

ACORN-SAT station adjustment summary—Thargomindah (as at 24 September 2014)

Thargomindah is one of 112 ACORN-SAT stations used by the Bureau of Meteorology to assess changes in Australia's climate. The official long-term temperature record for Thargomindah is defined by the Bureau as a combination of the old 'town' station (station number 45017) and the automatic weather station (AWS) at the airport (station number 45025).

Observations at Thargomindah are believed to have begun in the late 19th or early 20th century, but digitised data are available only from 1957. Comparison of the Thargomindah data with surrounding stations (neighbours), 13 of which have been used at various times, combined with the use of documentary records, reveals that there have been two significant breaks in the data. One of these is associated with a site move. The raw data series is a combination of several data series that must be adjusted to derive a single, consistent and accurate representation of temperature changes over time.

The ACORN-SAT record contains daily records of minimum (night-time) temperature (Min T) and maximum (daytime) temperature (Max T). The charts in this fact sheet show annual average values of Min T and Max T. The adjustment values we refer to below relate to the impact that the adjustments we make have on those annual average values.

The changes that occurred at Thargomindah and the resulting impacts are summarised as follows:

1. 1 January 1967—breakpoint detected by statistical methods.
 - No clear documentation relating to breakpoint. Station begins to appear warmer relative to surrounding stations, especially in autumn and winter.
 - Max T adjusted by +0.24 °C on an annual basis but larger adjustments in autumn and winter. No detectable impact on Min T so no adjustments made.
2. 1 August 1999—site move from town area to airport (1.3 km to northwest).
 - Minimum temperature begins to appear warmer relative to surrounding stations.
 - Min T adjusted by +0.52 °C. No detectable impact on Max T so no adjustments made.
 - Town site continued until 2005, but changes at that site after 1999 (changes in surrounding vegetation, and new metal tanks near site) meant it was no longer representative of pre-1999 conditions there, so overlap was not used in adjustment.

Small site moves within the town area on 14 July 1983 and 23 June 1994 had no significant impact on temperatures and no adjustments were made.

Charts 1 and 2 compare raw and adjusted data for annual average Min T and Max T when all relevant factors from 1941 onwards are included.

In Chart 1 the trend lines show that the adjusted average Min T is not increasing as quickly as the raw data would suggest. In this case, the adjustment has reduced the artificially large warming trend indicated by the raw data.

In Chart 2 the trend lines show that the adjusted average Max T is increasing slightly less quickly than the raw data suggest. In this case, the adjustment has slightly reduced the artificially large warming trend indicated by the raw data.

Chart 3 shows a comparison of minimum temperatures at Quilpie (159 km north of Thargomindah) and Thargomindah in the years around 1999. Thargomindah is consistently cooler than Quilpie prior to 1999 and consistently warmer after 1999. This, combined with similar results when Thargomindah's data are compared with other sites in the region, provides a very clear demonstration of the need to adjust the temperature data.

Chart 1: Thargomindah annual average minimum temperatures (1957–2013)

