

## ***Interactive comment on “Climate and hydrological variability: the catchment filtering role” by I. Andrés-Doménech et al.***

### **Anonymous Referee #1**

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The manuscript proposes an analysis to investigate on the watershed filtering role respect to the climate variability.

The research question concerns the effects of climate variability due to the climate change on the peak flood frequency distribution and the smoothing effect offered by the rainfall-runoff transformation.

The topic is particularly interesting and the manuscript is pleasant to read, so I am glad to suggest its publication.

In the following I have some comments to share with the authors.

1) Although the adopted model is really simple, the proposed framework is potentially

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useful to offer an interesting overview not limited to the role of climate change. Indeed, it could represent a good opportunity to investigate on the possibility that the variability of the watershed properties has a greater effect compared to the variability induced by the climate change. For instance, in my opinion, the land use change has a predominant role compared to the climate change variability. The proposed manuscript could be more appealing if this issue is included or underlined with more emphasis.

2)The analysis related to the number of event per year (Equation 8) is confusing, I mean, while it is clear the aim, the hypothesis of 20% variability includes both rainfall-runoff transformation and climate variability. So it is not clear how to identify the specific component of variability. Indeed, the “Beta” parameter in Eq 8 is described as the number of rainfall events per year...while it should be the number of extreme flood peaks per year, please clarify this point.

3)Authors list a series of parameters (a-g) on which the peak flow distribution is related. However, the analysis described in Section 3 & 4 does not includes some important parameters, like initial abstraction and concentration time. So, apparently, the analysis is incomplete since the variability of these additional parameters can affect the rainfall-runoff transformation.

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