**Climate
of the Past**
Discussions

Interactive comment on "Identifying homogenous sub-periods in HadISD" *by* R. J. H. Dunn et al.

R. J. H. Dunn et al.

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We thank Blair Trewin for his detailed review and respond to each point individually below.

1) Reviewer

The widespread use of the term 'adjustment' to describe the magnitude of an inhomogeneity creates a certain amount of confusion, as no adjustment is actually carried out in this paper (as described at the end of p4). While I appreciate that the authors have defined this at p5 line 6, I still think it would be helpful to the reader if an alternative term could be found (perhaps 'magnitude' or 'size' of the inhomogeneity).

Response

Replaced most instances of "adjustment" with "inhomogeneity magnitude"

2) Reviewer

There is no real discussion of possible causes of inhomogeneities, how these might differ between variables, and in particular how the method of construction of this data set introduces possibilities for inhomogeneity types which might not exist in some other data sets – for example, at p8 line 11-15, an obvious potential cause of inhomogeneity in both mean and diurnal range of temperature is a change in reporting schedule of the station, either explicit, or implicit through the use of daylight savings time (see also comments below on diurnal range). Wind, dewpoint and pressure all have their own homogeneity issues, too, and some citations of relevant papers would be useful (in the case of wind, some of the particular difficulties are discussed in Jakob 2010, Aust. Met. Oceanogr. J. 60. 227-236 - http://www.bom.gov.au/amoj/docs/2010/jakob2_hres.pdf). It might also be worth a brief discussion of data quality issues that might have implications for homogeneity if they occur too frequently – two common ones (from my experience) are dewpoints tracking dry-bulb temperatures as a result of dried out wet-bulbs, and double conversions from SLP to MSLP leading to spuriously high values of the latter.

Response

We have added a couple of paragraphs in the introduction outlining possible causes for inhomogeneities, and identifying those peculiar to this sub-daily dataset. Extra references to other works which discuss inhomogeneities in the variables assessed in this work have also been included.

Minor

1) Reviewer

P7 line 18-20 – note that Trewin (2013) actually used annual and seasonal, not monthly, mean values of maximum and minimum temperatures in the detection of inhomogeneities in the ACORN-SAT data set. (I'm assuming the point which is being made

here is that maximum and minimum are being used, as opposed to mean or diurnal temperature range).

Response

Reference to Trewin (2013) and sentence clarified.

2) Reviewer

P8 line 15 – if I've understood this correctly, in this context the diurnal range is the difference between the highest and lowest hourly observation of the day, and the monthly average is taken as the average of the daily diurnal ranges? This definition, if correct, would be different to the more commonly used definition of diurnal temperature range as the difference between the daily maximum and minimum temperature – this needs to be clarified in the text.

Response

Construction of diurnal range from HadISD data clarified

3) Reviewer

P9 line 1 – what would result in a station being unable to be processed by PHA? (presumably an excessive amount of missing data – anything else?).

Response

Examples given for reasons why a station could not be processed by PHA

4) Reviewer

P10 line 12-13 – the station numbering system is not described anywhere in the paper. It would be useful to list where these stations are (perhaps in a footnote). Also affects line 6 page 12.

Response

Station numbering system explained in footnote, and station names also given

5) Reviewer

P10 line 15-17 – is there any indication of why medium-length stations might have fewer change points than shorter ones? (does PHA have any known issues with over- or under-detection of change points near the start/end of a time series, for example?).

Response

We have clarified the discussion of these figures as the peaks in the colour scale arise from the uneven distribution of stations with record length.

6) Reviewer

P10 line 29 – 'wing' – I'm more used to seeing this described as 'tail', but if 'wing' is also a standard term I can live with it. Also appears elsewhere.

Response

Changed "wing" to "tail" - wing was the term used in another field the author used to work in.

7) Reviewer

P11 line 10 – presumably the same data completeness criteria apply for these variables as for temperature – if so it would be useful to say so.

Response

Sentence confirming completeness criteria for these other variables added

8) Reviewer

P12 lines 24-25 – 'The stations which were not processed by PHA cluster' – does this apply for all three variables considered in Fig. 11, or just for some of them?

Response

Sentence clarified to indicate which variables are considered.

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