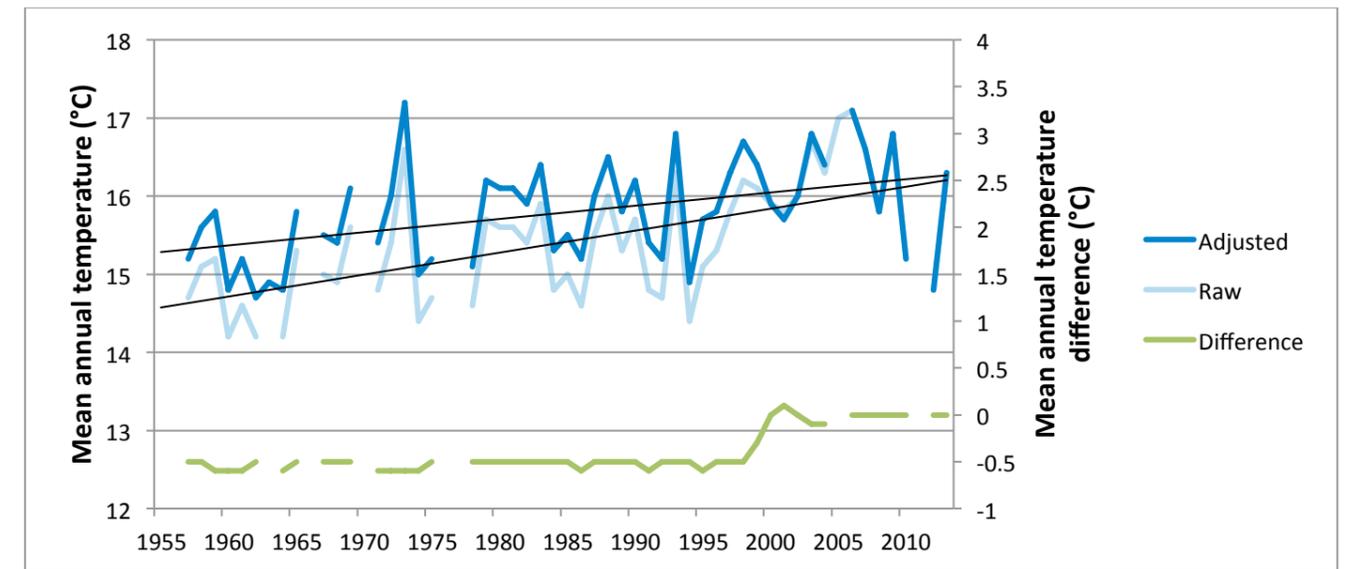


Chart 2: Thargomindah annual average maximum temperatures (1957–2013)

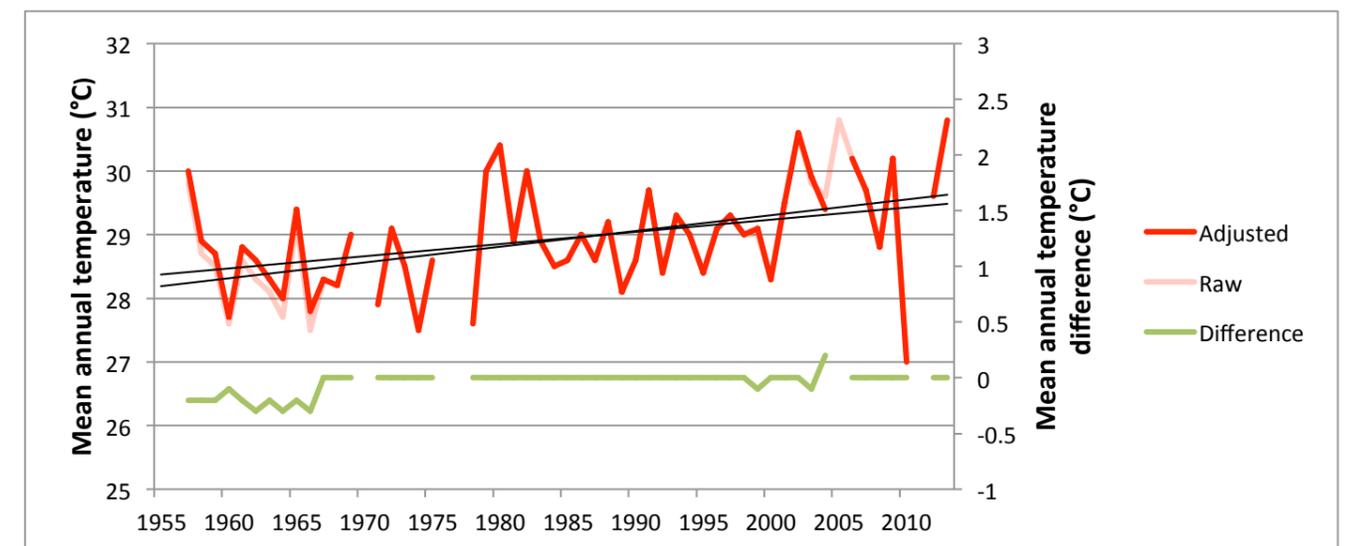
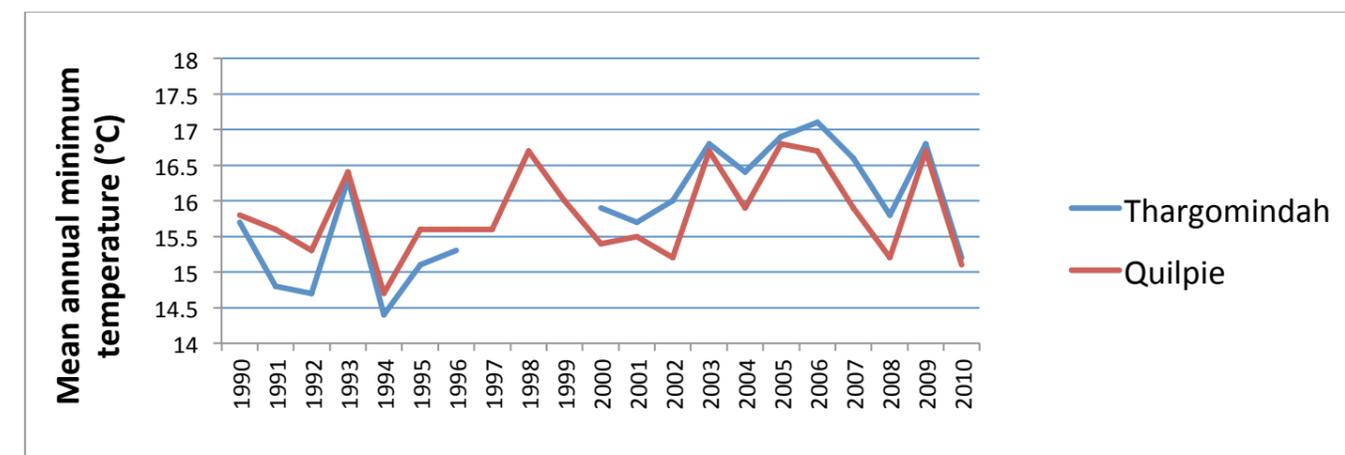


