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EVIDENCE ACT 1995 SECTION 155

FROM THE OFFICIAL METEOROLOGICAL RECORDS OF THE COMMONWEALTH OF AUSTRALIA

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Bureau of Meteorology Data Document 123ABC1234-1

Canberra area weather observations

This document, prepared on 25 September 2024, contains:

- Automatic Weather Observations on 1 March 2024 for the Bureau of Meteorology weather reporting site Canberra Airport.
- Daily Weather Observations on 1 March 2024 for the Bureau of Meteorology weather reporting site Canberra Airport.
- Daily Rainfall Observations from 1 March 2024 to 2 March 2024 (inclusive) for the Bureau of Meteorology weather reporting sites Canberra Airport, Bruce (Australian Institute of Sport), Aranda (Bindaga St) and Torrens (Darke St).

Included in Appendix A is a table with station details for the Bureau sites used to prepare this report.
Information to assist with your interpretation of the weather observations is included in Appendix B.
A copy of the Beaufort Wind Scale, which provides a reference for wind speed, is included in Appendix C.

Automatic Weather Observations for Canberra Airport

Canberra Airport (Site No. 70351)									
Date	Time (LCT)	Rain since 9am (mm)	Air Temp (°C)	Dewpoint Temp (°C)	Relative Humidity (%)	Wind Speed (km/h)	Wind Direction (degrees)	Wind Gust (km/h)	MSL Pressure (hPa)
01/03/2024	12:00 AM	0.0	23.2	15.3	61	15	330	21	1015.3
01/03/2024	12:30 AM	0.0	22.9	15.7	64	9	040	11	1015.1
01/03/2024	01:00 AM	0.0	21.9	15.7	68	9	040	13	1015.1
01/03/2024	01:30 AM	0.0	22.7	16.5	68	13	040	15	1015.0
01/03/2024	02:00 AM	0.0	22.2	16.5	70	8	030	11	1014.8
01/03/2024	02:30 AM	0.0	22.4	16.7	70	13	040	15	1014.7
01/03/2024	03:00 AM	0.0	22.4	16.4	69	13	030	17	1014.6
01/03/2024	03:30 AM	0.0	22.0	16.3	70	15	030	18	1014.2
01/03/2024	04:00 AM	0.0	21.5	16.2	72	11	020	15	1013.8
01/03/2024	04:30 AM	0.0	19.3	15.2	77	8	010	9	1013.8
01/03/2024	05:00 AM	0.0	18.5	16.3	87	0	000	0	1013.9
01/03/2024	05:30 AM	0.0	17.6	15.2	86	5	010	8	1013.8
01/03/2024	06:00 AM	0.0	17.8	15.6	87	8	010	8	1014.7

Daily Weather Observations for Canberra Airport

Canberra Airport (Site No. 70351)																	
Date	**Max Temp (°C)**	**No. of days**	**QC**	**Time of Max Temp (LCT)**	**QC**	**Min Temp (°C)**	**No. of days**	**QC**	**Time of Min Temp (LCT)**	**QC**	**Max Wind Gust (km/h)**	**QC**	**Max Wind Gust Direction (degrees)**	**QC**	**Time of Max Wind Gust (LCT)**	**QC**	**No. of days**
01/03/2024	33.2	1	N	02:12 PM	N	16.2	1	N	06:06 AM	N	48	N	251	N	02:07 PM	N	1

Daily Rainfall Observations

	Canberra Airport (Site No. 70351)			Bruce (Australian Institute of Sport) (Site No. 70307)			Aranda (Bindaga St) (Site No. 70242)			Torrens (Darke St) (Site No. 70308)		
Date	**Rain to 9am (mm)**	**No of days**	**QC**	**Rain to 9am (mm)**	**No of days**	**QC**	**Rain to 9am (mm)**	**No of days**	**QC**	**Rain to 9am (mm)**	**No of days**	**QC**
01/03/2024	0.0	1	N	0.0		N	0.0		N	0.2	1	N
02/03/2024	0.0	1	N	0.0		N	0.8	1	N	0.0		N

Appendix A: Location of sites provided

Please note that not all weather stations report all types and frequencies of data. Data from the closest weather stations to the area of interest that report the data requested have generally been included in this document.

