

Journal: Climate of the Past

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Title: Air temperature changes in SW Greenland in the second half of the 18th century

Dear Chandal Camendish

Editor, Climate of the Past

We would like to thank the 2nd anonymous reviewer for providing positive feedback and constructive comments on our manuscript. All comments were carefully considered, and we believe they helped us improve the description of our work. The detailed corrections/modifications are listed below, point by point.

(Note: The changes in the text and the answers to the reviewer's questions/suggestions are marked in red font. We revised the text, taking into account all comments and suggestions proposed by the reviewer. All changes have been carefully applied to the text.)

## **Referee No. 2.**

This is a rigorous and deep work, well organized in general, done by authors with ample experience in the study of Arctic climatology, who, by delving into historical data, try to obtain the maximum information available. They are aware of the testimonial value of the original data and of the possibility that they could be used as a reference for subsequent local and regional climate reconstruction studies.

**ANS: Thank you.**

This study presents the results of an analysis of historical climate data referring to the second half of the 18th century in Greenland. It covers two groups of years: 1767-68 and 1784-1792. The analysis is focused especially on the second of these groups, because it contains the most data. Although there is no complete information for all the years and months included in the latter group, the results obtained are in line with those of other studies in Greenland and the Arctic which demonstrates both the quality of the data used and the reliability of the analysis. The temporal sequence analyzed is also a significant contribution, because no data as old as these exist for the Arctic area to date and, as in all historical data prior to contemporaneous observations, there is no option but to study what is available.

**ANS: Thank you.**

The general guidelines I followed for the review were the following: Control of the general structure of the work and the contents of the different sections. Proposals to maximize the value of the analysis carried out and to enhance the results. Proposals to expand interest in the work in non-specialist readers along with reaching other related scientific fields

The statistical treatment performed is based on the comparison of historical data with current data from the 1991-2020 series by referencing historical data to the 1991-2020 series and checking

deviations from normal value. This is a type of analysis that fits well with the nature of the data and is accompanied by numerous graphs and tables.

ANS: Thank you.

#### SPECIFIC COMMENTS

##### Area and method section

This section is too short considering the interest and the complexity of the study's reconstructions, methods used, or motivations to start this analysis. To complete it and help readers to assimilate the text rationally and fluently, the following is proposed:

The text would improve by including some comment on the study area, considering its geographical singularity in relation to the meteorology, climatology, and natural environment.

ANS: Thank you very much for this suggestion. We have added significantly more information about the natural environment and climatology of the study area in the text.

For both historical and statistical interest, it would be quite convenient to include more information about the methodology used to obtain the original data as well as its preparation and correction.

ANS: Thank you very much for this suggestion. We have added more information about the methodology which we used in preparing the data for the analysis, for details see the revised version of the manuscript.

Even though the statistical methods selected fit well with the typology of the original data, please add some comments to justify, in climatic or/and environmental terms, why the indexes in table 2 were selected.

ANS: We answered exactly the same suggestion directed to us by the first reviewer. The answer is given in Reply to Reviewer 1, point 3.

##### Discussion section

The comparison of the results with the previous references is intense and complete. However, it is focused on contrasting it with other authors' results, relegating other interesting findings. Considering that the study is based on historical data not contained in any previous work, and that unusual statistical indices have been used, this section should also include an interpretation of the complete statistical work that has been done, as well as its climatic, environmental, and human implications. Consequently, these should be reflected in the conclusions section.

ANS: Thank you very much for this suggestion. We have added a deeper explanation in the discussion part, in line with the suggestion.

#### Conclusion section

A part of the paragraph between lines 439 and 450 in page 21 could be moved to section 2.

ANS: Thank you very much for this suggestion. After discussion among authors we came to the opinion that, although your proposition is good, we think that it will be a little better if we leave this paragraph here as it is, and will instead add some information about the possible biases in section 2, as you propose. One reason for this decision is that many scientists don't initially read the entire paper but concentrate on the abstract and conclusion.

#### TECHICAL CORRECTIONS

##### Section numbering

The Discussion section numbering should be 4 and, consequently, the Conclusion section 5.

ANS: corrected

##### Repeated paragraphs

Page 12, paragraph 2, lines 245-255 is repeated, as well as pages 14-15, lines 274-282.

ANS: Thank you very much for this suggestion. We have already also noted this repetition.

The second repeated passage was deleted.

References missed in the Reference list.

Bertrand et al. (2002)

Born et al. (2021)

Kaufman et al. (2009)

Houghton et al (1990)

Overpeck et al. (1997)

ANS: Thank you very much for this information. All missing references were added.

### 3. TYPING ERRORS

Lines 339-340: delete space between; and Kobashi.

ANS: corrected

Line 340: Publication year in Crespin et al. no coincidence between text and reference list. In line 349: Crespin et al. (2012), in line 378 Crespin et al. (2009) and Crespin et al. (2014), in line 380 Crespin et al. (2009), but in the reference list: Crespin et al. (2014) (2013) and (2019).

ANS: corrected

Lines 395 correct year 1021 by 1921

ANS: 1021 is the corrected date, because the value of the temperature anomaly was calculated for the Medieval Warm Period, 1021-1050.

Line 460 The Author contribution section name is repeated and wrong in this place.

ANS: corrected

Line 471: Delete , after Corne

ANS: corrected

Line 478. Does [et]. c. means [etc.]?

ANS: corrected

Line 486: delete point after Ebers

ANS: corrected

Line 550: replace the year 2012 by 2021

ANS: corrected

Line 551: delete , after . in Lüdecke, C.

ANS: corrected

Line 606: add publication year

ANS: corrected