personal Weather Station Group (PWS) activities by adding a meeting in the odd months of the year (March, May, July, September and November) bringing the meeting numbers up to ten (10) a year. It also plans to expand the *Monana* magazine to include information about the PWS group as you can see from this article.

What will the PWS Group focus on? Well, the obvious answer is personal weather stations, but it will encompass much more than that. The popular even-month meetings tend to focus on how meteorology is used in various activities such as agriculture, aviation and general weather and climate at an intermediate level. That is, it normally looks at how the modelling and analysis of weather observations is used, rather than the tools that are used to make the measurements.

The PWS group will focus on the instruments that gather these readings and how the readings are useful in meteorology. For example, it will look at the sensors in a typical PWS and explain how they work, what are the factors that can affect its accuracy and what can be done to mitigate the issues. Part of that process will involve explaining what aspects of the weather are influenced by the parameter that the sensor is reading.



Original image from the Bureau Of Meteorology

For example, most people understand that the temperature affects how hot we feel, but not as many people realise that the temperature also affects the atmospheric density and pressure, which in turn can affect the wind patterns. For example, we have seen in the summer fire storms that the heat of the bushfires can cause massive clouds that can result in disastrous “dry lightning” storms that can trigger even more fires, and we saw winds generated by the fires pick up embers and transport them significant distances to start more fires as well.

PWS Group Meeting Calendar

17-March-2020—Welcome to the PWS Group.

T.B.D.—Measure temperature with an Arduino.
A practical session introducing to the Arduino computer and how to program it to read the temperature from a connected sensor.

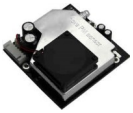
19-May-2020—Presentation To Be Announced (T.B.A.)

21-July-2020—Presentation T.B.A.

15-September-2020—Presentation T.B.A.

17-November-2020—Presentation T.B.A.

As well as looking at commercial weather stations and basic meteorology that surrounds them, the PWS will develop projects to expand the capability of a PWS or allow a person to build their own PWS from the ground up. This will be done using readily available small computers such as the Arduino or the Raspberry Pi, and cheap sensors that are available from local or Internet-based hobby shops or the ubiquitous eBay.



Many may instinctively think ‘’Oh, I don’t know anything about computers or electronics, so this isn’t for me’’, but they would be wrong. One of the objectives of the PWS group is to help people develop the skills to understand, build and use these sensors. No one will end up with a degree in electronics or computer programming, but they will gain enough practical electronics and software knowledge to understand, construct and use these additional sensors.

The PWS group will also encourage people with an Internet-capable weather station to connect their system so that it uploads their readings to the Bureau Of Meteorology (BOM) supported *Weather Observations Website (WOW).* The BOM WOW FAQ (Frequently Asked Questions) web page says it all: *“The independent information you submit to WOW increases knowledge of weather and climate, as well as raising awareness of unrecorded weather events. This leads to better informed communities, in remote, regional and local areas. Your weather information really counts!”*

WOW
WeatherObservationsWebsite
In partnership with Met Office

Australian Government
Bureau of Meteorology

Many cheaper weather stations are automatically setup for an alternate commercial website called the *Weather Underground (WU)* which requires a different message format. The images above show just some of the alternate sites that will accept uploads from personal weather stations, although not every weather station is compatible with every site.

In many cases, it is possible to use a software wedge that sits between the weather station and the Internet to send out messages to WOW and in the format required by WOW (and/or quite a few other systems).

Although a personal weather station is unlikely to provide observations that match the quality of professional weather instruments, system such as WOW, WU and others take these limitations into account when they incorporate this data into their models. This means that people are contributing to Citizen Science when they upload their data to these sites.

If you are interested in contributing to Citizen Science, learning more about personal weather stations and/or learning about electronics and computer programming with an emphasis on meteorology, then the PWS Group could be for you, or someone you know.

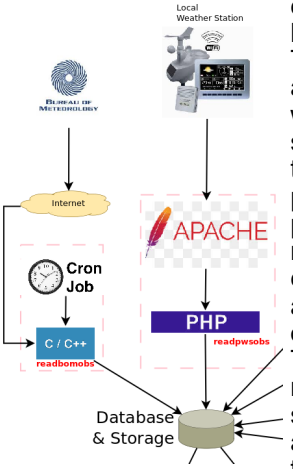
Did you know?

- An **Absorption Hygrometer** is an instrument measuring the water vapour content by means of the absorption of vapour by a hygroscopic material.
- An **Aeolian Anemometer** uses the principle that the pitch of tones generated by air moving past an obstacle is a function of the speed of the air. Largely a curiosity without practical use in modern meteorology.
- An **Albedometer** measures the reflecting power (albedo) of a surface.

Monitoring My Personal Weather Station's Performance *By Mark Little*

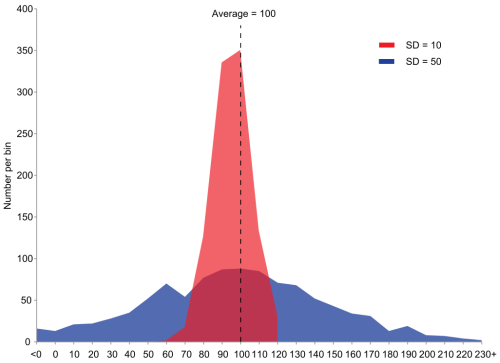
One of the things about having a personal weather station is that you really should periodically do maintenance, such as cleaning out dirt and/or bird dropping from the rain gauge and making sure that there are no cobwebs slowing down the cups of the anemometer or the weather vane or blocking the air flow to the sensors. There is probably not much we can do to stop having to clean, but I wondered if it was possible to automate some sort of basic automated testing of whether the weather station appears to be operating correctly.

My first criterion was that the tests have to be capable of being carried out while I am not at home. That effectively rules out periodically putting another sensor (for example, a thermometer) next to it and comparing the readings manually. Putting up a second weather station seemed a bit excessive and if there was a problem, which one would have the problem? After that, I thought about the local personal weather station and rejected them for the same reason, but there was one local weather station that I could have a fairly high degree of confidence in, and that was the BOM weather station at the Parafield Airport. The question is how to access that weather station's readings and how to do sensible comparison tests using a device that is 1.75 kilometres away.



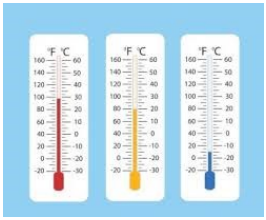
To be able to compare the two sets of readings automatically, first they must be captured. Because my weather station is pushing out a set of readings every 15-20 seconds it just needs to be caught, but the readings from the BOM needed to be pulled out of their website, two pieces of software were required. The "readpwsobs" program runs whenever my weather station sends a set of readings. The BOM file holding the Parafield observations contains the last three day's of 30 minute spaced readings, a timer starts the program "readbomobs" to read that file once a day.

The first step in doing a comparison, is to find a set of readings that were taken at the same time at each weather station—easily done with the database, even though there are hundred of thousands of readings available. Once this dataset is selected, it is time to do a bit of statistical magic to calculate the average difference between the two sets of data along with the standard deviation. As you can see from the Standard Deviation (SD) graph to the right, there are two sets of readings that have the same average value, but the red set of readings are clustered much closer around the average, so it is more likely that the red readings are more significant than the blue readings which may just coincidentally have the same average value.



Comparing Air Pressure Readings

For an initial analysis to see if my thinking was valid, I chose to look at the atmospheric pressure. Air pressure seems to be the reading least likely to vary significantly over distance between the stations. Using the last 30 days of data, on average, my weather station read 1.8 hPa lower than the barometer at Parafield Airport with a Standard Deviation of 0.16 hpa. As stated above, a low Standard Deviation means that most of the values were close to the average, so this set of data can be considered significant. According to the datasheet of my weather station, the accuracy of the pressure sensor is ±3 hPa. From this, it is reasonable to conclude that my air pressure sensor is working within specification. The low Standard Deviation reading also means that it would probably be valid to alter the calibration of the air pressure sensor to try to remove that difference. because looking at the raw data, it appears to be mostly just an offset, rather than any other type of error, although a bit more maths (curve fitting) is required to be sure, but that is something for later. The weather station provides an internal calibration factor for the sensors. Some involve an offset factor and some involve a scale factor. The pressure sensor has an offset calibration entry, so my initial guess about an offset error is probably reasonable.