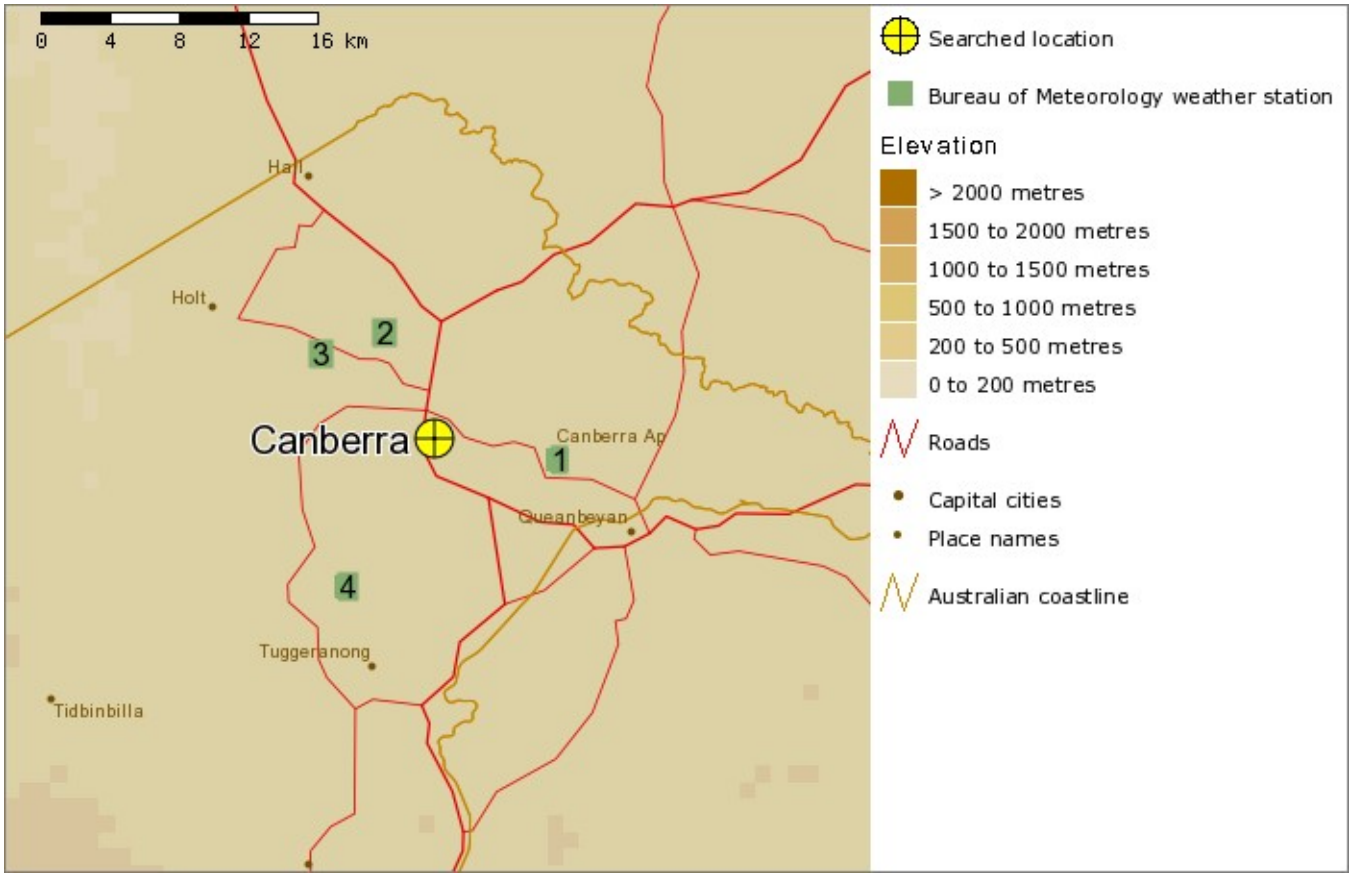

Figure 1: Map of Bureau of Meteorology weather stations in the Canberra area included in Bureau of Meteorology Data Document 123ABC1234-2

Label	Site Name	Site No.	Distance (km)	Elevation (m)	Latitude	Longitude
1	Canberra Airport	070351	5.9	577.1	-35.3106	149.197
2	Bruce (Australian Institute of Sport)	070307	6.5	610	-35.2459	149.1067
3	Aranda (Bindaga St)	070242	7.2	630	-35.2572	149.0742
4	Torrens (Darke St)	070308	9.4	653	-35.3757	149.087

Table 1: Station details of Bureau of Meteorology weather stations in the Canberra area included in Bureau of Meteorology Data Document 123ABC1234-2

Appendix B: Observation Notes

The following notes are provided to assist with your interpretation of the supplied weather observations.

