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## ***Interactive comment on “Last nine-thousand years of temperature variability in Northern Europe” by H. Seppä et al.***

**Anonymous Referee #1**

Received and published: 30 June 2009

Review of “Last nine-thousand years of temperature variability in northern Europe” by H Seppä, AE Bjune, R Telford, HJB Birks and S Veski, submitted to Climate of the Past (CP)

Based on pollen-inferred mean July and annual temperatures from 35 sites, the paper by Seppä et al. synthesizes past temperature (and to some extent precipitation) patterns in northern Europe during the past 9000 years. The results are compared to independent climate reconstructions and also different forcings are considered and discussed. Overall, the paper is significant, including a mixture of original data and synthesis of existing, published data-sets. It fits well within the scope of the journal Climate of the Past (CP). The argumentation is in general based on sound data and appropriate methods. Moreover, the results are clearly presented and illustrated. Below, I list a few

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points that the authors should consider prior to publication of the paper.

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Abstract:

-Whereas the temperature (annual, summer) is covering the entire year, only statements about former summer humidity are included. Is it possible to add some information on winter humidity, in particular in the light that cold (warm) conditions are related to dry (wet) conditions, i.e. the opposite of the modern summer modes (see also below).

-Is the second part of the last sentence supported by the data presented in manuscript, or rather speculative? Should it be removed?

Results and discussion

-Page 9: The magnitude of the HTM is lower for T(July) than for the T(Ann). Considering the higher summer insolation during the early Holocene in the high latitudes, this is to me somewhat surprising. Is there any explanation for this pattern?

-Page 15: I think the initial statements of this paragraph apply only to summer conditions. I would welcome – if possible – a more detailed and seasonally resolved assessment and discussion of the relationship between temperature and precipitation. Considering for example pollen-based precipitation reconstructions from northern Scandinavia (e.g. Seppä & Birks 2001, *The Holocene*), the HTM precipitation is suggested to be higher than during the past 4-5 kyrs. Are pollen-based precipitation reconstructions not valid in this context? Or are mechanisms more complex than acknowledged in the paper? The conclusion gives a more balanced and cautious picture about the relationships between precipitation and temperature, which could be also adopted in the result and discussion part.

-Page 16: No obvious correlation between the stacked temperature curve and the C-14/C-12 ratio was observed. This should also be discussed in the light of dating uncertainty and sampling resolution of most of your records, which could potentially

5, C402–C405, 2009

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lead to a “smearing out” of a correlation.

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#### Editorial comments

- Page 35, line 8: Insert space after 1291
- Page 26, line 18: Remove dot after Table
- Page 37, Figure 1: Numbers for sites 18 and 30 are not marked on the map
- Page 38, Figure 2: Decimal points on all y-axes should be dots, not commas
- Page 39, Figure 3: Rotate right offset axis that numbers read according to left offset axis
- Page 39, Figure 3: Decimal points on all x-axes should be dots, not commas
- Page 40, Figure 4: Decimal points on all x-axes should be dots, not commas
- Page 41, Figure 5: Rotate right offset axis that numbers read according to left offset axis

#### Comments related to references

- Page 4, line 1: Lotter et al. 2002 should be Lotter et al. 2000 (according to page 26).
- Page 7, line 10: Remove dot after Linderholm
- Page 18, line 22: Change dash to hyphen
- Page 19, line 2: Is this journal abbreviation appropriate?
- Page 20: Bigler et al. 2002 cited in the text (page 42), but missing in the reference list
- Page 20: Birks and Seppä 2004 in the reference list, but not cited in the text.
- Page 26: Kaufman et al., submitted is cited as Kaufman et al. 2009 (page 13). Update!
- Page 27, line 11: Delete dot after 2004

5, C402–C405, 2009

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- Page 29: Renssen et al. in press in published now. Update!
- Page 29: Rosén et al. 2001 should be Rosén et al. 2002 (according to page 13).
- Page 31: Seppä et al. 2008 in the reference list, but not cited in the text.
- Page 33-34: Reference with author names starting with V should consistently be placed before references with author names starting with W

End of the review.

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5, C402–C405, 2009

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