

Interactive comment on “Selection of borehole temperature depth profiles for regional climate reconstructions” by C. Chouinard and J.-C. Mareschal

Anonymous Referee #2

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General Comments

The manuscript presents the results of a study performed by the authors to try to answer the general question concerning the way temperature logs must be selected for ground surface temperature (GST) reconstructions. The manuscript also tries to answer the question on how to perform the inversions to obtain ground surface temperature histories, i.e., should joint inversions of several temperature logs be used or should averages of individual inversions be used. I read the manuscript with pleasure and interest. The manuscript is well written and uses a quite readable style. I find the “Introduction” very good; there, the authors give a brief overview of the problem stated in the title

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Interactive Discussion

Discussion Paper

of the manuscript. The second section of the manuscript (“Theoretical framework”) is also brief and gives a very readable review of the state-of-the-art in the determination of ground surface temperature histories. In the third (“Description of the data”) and fourth (“Results”) sections the authors describe the data used to obtain the GST histories in three regions in Canada. The “Discussion” is interesting and, besides giving the reader an overview of the results of the calculations performed and explained in the manuscript, also gives a kind of six “recipes” for selecting temperature logs for reconstructing the ground surface temperature in the past. In my view this is a good manuscript.

Technical Corrections

The number of entries in the tables with the boreholes for the three regions in Canada is not consistent with the text. In my opinion, the authors should choose to put the entire data set for the three regions or else to put in the tables only the actual data used to perform the calculations described in the manuscript.

I also detected a few typing errors: In page 136, line 10, instead of “profile” it should be “profiles”; In page 137, line 16, instead of “GSTH; It” it should be “GSTH; it”; In page 147, the reference “Misener and Beck (1960)” should mention the title of the paper and the complete name of the editor of the book, i.e., S.K. Runcorn.

Final comment

Overall, I think the manuscript is interesting, readable, and presents results not only important in terms of regional ground surface temperature reconstructions for Canada but also in terms of criteria to select temperature logs for GST reconstructions and comparison of methodologies to obtain ground surface temperature histories. In my view the sections “Introduction” and “Discussion” are very pedagogic and worth reading and study by those interested in paleoclimatology using geothermal data.

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