

FAST FACTS: How does the Bureau measure temperature?

The Bureau of Meteorology holds the integrity of our weather observations and climate data to the highest possible standards.

Every day the Bureau records temperatures at nearly 700 locations across Australia.

How does the Bureau measure and record temperature?

- The Bureau measures air temperature using an electronic sensor (a platinum resistance thermometer) placed within a Stevenson Screen, and temperature is measured every second.
- The air temperature fluctuates frequently on the scale of seconds. By using a sensor which has a longer response time than the fluctuations of the air temperature, the sensor “averages” these fluctuations.
- Both the mercury-in-glass thermometers, and the electronic sensors, are housed within a Stevenson Screen. The time taken for air to be exchanged from the outside environment to within the screen provides a further time integration for the measurement of the ambient air temperature.
- The response time of the sensor used in the Bureau AWSs is as long or longer than the changes in the temperature of the air it is measuring.
- This means that each one second temperature value is not an instantaneous measurement of the air temperature but an average of the previous 40 to 80 seconds. This process is comparable to the observation process of an observer using a "mercury-in-glass" thermometer.

Are these methods consistent with international best practice?

- The Bureau's procedures comply with the World Meteorological Organization's Guide to Meteorological Instruments and Methods of Observation (the CIMO Guide) WMO-No. 8 (2014 edition). The guide is available [here](#).
- The guide recommends that temperatures be integrated over time to smooth out rapid fluctuations. There is more than one method of achieving this. The WMO guidelines do not prescribe which method to take. In its automatic weather stations the Bureau achieves this by using platinum resistance thermometers. These are comparable to mercury in glass thermometers.

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