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How do we know which baseline period to use?

The World Meteorological Organization's standard reference period, for use in monitoring long-term climate change, is the 30-year period 1961–1990. All State of the Climate reports, including State of the Climate 2020, uses that baseline period for long-term averages where suitable data are available. It normally uses the full period of available nationwide data for extremes and frequency distributions. Records from the monitoring of the ocean, atmosphere and land can vary in length, influencing the baselines used.

National records across Australia are available for rainfall from 1900, and from 1890 for smaller regions with good rainfall gauge coverage in the earlier part of the record, such as the southwest of WA and the southeast of Australia shown in the report. National records are available for temperature, from consistent thermometer screens, from 1910.

The measurement of atmospheric constituents such as CO₂ began in Mauna Loa, Hawaii in 1958, and clean air baseline measurements started in the mid-1970s at Cape Grim, Tasmania

High-quality satellite altimeter data has been available for monitoring sea level of the oceans surrounding Australia since 1993. Sea level measurements can also be taken from tide gauges along the Australian coastline.

Archives of in situ sea surface temperature measurements extend back more than 160 years, with increasing spatial

coverage in recent decades. The number of ocean temperature profile measurements in the upper 700 m have increased since the 1950s. For depths below 2000 m, ocean temperature profiles are largely measured by ship-based surveys (GO-SHIP) since the 1970s. In 2006, the Argo profiling float array achieved near-global coverage for the upper 2000 m.

Satellite measurements started in the late 1970s and provide information about sea-ice, oceans and land.

The concept of pre-industrial as a baseline period for comparison with recent trends is used in the report. This baseline refers to the climate immediately before the acceleration of human influence such as emissions of greenhouse gases from the 1700s. There is no one official pre-industrial baseline, and observations are very sparse before the 20th Century so slightly different baselines are used for different applications. **Read more in this article.** For State of the Climate 2020, we have specified in the text, or associated figures, which specific period is being used.

Projections used in this report are from www.climatechangeinaustralia.gov.au and are generated by global climate models using different greenhouse gas and aerosol emissions scenarios. These projections are generally compared to a 1986–2005 baseline.