

Clim. Past Discuss., author comment AC2  
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## Reply on CC1

Liangjun Zhu et al.

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Author comment on "Overcoming model instability in tree-ring-based temperature reconstructions using a multi-species method: A case study from the Changbai Mountains, northeastern China" by Liangjun Zhu et al., Clim. Past Discuss., <https://doi.org/10.5194/cp-2021-2-AC2>, 2021

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### Dear editor, dear referees,

We are so sorry for this late reply. Thank you for your constructive comments on our manuscript. The comments were valuable for helping us to revise and improve our paper, as well as the important guiding significance to our future research. We will do our best to improve the MS according your suggestions.

On behalf of the authors

Yours sincerely

Liangjun

### Reply to CC:

#### General remarks:

The manuscript presented a multiple species method that significantly improves the accuracy of tree-ring-based climate reconstructions in areas with unstable growth-climate relationships. And also the linkage of the regional temperature of Changbai Mts in northeast China to aspects of the AMO index is one of the highlights of the MS. Overall, this paper is well-organized, and the results and conclusions are well supported by data. It provided a new idea for the development of tree-ring-based climate reconstruction. I suggest this MS being accepted by CP if the coauthors can address all reviews' concerns and taking into account of comments in CPD (if they are reasonable).

Below I present some suggestions that the authors could find useful when revising the manuscript.

## Specific comments:

- Figure 2: In the captions, the authors use the abbreviation " $T_{\min}$ " and " $T_{\max}$ " to represent the minimum and maximum temperature. However, subscripts are not used in the Figure 2a and Table 3.

Reponses: we will keep the same.

- Line 134: "Atlantic Multi-decadal Oscillation (AMO)" should be "Atlantic Multidecadal Oscillation (AMO)".

Reponses: we will do so.

- Line 171: The abbreviation of the number of cases sometimes uses  $N$ , sometimes uses  $n$  (see table 1), please keep the same.

Reponses: we will do so.

- Lines 176, 186 and 187: Change the "observed" to the "actual" to keep the same in whole text.

Reponses: we will do so.

- Line 187: Change the "1959-2014" to the "1959-2015".

Reponses: we will do so.

- Table 3: Give the UNIT of minimum temperature, and add the notes for " $T_{\min}$ ".

Reponses: we will do so.

- In discussion section 4.2, the authors pointed out that their new temperature reconstruction has a higher quality than regional records. It is better to compare the correlations between the existing (TS, CB and LB in figure 6) reconstructed temperature records and other temperature records (XXA and NH). A new table should be added.

Reponses: we will add the table.

- In figure 6: What is the  $R$  and  $R_{\text{low}}$ . The same in figure 8.

Reponses: we will add the notes.

- Line 268: Change the "The Atlantic Multidecadal Oscillation (AMO)" to the "The AMO".

Reponses: we will do so.

- Line 285: “.....the actual April-September AMO index.....”.

Reponses: we will revise it.

- Line 291: “.....and the reconstructed AMO index (annual Sea Surface Temperature anomalies for the North Atlantic) from Gray (2001).....”.

Reponses: we will do so.

- Line 294: “.....the AMO index used in this study (thin line).....”.

Reponses: we will do so.

- Figure 9: The arrows in Figure 9a are not clear, please replot it.

Reponses: we will do so.

- Please double check and update the references. For example, Zhu et al., 2020a (CATENA) should be update to 2021.

Reponses: we will double check the references.