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Hydrology and Earth System Sciences
Discussions

Interactive comment on "Event-scale power law recession analysis: Quantifying methodological uncertainty" *by* David N. Dralle et al.

Anonymous Referee #1

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Review of Event-scale power law recession analysis: Quantifying methodological uncertainty by Dralle et al.

The authors state that, while there is increasing attention for single streamflow recession characterization, it is unknown what the dependence of estimated model parameters on methodological choices is. To resolve this problem, they use daily streamflow data from 16 catchments located in California and Oregon and investigate how commonly used streamflow recession definitions influence the parameters of a power-law recession model that describes the recession. The methodological choices include: - the start of a recession - the end of a recession - the minimum length of a recession - the method of power law model fitting Results indicate that these choices can impact parameter value estimates, whereby the recession parameter distributions are method-dependent, but a particular method affects a given parameter in similar ways

across most catchments.

The article is generally well written and addresses a relevant topic (i.e. suitable for HESS). While I am generally positive about this article I think a few things need to be clarified before I can recommend publication in HESS.

- The article lacks information of the hydrology of the catchments beyond its approximate location, size, and that they are in a Mediterranean climate. Some more hydrological context will help to better understand the (lack of) transferability (to other catchments) of your results. For example I can imagine that these methodological choices may have a different influence for an arid headwater catchment vs a wet large catchments etc. etc. When you provide some additional information about the catchments, I also expect that you put your results into context of the range of catchments that you cover, i.e. how generalizable do you think your results are, or are they only representative for this small subset of catchments?

- The goal of event-scale recession analysis is to interpret variations in catchment response to rainfall as a function of the properties of rainfall events or the catchment state. Because your methodological choice will affect what information you obtain from the recessions (e.g. do you include the recession just after a peak, or do you wait a few days can affect if you include the information on quicker flow processes) I expect that such choices are explicitly discussed in context of single recession analysis (and thereby you differentiate your work better from e.g. Stoelzle et al, who have done something similar as you present but then for a cloud of points).

- Given the (approximate) location of your catchments I suspect that snow may play a role in streamflow generation. Do you need to account for this in determining the hydrograph recession periods? If yes; please apply a method that takes the role of snow into account. If no: make clear why snow is irrelevant for your study.

Technical/minor comments:

- To my understanding Ye et al. (2014) do not use individual recession events but they use the lumped version instead.

Please check your reference list. There is missing information (e.g. page numbers) and wrong information (wrong journal). This list below is therefore not complete.

- Berghuijs, W., Hartmann, A., and Woods, R.: Streamflow sensitivity to water storage changes across Europe, Water Resources Research, doi:10.1002/ 2016GL067927, 2016 is published in GRL, not WRR.

- Stoelzle, M., Stahl, K., and Weiler, M.: Are streamflow recession characteristics really characteristic?, Hydrology and Earth System . . . , 2013.: "Misses information"

- Whiting, J. A., and Godsey, S. E. (2016): add “30: 2305–2316. doi: 10.1002/hyp.10790.” to reference

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