



# Essential and background material for the ACORN-SAT Technical Advisory Forum

In many cases references within the listed papers will provide further information. In particular, the Venema et al. 2012 paper contains references for many commonly used homogenisation methods.

## Essential material

Trewin, B. 2012. Techniques involved in developing the Australian Climate Observations Reference Network – Surface Air Temperature (ACORN-SAT) dataset. CAWCR Technical Report 49.  
[www.cawcr.gov.au/publications/technicalreports/CTR\\_049.pdf](http://www.cawcr.gov.au/publications/technicalreports/CTR_049.pdf)

*The most comprehensive documentation available for the dataset. (See online version for colour images)*

Trewin, B.C. 2013. A daily homogenised temperature data set for Australia. Int. J. Climatol., 33, 1510–1529.

[onlinelibrary.wiley.com/doi/10.1002/joc.3530/epdf](http://onlinelibrary.wiley.com/doi/10.1002/joc.3530/epdf)

*Demonstrates publication of methods in a peer-reviewed journal. Doesn't contain any significant information which is not in the Technical Report*

Fawcett, R.J.B. et al., 2012. On the sensitivity of Australian temperature trends and variability to analysis methods and observation networks. CAWCR Technical Report 50.

[www.cawcr.gov.au/publications/technicalreports/CTR\\_050.pdf](http://www.cawcr.gov.au/publications/technicalreports/CTR_050.pdf)

*(See online version for colour images)*

Trewin, B.C. 2010. Exposure, instrumentation and observing practice effects on land temperature measurements. Wiley Interdisciplinary Reviews: Climate Change, 1, 490–506.

[onlinelibrary.wiley.com/doi/10.1002/wcc.46/pdf](http://onlinelibrary.wiley.com/doi/10.1002/wcc.46/pdf)

*General background on what most influences temperature observation*

The 2011 report of the Independent Review Panel

[www.bom.gov.au/climate/change/acorn-sat/documents/ACORN-SAT\\_IPR\\_Panel\\_Report\\_WEB.pdf](http://www.bom.gov.au/climate/change/acorn-sat/documents/ACORN-SAT_IPR_Panel_Report_WEB.pdf)

Bureau of Meteorology response to recommendations of the 2011 Independent Peer Review Panel, 15 February 2012

[www.bom.gov.au/climate/change/acorn-sat/documents/ACORN-SAT\\_Bureau\\_Response\\_WEB.pdf](http://www.bom.gov.au/climate/change/acorn-sat/documents/ACORN-SAT_Bureau_Response_WEB.pdf)

ACORN-SAT fact sheet

[www.bom.gov.au/climate/change/acorn-sat/documents/ACORN-SAT-Fact-Sheet-WEB.pdf](http://www.bom.gov.au/climate/change/acorn-sat/documents/ACORN-SAT-Fact-Sheet-WEB.pdf)

## Background material

### More detail on ACORN-SAT

Reports prepared for the Independent review – linked from [www.bom.gov.au/climate/change/acorn-sat/index.shtml#tabs=Expert-review&-network=](http://www.bom.gov.au/climate/change/acorn-sat/index.shtml#tabs=Expert-review&-network=)

Summary list of ACORN-SAT adjustments and detailed case studies for six stations  
[www.bom.gov.au/climate/change/acorn-sat/index.shtml#tabs=Adjustments&-network=](http://www.bom.gov.au/climate/change/acorn-sat/index.shtml#tabs=Adjustments&-network=)

### Other Australian datasets

Della-Marta, P., Collins, D. and Braganza, K. 2004. Updating Australia's high-quality annual temperature dataset. Aust. Met. Mag., 53, 75–93.

Torok, S.J. and Nicholls, N. 1996. A historical annual temperature dataset for Australia. Aust. Met. Mag., 45, 251–260.

*Both of these papers describe the annual high-quality set which ACORN-SAT superseded*

Jones, D.A., Wang, W. and Fawcett, R. 2009. High-quality spatial climate data-sets for Australia. Aust. Met. Oceanogr. J., 58, 233–248.

