

Interactive comment on “Precipitation reconstruction based on tree-ring width over the past 270 years in the central Lesser Khingan Mountains, Northeast China” by Mingqi Li et al.

Anonymous Referee #1

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This manuscript uses a large number of tree cores to build a robust tree-ring width chronology. Precipitation, a main limiting factor on tree growth, was reconstructed over the past 270 years. The reconstructed precipitation series was valuable to understand the long-term precipitation variations and its driving factors in the semi-humid Northeast China which produces a large amount of grains in China. In terms of this aspect, this manuscript is useful and valuable. I recommend its publication after some modifications. Major Comments: 1. Since APCI is an important driving factor, it should be introduced in details. For example, how long is the APCI series? How many APCI series are developed? Are they comparable? 2. It is weird to see that the chronology is positively correlated with June minimum temperature, but negatively correlated with

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June mean and maximum temperature, even reaching a significant level. Generally, it is thought that minimum, mean, and maximum temperatures change the same way on annual to decadal time scales, at most with some amplitude and/or changing rate differences. The meteorological data should be checked, especially of the June temperature data. Also, can the same results be reached when using data from other nearby meteorological stations? If so, please show them in the supplementary material. Or at least a reasonable explanation should be given why such a weird phenomenon occurs.

3. October-June precipitation was reconstructed. But, each monthly precipitation from previous October to current May is not significant with the chronology (Fig. 4). It is hard to say that they can be represented by the chronology. Maybe only June precipitation is a limiting factor on tree growth here. The chronology has a pretty weak relationship with January-March precipitation, so what is the meaning of the comparison between the reconstructed precipitation with the January-March streamflow in Fig. 7? 4. Paragraph 2 of Possible driving mechanisms. The relationship between the reconstructed precipitation is stronger with May-June APVI index than with previous October to current May APVI index. It is easy to understand the phenomenon when considering that the chronology represents June precipitation, but not October-June precipitation. Therefore, the representative season for reconstruction should be carefully and comprehensively analyzed and decided, not just by the highest correlation between the chronology and climatic factors. 5. As for analyzing the driving mechanisms, the analysis might stop in the APVI based on two reasons. One is that the relationship with NAO index is low and not significant for the period 1748-2001. The other is that their periodicities do not match. Therefore, it is recommended to delete the last paragraph of this part. Minor comments: 6. Paragraph 2 of Introduction. The ms lists a few tree-ring papers from other regions of China here. Introducing the situation of tree-ring studies conducted in Northeast China should follows. 7. L93-95 is unclear. 8. L138-141 is unclear. 9. ENSO is a phenomenon, not an index. So, what indices are used to represent ENSO in Table 4, and relevant content in the ms? 10. How is the growing season defined in the ms? When does the growing season start and end?

11. The correlation coefficients could be provided in Fig. 7 to show the strength of the relationships 12. Units are needed in Fig. 7.

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