



Data Archive Note 01/2016

An unadjusted (not homogenised), historical temperature profile for Australia

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Tony Heller's GHCN Temperature Reconstruction for Australia

Summary

The Heller-GHCN Australian series is a simple compilation of all 1655 maximum temperature series as archived in the Global Historical Climatology Network (GHCN), converted to an annual anomaly. It is proposed as a convenient, interim-surrogate Australian temperature profile: free of homogenisation and the contrived-weighting systems inherent in current official reconstructions, for example ACORN-SAT.

It makes no correction for equipment changes, or the addition of individual series over time; the *ClimateLab* thus recommends that the Heller-GHCN Australian series be truncated to begin from 1910. When the Heller-GHCN series is truncated to begin in 1910 the hottest years are 1980, 1914, 1919, 1915 and 1940, respectively. A linear trend line through the data gives a rate of warming of 0.4 degree Celsius per century.

Background

Claims that the Earth is heating up because of human-caused global warming are typically based on datasets that generate temperature profiles based on a weighted-subset of remodeled surface-air temperature measurements. For example, 'Australia's surface air temperature' graph in the *State of the Climate 2016* report by the CSIRO and Bureau of Meteorology, has been generated from the Australian Climate Observations Reference Network – Surface Air Temperature (ACORN-SAT), with 109 of the 112 individual temperature series used in this reconstruction actually remodelled relative to hypothetical conditions – the technical term is homogenised. Furthermore, this ACORN-SAT series only begins in 1910, and no specific set of weightings is attached to each value used to generate the national temperature profile – the effective contribution changes on a daily or monthly basis.

Ideally there would be an historical temperature reconstruction for Australia that:

1. Was based only on un-homogenised temperatures i.e. the actual measured temperatures subject only to quality assurance;
2. Began before the Federation drought (1895-1902);
3. Had a logical and transparent method for area weighting; and

4. Incorporated appropriate adjustments for equipment changes and site moves.

Such a reconstruction does not exist. In the interim Tony Heller's GHCN Australian temperature reconstruction is a useful surrogate.

Data description

The Heller-GHCN series is the simple compilation of all 1655 maximum temperature series as archived in the Global Historical Climatology Network (GHCN), converted to an anomaly which was calculated using 1875 to 1975 as the baseline. The aggregation of these individual series was undertaken by Tony Heller through the application of a code available for download here: <https://stevengoddard.wordpress.com/ghcn-code> .

The series, as archived with this note, begins in 1855 and ends in 2015, see Table 1.

When the entire series is plotted, it is apparent that the hottest three years are 1878, 1867 and 1888, respectively, as shown in Chart 1. A linear trend lines gives a rate of warming of 0.02 degree Celsius per century, as shown in Chart 1. When the Heller-GHCN series is truncated to begin in 1910 the hottest years are 1980, 1914, 1919, 1915 and 1940, respectively, as shown in Chart 2. A linear trend line gives a rate of warming of 0.4 degree Celsius per century; which is about half the ACORN-SAT value of 0.97, Chart 2.

Data: tables and charts

Table 1. Annual anomalies as calculated by Tony Heller based on every Australian maximum temperature series archived at the GHCN.

Year	Tmax anomaly
1855	-0.24
1856	-0.634
1857	0.163
1858	0.234
1859	-0.001
1860	-0.594
1861	-0.129
1862	0.773
1863	-0.177
1864	-0.307
1865	0.383
1866	0.859
1867	1.162
1868	0.878
1869	0.546
1870	0.469
1871	0.76
1872	-0.33
1873	-0.3
1874	-0.345

1875	-0.028
1876	0.426
1877	0.633
1878	1.163
1879	-0.426
1880	0.804
1881	0.55
1882	0.668
1883	0.789
1884	0.809
1885	0.664
1886	0.423
1887	-0.158
1888	1.039
1889	0.598
1890	-0.287
1891	-0.524
1892	0.4
1893	0.093
1894	-0.73
1895	0.095
1896	-0.078
1897	0.556
1898	0.338
1899	-0.107
1900	0.409
1901	0.127
1902	0.854
1903	-0.109
1904	-0.019
1905	0.135
1906	0.178
1907	0.177
1908	-0.362
1909	-0.501
1910	-0.239
1911	-0.199
1912	0.364
1913	-0.219
1914	0.742
1915	0.546
1916	-0.317
1917	-0.989
1918	0.094

1919	0.554
1920	-0.253
1921	0.124
1922	0.118
1923	0.179
1924	-0.308
1925	-0.284
1926	0.236
1927	-0.104
1928	0.295
1929	-0.352
1930	0.118
1931	-0.291
1932	-0.077
1933	-0.127
1934	-0.12
1935	-0.092
1936	0.152
1937	0.145
1938	0.386
1939	-0.244
1940	0.517
1941	-0.187
1942	0.142
1943	-0.349
1944	0.163
1945	0.028
1946	-0.094
1947	-0.176
1948	0.028
1949	-0.388
1950	-0.268
1951	0
1952	-0.12
1953	-0.017
1954	-0.045
1955	-0.467
1956	-0.706
1957	0.473
1958	0.034
1959	0.288
1960	-0.53
1961	0.479
1962	0.107

