Hydrol. Earth Syst. Sci. Discuss.,
doi:10.5194/hess-2016-250-EC1, 2016

Hydrology and Earth System Sciences
Discussions

Interactive comment on "Estimating extreme river discharges in Europe through a Bayesian Network" *by* Dominik Paprotny and Oswaldo Morales Nápoles

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Received and published: 13 September 2016

Thanks for submitting this interesting manuscript to HESS. This manuscript presents a new approach to discharge peak estimation, which obviously is a very timely issue. The reviewers provide valuable comments on the manuscript. In addition I have the following concerns:

The presentation of the BN performance in figs 5&8 is misleading as the values are given in m3/s, where results always look much nicer than if specific discharge values would be plotted (see figs 6&7 in Wrede et al. (2013) as example). Based on my comments &reply before publication in HESS-D, I understand the aim to compare results with previous papers (which used the m3/s comparison) and the drop in performance

is now mentioned in one sentence. However, it would be much better if the plots would present the simulations in the fair way (i.e. specific discharge values) and the comparison would be given in words that vice versa. After all, we should aim at providing examples of good practices!

Opposite to the authors' interpretation of Rojas et al. (2012) different climate models (GCM/RCM combinations) can provide largely varying results. Therefore, the use of only one GCM/RCM comination is a clear limitation and largely ignoring the uncertainties caused by the climate models (see conclusions in Rojas et al. 2012; and recent papers by PhD students in my group (Teutschbein and Seibert, 2012; Addor et al., 2014). Furthermore, given the often significant biases in climate model simulations, the decision to not use any bias correction is surprising at least. Both decisions (only one model, no bias correction) need to be motivated more convincingly. At least I would recommend the authors to test the effects of using another model and/or bias correction.

My major concern, however, is figure 7, which illustrates predicted future changes in the 100-year floods over Europe. Such figures easily get the attention of media and decision makers and as scientists we, thus, really have to be careful in how we communicate such results. Presenting such results without also quantifying uncertainties is problematic. I, thus, strongly recommend to quantify the uncertainties of the results shown in fig. 7. There are partly huge differences in the predicted changes in neighboring streams (even in regions where snow is not important) and I am missing an explanation of these differences. One approach to help understanding the patterns would be to use a uniform precipitation change, so that the effects of differences in catchment characteristics versus differences in precip-changes could be disentangled. (In addition, as far as I can see, the climate change prediction is not mentioned in the methods part.)

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Interactive comment on Hydrol. Earth Syst. Sci. Discuss., doi:10.5194/hess-2016-250, 2016.