

Interactive comment on “Modelling borehole temperatures in Southern Norway – insights into permafrost dynamics during the 20th and 21st century” by T. Hipp et al.

Anonymous Referee #1

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The manuscript "Modelling borehole temperatures in Southern Norway - insights into permafrost dynamics during the 20th and 21st century" presents a simple heat conduction modeling approach investigating permafrost evolution since the approx. end of the little ice age until the end of the 21 century at three locations in Southern Norway. The modeling study was performed at 13 boreholes covering an altitudinal range of around 1200m asl to 2000m asl, and provides valuable insights into ground temperature evolution, changes in active layer thickness and possible permafrost distribution over two centuries for different ground types. Additional to the results concerning the modeling study, the authors discuss diverse sources of uncertainties and possible implications on model output. Through this calibration, validation and quantification of uncertain-

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ties, the authors enhance the reliability of their modeling approach and increasing the value of their study. The reviewer has some minor suggestions mentioned below and in the attached PDF. The reviewer suggests a publication of the manuscript if these minor issues were addressed.

Minor issues:

Introduction: The introduction should be re-structured. Some paragraphs are out of context. For details and suggestions, please consider the attached PDF.

Validation: Please provide the Nash-Sutcliffe (NS) values for your validation when starting the simulation in the year 1860. I don't understand why for the first validation of the model during S2 and S3 you use NS, and for the validation of the whole model experiment starting in 1860 you only compare MAGT_{meas} to MAGT_{mod}. Give NS values as well, and provide the ranges of the NS values (see comment in attachment, page 354).

Historic temperature data (Page 348 and 349): Reformulate the paragraphs to make your procedure better understandable. What data do you have for what time period? How is the data interpolated (spatially) or extrapolated (temporally)? Your methods are unclear to me.

Language: Check the use of present and past in your manuscript. Check the logical order of your statements and paragraphs.

Please also note the supplement to this comment:

<http://www.the-cryosphere-discuss.net/6/C71/2012/tcd-6-C71-2012-supplement.pdf>

Interactive comment on The Cryosphere Discuss., 6, 341, 2012.

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