1963	-0.189
1964	-0.339
1965	0.345
1966	-0.34
1967	0.238
1968	-0.272
1969	0.063
1970	-0.097
1971	-0.238
1972	0.496
1973	0.257
1974	-0.436
1975	0.045
1976	-0.179
1977	0.383
1978	-0.247
1979	0.489
1980	0.859
1981	0.339
1982	0.586
1983	0.164
1984	-0.294
1985	0.158
1986	0.012
1987	0.21
1988	0.612
1989	-0.07
1990	0.288
1991	0.579
1992	-0.228
1993	0.224
1994	0.485
1995	-0.021
1996	0.128
1997	0.318
1998	0.339
1999	0.211
2000	0.131
2001	0.282
2002	0.642
2003	0.344
2004	0.365
2005	0.509
2006	0.443

2007	0.465
2008	0.219
2009	0.583
2010	0.143
2011	0.124
2012	0.298
2013	0.628
2014	0.611
2015	0.456

Figure 1. GHCN-Heller Australian temperature reconstruction 1855-2015

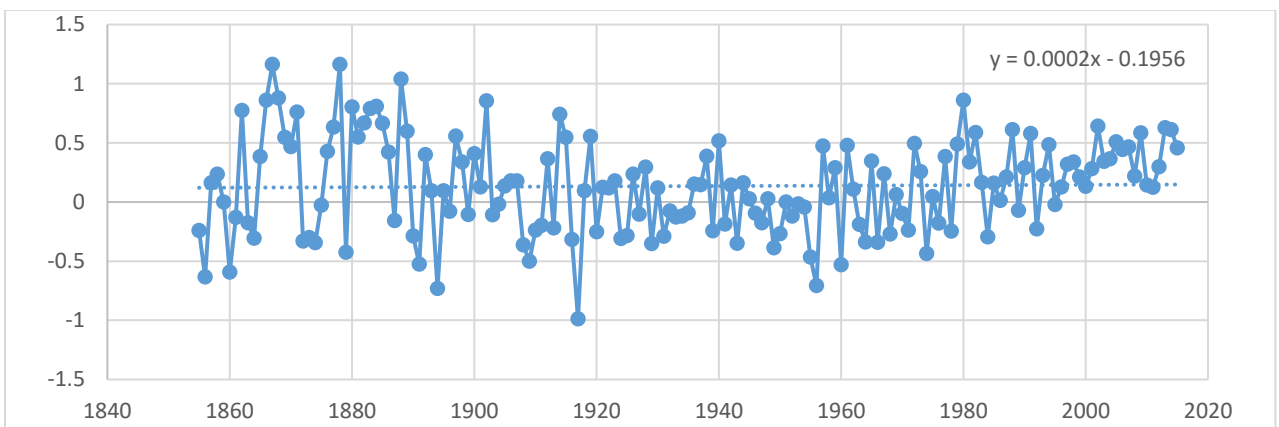
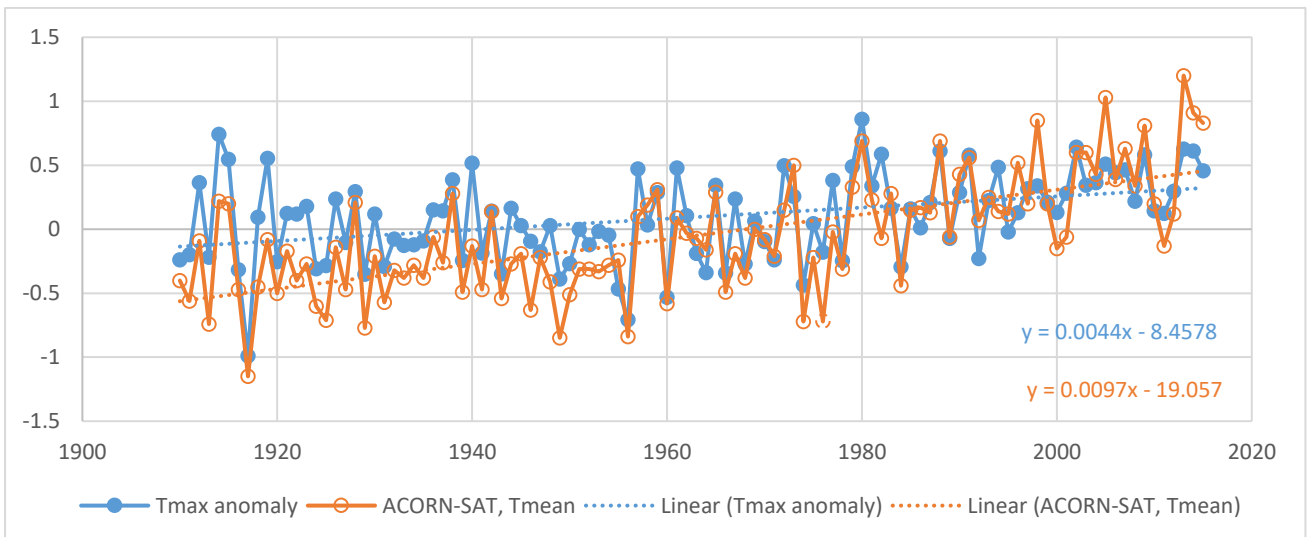


Figure 2. GHCN-Heller Australian temperature reconstruction truncated to begin in 1910, plotted with ACORN-SAT



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