General Information

Date and time

Observation Date and Time are expressed in Local Clock Time (LCT). LCT is the 'clock time' and is normally the same as Local Standard Time, but reflects Daylight Saving where applicable. For further information on the various time-zones used across Australia, please refer to:
http://www.bom.gov.au/climate/averages/tables/daysavtm.shtml.

Date format is in dd/mm/yyyy, whilst Time format is hh:mm AM/PM.

Gaps and missing data

Very few sites have a complete unbroken record of climate information. A site may have been closed, reopened, upgraded to a full weather site or downgraded to a rainfall only site during its existence, causing breaks in the record for some or all elements. Some gaps may be for one element due to a damaged instrument, others may be for all elements due to the absence or illness of an observer. Some elements are only recorded when an observer is present. When suspect data have been identified through the quality control process, these data have been excluded.

Where there are gaps in the data tables provided, that means that no data is available.

Quality control (QC)

Recent data may not have been fully quality controlled, indicated by an "N" in the QC columns. This means the data is 'as read'. This does not mean that the data is incorrect, merely that the full quality control process has not been completed.

Data that has been quality controlled and found to be acceptable has a quality flag of "Y".
Data that has been quality controlled and found to be suspect has a quality flag of "S".
Data that has been quality controlled and found to be wrong has a quality flag of "W".
Data that has been quality controlled and found to be inconsistent with other known information has a quality flag of "I".

In tables where "QC" columns are included, the QC value relates to the observed value in the column immediately to its left.

General Observation Notes

Rainfall is measured either manually using a 203 mm rain gauge, or automatically using a "Tipping Bucket Rain Gauge". Rainfall includes all forms of water particles, whether liquid (for example, rain or drizzle) or solid (hail or snow), that fall from clouds and reach the ground at the point of observation. For more information please refer to: http://www.bom.gov.au/climate/how/observations/rain-measure.shtml.

Temperature (including air temperature, dewpoint temperature and wet bulb temperature) is recorded in a Stevenson Screen, which allows for good air flow across the thermometers, and prevents heating from direct

sunlight. The height of the thermometers is approximately 1.2 m above the ground. For more information please refer to: http://www.bom.gov.au/climate/cdo/about/airtemp-measure.shtml.

Dewpoint Temperature is the temperature to which the air must be cooled, without change in pressure and water vapour content, in order for condensation of water vapour to occur. It therefore directly indicates the moisture content of the air; a low value indicates dry air. The closer the dewpoint is to the air temperature, the more moist the air and the higher the relative humidity.

Relative humidity (RH) indicates the moisture content of the air. It is the ratio of the amount of moisture actually in the air to the maximum amount of moisture which the air could hold at the same temperature. RH is obtained either from measurements by an electronic relative humidity sensor or derived via complex equations from wet and dry bulb temperature observations. There can be slight differences between RH values measured directly by a relative humidity sensor and those derived using equations. Typically these differences are less than 1%. In very dry air as RH approaches 0%, and in very humid conditions as RH approaches 100%, the uncertainty associated with RH data increases. There are some occasions when reported RH values may slightly exceed 100%. In these instances you should consider the value to be 100%.

Wind speed and direction are generally measured using an anemometer at a height of approximately 10 metres above the surface. However, at some sites, typically those without an Automatic Weather Station (AWS), wind speed may be estimated visually using the Beaufort Wind Scale. Refer to "Appendix C - Beaufort Wind Scale" for wind speed categories. Wind direction is measured clockwise from True North and indicates the direction from which the wind is blowing. For example 090 is equivalent to a wind coming directly from the east. Calm conditions are expressed as 0 in both wind direction and wind speed.