Chart 3: Comparison between Thargomindah and Quilpie



Thargomindah station temperature adjustments

Station name	Station number	Temperatures adjusted	Date (adjustment applied to all data prior to this date)	Cause	Impact of adjustment (°C)	Seasonal (if applicable)	Comparative stations										Notes
							44026	45015	38024	48079	48015	17123	46037	38002	44021	44010	
Thargomindah	45025	Min	1/8/1999	Move	0.52		44026	45015	38024	48079	48015	17123	46037	38002	44021	44010	
Thargomindah	45025	Max	1/1/1967	Statistical	0.24	Autumn 0.35, Winter 0.34	44026	45015	48013	38024	46037	38002	44010	52026	44021	45000	

Comparative stations

Station number	Station name
17123	Moomba Airport
38002	Birdsville Police Station
38024	Windorah
44010	Bollon
44021	Charleville Airport
44026	Cunnamulla
45000	Adavale
45015	Quilpie
46037	Tibooburra Post Office
48013	Bourke Post Office
48015	Brewarrina
48079	Wanaaring
52026	Walgett Council Depot

Station temperature adjustment table legend

- Station name: name used in the national climate record
- Station number: the active ACORN-SAT station number as at 31 December 2011.
- Temperatures adjusted: this describes which aspect of the temperature record was adjusted—Max for daily maximum temperature; Min for daily minimum temperature.
- Date: all data prior to this date was adjusted for the reason (cause) cited.
- Cause: this describes why an adjustment was required.
 - Merge: data from two different station numbers are being merged, with overlap.
 - Move: a documented site move.
 - Move (n): a documented site move, together with a change of station number.
 - Screen: indicates a change or repair to the Stevenson screen.
 - Obs time: indicates a change in observation time (most often the 1964 change at some stations from a midnight to 9 am observation time).
 - Site env: a change has occurred in the local site environment (e.g. addition/removal of building nearby, change in vegetation).
 - Statistical: a change found by statistical methods without specific documentary support.
 - Statistical*: indicates some kind of documentary support which may be imprecise or subject to interpretation. This is further explained in the notes field.
 - AWS: installation of an automatic weather station; if there was an associated site move this is shown as 'move'.
- Impact of adjustment: the overall impact of the daily adjustments made for the particular reason (cause) cited.
- Seasonal (if applicable): this applies where the adjustment was made on the basis of seasonal, rather than annual, criteria. In general the minimum threshold for adjustment is a 0.3 °C difference in the annual mean. Exceptions include:
 - where seasonal criteria are met (0.3 °C in two seasons, or 0.5 °C in a single season), in which case details are given; or
 - for the 1964 observation time change, which standardised the time for taking all observations at 9.00 am.
- Comparative stations: stations against which the station's data was compared statistically.
- Notes: provides additional explanatory information.