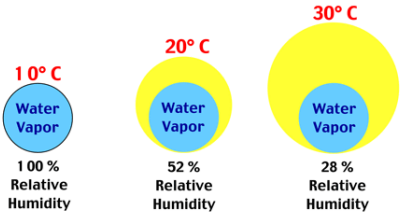
Comparing Air Temperature Readings

Air temperature was the next reading to be compared to the Parafield weather station. There are likely to be discrepancies between the two sets of readings for a variety of reasons, not the least of which is that my home weather station is not located where it would meet the minimum BOM standards. The accuracy of my weather station is rated as ± 1°C, so my initial expectation is that the difference between the two stations could be around or above that value because of the reasons stated.

So after running my queries on the database, modified for the external air temperature, I got an average difference of 0.36°C with a standard deviation of 1.1° C. Given that factors such as the siting of my weather station and knowing that temperature is more likely to be variable over the distance between them, these values are enough to give me confidence that my temperature readings indicate that my thermometer is operating correctly. If the readings had a larger variation, it would be possible to repeat the analysis including the time of day as a parameter to see if factor such as local structures operating as a heat bank are affecting the temperature readings to any significant extent.

Comparing Relative Humidity Readings

This comparison is a bit more tricky since relative humidity depends on the air temperature. The relative humidity can vary widely for the same amount of atmospheric moisture if the temperature changes. This is often easy to see if you watch the relative humidity as the Sun rises.



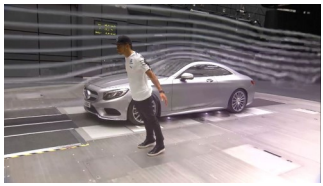
Even on a still day even when the air is not moving about, the relative humidity will drop as the temperature rises. Given this, the comparison of the relative humidity values also takes into account the air temperature by restricting comparisons to relative humidity readings not only those taken at the same time, but to those where the air temperature difference between the sites is less than 0.1°C. This is not without its own problem as it reduces the number of readings to be compared and reduces the confidence in the calculation.

Running the database script for the relative humidity gave an average of 2.7% lower

than Parafield with a standard deviation of 1.3%. The stated accuracy of my weather station is ±5%, so given the environmental variables involved, I think it is reasonable to conclude that my relative humidity sensor is working correctly.

Comparing Wind Speed Readings

One of the prime concerns about comparing my weather station to Parafield Airport is the same concern as with the relative humidity—my weather station is not mounted in a location to meet the BOM minimum standards. There are large trees in most directions from my property and the anemometer is not above all of the roofline. Running the database gave an average wind speed that was 14 kph below the average wind at Parafield Airport with a standard deviation of 8.2 kph.



From my weather station's specifications, the accuracy of the anemometer is ±1 m/s (±3.6 kph) for wind speeds below 5 m/s (18 kph) or ±10% for speeds above 5 m/s (18 kph). Given the location of the Anemometer and wider environmental factors, it is not surprising that my measured wind speed is lower than the Parafield Airport reading by a factor much larger than could be expected just from combined accuracies of my weathers station and the Parafield station, so it is not a good indicator of the local wind speed accuracy.

Comparing Wind Direction Readings

Although it would be expected that variations in wind direction would be large due to siting and environmental conditions, it is much more complicated than that. The BOM weather station only records the wind as compass points and my weather station uses degrees. The direction can vary by 22.5° in the same compass point. Also, because wind direction rolls over from 359° to 0°, a 1° change can seen to a 359° change. Wind direction averaging needs to use vector maths which requires a bit more software.

Using the WOW Site for Comparisons

The Weather Observations Website (WOW) has a comparison system that allows comparisons to another weather station, including the Parafield Airport. The readings 60 minutes apart are graphically compared, however inspection of the graphs shows that the time between the readings at each station being compared are often 9 minutes apart. My current scheme does not yet provide a graphical display, but it ensures that comparison readings were taken at the same time, reducing at least one source of error in the comparisons.

Conclusion

While not perfect, automatic comparisons with BOM stations as a reference has promise as a quality checking tool for me, but needs more investigation and software development to be practical.

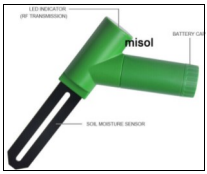
Initial Review of the HP2550 Weather Station

By Mark Little

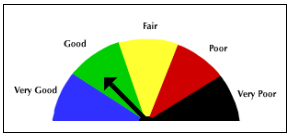
I have two weather stations– one at home and another on my houseboat. Unfortunately, the one on the houseboat, a HP1000, failed when the power supply that converted the boat's 12V supply to 5V failed in the 46+ degree days and cooked the weather station. It was time to look for a new weather station. Since this is just a hobby, I tend to pick relatively cheap units, because a $300 unit (including extras) that lasts 5 years ends up being cheaper than a $1,500 base unit that lasts 15 years. Not only that, because technology

marches on, each new unit is usually superior to the last one. So, looking around, I came across the HP2550 weather station. Like most low end weather stations, the basic weather station can be found badged under a wide range of companies. Not only that, it can be found in different physical configurations. For example, in one model the rain gauge is separate from the anemometer so that the rain gauge can mounted at ground level.

Unlike the weather station that failed, this weather station can accept additional sensors. For example, you can add up to eight (8) additional temperature-humidity sensors that can be used indoors or outdoors. The package I got included an additional temperature-humidity sensor. If you want extra protection, an optional 3rd-party shield is available—see photo for a cut-away view of the shield. My additional sensor is used under cover, so I didn't consider the extra shield. The thermometer units are about $20~25 each and shields are about $40 each. The shield seems a bit expensive, but I guess it would be worth it, compared to something like a Stevenson Screen which would be overkill for the typical modern backyard setting with its non-standard weather station environment.



The weather station can also support up to eight (8) soil moisture sensors. These units don't need any wiring, just push them into the ground (after you put in a battery) and the weather station will start reading them. The ground moisture units are about $30 each.



In addition to these sensors, the HP2550 can connect to up to four (4) PM2.5 air quality sensors. PM2.5 fine particulate matter (2.5 micrometres in diameter or smaller) which come from power plants/ industrial processes/ vehicle tailpipes/ wood stoves and even more relevant these days, bushfires. These particles can impact your health and can cause respiratory issues such as allergies/asthma/ lung cancer etc.

In addition to the particle measurements, it provides an AQI (Air Quality Indicator) value of Good, Moderate, Poor, Unhealthy, Severe or Hazardous, although the names vary from place to place. For example, New South Wales uses Very Good, Good, Fair, Poor, Very Poor and Hazardous. The EPA monitoring in South Australia does not appear to use the Hazardous category, which I hope says good things about our air quality rather than simply an omission by the EPA.

From a quick search on the Internet, it looks like an air quality sensor costs about US$70 each. I haven't found them at local supplier yet, but I have just started looking.

The final option that that I did take is the bird spikes to discourage birds from roosting on the rain gauge. Those who saw my presentation on rain gauges would have seen the photos of the pigeons roosting on the HP1000 weather station. Perhaps you may think that shouldn't really be a problem, but the mouth of my HP1000 rain gauge, that had only been cleaned a month earlier, was completely fouled by the roosting pigeons.

Many home weather stations can upload its observations to the Internet, using either built in capabilities or optional extras. The HP1000 model was only able upload to

one site that used the Weather Underground message format. This meant that I could not up load to the Weather Observations Website (WOW) that the Bureau Of Meteorology (BOM) supports. While I would have liked to upload to the WOW site, the Weather Underground provides (in my opinion) a superior interface for users to analyse their uploaded observations.

The HP2550 overcomes this problem by allowing uploads to multiple sites at the same time, so now I can support the BOM by uploading to my WOW account, but still have the displays on my Weather Underground account. The only complication is that neither of those sites accepts all of the optional sensors available on the HP2550. But luckily, the EcoWitt company, which one of the companies that badge this weather station, has its own site which accepts observations from all of the optional sensors. The weather station can also send messages to another system called Weather Cloud, but I haven't looked at that one yet.

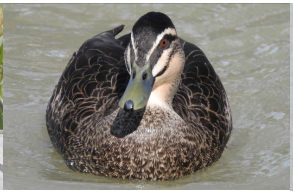
The most important thing for me is that while the weather station is (optionally) sending out messages to the four sites simultaneously, it can also send messages to my own computer so that I can play with the readings from all the sensors as well. More about that in the future.

Although it is early days with this weather station, I'm happy at this stage. Only time will tell how reliable the unit turns out to be, but a quick comparison of its readings with the local BOM station shows a favourable reading comparison at the moment. Like the HP1000, the HP2550 has in-built calibration factors that can be set to take into account variations between its readings and those of a more accurate reference.

2019 Wild Weather on the Murray

By Mark Little

Last year in August 2019, Alexa and I went for a trip on our houseboat *My Lady*. It started with a rather sedate trip downstream from Blanchetown to Lake Carlet, upstream of Mannum, for gathering of our boat club. We like to travel for a few hours, then moor for a look around, or if we are near a



township, inject a bit money into the local economy by visiting the shops. If possible that includes the pub for a good meal while watching the river change as the Sun sets.

