

Hydrol. Earth Syst. Sci. Discuss., referee comment RC1
<https://doi.org/10.5194/hess-2021-352-RC1>, 2021
© Author(s) 2021. This work is distributed under
the Creative Commons Attribution 4.0 License.

Comment on hess-2021-352

Anonymous Referee #1

Referee comment on "Rainfall–runoff relationships at event scale in western Mediterranean ephemeral streams" by Roberto Serrano-Notivoli et al., Hydrol. Earth Syst. Sci. Discuss., <https://doi.org/10.5194/hess-2021-352-RC1>, 2021

This paper aims at better understanding rainfall-runoff relationships through statistical modelling in two ephemeral streams in Spain (with a focus on rainfall events triggering runoff). The paper is well structured. The objectives are also clearly presented.

Evapotranspiration is probably another driver (see L180) – depending when extreme events occur, response in terms of runoff may differ with the stage of plant growth. Why have you not introduced ET₀ data (e.g. <https://essd.copernicus.org/articles/11/1917/2019/>) in your analyses ? e.g. considering P-ET₀ as explanatory variable.

I have some doubts about the method used for the frequency analysis: obviously, all the episodes have been kept (more than one value sampled each year) and the peak over threshold approach should be carried out to derive return levels. The generalized Pareto distribution is the most suited distribution (instead of GEV adapted for the block maxima method). For example, the empirical return period of the observed maximum and the length of the time series should be in the same order while Figure 8 suggests return periods > 100 years. Consequently, the rainfall events triggering runoff are probably more frequent than those derived from the frequency analysis. The authors have applied the block maxima approach to data resulting from the selection of over-threshold values (threshold = 0). The method and the discussion should both be revised.

There are many studies on rainfall-runoff relationships in ephemeral streams. The authors should develop more the peculiarities of their findings for the two catchments regarding these relationships.

Details:

L35: There is an inversion between first name and last name in the reference « Thibault et al. 2017 ». = = > Datry et al. is the correct reference.

L40: a reference regarding sediment transport:
<https://doi.org/10.1016/j.catena.2020.104865>

Fig. 1: we do not see the main river network. Please add the location of the two reservoirs, even if we guess that they are the mouths of the two catchments, and point out the stations used to compute the precipitation time series.

L102-106: The authors used long time series to perform a stationarity analysis. Are gridded and local data consistent during the concomitant period (correlation, mean, etc.)? This is important to assess the representativeness of the gridded data for the two catchments.

L218-219 & S2: Some criteria have been computed, but not commented (please add some comments or delete the values).

Figs 6, 7 and 8: Please use semi-log plots with the y-axis on a logarithmic scale to make the reading easier.