

Explanation by Chris Gilham.

Australia's Bureau of Meteorology (BoM) claims that "The new (ACORN-SAT) data show that Australia has warmed by approximately 1°C since 1910."

While this might be numerically true for the homogenised ACORN-SAT dataset, the unadjusted temperature change for Australia is less than half that figure. We can measure change by taking start and end points of a period of time.

For start points, we address four datasets. We show that change depends on choice of data set. The four datasets are:

1) Climate Data Online (CDO) at the BoM website. This data is commonly known as "RAW".

2) ACORN, also online from the BoM.

3) [Official Year Book of the Commonwealth of Australia](#), issue #39 published in 1953 including tabulated mean temperature readings from 1911 to 1940 at 44 locations across the country used by the Weather Bureau at that time to accurately portray Australia's climate record on the world stage.

4) [Meteorological Data for Certain Australian Localities](#) published in 1933 by the Council for Scientific and Industrial Research collating minima and maxima from the earliest records at hundreds of weather stations up to and including 1931.

For end points, we use the official RAW and ACORN datasets.

Summary of results

Mean temperatures recorded and estimated by Australia's leading meteorologists at 44 weather stations across the country prior to and including 1940 were the same as the BoM RAW mean from their start years to 2014.

In the adjusted ACORN dataset used by government to measure climate change in Australia, comparable weather station mean temperatures from the years 2000 to 2014 ("Australia's hottest decade") were 0.5C warmer than unadjusted temperatures up to and including 1931.

The following table provides the comparative averaged temperatures of CSIR, Year Book 1940, ACORN and RAW in different timeframes at 19, 66 and 79 locations that can be matched within the datasets.

Matching CSIR vs Year Book vs ACORN vs RAW	19 CSIR stations <-1931	19 YB stations 1911-40	19 ACORN stations 1911-40	19 RAW stations 1855-2014
Min	12.6	12.8	12.0	12.6
Max	24.2	24.1	23.9	24.1
Mean	18.4	18.5	17.9	18.3
CSIR vs matching ACORN	66 CSIR station <-1931	66 ACORN stations 1910-31	66 ACORN stations 2000-14	
Min	13.0	12.6	13.5	
Max	24.9	24.6	25.4	
Mean	18.9	18.6	19.5	
CSIR vs matching ACORN	79 ACORN stations <-1931	79 ACORN stations 2000-14		
Min	13.1	13.6		
Max	25.1	25.6		
Mean	19.1	19.6		

Comments

The "odd man out" is ACORN. Its adjustments cool the past and slightly warm the present, so the trend from past to present becomes greater than non-adjusted.

The last line in the table above calculates 0.5 degrees C as the change from CSIR pre-1932 to the years 2000-2014 at locations that subsequently became part of the ACORN network.

The table display of 19 stations with the same locations in all four datasets points to a mean 0.6C cooling by ACORN of the years 1911-40, mainly to minimum temperatures.

The table display of 66 stations open before 1931 with the same locations in the CSIR and ACORN datasets points to 0.3C cooling by ACORN, with 0.6C warming to 2000-14 compared to the CSIR dataset up to and including 1931.

The table display of 79 stations with the same locations in the CSIR and ACORN datasets points to 0.5C warming from before 1931 to 2000-14, bearing in mind that ACORN and RAW temperatures are mostly identical from 2000 to 2014.

These different location and timeframe comparisons tend not to change the conclusion by more than +/- 0.1 deg C over the century.

These results suggest that of the approximate 1 degree of warming claimed for Australia, about 0.5 degrees is caused by adjustment and another 0.5 degrees by plausible climate change.

The main artificial influences on temperature records are different **thermometer screens** and Urban Heat Island (UHI) warming.

These influences and more detailed information are analysed at <http://www.waclimate.net/year-book-csir.html> where the CSIR and Year Book datasets can be downloaded, as well as extensive spreadsheets itemising all historic and BoM data at 225 weather station locations.