We must have looked suspicious, because the local wildlife kept a keen eye on us each time we stopped along the way.

When we got to Lake Carlet, it was time to relax with the other boaties, and watch the passing parade on the river.
Unfortunately, as we continued travelling downstream, we were hit by the end of the good weather! *My Lady* generally travels at about 7.5 kph, but the Northerly wind was a screamer and we were travelling up to 10.5 kph with the wind behind us, but if we had the misfortune to turn a corner and run into the wind, our speed dropped to about 3.5 kph at the same engine speed. Fortunately, that wasn't common because it takes a lot more fuel to get anywhere in those conditions.
As we approached Tailem Bend, we thought that we really should moor and what better place than in front of the Tailem Bend. What a mistake that was!! The pub mooring was at the end of a rather long straight in the river and there was plenty of time for the waves to build. The bank was rocky and as the waves hit the boat, there was a dreadful shudder as the pontoons repeatedly smashed into the rocks. Luckily, the front of our pontoons is double thickness steel, but we decided that ultimately they would be damaged if the pounding kept up, not to mention all of the crockery being tossed about in the kitchen.

So, we set off again heading towards Wellington in the most ferocious wind. Eventually we decided that it was unsafe to continue, but there were no mooring spots along the river. In the end, we waited until we got to a spot where the wind was blowing across the river. We picked a gap in the willows and drove the boat in, smashing tree branches out of way as we went in. After hanging over the front of the boat, we eventually got the boat tied up. We sat there for two nights while the windstorm raged, then we backed out and turned for home sustaining only minor damage to the hooks holding the oars and the paddles. When we arrived back at Mannum, we saw that had happened there. The log lying on the bank in the photo to the left isn't just any old bit of wood, it was a houseboat mooring post that had been ripped out of the ground. The other photo gives a better indication of what happened and how much force must have been applied. It would have been ultra-scary if it happened in the dead of the night.

Although it remained windy for the rest of the trip and we were running into a head wind, the trip was a lot more relaxed than the previous few days, even if we used a heap more fuel.

2019 AMETA AGM

The recent 15th October 2019 AMetA Meeting was held in the usual BOM Meeting Room, commencing with the 2019 Annual General Meeting. All committee positions were filled, although no voting was required for any positions. Mark Little was welcomed as our new President, with Beth Walton now vice-President after a decade as President. John Braendler is taking a well earned rest from his greatly appreciated stint as Treasurer and will be replaced by Liam Smart. Darren Ray will continue his role as our Secretary. Ordinary members of the new committee include Mac Benoy, John Braendler, Bruce Davis, Jon Lethbridge, Warwick Grace and David Brown.

Darren Ray commenced the "formal" presentations with his usual interesting assessment of the weather outlook for the next few months. He included a number of tips on how to make use of some new features available on the BOM website. This was followed by Beth Walton's presentation about Meteorology & Aviation.

Please Note: Annual Subscriptions for 2019-20 ($15) are now due

ANNUAL DINNER 2019

The 2019 AMETA Annual Dinner was held on Tuesday 26th November in the Crystal Room at the Benjamin on Franklin Hotel, Franklin St., Adelaide. The highlight of the evening was a presentation of AMETA Life Membership to Beth Walton, who was retiring as President after many dedicated years of service to the association. The presentation was made by the new president, Mark Little.

CHANGE TO MONANA LAYOUT

For many years now this newsletter has contained a relatively detailed summary of climate information for Adelaide and South Australia. Although this was provided by the Bureau of Meteorology it was not readily accessible by the general public. That situation has now changed. and for some time all of this information has been placed on the Bureau's website where it is publicly available. Hence, it has been decided to amend this newsletter and only include the brief introductory paragraph referring to that particular item, plus details of how to access the more detailed data. Tabular information on daily Adelaide observations plus graphics showing state-wide rainfall and temperature will continue to be included. This change will drastically reduce the distribution costs and we hope will be acceptable to members.

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.

Greater Adelaide in October 2019: drier than average with warm days

Rainfall in October was below average across most of Adelaide and the Hills and particularly dry in the city's northern suburbs. Despite some cooler than average days through the middle of the month, several very hot days resulted in above average mean maximum temperatures for the month as a whole. Night-time temperatures were also warmer than average.

For more information plus a summary of October's statistics please see:
http://www.bom.gov.au/climate/current/month/sa/archive/201910.adelaide.shtml

Adelaide (West Terrace / Ngayirdapira), South Australia
October 2019 Daily Weather Observations

Australian Government
Bureau of Meteorology

The official site for Adelaide, having reopened in May 2017.

Date	Day	Temps		Rain	Evap	Sun	Max wind gust			9am						3pm					
		Min	Max				Dirn	Spd	Time	Temp	RH	Cld	Dirn	Spd	MSLP	Temp	RH	Cld	Dirn	Spd	MSLP
		°C	°C	mm	mm	hours		km/h	local	°C	%	eighths		km/h	hPa	°C	%	eighths		km/h	hPa
1	Tu	13.1	28.6	0			NE	33	07:44	20.9	32		NNE	15	1025.3	27.9	25		NE	13	1020.7
2	We	20.7	27.4	0			NNW	33	10:17	24.6	22		N	17	1020.0	22.5	54		WSW	15	1018.4
3	Th	12.8	19.8	0			WSW	28	12:48	15.2	72		SSE	6	1023.4	18.5	65		WSW	13	1021.2
4	Fr	12.6	31.8	0			NE	37	10:55	19.7	42		ENE	9	1020.8	30.3	29		N	6	1014.0
5	Sa	15.6	33.8	0			N	33	10:09	24.9	33		NE	13	1012.0	32.8	19		N	11	1006.3
6	Su	15.8	17.3	0			WNW	39	08:11	16.2	76		WNW	20	1013.8	15.3	89		W	13	1015.5
7	Mo	11.9	17.0	0.2			WSW	39	17:37	13.5	70		SSW	11	1018.0	15.1	66		WSW	13	1017.3
8	Tu	8.5	16.8	1.0			SW	48	01:01	11.8	58		S	17	1025.8	15.9	40		S	17	1025.6
9	We	7.8	17.5	0			WNW	30	12:22	12.1	53		E	9	1030.2	15.8	50		WSW	17	1027.1
10	Th	6.4	21.5	0			SSE	26	17:17	14.0	61		SE	6	1025.4	20.2	41		WSW	13	1022.4
11	Fr	9.1	21.8	0			SE	28	17:36	14.7	51		E	13	1020.0	20.4	40		W	17	1016.0
12	Sa	10.3	25.6	0			ESE	31	23:57	17.8	41		ESE	11	1015.3	25.0	27		NW	7	1010.8
13	Su	17.5	23.9	0			ENE	39	00:37	22.0	23		NNE	13	1009.7	17.9	78		SSW	17	1012.5
14	Mo	13.1	19.1	3.0			WSW	28	12:06	14.5	73		SW	11	1015.7	18.4	55		SW	13	1015.4
15	Tu	6.9	18.9	0			SW	26	18:22	13.8	63		N	7	1015.5	15.2	69		SW	13	1014.9
16	We	12.6	17.7	5.8			W	56	18:41	12.7	92		WSW	13	1014.0	16.7	48		WSW	20	1012.9
17	Th	9.8	17.2	2.6			SW	50	23:06	12.9	50		SW	24	1018.7	15.4	47		SW	15	1018.8
18	Fr	7.5	20.6	0			SW	44	17:06	11.8	66		N	11	1017.9	19.3	50		W	20	1016.0
19	Sa	9.4	16.8	1.0			WSW	44	11:33	13.3	55		SW	20	1022.1	15.7	49		WSW	19	1023.8
20	Su	6.8	18.3	0.2			W	31	14:20	12.4	72			Calm	1029.7	17.0	49		WSW	17	1028.2
21	Mo	7.8	24.8	0			WSW	24	14:00	15.4	55			Calm	1028.2	24.3	30		W	13	1025.2
22	Tu	10.9		0						22.3	37		N	6	1023.9	28.8	16		WSW	15	1020.7
23	We	15.1	33.6				N	31	10:59	24.6	31			Calm	1019.1	32.0	11		WSW	15	1015.0
24	Th	20.3	36.6	0			SW	50	21:42	28.6	16		NE	13	1009.2	35.1	6		NW	24	1004.0
25	Fr	14.4	19.7	0			W	54	11:51	15.2	54		W	26	1011.6	17.3	52		WNW	26	1010.6
26	Sa	11.7	18.4	1.8			WSW	50	23:50	14.5	52		SW	26	1014.6	17.1	45		WSW	19	1017.0
27	Su	12.0	19.5	0			SW	31	11:46	14.7	58		SW	13	1020.5	18.6	48		WSW	15	1020.9
28	Mo	8.1	25.4	0			WSW	26	12:46	14.5	66		NE	11	1023.9	21.2	40		WSW	9	1021.0
29	Tu	14.2	32.7	0			WNW	35	12:13	23.6	28		N	13	1018.0	31.4	14		NW	17	1015.2
30	We	14.8	35.5	0			NW	37	13:50	27.8	17		NNW	15	1014.1	35.0	8		WNW	20	1011.7
31	Th	23.6	37.2	0			N	70	15:01	27.5	24		NNE	20	1009.3	36.2	10		NNE	24	1003.8
Statistics for October 2019																					
	Mean	12.3	23.8							17.7	49			12	1018.9	22.3	40			15	1016.9
	Lowest	6.4	16.8							11.8	16			Calm	1009.2	15.1	6		N	6	1003.8
	Highest	23.6	37.2	5.8			N	70		28.6	92		#	26	1030.2	36.2	89		WNW	26	1028.2
	Total			15.6																	

