



***Interactive comment on* “Evaluation of numerical weather prediction model precipitation forecasts for use in short-term streamflow forecasting” by D. L. Shrestha et al.**

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General remarks:

This paper is a nicely prepared exercise of NWP quantitative precipitation forecasts (QPF) using only partly state-of-the-art verification methods and considering hydrological boundaries (analysis at catchment scale). Some specific QPF verification methods are not discussed (see comments below).

While in the title “streamflow-forecasting” takes a prominent role, no quantitative

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streamflow simulation is presented in the whole manuscript. Some speculative arguments concerning propagation of precipitation by streamflow forecasting are declared in the conclusions. But in the whole manuscript we obtain no information about the structure, name and configuration of an hydrological model having being forced by the presented QPF. I find also a bit a pity, that the verification and results almost solely focus on the coarse ACCESS-G product, while for the high resolution ACCESS-VT and ACCESS-A models only one figure is given.

My judgement as a reviewer is that this paper might be adequate for final publication in HESS after addressing some issues presented below.

The paper is written in fluent English by native English speakers. As a non-native English person it was no problem for me to read it.

Major issues: Page (line)

P 12572-12575: While I find the general declaration of the used scores well formulated, I was a little bit surprised, that I was not able to find in the whole manuscript any reference to the SAL (for structure (S), amplitude (A), and location (L) of the precipitation field) verification method proposed by Wernli et al. (2008). Have you considered this method and then decided to disregard it? Would the SAL approach suit to evaluate your data?

P 12582: You don't show many results on the verification of the high resolution ACCESS-VT and ACCESS-A models. I would welcome in a revised manuscript to give more weight on results for all models.

P 12586 (8-11): You write: "The catchment average precipitation is used as the

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input to lumped hydrological models when forecasting streamflow. Furthermore, the sensitivity of the streamflow forecasts to the errors in catchment average precipitation is higher than to the stations precipitations because of a smoothing effect.”

First issue: From the manuscript we don’t learn any details on which kind of hydrological models are used (or planned to be used). As you average precipitation for sub-catchments one might expect that you use lumped models, but there is enough literature also on the use of distributed models for hydrological forecasting.

Second issue: How can you conclude on the sensitivity of the streamflow forecasts? You should carefully revise the paper in order to eliminate any speculation on streamflow-forecasts. I have the impression that you have already the results of the streamflow forecasts and that you plant to present them in a follow-up paper. No problem with this, as long as you avoid making conclusions and interpretation of streamflow forecasts in this manuscript.

Minor comments: Page (line):

P 12564 and 12565: I would expect some citation to support the general affirmations of the first paragraph of the introduction. E.g. for the intercomparison of NWP models you could refer to Rotach et al.(2009).

P 12565: There is a recent review paper by Rossa et al. (2011) on propagation of uncertainty from NWP into hydrological models.

P12567: You might be eventually also interested in the paper by Ament et al. (2011).

P12568-12569: Is this the first study using the ACCESS model suite? If yes I

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would expect more information on the model and its relation to other similar model suites (e.g. COSMO). If other studies have been already published, then you should cite them.

P 12570: Can you give some information on how you estimated potential evapotranspiration?

P 12571, lines 9-18: This paragraph is formulated in a not very scientific way (e.g. “suspicious data”). Can you re-elaborate this in give some information on how you detected the suspicious data, how many data (in percent) were “suspicious” and how many needed to be “infilled” (and how ...)

Figure 3: Can you assign a colour to the area of the Wangaratta basin?

Best regards

Massimiliano Zappa, WSL, Switzerland, 9.1.2013

References:

Ament, F., T. Weusthoff and M. Arpagaus, 2011: Evaluation of MAP D-PHASE heavy precipitation alerts in Switzerland during summer 2007, Atmospheric Research, 100 (2-3): 178-189.

Rossa A, Liechti K, Zappa M, Bruen M, Germann U, Haase G, Keil C, Krahe P. 2011. The COST 731 action: a review on uncertainty propagation in advanced hydro-meteorological forecast systems. Atmospheric Research. . Thematic Issue on

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Rotach MW, Ambrosetti P, Ament F, Appenzeller C, Arpagaus M, Bauer HS, Behrendt A, Bouttier F, Buzzi A, Corrazza M, Davolio S, Denhard M, Dorninger M, Fontannaz L, Frick J, Fundel F, Germann U, Gorgas T, Hegg C, Hering A, Keil C, Liniger MA, Marsigli C, McTaggart-Cowan R, Montani A, Mylne K, Ranzi R, Richard E, Rossa A, Santos-Muñoz D, Schär C, Seity Y, Staudinger M, Stoll M, Volkert H, Walser A, Wang Y, Wulfmeyer V, Zappa M. 2009. MAP D-PHASE: Real-time Demonstration of Weather Forecast Quality in the Alpine Region. *Bulletin of the American Meteorological Society*. 90. Pages 1321-1336. doi:10.1175/2009BAMS2776.1

Wernli, Heini, Marcus Paulat, Martin Hagen, Christoph Frei, 2008: SALĀĀĤA Novel Quality Measure for the Verification of Quantitative Precipitation Forecasts. *Mon. Wea. Rev.*, 136, 4470–4487. doi: <http://dx.doi.org/10.1175/2008MWR2415.1>

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