

Interactive comment on “Filling the white space on maps of European runoff trends: estimates from a multi-model ensemble” by K. Stahl et al.

Anonymous Referee #2

Received and published: 10 April 2012

The paper validate estimated trends of hydrologic signatures (annual runoff, high flow and summer low flows) from an ensemble of large scale models and extrapolate the trend estimates in space, over all Europe. It is a nice exercise of model validation and regionalisation. It is clearly written and extremely interesting for other hydrologists like myself, who happen to live surrounded by the "white space" the authors mention in the title. Even though the attribution of trends is not covered in this paper, some hypotheses are formulated in the discussion section, which is inspiring for further research. Regarding uncertainty, the paper concludes that the ensemble mean outperforms the single models. That is quite striking for me: why is that so? I realise that answering to this question goes beyond the scope of this paper, but maybe the authors could discuss briefly what do they think the reasons are (I cannot find one myself). What the first reviewer suggests, i.e., to discuss the performance of individual models singularly,

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could perhaps provide a key to interpret this result. Also, if the multimodel ensemble is the way to go, some results on the spread of the ensemble (and in how many cases the observed value lies inside/outside it) could be added to the paper and discussed.

Minor comments:

Page 2011, line 20, eq. 1: maybe write again here what is m.

Page 2014, line 5: it is interesting that the ensemble mean works better than individual models in getting trends right for high flows and low flows. What could be the reason?

Page 2014, line 19: why are the trends in May and June harder to model? Any idea about what processes could determine that?

Figure 1: (this is just a suggestion) add probability plots like those in the forecast literature, which show how uniformly the ensemble contain the observed trend.

A table could be added with a summary of the characteristics of the catchment used for validation (area, elevation, mean annual precipitation, ...).

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 9, 2005, 2012.