Observations were drawn from Adelaide (West Terrace / Ngayirdapira) {station 023000}
This is now the "official" site for Adelaide, having reopened in May 2017. Observations are also available from the Kent Town site {station number 023090}.

IDCJDW5081.201910 Prepared at 13:02 UTC on 17 Jan 2020

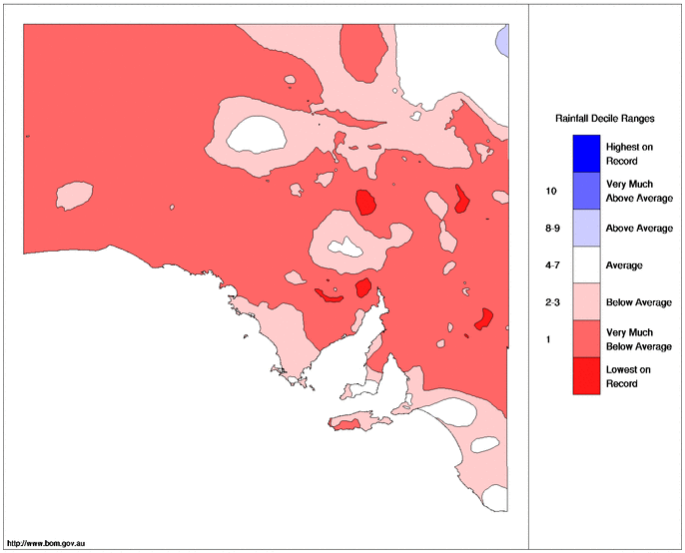
South Australia in October 2019: very dry and warm

Rainfall in October was below to very much below average in most areas of South Australia. Overall, it was South Australia's second-driest October on record. South Australia had its third-warmest October on record, with both mean maximum and mean minimum temperatures well above average.

Many records were set in October. For more information please see:
http://www.bom.gov.au/climate/current/month/sa/archive/201910.summary.shtml

South Australian Rainfall Deciles October 2019

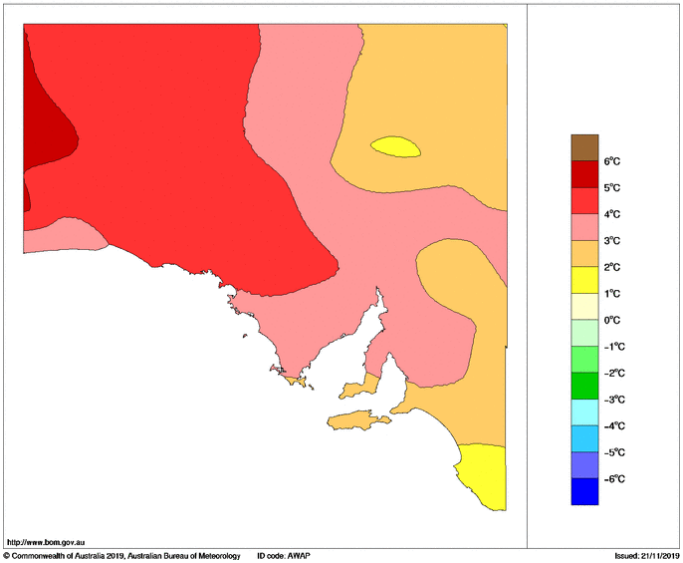
Distribution Based on Gridded Data
Australian Bureau of Meteorology



 ID code: AWAP Issued: 19/01/2020

Maximum Temperature Anomaly (°C) October 2019

Australian Bureau of Meteorology



 ID code: AWAP Issued: 21/11/2019

Adelaide (West Terrace / Ngayirdapira), South Australia
November 2019 Daily Weather Observations

Australian Government
Bureau of Meteorology

The official site for Adelaide, having reopened in May 2017.

Date	Day	Temps		Rain	Evap	Sun	Max wind gust			9am						3pm					
		Min	Max				Dirn	Spd	Time	Temp	RH	Cld	Dirn	Spd	MSLP	Temp	RH	Cld	Dirn	Spd	MSLP
		°C	°C	mm	mm	hours		km/h	local	°C	%	eighths		km/h	hPa	°C	%	eighths		km/h	hPa
1	Fr	25.2	29.6	0			S	50	16:48	28.2	34		N	15	1005.6	26.1	40		SW	9	1004.0
2	Sa	15.7	23.3	10.4			W	31	11:42	16.4	84		N	9	1010.1	22.4	25		W	15	1008.5
3	Su	13.1	19.6	5.8			SW	39	16:37	16.2	61		W	17	1015.4	17.9	49		SW	19	1016.0
4	Mo	12.6	18.7	1.0			WSW	46	14:32	14.6	67		SW	19	1020.6	17.6	52		SW	26	1021.6
5	Tu	9.4	23.4	0			NW	39	13:42	14.7	59		NW	6	1023.2	22.0	34		NW	20	1018.5
6	We	12.2	20.4	0			WSW	54	20:19	17.5	67		NW	19	1012.9	18.0	57		WSW	24	1011.5
7	Th	12.3	19.7	0			WSW	56	02:08	15.4	61		W	20	1012.5	18.3	61		W	28	1011.0
8	Fr	11.1	17.0	4.0			SSW	59	08:19	13.5	60		SW	30	1013.5	15.9	47		SW	28	1017.1
9	Sa	9.3	17.5	0.8			WSW	35	10:18	13.4	52		SW	17	1023.9	16.1	50		SW	17	1022.7
10	Su	12.9	23.5	0			SW	26	23:58	15.4	58		S	7	1021.7	21.5	34		WNW	11	1017.9
11	Mo	13.1	32.6	0			NNW	54	12:52	23.5	23		N	17	1010.5	31.7	10		NNW	24	1006.2
12	Tu	12.9	17.7	0			WSW	43	09:49	14.0	45		SW	20	1017.4	16.0	46		WSW	22	1019.2
13	We	12.5	19.5	0			SSW	33	23:04	14.9	62		SW	17	1023.5	18.3	48		WSW	15	1022.2
14	Th	12.7	19.6	0.2			SW	33	18:44	15.1	66		WNW	15	1020.9	18.4	54		WSW	11	1018.4
15	Fr	13.8	19.3	0			WSW	41	13:55	15.7	54		WSW	17	1017.0	17.5	53		WSW	22	1017.5
16	Sa	7.4	19.2	0			SW	46	15:53	14.3	51		SSE	7	1022.0	17.4	49		SW	24	1020.8
17	Su	8.2	21.6	0			WSW	31	11:32	15.5	49		SSE	11	1024.3	18.6	48		SW	17	1021.7
18	Mo	11.4	32.6	0			WNW	33	13:28	21.4	31		N	13	1017.7	31.7	12		NW	19	1013.9
19	Tu	14.2	34.0	0			SW	24	12:06	21.3	53			Calm	1013.9	25.7	46		WSW	11	1011.9
20	We	21.2	41.6	0			NW	63	12:23	34.0	13		N	15	1007.0	40.2	8		NW	35	1002.7
21	Th	16.9	21.9	0			W	46	04:33	17.0	77		SW	17	1009.1	20.6	52		SW	17	1012.0
22	Fr	10.2	21.8	0			WSW	35	11:54	16.0	55		SW	13	1019.5	20.0	19		SW	17	1017.9
23	Sa	10.5	21.9	0			SW	33	15:19	17.5	59		NNW	7	1021.6	20.6	52		SW	17	1020.1
24	Su	9.0	27.5	0			SW	24	11:27	17.0	56		NNE	9	1018.2	26.2	16		W	13	1013.8
25	Mo	14.7	27.7	0			SSW	44	17:27	22.8	23		S	7	1008.2	27.4	20		NW	17	1004.1
26	Tu	12.3	19.2	0			SW	57	00:52	15.0	48		SSW	19	1016.7	18.7	40		WSW	22	1018.4
27	We	8.7	25.4	0			WNW	28	13:24	16.7	44		N	13	1018.0	25.0	23		W	11	1015.1
28	Th	9.1	25.2	0			WSW	30	13:31	17.3	48		SSE	2	1016.6	22.8	32		SW	19	1013.2
29	Fr	10.8	19.0	0			SW	31	10:52	17.4	62		SW	11	1015.8	17.5	66		S	11	1015.4
30	Sa	9.3	19.0	1.0			SW	43	18:02	12.9	87		WSW	13	1018.7	18.7	47		SW	19	1016.8
Statistics for November 2019																					
	Mean	12.4	23.3							17.5	53			13	1016.5	21.6	39			18	1015.0
	Lowest	7.4	17.0							12.9	13		Calm		1005.6	15.9	8		SW	9	1002.7
	Highest	25.2	41.6	10.4			NW	63		34.0	87		SW	30	1024.3	40.2	66		NW	35	1022.7
	Total			23.2																	

