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Climate of the Past Discussions

Interactive comment on "On the verification of climate reconstructions" *by* G. Bürger and U. Cubasch

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1). I agree with the Burger and Cubasch results and conclusions in general. Indeed, all NH reconstructions published to date gives a qualitative information only: For example, MWP and the Current Warming are warmer than LIA. But it is impossible to conclude with a certainty: either CW or MWP is warmer. It is even more so as concern centennial and decadal variations because these latter variations usually are of regional character.

2). Any calibration of proxy data is impossible if the target is decadal (and longer) temperature variations. The first reason consists of the general nonstationarity climate, in particular during the period used for a calibration. This reason is discussed in the Band C paper. The second reason consists of more or less large inertia of all kinds of proxies even including the higher-resolution proxies like tree-rings, corals and others

with formally annual lamination. The effective number of degrees of freedom for the instrumental time period is very small by this reason, and so any calibration is an illusion.

3). Each proxy is a kind of thermometer with unknown scale. Moreover, such a thermometer often is inertial, and so some temperature prehistory affects any current "temperature" for certain. Even moreover, some of such "thermometers" have their scale to be varying in time. Especially it is so for tree-rings (no standardizations can overcome this defect). By this reason, the only rings of mature trees must be used as "thermometers". The innermost rings (for about a century long period!) must be leaved without consideration.

By the way, attempts to create some surrogate proxy records by adding a white noise to model outputs (in order to obtain statistically significant results of the verification of different reconstruction techniques) like those have voiced by Mike Mann et al. are very naive because of the "thermometer" scale complexity.

4). Instead of any proxy calibration with respect to the instrumental temperatures it is necessary to develop a calibration of different proxy records with each other using a COMMON time period of these proxies observation. It is the same technique that can be used to compare temperatures measured in Celsius and other instrumental scales. Such a calibration is enough to compare relative warmness or coolness of climate events in past.

5). The most important topics of the paleoresearches for nearest years must be: - to update much more existing proxies for the current years;

- to collect a hemispheric (global) set of different proxies covering the same time period of two millennia AD and, maybe, the whole Holocene period;

- try to understand the essence of each proxy scale before creating surrogates of these;

- to develop a technique for these proxies calibration with each other over this common

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time period taking into account spatial variability of temperatures themselves and their proxy representation.

Basing on this new kind of calibration a completely NEW resonstruction must be done, and then compared with some model outputs.

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