

State-based Observations – 10 minute updates

User guide – version 1.1 – updated 12 June 2023

Observations in these files are updated from the same real-time database as the Latest Weather Observation tables on the Bureau of Meteorology web site (see Table 1). Data is sourced from Automatic Weather Stations, including some portable automatic weather stations (PAWS) and from some sites that are manually operated and update less frequently.

File Location

Files appear in the /fwo subdirectory of Registered Users' directories.

Files are also available via anonymous FTP at: <ftp://ftp.bom.gov.au/anon/gen/fwo/>. Please note that use of data from anonymous FTP should be in accordance with the [copyright notice](#) and [disclaimer](#).

Products

Table 1 provides a list of products included in the Observations – Australia – 10 min updates (IDB00009) bundle and links to weather observation station tables and maps for each state/territory.

Product Code	State/Territory	Weather Observation Station Table	Weather Observation Station Map
IDD60920	Northern Territory (NT)	NT Station Table	NT Station Map
IDN60920	New South Wales (NSW) and Australian Capital Territory (ACT)	NSW and ACT Station Table	NSW and ACT Station Map
IDQ60920	Queensland (QLD)	QLD Station Table	QLD Station Map
IDS60920	South Australia (SA)	SA Station Table	SA Station Map
IDT60920	Tasmania (TAS)	TAS Station Table	TAS Station Map
IDV60920	Victoria (VIC)	VIC Station Table	VIC Station Map
IDW60920	Western Australia (WA)	WA Station Table	WA Station Map

Table 1 Links to weather observation station tables and maps

File Naming Convention

Files are overwritten with each issue and file names are unchanging allowing for direct addressing. Product files conform to the following naming convention:

IDX60920.xml

File-name key

IDX60920	Product Code as listed in Table 1
X	represents the state/territory of origin – D for Northern Territory, N for NSW and ACT, Q for Queensland, S for South Australia, T for Tasmania, V for Victoria and W for Western Australia

File Update Frequency

Every ten minutes, at x:00, x:10, x:20, x:30, x:40, x:50.

Observation Source Types

Data shown is sourced from a number of message types. The source message from the automatic weather station (AWS) determines which meteorological elements are displayed in the product.

For wind measurements, the source message also determines how the wind value is calculated (see Table 2). The source message type for wind information is given by the attribute *wind-src*.

Message types used at each site are determined based on the following hierarchy (most preferred to least preferred):

- **OMD**: One minute frequency messages. As far as possible, all sensors connected to an AWS are polled once per second; values are reported as per Table 2.
- **metar**: METAR format, issued either half-hourly or hourly (on the hour or half-hour). Includes SPECI messages issued at non-standard times where conditions change significantly from the preceding message.
- **metar_10**: METAR format, issued either half-hourly or hourly (on the hour or half-hour). Does not include SPECI messages.
- **mdf, synop**: Sites which update only at three-hourly or less frequent intervals are sourced from SYNOP messages, which are manually generated by Bureau observers. Those with the type "Non-AWS" are usually SYNOP messages.
- **TMD**: Ten-minute frequency messages. This message format has been superseded and is being replaced by one minute data and METAR messages.

Table 2 provides a list of the headings and their meanings.

Heading	Meaning
Date/time	Time is given in both local time (time-local) and UTC (time-utc).
air_temperature	Last valid one second sample of the specified minute.
apparent_temp	Steadman Apparent Temperature, calculated using temperature, relative humidity and wind speed.
dew_point	Calculated from either wet and dry bulb temperature (preferred) or air temperature and relative humidity.
rel-humidity	Calculated from either wet and dry bulb temperature (preferred) or directly measured by a humidity sensing probe. Last valid one second sample of the specified minute (where directly measured).
delta_t	Air temperature minus wet bulb temperature. Not included for Antarctic observations.
wind_dir	Calculated using a trigonometric technique, given as one of 16 cardinal points. Calm conditions displayed as "CALM". <ul style="list-style-type: none"> • OMD: Mean over one minute. • metar: See Appendix 3. • metar_10, synop, mdf: Mean over ten minutes.
wind_dir_deg	Calm conditions displayed as "0". <ul style="list-style-type: none"> • One minute: Mean over one minute. • metar: See Appendix 3. • metar_10, synop, mdf: Mean over ten minutes.
wind_spd_kmh	<ul style="list-style-type: none"> • OMD: Mean (km/h) over one minute. • metar: See Appendix 3. • metar_10, synop, mdf: Mean (km/h) over ten minutes.
gust_kmh	<ul style="list-style-type: none"> • OMD: The highest three second mean wind speed (km/h) over the one-minute period. • metar, metar_10: The highest three second mean wind speed (km/h) over the ten-minute period. • synop, mdf: Not available.
wind_spd	<ul style="list-style-type: none"> • OMD: Mean (knots) over one minute. • metar: See Appendix 3. • metar_10, synop, mdf: Mean (knots) over ten minutes.
wind_gust_spd	<ul style="list-style-type: none"> • OMD: The highest three second mean wind speed (knots) over the one-minute period. • metar, metar_10: The highest three second mean wind speed (knots) over the ten-minute period. • synop, mdf: Not available.
pres	Sourced from either QNH or mean sea level pressure (MSLP). Where both QNH and MSLP are available, the value shown is MSLP. Last valid one second sample of the specified minute.

