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Climate of the Past Discussions

Interactive comment on "Northern high-latitude climate change between the mid and late Holocene – Part 1: Proxy data evidence" *by* H. S. Sundqvist et al.

Anonymous Referee #4

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This paper atttempts to provide anomalies of climate estimates of a few climate variables (summer, winter and annual temperature and annual precipitation) between 6ka and 0ka (1750 AD). The area of concern is Fennoscandinavia where the available dataset of palaeoclimate reconstructions is quite consistent. The authors have collected an important dataset for their statistical analyses. The authors underline the fact that there are biaises and pitfalls in the proxies (pollen, chironomids ...) used by the original authors who performed the initial climate reconstructions as well as in the methods used to obtain the climate variables.

As stated by the authors, this is a very challenging issue since they are dealing with a heterogenous dataset in many aspects (sampling resolution, dating uncertainties, different proxies ...). My main remark in this ms concerns the uncertainty within the results. Whatever the accuracy of the method used, it doesn't seem to me reasonable to evaluate the climate anomalies with a precision of 0.01°C. Apologies if my remark is too direct but only digital thermometers used in a specific environment can provide such highly precise and synoptic measure of temperature. Sorry to be insistant but even in the modern meteorology, we are unable to provide such precision of 0.01°C between two successive years so how could it be so when averaging data from several sites and over several (tens of) years?

I am hammering about this issue because it is a central point of the paper. In page 1828, lines 9 and 10, the summer temperature at 6ka was 0.96 +/-0.42; the winter temp was 1.71+/-1.70°C; the most pronounced cooling in Siberia was 2.24+/-0.88°C ...etc etc This high precision is used all throughout the manuscript.

The annual precipitation decrease is evaluated at 37 mm (page 1830, line 7). Nowadays, Fennoscandia receives more than 600mm/year on average. What is the impact of a decrease (or increase) of 37mm per year on the proxies that have been used for the paleoreconstruction?

There is even a comparison of reconstructed temperatures from pollen, diatoms and chironomids (page 1832) in the whole paragraph # 3.4 with that precision. Reconstructed temp from pollen is 1.23+/-0.37°C and diatoms is 1.03+/-0.67°C ... then a discussion follows up on pollen that provide lower (1.60°C) reconstructed values than diatoms (1.7°C). I respect my colleagues but the discussion in this paragraph just seems unrealistic.

The paragraph 3.6 should appear earlier just before the results as it discusses other data uncertainties.

To sum up, I didn't understand how the average of all uncertainities (described by the

CPD

5, C625–C627, 2009

authors in the methods) lead to such precision in the climate values?

Interactive comment on Clim. Past Discuss., 5, 1819, 2009.