*Describes the AWAP data set for temperature and other variables*

Ashcroft, L., Karoly, D. and Gergis, J. 2012. Temperature variations of southeastern Australia, 1860-2011. Aust. Met. Oceanogr. J., 62, 227-245.

*Describes pre-1910 data for southeastern Australia and associated issues*

### Some data analyses

Boretti, A. 2013. Statistical analysis of the temperature records for the Northern Territory of Australia. Theor. Appl. Clim., 114, 567–573.

*An analysis using data with limited homogenisation which generated largely misleading results*



Trewin, B.C. and Jones, D.A. 2014. Comment on Boretti (2013), 'Statistical analysis of the temperature records for the Northern Territory of Australia'. *Theor. Appl. Clim.*, published online 25 April 2014, doi 10.1007/s00704-014-1158-3.

*Response to the above*

### **General issues of data homogeneity and data set development**

Thorne, P.W. et al. 2011. Guiding the creation of a comprehensive surface temperature resource for twenty-first-century climate science. *Bull. Amer. Met. Soc.*, 92, ES40-ES47.

### **International and other national data sets**

Morice, C.P. et al. 2012. Quantifying uncertainties in global and regional temperature change using an ensemble of observational estimates: the HadCRU4 dataset. *J. Geophys. Res.*, 117, D08101.

*HadCRU dataset.*

*Note: there is no single paper describing the current NCDC dataset – rather there is a paper updated by various technical reports for the land component and a separate paper for the ocean component*

Vincent, L.A. et al. 2002. Homogenization of daily temperatures over Canada. *J. Climate*, 15, 1322–1334.

*Canadian national dataset – there are more recent versions but they seem to be documented only in conference papers*

Rohde, R. et al. 2013. Berkeley Earth temperature averaging process. *Geoinfor Geostat: An Overview*, 1:2 (available at [www.scitechnol.com/2327-4581/2327-4581-1-103.pdf](http://www.scitechnol.com/2327-4581/2327-4581-1-103.pdf) or via [www.berkeleyearth.org](http://www.berkeleyearth.org)).

*The paper describing the Berkeley Earth dataset*

### **Methods of homogenisation**

Menne, M.J. and Williams, C.N. 2009. Homogenization of temperature series via pairwise comparisons. *J. Clim.*, 22, 1700–1717.

*Describes US national data set*

Peterson TC and co-authors. 1998. Homogeneity adjustments of in situ atmospheric climate data: A review. *Int. J. Climatol.* 18: 1493–1517.

*A general review paper on methods – still accessible and a useful overview of issues despite its age*

Venema, V.K.C. et al. 2012. Benchmarking homogenization algorithms for monthly data. *Clim. Past.* 8, 89–115.

Mestre O, Gruber C, Prieur C, Caussinus H, Jourdain S. 2011. SPLIDHOM : a method for homogenization of daily temperature observations. *J. Appl. Met. Climatol.* 50: 2343–2358.

Della-Marta, P.M. and Wanner, H. 2006. A method of homogenizing the extremes and mean of daily temperature measurements. *J. Clim.*, 19, 4179–4197.

### **Specific issues**

Parker D.E. 2010. Urban heat island effects on estimates of observed climate change. *Wiley Interdisciplinary Reviews: Climate Change* 1: 123–133.

Williams, C.N. et al. 2010. On the reliability of the U.S. surface temperature record. 22nd Conference on Climate Variability and Change, Atlanta, 16 January 2010.

*This describes the impact of station exposure on observed temperature trends*

Peterson T.C. 2003. Assessment of urban versus rural in situ surface temperatures in the contiguous United States: no difference found. *J. Clim.* 16: 2941–2959.

Parker D.E. 1994. Effects of changing exposure of thermometers at land stations. *Int. J. Climatol.* 14: 1–31.

*Deals particularly with late 19th/early 20th instrument shelter changes, though note that some of his information about specific changes in Australia has been superseded*