Observations were drawn from Adelaide (West Terrace / Ngayirdapira) {station 023000}
This is now the "official" site for Adelaide, having reopened in May 2017. Observations are also available from the Kent Town site {station number 023090}.

Greater Adelaide in November 2019: drier than average

Rainfall in November was less than average across Adelaide and the Hills, though closer to the long-term average in areas south of the city. Both daytime and night-time temperatures were generally cooler than average, despite a blast of heat during a day of strong northerly winds on 20 November.

Many records were also set in November. For more information plus a summary of statistics please see:
http://www.bom.gov.au/climate/current/month/sa/archive/201911.adelaide.shtml

South Australia in November 2019

Rainfall in November was near-average over much of eastern South Australia, but there were large areas that had below average rainfall, particularly in the State's west. Daytime temperatures for November were warmer than average in the west and close to average elsewhere as numerous cool days were offset by a few very hot days. Night-time temperatures were generally cooler than average, with some areas having very much below average minimum temperatures for the month.

Many records were set in November. For more information plus a summary of statistics please see:
http://www.bom.gov.au/climate/current/month/sa/archive/201911.summary.shtml

Greater Adelaide in spring 2019: drier than average

Spring was drier than average across Adelaide and the Hills, though closer to average in some southern suburbs. Daytime temperatures were generally warmer than average, particularly in the northern suburbs and in the Hills. Night-time temperatures were generally near-average or cooler than average.

Many records were set in Spring. For more information plus a summary of statistics please see:
http://www.bom.gov.au/climate/current/season/sa/archive/201911.adelaide.shtml

South Australia in spring 2019: drier than average

Rainfall in spring was below average over most of South Australia, making it the State's third-driest spring on record and lowest spring rainfall total since 1967. Daytime temperatures in spring were warmer that average, particularly in the west, with the State's mean maximum temperature the sixth-highest on record for spring. Night-time temperatures were generally closer to average, though above average in the west and some areas of below average mean minimum temperatures in the Riverland, Mid North, and South East districts

Many records were set in Spring. For more information plus a summary of statistics please see:
http://www.bom.gov.au/climate/current/season/sa/archive/201911.summary.shtml

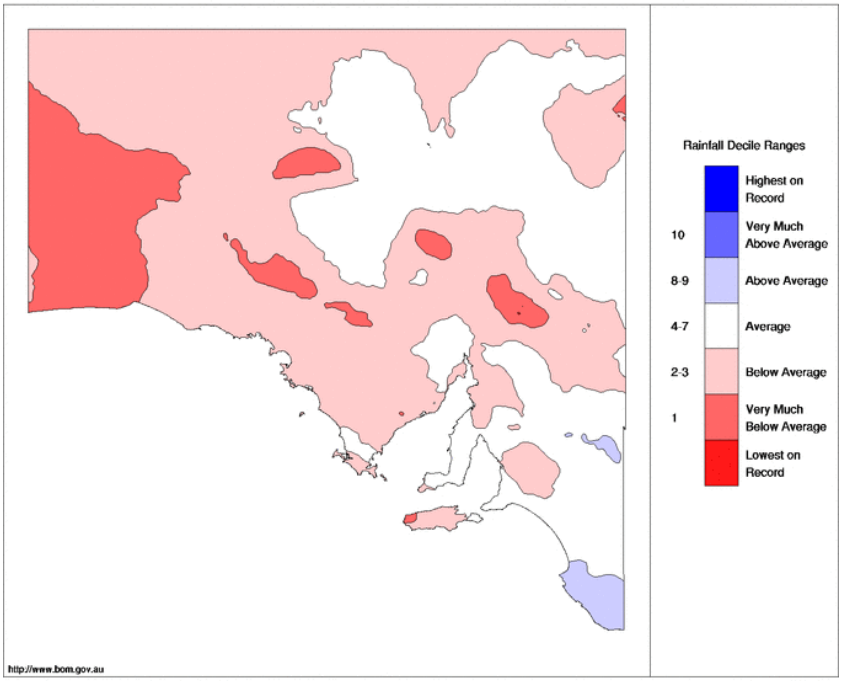
Greater Adelaide in 2019: drier than average

Rainfall in 2019 was below average to very much below average across Adelaide and the Hills. A hot end to the year ensured that daytime temperatures were warmer than average, while night-time temperatures were near-average or warmer than average.

Many other records were also set in 2019. For more information plus a summary of statistics please see:
http://www.bom.gov.au/climate/current/annual/sa/archive/2019.adelaide.shtml

South Australian Rainfall Deciles November 2019

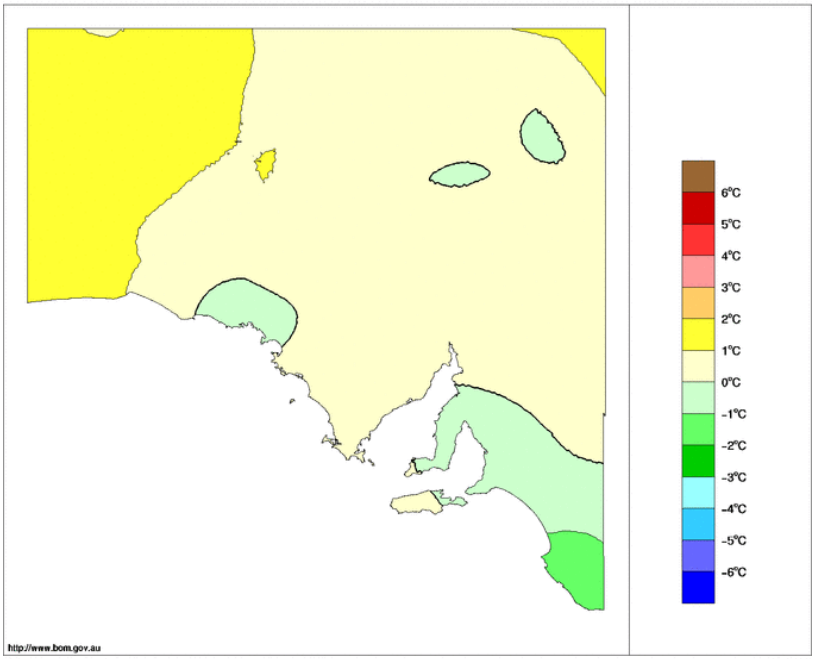
Distribution Based on Gridded Data
Australian Bureau of Meteorology



