

Interactive comment on “Northern Hemisphere temperature patterns in the last 12 centuries” by F. C. Ljungqvist et al.

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Received and published: 19 December 2011

We wish to thank Anonymous Referee #3 for positive, detailed and constructive comments on our manuscript. To further explore the uncertainty in the spline fits and to develop probabilistic ensembles of centennial values would certainly be an interesting objective, but as Anonymous Referee #3 admitted, this would fall well outside the scope of the present study. In the same way, specific assessments of the uncertainty estimation in proxies with different temporal resolution would also be a possible topic for a separate study.

Specific comments:

Page 3350, line 16: OK, we will add Ammann and Wahl (2007) to the list of previous

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works.

Page 3351, lines 9–11: OK, this will be corrected.

Page 3351, line 13: We will change this passage in agreement with the suggestion from the referee.

Page 3351, line 17: OK, we will replace “Previous” with “Recent”.

Page 3353: line 12: This will be clarified. We refer to our Response to Anonymous Referee #1.

Page 3353: line 13: Yes, we agree improvement is needed here in the main text. We will clarify this step in the final revised version.

Page 3353: lines 14 and 22: OK, this will be corrected.

Page 3353: line 15: The first reference to Fig. 4 is ill placed. We will correct this in the final revised version and include mention of the bootstrap confidence intervals.

Page 3354, second paragraph of section 2.1: No, the gridding procedure does not additionally smooth the proxy data it only distributes the proxy-local means over a Cartesian coordinate system. However, the same method employed in the calculation of the proxy mean (weighted average) is used in the spatial gridding, only instead of being performed over the lat and long of each proxy location it is performed over the intersection of every node in a Cartesian grid provided there are two or more proxies within a node-local search radius. Meaning, proxies that are closer to a grid node get a higher weight than proxies that are further from the grid node.

Page 3355, section 2.2: Anonymous Referee #3 correctly observes that it is hardly feasible in the present study, given the heterogeneous collecting of proxy records, to make any meaningful weighting of the proxies by correlation with nearby instrumental temperature. We address the issue in more depth in our Response to Anonymous Referee #2.

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Page 3357, line 13: It is Graham et al. (2010) and it is now added to the reference list.

Page 3357, line 23: OK, this will be corrected.

Page 3358, line 15: OK, “proves” will be replaced with “helps demonstrate”.

Page 3366, lines 9–11: We will remove this sentence.

Page 3366, lines 11–15: We are going to change “The lack of agreement on the sign in the 20th century should not be taken to mean that the proxies fail to capture the thermal state of the climate in the last century. Rather, it tells us that the proxy values are sufficiently close to the mean over the nine-century long baseline period for a substantial number of them to end up on either side of the baseline period mean” to “The lack of agreement on the sign in the 20th century does not necessarily mean that the proxies fail to capture the thermal state of the climate in the last century: it could be that the proxy values are sufficiently close to the mean over the nine-century long baseline period for a substantial number of them to end up on either side of the baseline period mean.”

References

Ammann, C., and Wahl, E.: The importance of the geophysical context in statistical evaluations of climate reconstruction procedures, *Climatic Change*, 85, 71–88, 2007.

Graham, N. E., Ammann, C. M., Fleitmann, D., Cobb, K. M., and Luterbacher, J.: Support for global climate reorganization during the “Medieval climate anomaly”, *Clim. Dynam.*, 37, 1217–1245, 2010.

Interactive comment on *Clim. Past Discuss.*, 7, 3349, 2011.

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