Mean Sea Level Pressure is the atmospheric pressure converted to an equivalent pressure at sea level. The use of MSLP allows for comparison of sites at different elevations.

Automatic visibility observations are made with a visibility meter. Visibility meters measure air clarity using the principle of forward scattering of visible light. Light is transmitted from a high intensity source and beamed into a scattering volume which is viewed by a receiver. The amount of light received is expressed as a measure of visibility and is expressed in metres (m). The information should be used with care as it samples only a small volume of air. Where visibility is given as 10km, this most likely means that visibility is 10km or more. For more information about visibility meters, please refer to the reference material available at: http://www.bom.gov.au/aviation/data/education/ceilometer-visibility.pdf.

Automatic cloud observations are made by a ceilometer. The ceilometer is an instrument which uses a vertical laser beam to estimate the cloud amounts and heights. The instrument only samples the sky directly above it and so care should be taken when using these values for estimates of whole sky amounts. The data are collected over a half hour period and then processed to produce estimates. The data in the most recent 10 minute period are given a double weighting to produce a better response time in situations when cloud cover is changing rapidly. The ceilometer reports heights to 12,500 feet. For more information about ceilometers, please refer to the reference material available at: http://www.bom.gov.au/aviation/data/education/ceilometer-visibility.pdf.

Data table notes

Notes for Automatic Weather Observations Table:

1. Automatic Weather Stations (AWSs) provide observations of meteorological conditions, generally reporting at one-minute, half-hourly or hourly intervals.
2. All Bureau of Meteorology AWS equipment is designed and maintained to Bureau of Meteorology standards. Apart from routine inspections, no further quality control of half-hourly or hourly AWS observations is undertaken.
3. Bureau of Meteorology AWSs are unable to make audio or visual observations, so they do not report the occurrence of thunderstorms, fog, or other weather phenomena.
4. Rain since 9am is expressed in millimetres (mm), and is the cumulative precipitation recorded since 9am local time. The rainfall total is reset to zero daily at 9am local time.
5. Air Temp refers to the air temperature at the time expressed in degrees Celsius (°C).
6. Dewpoint Temp refers to the dewpoint temperature at that time expressed in degrees Celsius (°C).
7. Relative Humidity is for the time indicated and is expressed as a percentage (%).
8. Most of the Bureau of Meteorology's Automatic Weather Stations report observations of air temperature, dew-point temperature, relative humidity and pressure as instantaneous values (1-second samples). A small proportion of our Automatic Weather Stations report a 1-minute average for air temperature, dewpoint temperature, relative humidity and pressure. The difference, if any, between these reporting periods is insignificant.
9. Wind Speed is expressed in kilometres per hour (km/h) and is the average wind speed, usually observed over the 10 minutes prior to the observation time. When a significant wind change occurs during the 10 minute period prior to an observation, additional special observations may be reported by the AWS. In these cases, the wind data is not always averaged over the standard 10 minute averaging period.
10. Wind Direction is expressed in degrees (true) and is the mean wind direction averaged over the same period as the wind speed, typically during the 10 minute period up until the observation time. It is rounded to the nearest 10 degrees.
11. Wind Gust is expressed in kilometres per hour (km/h) and refers to the maximum 3-second wind speed over the same period as the wind speed, typically 10 minutes prior to the indicated time. When the wind direction and wind speed are both zero, wind gust is also assumed to be zero.
12. MSL Pressure refers to the mean sea level pressure (MSLP) expressed in hectopascals (hPa).

Notes for Daily Data Table:

1. Maximum temperature is expressed in degrees Celsius (°C) and is the highest air temperature recorded during the 24-hour period starting at 9am on the indicated date. Sometimes this is only reported to the nearest whole degree.
2. The time of maximum temperature is expressed in Local Clock Time (LCT) and is the time of the highest air temperature in the 24-hour period starting at 9am on the indicated date. Normally, the time of maximum temperature will occur during mid-afternoon on the date shown, but may occur at any time in the 24-hour period from 9am.
3. Minimum temperature is expressed in degrees Celsius (°C) and is the lowest air temperature recorded during the 24-hour period prior to 9am on the indicated date. Sometimes this is only reported to the nearest whole degree.