 ID code: AWAP Issued: 20/01/2020

Maximum Temperature Anomaly (°C) November 2019

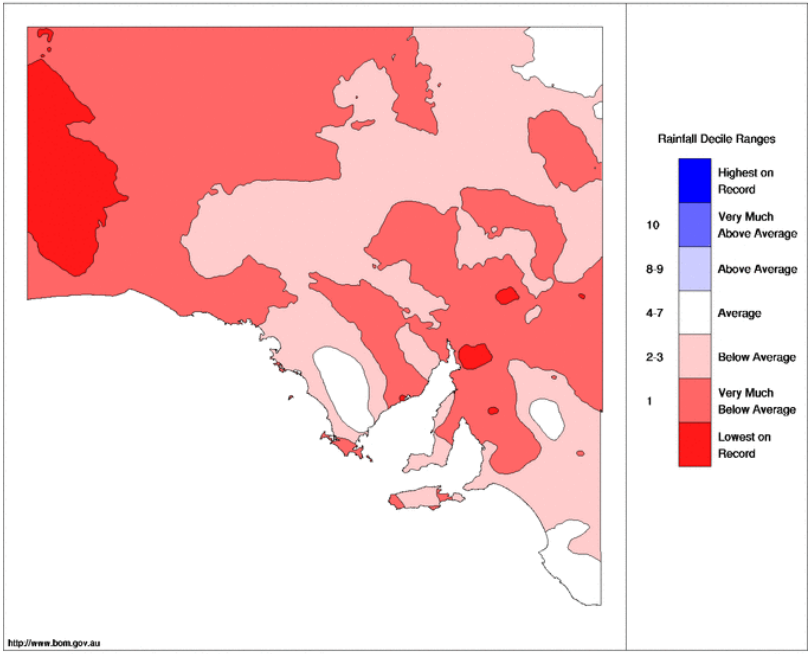
Australian Bureau of Meteorology



 ID code: AWAP Issued: 21/12/2019

South Australian Rainfall Deciles 1 September to 30 November 2019

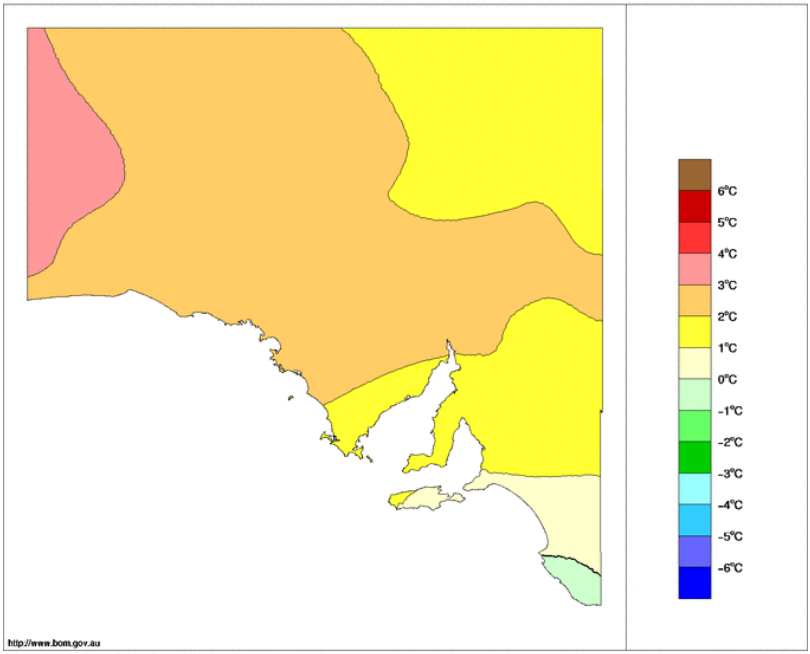
Distribution Based on Gridded Data
Australian Bureau of Meteorology



 ID code: AWAP Issued: 20/01/2020

Maximum Temperature Anomaly (°C) 1 September to 30 November 2019

Australian Bureau of Meteorology



 ID code: AWAP Issued: 21/12/2019

Adelaide (West Terrace / Ngayirdapira), South Australia
December 2019 Daily Weather Observations

The official site for Adelaide, having reopened in May 2017.

Australian Government
Bureau of Meteorology

Date	Day	Temps		Rain	Evap	Sun	Max wind gust			9am						3pm					
		Min	Max				Dirn	Spd	Time	Temp	RH	Cld	Dirn	Spd	MSLP	Temp	RH	Cld	Dirn	Spd	MSLP
		°C	°C	mm	mm	hours		km/h	local	°C	%	eighths		km/h	hPa	°C	%	eighths		km/h	hPa
1	Su	11.3	17.7	2.4			WSW	54	14:30	14.6	80		W	22	1008.7	17.7	56		WSW	24	1006.5
2	Mo	11.6	19.7	6.0			SW	56	04:21	13.0	81		SSW	19	1007.9	19.4	50		SW	20	1010.2
3	Tu	13.0	20.5	0.2			SW	39	12:56	14.8	78		SW	17	1014.9	19.8	49		SW	19	1014.8
4	We	14.2	23.0	0			WSW	26	13:18	16.5	64		W	13	1017.8	21.7	43		W	13	1015.8
5	Th	13.2	24.0	0			WSW	28	15:02	17.9	68		W	11	1014.3	22.6	54		WSW	13	1013.2
6	Fr	10.7	21.9	0			SW	37	11:59	16.0	60		SSE	9	1016.6	20.2	54		WSW	20	1015.8
7	Sa	8.6	27.0	0			WSW	28	11:48	16.4	52		ENE	7	1018.2	23.9	40		SW	17	1015.1
8	Su	14.8	38.9	0			NE	35	22:42	26.7	22		NE	15	1013.2	37.4	8		WNW	13	1010.5
9	Mo	20.7	24.7	0			SW	46	17:45	21.9	65		W	4	1014.5	20.9	64		SW	20	1017.3
10	Tu	13.9	26.5	0			S	33	15:32	17.4	63		S	13	1020.6	25.0	34		SE	11	1018.2
11	We	10.8	26.3	0			SSW	31	14:01	18.0	52		SSE	9	1019.6	25.7	33		SSE	15	1018.1
12	Th	14.3	23.3	0			SW	43	14:28	17.9	53		SE	17	1022.0	21.7	47		WSW	24	1020.8
13	Fr	12.7	20.9	0			SW	37	14:32	15.9	55		S	9	1022.6	19.3	55		WSW	19	1020.5
14	Sa	13.7	23.2	0			WSW	26	09:47	16.1	75			Calm	1019.2	20.9	43		WSW	15	1016.8
15	Su	12.4	30.2	0			SSW	30	16:34	19.3	61		WSW	6	1013.2	28.3	15		SW	11	1011.6
16	Mo	14.8	34.1	0			E	30	22:38	26.0	21		NNE	7	1014.2	32.2	16		WSW	17	1012.9
17	Tu	19.6	42.1	0			WSW	31	14:20	29.0	28		S	6	1015.2	40.9	7		SE	6	1012.2
18	We	28.6	43.7	0			W	31	14:03	35.6	13		NNE	13	1012.8	42.2	7		W	17	1010.4
19	Th	21.3	45.3	0			E	26	20:30	35.5	16			Calm	1011.9	42.9	10		ESE	7	1008.9
20	Fr	33.6	43.9	0			NW	57	12:44	38.8	12		N	19	1007.3	41.0	15		NW	24	1004.9
21	Sa	17.1	24.7	0			S	37	10:49	19.9	55		S	19	1020.1	20.0	55		SSE	15	1020.7
22	Su	12.6	27.8	0			SSE	30	23:16	18.7	44		NW	9	1021.1	25.7	25		SW	7	1018.0
23	Mo	17.3	33.4	0			SW	28	15:21	27.0	22		NNW	2	1015.8	29.0	18		WSW	17	1015.4
24	Tu	14.7	31.5	0			SW	30	16:45	24.0	53		WNW	9	1016.0	28.3	37		WSW	17	1014.4
25	We	18.1	35.5	0			WSW	33	13:12	27.2	23		WNW	6	1016.3	30.8	28		WSW	17	1015.0
26	Th	16.5	35.2	0			S	35	14:30	24.4	27		WSW	7	1018.2	33.9	18		WSW	15	1015.3
27	Fr	23.1	42.1	0			NNW	33	14:41	30.7	19		ENE	13	1012.8	40.3	10		WNW	15	1009.3
28	Sa	23.7	37.8	0			SSE	30	00:06	27.9	42		WSW	11	1012.0	36.9	20		WSW	15	1010.6
29	Su	21.6	38.4	0.2			WSW	31	08:18	32.5	22		WSW	6	1011.7	34.4	25		WSW	15	1010.7
30	Mo	26.5	41.9	0			W	54	05:50	32.3	28		NE	13	1004.5	35.0	26		SW	19	1000.7
31	Tu	14.8	24.4	0			WSW	43	14:11	18.3	46		S	17	1015.3	23.2	36		SW	24	1014.4
Statistics for December 2019																					
Mean		16.8	30.6							22.9	45			10	1015.1	28.4	32			16	1013.5
Lowest		8.6	17.7							13.0	12			Calm	1004.5	17.7	7		SE	6	1000.7
Highest		33.6	45.3	6.0			NW	57		38.8	81		W	22	1022.6	42.9	64		#	24	1020.8
Total				8.8																	

Observations were drawn from Adelaide (West Terrace / Ngayirdapira) {station 023000}
This is now the "official" site for Adelaide, having reopened in May 2017. Observations are also available from the Kent Town site {station number 023090}.

