Clim. Past Discuss., 7, C2035–C2036, 2011
www.clim-past-discuss.net/7/C2035/2011/


Climate of the Past Discussions

# *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: 14 December 2011

We wish to thank Anonymous Referee #2 for constructive comments on our manuscript. A suggestion is made that we use a weighted average of the proxies, where the weights are based on the correlation between instrumental temperature and the proxy in question. If we had worked with only proxy records possessing high resolution (e.g., annual to sub-decadal) measurements this would have been possible. However, it would be very difficult to apply this idea to the many proxies with low resolution used in this experiment. A correlation between an instrumental record and a proxy that has only a few values in the instrumental period does not make a lot of sense.

In Experiment 1 we exclude one category of proxies at the time which can be consid-



ered as a form of validation testing. These experiments (Figs. S1–S8) demonstrate that excluding different proxy types does not change the results of our study. Also, with Experiment 3 in the supplement we do principally what Anonymous Referee #2 asks for when we use only proxies with 4 or more or 10 or more observations per century (Figs. S10–S11). This basically leaves only the documentary, ice-core, speleothem and tree-ring records, as well as some lake sediment records with annual varves, in the experiment. Still, the observed patterns remain the same, although with less spatial coverage. We are acquainted with the article by Li et al. (2010) that Anonymous Referee #2 refers to and have also reread it but do not find it relevant to our study. Suggestions in this article, for example using a Bayesian hierarchical model, is probably more suited for reconstructions of temperature time-series than for a reconstruction of spatial anomaly patterns.

References Li, B., Nychka, D., and Ammann, C.: The value of multi-proxy reconstruction of past climate, J. Am. Stat. Assoc., 105, 883–911, 2010.

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