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Hydrology and Earth System Sciences Discussions

Interactive comment on "Snow glacier melt estimation in tropical Andean glaciers using Artificial Neural Networks" *by* V. Moya Quiroga et al.

B. Schaefli (Editor)

bettina.schaefli@epfl.ch

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Both reviewers agree that this paper presents an interesting attempt to reduce the number of meteorological variables to simulate glacier melt. I encourage the authors to submit a revised version accounting for all their answers to the reviewers comments. In particular, this revised version should contain a better literature review, putting their work into perspective with similar work, including work in different climatic regions. Furthermore, the new version should more clearly discuss the limitations of ANN in general and for the application at hand and explicitly discuss how valuable the approach

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is for different climate conditions and how e.g. a calibrated ANN can be transposed to other similar case studies.

Another important point is the lack of validation data or comparison to other models. The authors should concisely argue why they think that their validation is good enough. In absence of the possibility to set up e.g. a temperature-index model, a comparison to a regression model (reviewer 2), for example considering different scenarios of data availability, might still be interesting even if the ANNs have been shown to outperform such regression models (since regression models are straightforward to interpret, this would help the reader to get a quick impression of the performance differences; it might also be interesting to see how this method reacts to temperature input uncertainties compared to how the ANN reacts).

Additional detailed comments:

- I do not think that providing simulations for different elevation bands is interesting here since you do not have observed data to validate the melt rates obtained per elevation band

- an analysis of input uncertainty for temperature would be very welcome; in fact, such an analysis should, as far as possible, be included in any modeling study

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Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 9, 9455, 2012.