Greater Adelaide in December 2019: dry and very warm

Rainfall in December was below average throughout Adelaide and the Hills, including some northern suburbs having their driest December on record. A hot second half of the month resulted in above average mean maximum and mean minimum temperatures throughout Adelaide and the Hills.

Many other records were also set in December. For more information plus a summary of statistics please see:
http://www.bom.gov.au/climate/current/month/sa/archive/201912.adelaide.shtml

South Australia in December 2019: dry and very hot

South Australia had its warmest December on record and driest December since 1972. Rainfall was below average across most of the State, including some areas of driest on record. Both daytime and night-time temperatures were very much above average across large areas of South Australia.

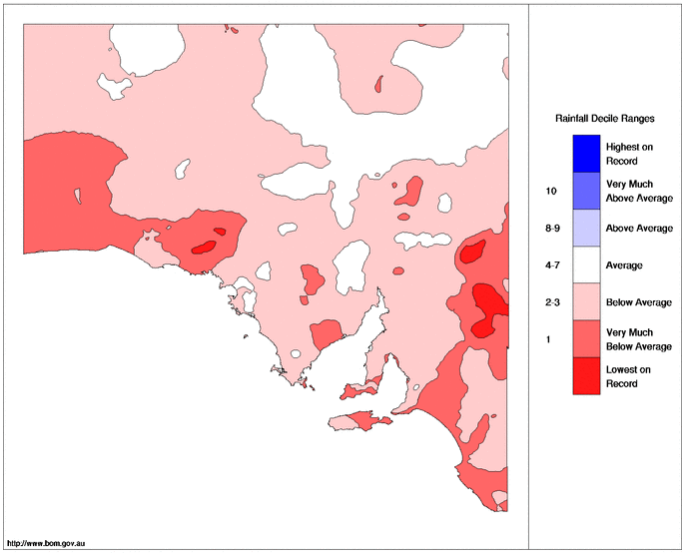
Many records were set in December. For more information plus a summary of statistics please see:

http://www.bom.gov.au/climate/current/month/sa/archive/201912.summary.shtml

South Australian Rainfall Deciles December 2019

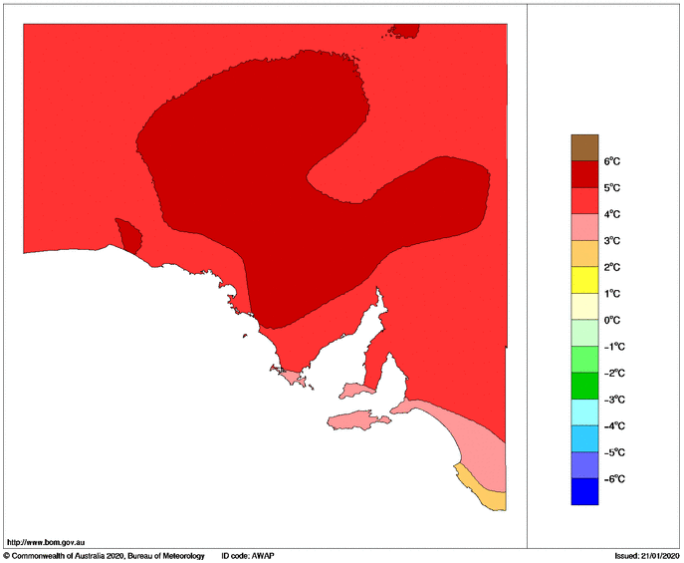
Distribution Based on Gridded Data

Australian Bureau of Meteorology



Maximum Temperature Anomaly (°C) December 2019

Australian Bureau of Meteorology



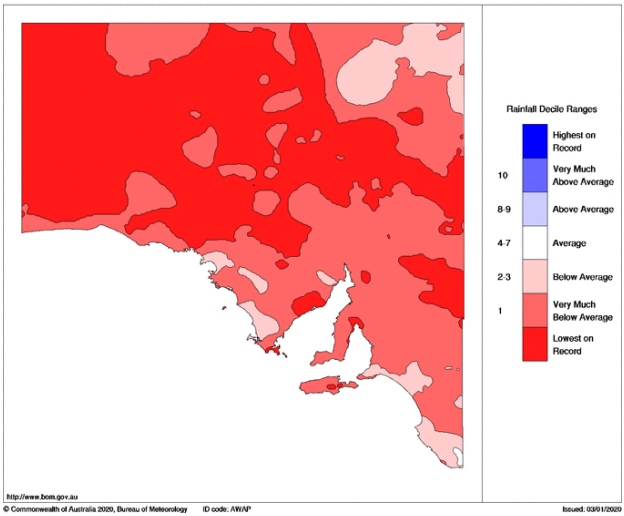
 ID code: AWAP Issued: 21/01/2020

South Australia in 2019: very dry with warm days

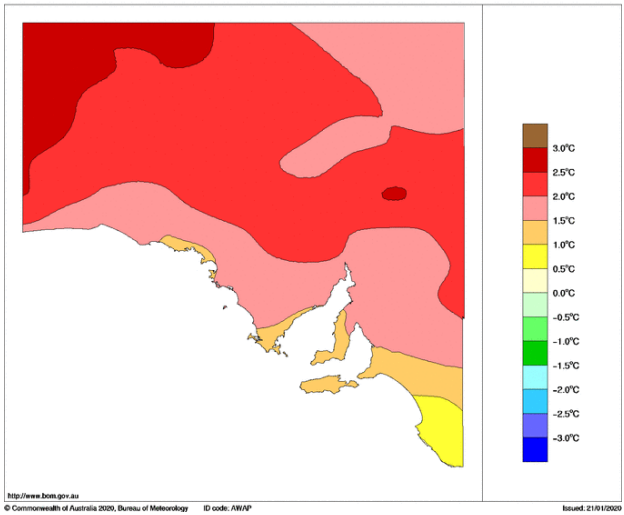
Rainfall in 2019 was below average across almost all of South Australia, including large areas of driest on record in the north and west. Overall, it was the State's driest year on record, with large areas of the Pastoral districts receiving less than 30 mm. Daytime temperatures were highest on record in many areas of the Pastoral districts and warmer than average elsewhere. Night-time temperatures were closer to average, but still warmer than average in most districts. Overall, it was South Australia's second-warmest year on record.

Many records were also set in 209. For more information plus a summary of statistics please see:
http://www.bom.gov.au/climate/current/annual/sa/archive/2019.summary.shtml

South Australian Rainfall Deciles 1 January to 31 December 2019
Distribution Based on Gridded Data
Australian Bureau of Meteorology



Maximum Temperature Anomaly (°C) 1 January to 31 December 2019
Australian Bureau of Meteorology



Adelaide (West Terrace / Ngayirdapira), South Australia
January 2020 Daily Weather Observations

The official site for Adelaide, having reopened in May 2017.

