Hydrol. Earth Syst. Sci. Discuss., 12, C6899–C6901, 2016
www.hydrol-earth-syst-sci-discuss.net/12/C6899/2016/

Hydrology and Earth System Sciences
Discussions

Interactive comment on "Effects of record length and resolution on the derived distribution of annual precipitation" *by* C. I. Meier et al.

Anonymous Referee #2

Received and published: 29 February 2016

General comments:

The authors test a method proposed by Eagleson (1978) to estimate the probability distribution of annual rainfall from short observed records of individual storms. Especially they address the questions how record length and temporal resolution of rainfall influence the estimation accuracy. They apply the method for one rainfall station in Conception/ Chile and one station in Lugano/ Switzerland. They found, that using short records of storms provides better estimates of annual rainfall statistics than using short annual rainfall records directly.

The idea and methods are not new. The special focus on record length and temporal resolution is only partly novel. However, the revival of this idea may have important practical relevance for dealing with non-stationary time series, which cannot be used in

full length for future water resources management. This message would justify publication of the article. It is a pity, that the authors only mention this in the introduction and in their conclusions, but did not investigate this in more detail e.g. using non-stationary time series. The manuscript is well written and quite compact and can be published after some revisions.

Detailed comments:

1. Introduction: There is no reference where the method of Eagleson (1978) has been applied. It would be useful for the reader to discuss a couple of applications and to compare it with the results of the authors in the conclusions. Is this really the first time Eagleson's method has been used, which would be quite surprising for me?

2. Page 12994: The data are resampled 200 times. Is this done with or without replacement and why? The former is the bootstrap the latter the permutation approach. Using the former also allows to resample the full 25-year record and to estimate it's sampling uncertainty .

3. Page 12995: Small storms < 1mm are neglected. How much do those storms contribute to annual rainfall. If this is significant, how can this be estimated using the DDA approach to obtain the real total annual rainfall sum.

4. Page 12995-12996: The fitting of distributions (exponential, gamma, normal and lognormal) should be accompanied with results from a goodness of fit test. Especially, the choice of the normal distribution should be justified by a quantitative test measure.

5. Figs. 5 to 8: In these figures the highest density for the samples of the DDA approach appears always on the left side of the peak of the full sample. This looks like a bias? Please discuss this outcome.

6. Conclusions: The limits of this approach should be mentioned, i.e. it can only be used for estimating annual rainfall sums. It should be made very clear, that for many engineering applications extreme values of short durations are required and that for

this long records are still necessary and this method is not applicable.

7. Figure 10: It is not clear what is the difference of the data for the x and y axes. Both are labelled “Annual rainfall”?

Technical corrections:

- Equations: There seems to be a problem with many equations in the pdf-file. The sum sign is not readable.

- References: There are strange numbers at the end of many references.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 12, 12987, 2015.