Heading	Meaning
qnh_pres	Last valid one second sample of the specified minute.
msl_pres	Last valid one second sample of the specified minute.
rainfall	Precipitation during the stated period, usually since 9am local time. Some amounts may be rounded to the nearest millimetre.
rain_ten	Precipitation over the ten minutes preceding the observation time (metar and metar_10 only).
rain_hour	Precipitation over the hour preceding the observation time (metar and metar_10 only).
maximum_air_temperature	The highest sampled temperature from 6am to 9pm on the current calendar day. Observed time of this value is also given. Note: Maximum temperatures in the Bureau's climate records are measured from 9 am to 9 am and may differ from the values shown in the table.
minimum_air_temperature	The lowest sampled temperature from 6pm through to 9am on the current calendar day. Observed time of this value is also given. Note: Maximum temperatures in the Bureau's climate records are measured from 9 am to 9 am and may differ from the values shown in the table.
maximum_gust_dir	Wind direction at the time of highest wind gust, given as one of 16 cardinal points.
maximum_gust_kmh	Highest three second mean wind speed (km/h) measured from midnight to midnight for the current calendar day.
maximum_gust_spd	Highest three second mean wind speed (knots) measured from midnight to midnight for the current calendar day.
weather	Observed weather type (see Appendix 1) where manual observations are available (synop, mdf only).
cloud	Cloud description (see Appendix 2) generated either from ceilometer data at aerodrome AWSs or from manual observations where available. <ul style="list-style-type: none"> • OMD: Last valid one second sample of the specified minute (automated only). • metar, metar_10: Last valid one second (automated) sample of the specified minute or manual observation at the stated time. • synop, mdf: Manual observation at the stated time.
cloud_type	Observed cloud type (see Appendix 4) where manual observations are available (synop, mdf only).
cloud_type_ID	Observed cloud type ID (see Appendix 4) where manual observations are available (synop, mdf only).

Heading	Meaning
vis_km	<p>Visibility generated either from visibility meter data at aerodrome AWSs or from manual observations where available.</p> <ul style="list-style-type: none"> • OMD: Last valid one second sample of the specified minute (automated only). • metar, metar_10: Last valid one second (automated) sample of the specified minute or manual observation at the stated time. • synop, mdf: Manual observation at the stated time.
trend_pres	<p>Observed weather type where manual observations are available (synop, mdf only). 'R' indicates pressure rising; 'S' pressure steady; 'F' pressure falling.</p>
sea_height	<p>Manual observations at coastal sites (synop, mdf only). '+' indicates 'greater than', '<' indicates 'less than'.</p>
swell_height	<p>Manual observations at coastal sites (synop, mdf only). '+' indicates 'greater than', '<' indicates 'less than'.</p>
swell_period	<p>Manual observations at coastal sites (synop, mdf only). '+' indicates 'greater than', '<' indicates 'less than'.</p>
swell_dir	<p>Manual observations at coastal sites (synop, mdf only). Direction the swell comes from, given as one of eight cardinal points. 'CF' indicates confused swell, 'NS' indicates no swell.</p>

Table 2 List of headings and meanings.

Information on the elements themselves can be found here:

<http://www.bom.gov.au/catalogue/observations/about.shtml>

Contact us

For further enquiries please connect with us via webreg@bom.gov.au

Appendix 1 – Weather Types

Please be aware that these values are free text entered by an observer and may include contractions or typographical errors.

