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Hydrology and Earth System Sciences Discussions

Interactive comment on "Mapping snow depth return levels: smooth spatial modeling versus station interpolation" *by* J. Blanchet and M. Lehning

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General comments:

I fully agree with the review #1, that the study is very interesting, clearly written, with a good organization, well described results and clear contribution. I also have only a few minor comments and hence recommend to accept the manuscript for publication in HESS.

Specific comments:

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1) p.6132, l.21: the terminology smooth GEV approach appears here as it is a standard (well-known) approach (which is probably not the case). Please consider to make some definition/clarification first.

2) What is the advantage of using both, DEM and mean snow depth, in linear regression models (from methodological and practical views)? Both are inter-correlated, so why not to use only mean snow depth (if available)?

3) Are there any implications of using geographical coordinates (latitude, longtitude) instead of planar x,y, e.g. for distance calculation in spatial interpolation?

4) Kriging method: please consider to note that no nugget variance (model) is applied in kriging. Kriging is an exact interpolator only if nugget is set to zero.

5) Section 6: It is not so clear (in the beginning of the section), how is the smooth GEV model constructed.

6) Please check the uniqueness of mathematical symbols used. E.g. the N is used once as the number of years and then also denotes the number of stations.

7) Are there any significant regional differences between spatial patterns of selected return level, obtained by different approaches? Please consider to add some comments.

8) References: What is the meaning of the numbers at the end of each reference? Is it in line with Copernicus publication style?

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 7, 6129, 2010.