Hydrol. Earth Syst. Sci. Discuss., 10, C855–C856, 2013
www.hydrol-earth-syst-sci-discuss.net/10/C855/2013/

Hydrology and Earth System Sciences Discussions

Interactive comment on "Probability distributions for explaining hydrological losses in South Australian catchments" *by* S. H. P. W. Gamage et al.

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Received and published: 16 April 2013

The paper aims to identify suitable parametric and non-parametric probability distributions on initial loss (IL) and continuous loss (CL) data of four catchments in South Australia (SA) region. There are some serous controversies over the work. The main issue is the lack of innovation or scientific improvement of previous works. I refer to some parts of the text in this regard. On Page 4600 Lines 24-27 and Lines 28-29 it is stated that previous probabilistic methods could not be used for SA catchments. The question is do the work by authors can be generalized to other parts of Australia? The answer is no, as indicated in Page 4612 Line 21 "parameter generalization is not within

the scope of this paper". As stated in Page 4601 Lines 13-14 the present work is just a case study for four catchments in SA.

The authors used the terms "joint probability" which had the potential for making their work different from others. But there was not any sign of using this concept in their work. All the paper is based on the univariate analyses. I, as a reader, expected to see some joint probability distribution functions (jpdf) of IL and CL or any sets of two or more variables.

Some other major points are as follow:

1- Page 4604-4605, other goodness-of-fit tests such as Anderson-Darling are preferred to graphical methods which are based on visual comparison of empirical and selected distributions.

2- Some information missed in the paper, an important one is the size of observed IL and CL series for each catchment or better to say the number of rainfall and runoff events which are used to extract IL and CL data.

3- Page 4613 Lines 5-6 which criterion was used for similarity (consistency) between distributions. The authors stated that the obtained distributions for selected catchments in SA are similar to those of other studies. How can the authors support this statement?

4- It is suggested that the authors provide a map with more details for the selected catchments. For instance, the location of rainfall and hydrometry gages can be added to the map.

5- How can it be perceived from Table 3 that the observed and simulated IL values are within the 95% confidence interval? (Page 4611 Lines 12-14).

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 10, 4597, 2013.