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## ***Interactive comment on “Tree-ring reconstruction of seasonal mean minimum temperature at Mt. Yaoshan, China, since 1873 and its relevance to 20th-century warming” by Y. Liu et al.***

**Y. Liu et al.**

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Reply to Paul Krusic-1: RE Introduction: "tree growth is affected by environmental variables, such as temperature, precipitation and light" pjk - I would call these, with the exception of light, mainly climatic variables. Environmental variables are more local to the tree, e.g. slope, aspect, soil, elevation,etc.

[Reply] We have changed this sentence into "tree growth is mainly affected by climatic variables, such as temperature and precipitation". See Line 57-58.

"By using tree rings, series of temperature (Gou et al., 2008; Liang et al., 2008; Liu et al., 2009a, b, 2013; Cai et al., 2010, 2013; Bao et al., 2012; Li et al., 2013; Zhang

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Interactive Discussion

Discussion Paper



et al., 2013) have been elucidated in China." pjk- This sentence could be written more clearly.

[Reply] We have changed this sentence to "Based on tree rings, many temperature series have been reconstructed in different regions of China, mainly on the Tibetan Plateau (Gou et al., 2008; Liang et al., 2008; Liu et al., 2009a; Zhu et al., 2008), Loess Plateau(Cai et al., 2010, 2013; Li et al., 2013; Liu et al.,2009b), northeastern China (Bao et al., 2012; Chen et al., 2013; Liu et al., 2013), southeastern China (Chen et al., 2012; Duan et al., 2013) ." See Line 66-69.

"However, these documents have many disadvantages, for example, somewhat artificially effects caused by the recorders resulting in that the documents could not reflect the real natural climatic changes (Liu et al., 2001, 2003, 2007)." pjk - This sentence should also be re-written.

[Reply] We have changed this sentence to "we need more climatic information from different proxies in order to understand the past climate change more accurately." See Line 79-81.

"This would be the first time to reconstruct the seasonal mean minimum temperature using tree rings in the CPC, which is helpful to understand the mechanism of climate change and evaluate its social and economic effects in the vast CPC region. This research is also vital to establish the tree ring network in China." pjk - Though the authors may be correct naming this study as the first to reconstruct Min.Tmp at their site, it certainly is not the first attempt to reconstruct CPC temperatures from tree-rings.

[Reply] Yes, you are right. This is not the first attempt to reconstruct CPC temperature using tree rings. We have already pointed out in the Introduction (See Line 74-76). In order to avoid confusing, we have deleted the sentence "This would be the first time to reconstruct the seasonal mean minimum temperature using tree rings in the CPC, which is helpful to understand the mechanism of climate change and evaluate its social and economic effects in the vast CPC region."

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Interactive  
Comment

In the past year there have been two significant tree-ring, temperature reconstructions published for the same region. Cook, et al., 2013 (Climate Dynamics) produced a summer temperature reconstruction for 585 grid-points (coverage includes the area of this study) and Kaufman et al. (PAGES Consortium, 2013, *Nature Geoscience*) published an Asia-regional reconstruction of MinTMP, AveTMP and MaxTMP, all derived from tree-ring chronologies, and centered primarily over China.  
<ftp://ftp.ncdc.noaa.gov/pub/data/paleo/pages2k/DatabaseS1-All-proxy-records.xlsx>  
<ftp://ftp.ncdc.noaa.gov/pub/data/paleo/pages2k/DatabaseS2-Regional-Temperature-Reconstructions.xlsx> <ftp://ftp.ncdc.noaa.gov/pub/data/paleo/pages2k/auxiliaryinformation>  
I would like some explanation why these two publications are not mentioned nor their reconstructions utilized in this study?

[Reply] We have cited these two publications in the Introduction of the revision (See Line 69-70).

Secondly, I am curious to know how this study contributes to creating a tree-ring network in China? Of the extant 65 Chinese contributions in the ITRDB the single largest contributor (over 2/3rds) is the PAGES consortium (Kaufman, et al. 2013 *Nature Geoscience*). I cannot find any contributions by the authors of this article??? Please explain or remove.

[Reply] Thanks Paul. In fact, this question is nothing related to current paper. But we would like to say something to you. We Chinese dendrochronologists now are establishing a huge tree-ring network across whole China, and it is now still under developing. We already have obtained tree-ring chronologies from more than 200 sites within China. We hope we can share our research results with the scientists worldwide soon in the coming future.

RE Sampling: "According to the standard of the International Tree-Ring Data Bank (ITRDB), two cores were recovered from each individual tree." pjk - This is not true (see: <http://www.ncdc.noaa.gov/paleo/text/tringguide.html>). The ITRDB sets no standard for

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Interactive Discussion

Discussion Paper



Interactive  
Comment

the number of cores from a tree. As a matter of fact the ITRDB goes to great lengths to make submissions as painless as possible, which may be why it is the largest open access database of its kind, a fact the International Tree-Ring community is very proud of. The ITRDB's only requirement for submissions is measurements be cross-dated and accompanied by the sample's location (lat, lon, elev), species and some authoring authority, individual or group.

[Reply] "According to the standard of the International Tree-Ring Data Bank (ITRDB)"—has been deleted.

RE Chronology Development: "The curve obtained by averaging these series year by year reflected age-related biological noise." pjk - age-related biological growth "trend" would be better.

[Reply] We have changed this sentence to "The curve obtained by averaging these series year by year reflected age-related biological growth trend".

RE: Figures Fig.10. There is no 95% CL (dashed line) visible.

[Reply] In this figure, the bold line is the 95% confidence level.

Fig.9. It would be interesting to see how spatially significant the correlations are after accounting for trend in both datasets (eg. a plot of first-differenced or detrended correlations). I am assuming these are the significant correlations ( $p>10\%$ ). As an additional note, CRUts3.2 supersedes 3.1. Both are available for use on KNMI.

[Reply] Using CRU TS 3.21, we have calculated the spatial correlations after detrending for both datasets. Accordingly, this figure has been changed and detrended plots were added (see figure below).

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Interactive comment on Clim. Past Discuss., 10, 859, 2014.

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