Australian Government
Bureau of Meteorology

Date	Day	Temps		Rain	Evap	Sun	Max wind gust			9am						3pm					
		Min	Max				Dirn	Spd	Time	Temp	RH	Cld	Dirn	Spd	MSLP	Temp	RH	Cld	Dirn	Spd	MSLP
		°C	°C	mm	mm	hours		km/h	local	°C	%	eighths		km/h	hPa	°C	%	eighths		km/h	hPa
1	We	11.8	25.3	0			SW	31	12:44	18.8	50		SW	9	1018.5	24.3	35		SW	17	1017.3
2	Th	13.6	31.8	0			E	26	21:43	21.4	42		WNW	2	1019.2	29.5	27		WSW	15	1015.7
3	Fr	21.2	40.6	0			SSW	44	21:45	31.7	17		NE	15	1009.0	39.6	7		WNW	20	1003.6
4	Sa	19.8	24.6	0			SSW	46	14:53	20.7	59		SW	20	1014.4	23.3	39		S	20	1014.8
5	Su	11.5	17.8	3.8			SSE	37	23:04	14.5	79		S	7	1023.6	16.0	59		SE	9	1021.2
6	Mo	13.3	27.5	1.0			SSE	35	16:17	17.2	45		NNE	6	1019.7	21.8	50		SW	17	1016.1
7	Tu	14.7	32.3	0			SE	44	21:53	22.7	42		WSW	4	1016.1	30.1	28		SW	19	1013.4
8	We	22.3	35.3	0			ESE	33	23:33	28.3	23		E	11	1015.2	33.9	16		WSW	19	1012.5
9	Th	22.6	42.1	0			WSW	43	20:11	29.3	26		NE	15	1011.0	40.2	10		NW	7	1006.5
10	Fr	22.6	22.6	0			SW	41	11:16	22.6	79		WSW	20	1009.6	16.9	84		SSW	13	1014.8
11	Sa	12.7	25.1	1.8			S	37	14:50	17.4	54		S	15	1021.8	24.1	34		SSW	19	1020.5
12	Su	11.9	30.2	0			W	28	13:04	17.2	56		WSW	6	1021.0	25.8	44		W	19	1016.0
13	Mo	16.1	34.1	0			WSW	37	17:04	26.0	30		NE	9	1012.8	32.5	17		WSW	15	1010.4
14	Tu	18.2	32.5	0			SW	28	16:29	26.8	34		S	2	1012.7	31.3	30		WSW	17	1010.3
15	We	17.4	26.5	0			SW	48	15:14	22.2	49		SW	2	1011.2	24.9	49		SW	22	1010.7
16	Th	16.2	23.6	0			S	41	17:37	18.5	46		SSE	17	1015.5	21.8	37		SSE	20	1013.8
17	Fr	12.3	24.0	0			S	46	12:22	15.6	46		SE	17	1015.6	22.3	31		SE	11	1012.4
18	Sa	12.7	26.1	0			WSW	28	14:06	17.9	58		S	2	1010.6	24.9	35		WSW	17	1007.4
19	Su	16.0	22.2	0			SSW	41	16:06	18.2	68		SSW	9	1009.3	20.5	53		SW	15	1008.0
20	Mo	15.1	20.1	13.6			SSW	37	12:19	15.6	91		SSW	15	1010.6	18.7	67		SSE	15	1011.3
21	Tu	15.4	27.4	0			W	33	15:44	17.2	63		NE	7	1012.2	24.2	33		NW	11	1008.2
22	We	17.2	25.9	0			WNW	41	22:58	24.8	29		NNW	11	999.3	20.8	57		SW	15	1001.0
23	Th	14.1	20.9	5.8			W	52	08:24	17.0	65		WSW	30	1001.3	19.7	49		SW	22	1006.0
24	Fr	16.0	23.7	0.2			WSW	31	02:04	19.0	52		WSW	17	1014.4	22.4	50		W	17	1015.0
25	Sa	16.1	25.7	0			WSW	28	13:31	18.7	74		N	6	1016.4	24.3	49		W	11	1014.8
26	Su	15.9	26.6	0			SW	31	12:26	20.1	73		S	2	1016.6	24.5	49		WSW	19	1014.8
27	Mo	15.0	27.1	0			WSW	30	12:01	20.4	68		NNE	4	1016.1	24.5	55		WSW	15	1014.7
28	Tu	12.7	30.8	0			SW	30	16:31	20.2	55			Calm	1017.2	28.6	30		SW	17	1014.9
29	We	15.1	38.8	0			N	30	11:16	24.1	35		NNW	2	1016.0	37.9	9		NNE	11	1011.8
30	Th	23.1	43.3	0			NE	33	10:59	32.8	12		NE	11	1009.1	41.5	6		WSW	13	1005.1
31	Fr	29.0	35.6	0			NW	43	13:31	30.8	58		NNW	13	1005.9	34.5	46		NW	22	1002.9
Statistics for January 2020																					
	Mean	16.5	28.7							21.5	50			9	1013.6	26.6	38			16	1011.8
	Lowest	11.5	17.8							14.5	12		Calm	999.3		16.0	6		NW	7	1001.0
	Highest	29.0	43.3	13.6			W	52		32.8	91		WSW	30	1023.6	41.5	84		#	22	1021.2
	Total			26.2																	

Observations were drawn from Adelaide (West Terrace / Ngayirdapira) (station 023000)

This is now the "official" site for Adelaide, having reopened in May 2017. Observations are also available from the Kent Town site (station number 023090).

Greater Adelaide in January 2020

Rainfall for January was above average in the south and east, but it was generally drier than average in suburbs north of the city. Both daytime and night-time temperatures were generally cooler than average for January, despite several very hot days.

Many records were set in January. For more information plus a summary of statistics please see:
http://www.bom.gov.au/climate/current/month/sa/archive/202001.adelaide.shtml

South Australia in January 2020

Rainfall in January was below average for South Australia as a whole, but it was a wetter than average month in the west and for some central districts. Both daytime and night-time temperatures were generally close to average, but it was a warmer than average month in the State's north.

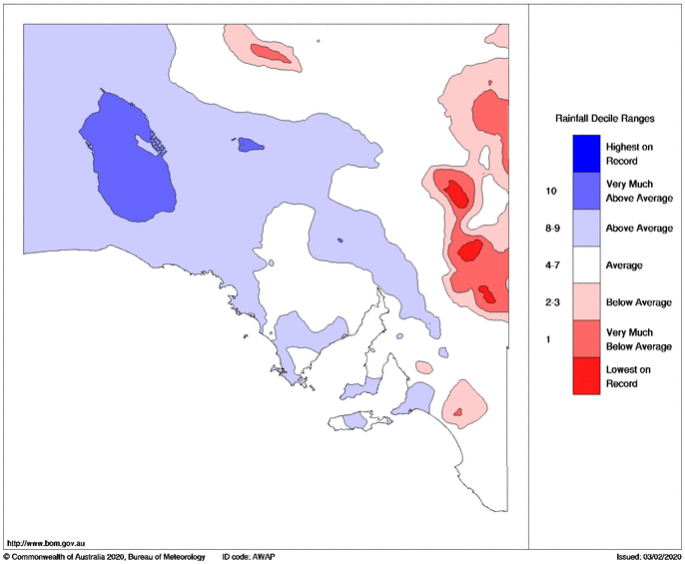
Many records were set in January. For more information plus a summary of statistics please see:

http://www.bom.gov.au/climate/current/month/sa/archive/202001.summary.shtml

South Australian Rainfall Deciles January 2020

Distribution Based on Gridded Data

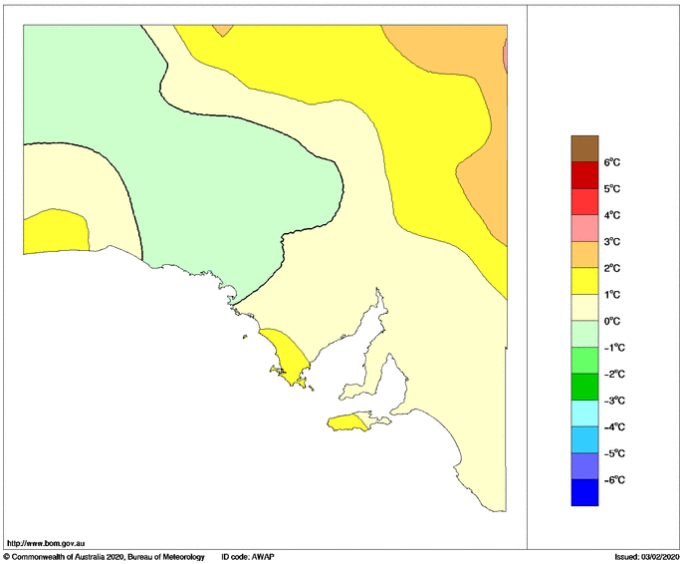
Australian Bureau of Meteorology



 ID code: AWAP Issued: 03/02/2020

Maximum Temperature Anomaly (°C) January 2020

Australian Bureau of Meteorology



 ID code: AWAP Issued: 03/02/2020

NEXT MEETING

6.00 PM TUESDAY 18 February 2020

Bureau of Meteorology offices, Level 4, Optus Building, NW corner of South Terrace & King William Street , Adelaide

Presentation : Hot Weather - it's effects on our urban environment

SPEAKER: Greg Ingleton - Business Development Manager - Environmental Opportunities at SA Water

Greg's passion is improving our living environment by using water in innovative ways to cool our urban areas, to more effectively irrigate our gardens and to facilitate the sustainable use of alternative water sources. He has a depth of practical experience to pass on to anyone living with Adelaide's dry summer heat.

His most publicised application is our airport's 3-year experiment with growing alfalfa to reduce ambient summer heat by 3^0. Greg's results were featured at an international airport conference last year. At scale, returns would be lower aircraft fuel use and air conditioning costs, carbon sequestration by the crops, and commercial cropping opportunities.

The meeting will be opened by South Australia's only independent climatologist, AMETA Secretary Darren Ray, who will review our summer so far then give us a prognosis for the coming months. Also, AMETA President, Mark Little will give a brief presentation on the set-up and use of personal weather stations using weather sensors and cheap computer hardware..

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

We look forward to seeing you.

For further information contact:

Secretary:	*Darren Ray*
Phone:	*8366 2664*
Fax:	*8366 2693*

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