Hydrol. Earth Syst. Sci. Discuss., 12, C4369–C4370, 2015
www.hydrol-earth-syst-sci-discuss.net/12/C4369/2015/

Hydrology and Earth System Sciences
Open Access
Discussions

Interactive comment on "A rainfall design method for spatial flood risk assessment: considering multiple flood sources" *by* X. Jiang and H. Tatano

Anonymous Referee #1

Received and published: 23 October 2015

The manuscript describes a rainfall design method using multivariate distribution of critical rainfall duration. Moreover a small basin case study application, where 49 years of hourly rainfall records are available, is presented.

The method proposes to identify different source of potential floods using concentration time for estimating critical rainfall durations. Moreover, it proposes to use copula function to generate triplets of critical rainfall in order to estimate design storms.

While I found the paper interesting, I have several doubts listed as in the following:

1) I did not well understand the rational of the proposed methodology, maybe the section 2.3 should be much more clear. Apparently, but maybe I am wrong, using a Chicago hyetograph the author could identify the desired possible flood sources re-

Full Screen / Esc
Printer-friendly Version
Interactive Discussion
Discussion Paper

lated to different critical duration.

2) The concentration time is particularly difficult to estimate so its application includes a high level of uncertainty difficult to evaluate [1].

3) The case study data set is not appropriate for a trivariate copula analysis (49 data).

4) It is not clear how the triplets are simulated starting from the multivariate distribution fixing the return periods 20-50-100 years.

5) In general, if the aim is the flood risk mapping, the design hyetographs based on critical duration are inclined to underestimation hydrograph volume. [2]

[1] Grimaldi, S., Petroselli, A., Tauro, F., Porfiri, M. Time of concentration: a paradox in modern hydrology [Temps de concentration: un paradoxe dans l'hydrologie moderne] (2012) Hydrological Sciences Journal, 57 (2), pp. 217-228.

[2] Grimaldi, S., Petroselli, A., Serinaldi, F. Design hydrograph estimation in small and ungauged watersheds: Continuous simulation method versus event-based approach (2012) Hydrological Processes, 26 (20), pp. 3124-3134.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 12, 8005, 2015.