Fine

Smoke

Haze

Dust

Dust whirls

Dust storm

Mist

Fog patches

Shallow fog

Lightning

Distant/nearby virga

Distant precipitation

Thunder

Squall

Funnel cloud

Recent drizzle

Recent rain

Recent snow

Recent rain and snow

Recent precipitation

Recent shower

Recent hail

Recent fog

Recent thunderstorm

Dust storm

Severe dust storm

Drifting snow

Blowing snow

Distant fog

Fog

Drizzle

Freezing drizzle

Rain



Freezing rain
Sleet
Snow
Ice prisms
Snow grains
Starlike crystals
Ice pellets
Shower
Violent shower
Snow shower
Soft hail shower
Hail shower
Thunderstorm
Thunderstorm and hail
Heavy thunderstorm
Thunderstorm and dust

Appendix 2 – Cloud Values

0 oktas: "Clear"
1-2 oktas: "Mostly clear"
3-5 oktas: "Partly cloudy"
6-7 oktas: "Mostly cloudy"
8 oktas: "Cloudy"
9 oktas: "Fog"

Appendix 3 – METAR/SPECI Wind Assessment Period (WAP)

The length of the WAP may be any value from 2 to 10 minutes. For METAR messages the WAP will be 10 minutes except when a wind discontinuity is detected during the 10-minute period preceding the observation, in which case the WAP will be 2 minutes plus the length of time expired since the discontinuity, up to a maximum of 10 minutes.

For a wind direction or wind speed SPECI, the length of the wind assessment period will always be 2 minutes.

For all other SPECI messages, the length of the wind assessment period will be the time elapsed since the last occurrence of any assessment period reset event (i.e. a wind discontinuity, a wind direction SPECIAWS, or a wind speed SPECIAWS) during the 10-minute period preceding the observation, in which case the WAP will be 2 minutes plus the length of time expired since the last reset, up to a maximum of 10 minutes. If a reset event has not occurred, the wind assessment period will be 10 minutes.

Appendix 4 – Cloud Types

Possible **cloud_type** values are:

Cirrus

Cirrocumulus

Cirrostratus

Alto cumulus

Altostratus

Nimbostratus

Stratocumulus

Stratus

Cumulus

Cumulonimbus

Towering Cumulus

Table 3 provides a list of possible **cloud_type_ID** values and cloud descriptions.

Cloud Type ID	Cloud Description
0	Cirrus
1	Cirrocumulus
2	Cirrostratus
3	Alto cumulus
4	Altostratus
5	Nimbostratus
6	Stratocumulus
7	Stratus
8	Cumulus
9	Cumulonimbus
10	No high level cloud
11	Cirrus fibratus, sometimes unicus, not progressively invading the sky
12	Cirrus spissatus in patches or entangled sheaves, which usually do not increase

Cloud Type ID	Cloud Description
13	Cirrus spissatus cumulonimbogenitus
14	Cirrus unicus or fibratus or both, progressively invading the sky
15	Cirrus (often in bands) and Cirrostratus or Cirrostratus alone, progressively invading the sky, but continuous cloud less than 45 degrees above the horizon.
16	Cirrus (often in bands) and Cirrostratus or Cirrostratus alone, progressively invading the sky, but continuous cloud more than 45 degrees above the horizon without covering the entire sky
17	Cirrostratus covering the entire sky
18	Cirrostratus not covering the entire sky and not progressively invading it
19	Cirrocumulus alone, or Cirrocumulus predominant
20	No middle level cloud
21	Altostratus translucidus
22	Altostratus opacus or Nimbostratus
23	Alto cumulus translucidus at a single level
24	Patches (often lenticular) of Alto cumulus translucidus, continually changing and at one or more levels
25	Alto cumulus translucidus in bands, or one or more layers of Alto cumulus translucidus or opacus, progressively invading the sky
26	Alto cumulus cumulogenitus or cumulonimbogenitus
27	Alto cumulus translucidus or opacus in two or more layers, or Alto cumulus opacus in a single layer, not progressively invading the sky, or Alto cumulus with Altostratus or Nimbostratus
28	Alto cumulus castellanus or floccus
29	Alto cumulus of a chaotic sky, usually at several levels
30	No low level cloud
31	Cumulus humilis, or Cumulus fractus (not of bad weather), or both

Cloud Type ID	Cloud Description
32	Cumulus mediocris or congestus, with or without Cumulus humilis or fractus or Stratocumulus, all bases at the same level
33	Cumulonimbus calvus, with or without Cumulus, Stratocumulus or Stratus
34	Stratocumulus cumulogenitus
35	Stratocumulus other than stratocumulus cumulogenitus
36	Stratus nebulosus or Stratus fractus (not of bad weather), or both
37	Stratus fractus or Cumulus fractus of bad weather or both (pannus)
38	Cumulus and Stratocumulus other than stratocumulus cumulogenitus, with bases at different levels
39	Cumulonimbus capillatus with or without Cumulonimbus calvus, Cumulus, Stratocumulus, Stratus or pannus

Table 3 cloud_type_IDs and descriptions