4. The time of minimum temperature is expressed in Local Clock Time and is the time of the lowest air temperature in the 24-hour period prior 9am on the indicated date. Normally, the time of minimum temperature will occur near dawn on the date shown, but may occur at any time in the 24-hour period prior to 9am.
5. Maximum Wind Gust:
   a. Speed is expressed in kilometres per hour (km/h) and is the maximum 3 second wind speed observed in the 24-hour period ending at midnight on the date shown.
   b. Direction is expressed in degrees (true), measured clockwise from True North, and indicates the direction from which the Maximum Wind Gust originated.
   c. Time is expressed in Local Clock Time and is the observed time of the Maximum Wind Gust in the 24-hour period ending at midnight on the date shown. Should the Maximum Wind Gust occur on multiple instances during this period, the time of the first instance is reported.

Notes for Daily Rainfall Table:

1. Rain to 9am is expressed in millimetres (mm) and is the total amount of precipitation recorded in the 24 hours ending at 9am on the date indicated, unless indicated as a multi-day total (see point 2 below). Rainfall is usually recorded in increments of 0.2 mm. Some sites that are part of the Flood Warning network may report rainfall to the nearest whole mm.
2. The "No of Days" refers to the number of days over which the rainfall total was collected. For example a 2 day rainfall accumulation refers to the 48 hour period prior to 9am on the indicated date. For observations which span more than one day it indicates that there were multiple dates on which the rainfall may have occurred. For rainfall totals of 0.0 mm, the "No of Days" column will either be blank, or have "1" displayed.

Appendix C: Beaufort Wind Scale

Please note: The Beaufort scale applies to mean winds and not wind gusts. Beaufort scale numbers and descriptive terms such as 'near gale', 'strong gale' and 'violent storm' are not normally used in Bureau of Meteorology communications or forecasts.

Beaufort Scale No.	Descriptive Term	Units in km/h	Units in knots*	Description on Land	Description at Sea
0	Calm	0	0	Smoke rises vertically	Sea like a mirror.
1-3	Light winds	19 km/h or less	10 knots or less	Wind felt on face; leaves rustle; ordinary vanes moved by wind.	Small wavelets, ripples formed but do not break: A glassy appearance maintained.
4	Moderate winds	20 - 29 km/h	11-16 knots	Raises dust and loose paper; small branches are moved.	Small waves - becoming longer; fairly frequent white horses.
5	Fresh winds	30 - 39 km/h	17-21 knots	Small trees in leaf begin to sway; crested wavelets form on inland waters	Moderate waves, taking a more pronounced long form; many white horses are formed - a chance of some spray
6	Strong winds	40 - 50 km/h	22-27 knots	Large branches in motion; whistling heard in telephone wires; umbrellas used with difficulty.	Large waves begin to form; the white foam crests are more extensive with probably some spray
7	Near gale	51 - 62 km/h	28-33 knots	Whole trees in motion; inconvenience felt when walking against wind.	Sea heaps up and white foam from breaking waves begins to be blown in streaks along direction of wind.
8	Gale	63 - 75 km/h	34-40 knots	Twigs break off trees; progress generally impeded.	Moderately high waves of greater length; edges of crests begin to break into spindrift; foam is blown in well-marked streaks along the direction of the wind.
9	Strong gale	76 - 87 km/h	41-47 knots	Slight structural damage occurs -roofing dislodged; larger branches break off.	High waves; dense streaks of foam; crests of waves begin to topple, tumble and roll over; spray may affect visibility.
10	Storm	88 - 102 km/h	48-55 knots	Seldom experienced inland; trees uprooted; considerable structural damage.	Very high waves with long overhanging crests; the resulting foam in great patches is blown in dense white streaks; the surface of the sea takes on a white appearance; the tumbling of the sea becomes heavy with visibility affected.
11	Violent storm	103 -117 km/h	56-63 knots	Very rarely experienced - widespread damage	Exceptionally high waves; small and medium sized ships occasionally lost from view behind waves; the sea is completely covered with long white patches of foam; the edges of wave crests are blown into froth.
12+	Hurricane	118 km/h or more	64 knots or more	Very rarely experienced - widespread damage	The air is filled with foam and spray. Sea completely white with driving spray; visibility very seriously affected

*Conversions of knots to kilometres per hour are not exact because of established conventions.