

Interactive comment on “Modelling of snow processes in catchment hydrology by means of downscaled WRF meteorological data fields” by K. Förster et al.

Anonymous Referee #3

Received and published: 29 May 2014

General Comments:

Overall the paper deals with an interesting question, because data availability is often the bottleneck for modeling.

I generally agree with the other referees, in particular it is essential to mention that WRF precipitation is not used to run the models in the abstract. Moreover there should be more specific information given, e.g. about how the calibration of the models was done. Also it was not clear if the measured precipitation is corrected for systematic errors like undercatch.

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Overall I suggest to focus revision on the calibration of the models and giving more specific information about them, e.g. if they use different thresholds to divide between rain and snow. This makes results hard to compare. Also the degree-day method should be explained better regarding the use of a fixed or variable degree-day factor. Finally, if there are snow height measurements available, they could be used to evaluate snow cover development for the point scale modeling.

The specific comments may help to provide missing information and if these deficits can be eliminated the paper meets the requirements of the journal.

Specific Comments:

P4067: Line 8pp: Regarding which climatological parameters?

P4067: Line 21pp: What is the range in altitude in the Sieber catchment? Are rain gauges representing the topography of the catchment?

P4068: Line 3pp: Is there a reference? Or derived through own data analysis?

P4068: Line 10pp: Why are just 2 years considered in the study? How well are the meteorological values modeled for the other seasons?

P4071: Line 26 pp: Please mention more about the used degree day method. Is the degree-day factor changing over the season or is a fixed factor used over the whole period?

P4074: Line 6 pp: Please clarify more how the calibration was done. Why did you calibrate with meteorological data from 1971 to 2000 but precipitation from 2002 to 2008? Why to use measured meteorological data if the model is driven by WRF data?

P4074: Line 8pp: Why don't you use another year (representing more average conditions) for calibration instead of one included in the study? Especially since you are just modeling 2 years.

P4074: Line 17 p: It would be interesting to have a plot of the other meteorological time

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series as well.

P4074: Line 20pp: FIGURE 4: Is the measured data compensated for errors like wind error? How does data from different stations look like? Are there some stations representing the modeled data?

P4076: Line 1pp: FIGURE 6: Is snow height measured at point scale? At the beginning of the event SWE values range from approx. 275 to 375 mm for the different models. So not only runoff for this event is interesting, also if the whole season is represented correctly.

P4077: Line 19pp: Is that a good measure for model performance?

P4077: Line 23p: Why weren't more winters used then? If comparing different models in performance, than a comparison or ranking should be possible.

P4077: It would be interesting to also see whole winter seasons for point observations.

P4078: Line 26pp: Not all models used the same thresholds to separate rain and snow? How are parameters for the models set? Do comparable parameters differ for the different models?

P4079: Line 23: It is not clear, how snow and rain are separated.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 11, 4063, 2014.

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