

Interactive comment on “Geomorphology-based index for detecting minimal flood stages in arid alluvial streams” by E. Shamir et al.

Anonymous Referee #2

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By Shamir et al.,

This work is motivated by the need to identify a minimal flow to issue a flash flood warning in ephemeral arid environments. The study identifies the characteristics of a field-based geomorphic index (termed AFIG) which fits these purposes and provides a methodology for its estimation in ungauged basins. The work fits very well with HESS and will attract the attention of hydrogeomorphologists and hydrometeorologists involved in flash floods in arid zones. The work is very well done, well organized and clearly presented. I have only a few minor remarks, which are listed below. I recommend ‘minor reviews’ for this manuscript.

Remarks:

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Abstract: In the abstract, the geomorphic index is presented as a ‘lower threshold for minor floods’ which is associated to flash floods. Actually, there is not a ‘higher threshold’ presented in the work. I suggest to reword this sentence in order to avoid possible misunderstandings.

Introduction: please add a sentence illustrating how the new index can be coupled with a model for flash flood forecasting to issue a warning.

Introduction: The text states that there is an association between bankfull flow, the corresponding 1-1.5 yr return period, and the effective discharge. Actually, I would invite the authors to nuance the statements. Phillips (2002), for instance, reports that ‘Bankfull flow may well have a recurrence interval of 2 years or so - there is not enough evidence to judge - but bankfull discharge does not appear to have any special significance with respect to maintaining or modifying the channel. This suggests that channel dimensions and sediments in coarse-bed mountain streams are likely to reflect relatively rare, large floods rather than more common flows with recurrence intervals of 2 years or so.’

Concluding remarks. This section states that “In arid environments there are many cases when even the largest flows do not overflow the channel’s sometimes undefined banks. Furthermore, planners in arid environments indicate that even the occurrence of low flow in the channel might already be considered as requiring warning.” The authors should report, both here and in the introduction, why there is such a difference between temperate humid and arid environments and which are the implications (i.e., they could develop on the observation that in arid environment, where ephemeral rivers are the rule rather than the exception, vulnerable properties, assets and activities are often located within the rivers, hence a different concept that bankfull flow is required to issue a warning).

References Phillips, J.D., 2002: Geomorphic impacts of flash flooding in a forested headwater basin. *Journal of Hydrology*, 269 (3-4), pp. 236-250.

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