**Climate
of the Past
Discussions**

Interactive
Comment

Interactive comment on "Borehole climatology: a discussion based on contributions from climate modeling" *by* J. F. González-Rouco et al.

Anonymous Referee #3

Received and published: 18 February 2008

This is a very important and thorough review on the potential and applications of boreholes in paleoclimtology. Such a contribution, to my knowledge, is lacking in the current literature and matches very well in CP and will be a very relevant publication for future applications in the field, research opportunity, etc.. The review also describes very nicely the combination of borehole climatology and paleoclimate modeling and the important contribution to understand the low frequency climate evolution covering the past centuries. It also shows also results which point to the potential for simulating the adequate energy balance within climate change scenario experiments. The paper is well written, the different parts are logically developed. I have just a few minor comments which I think the authors can address easily. I first start with some particular questions, followed by a few minor comments on parts of the manuscript. I look forward seeing

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Interactive Discussion

Discussion Paper
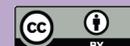
this publication published soon within the special issue of CP Interpreting subsurface temperature signals of climate change.

1) Improved understanding and knowledge of long-term natural climate variability and large-scale climate changes on different spatio-temporal timescales is of great importance to place recent anomalous, climate change in a longer-term context. To what extent can boreholes contribute to the current discussion on the spatial extend,intensity, trends within the so-called Medieval Warm Period/ Medieval Climatic Anomaly and the turn into the Little Ice Age?

2) The authors use ECHO-g for the model/borehole comparison. Can the authors state anything of other models such as HadCM3 or CCSM that also cover the last 500 years? It would be nice if the authors could incorporate some kind of comparison or discussion on the use of the other models as well. Do they show similar/different features?

3) The authors show the example of America (which is also discussed in more detail in a paper by Stevens et al. 2008, JGR. To what extent are the results applicable/comparable/relevant to other continents, say Europe?

4) Relate to the point above, to what extent can boreholes tell us anything about southern hemisphere, tropical climate change?

5) I was wondering about the uncertainties in the borehole data and the derived temperature estimate. Can the authors go a bit in more detail on this issue?

6) Is there a way to get cold/and or warm seasons climate information out from boreholes?

7) I think it would be of importance to detail also the 'limitations' of boreholes in our understanding of paleoclimate variability, etc. The manuscript mostly addresses the potential of this proxy.

8) As this paper is seen as a review article, I would suggest to incorporate the main findings of the other contributions within this special issue in CP as well Minor com-

ments on parts of the manuscript

9) page 16, line 17, is it correct 1951-1958?

10) page 17, line 24, is it correct north of 45degN?

11) page 18, lines 25ff, please provide the period under consideration

12) page 19, lines 9ff: can you estimate this effect?

13) Page 22, lines 20ff, see also point above: do the authors expect similar results for other regions?

14) please change all the bellow throughout the text with below

15) maybe the section 4 could be shortened, in my opinion it is a bit too detailed

16) page 28, line 21, can you say anything for the pre 1700 period? See also fig 7, is there a possibility to show also a trend over the full period or for the 1500 to 1700 period?

Interactive comment on Clim. Past Discuss., 4, 1, 2008.

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