

Interactive comment on “Jens Esmark’s Christiania (Oslo) meteorological observations 1816–1838: The first long term continuous temperature record from the Norwegian capital homogenized and analysed” by Geir Hestmark and Øyvind Nordli

Anonymous Referee #3

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This paper presents a very interesting and valuable data set which extends our knowledge of early 19th century climate in north western Europe. It is an important paper which I recommend to be published following some additional calculations and revisions. While the authors have made extensive efforts to account for data quality and to homogenize the readings for long term climatic analysis in the face of sparse metadata, I am particularly uneasy about the lack of information concerning the observation times, and it is my opinion that further analyses may help reduce this uncertainty.

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In particular, the authors could make use of frequency analysis as exemplified by the work of Bergström and Moberg (2002) and Slonosky (2014) to compare Esmark's daily morning, afternoon and evening observations to the nearly 25 years of modern hourly observations mentioned in Table 1 and possibly obtain an approximate idea of the times of observation. It may be necessary to sub-divide the historical record for suspected changes in observation time derived from the SNHT analysis and to consider the possibility of observation times, especially in the morning, changing with the season, if this is supported by other metadata (e.g the statement of observation times quoted on lines 188-189). If probable times of observation can be established, the entire analysis will stand on much firmer ground. As it stands, there are many adjustments made on a statistical basis which add to the uncertainty of the final values of the observations, particularly given the differences seen when compared with other nearby observations.

The accounting of the adjustments due to inhomogeneities detected by the SNHT and other intra-series comparisons is extremely thorough and to be commended, but as is presented leaves the reader confused. A plethora of monthly adjustments is proposed in Tables 2-5, but it is not clear which adjustments were finally applied to which observations, the sequence of the adjustments nor whether the adjustments were applied to the daily data or to the monthly means. If daily, there will be artificial jumps between the end of one month and the beginning of the next - see Vincent et al (2002). In general, more use might be made of the advantages gained by having daily, rather than monthly, observations to analyze; much work has been done in the field of historical climatology in the past decade and more on analyzing daily observations directly.

The fairly large differences shown between these data and other nearby stations, less than 1 km away, also give reasons for concern about the final quality of the data. Comparisons with other series, such as Uppsala -Bergström and Moberg (2002) - and Stockholm, -Moberg and Bergström (2002), although a considerable distance away, may still give valuable indicators as to the character of each month and help decide which series in the comparisons are the more reliable.

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Finally, the online archive where the data will be placed should be mentioned. Please see attached file for complete references.

Please also note the supplement to this comment:

<http://www.clim-past-discuss.net/cp-2016-60/cp-2016-60-RC3-supplement.pdf>

Interactive comment on Clim. Past Discuss., doi:10.5194/cp-2016-60, 2016.

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