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Hydrology and Earth System Sciences
Discussions

Interactive comment on "Comparison of methods for separating flood frequency of reservoir by sub-seasons" *by* J. Li et al.

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(1) Based on the flood regulating calculations in sub-seasons, we obtain the ranges of flood control level in each sub-season with the fixed flood control level of the original plan as the lower limit. Considering that this paper mainly highlights the methods for flood season separation, so there are not so many details in this paper about the determination of the flood control level in each sub-season, and by figure 5 we just want to show that flood control levels can be raised above the original fixed one based on the flood season separation. As you can see in figure 5, there is a raise of the flood control level in each sub-season and with different methods for separation comes different flood regulating calculations and thus flood control level is raised to different extents. (2) When using the fractal method, we try to find out the pattern or the rule of

the flood timing of the research reservoir, so we have recorded the first three largest daily inflows of each year in the 43-year research period and thus there are 43 groups of the three largest daily inflows. When plotting them on graph, we got three series which you can see in figure 2. Taking the largest series as an example, the horizontal axis does represent date, but points in this series don't come from the same year but from 43 years, so 43 points form a series. Noting that there are some years in which the largest daily inflows are lower than the second largest of latter years, and they occurred on very near dates, so the graph may be confusing by making you think it's unreasonable that some part of the largest series is below the second or third largest series, but the points are actually from different years. In order to find out which period is flood prone and the overall magnitude of floods in different period , we have to plot those three series in the above way. (3) In this paper we selected a reservoir in China to do case research, so the latter calculation should be consistent with the specific Chinese regulations about reservoir and hydro-projects. But the methods proposed in this paper can also be applied to reservoirs or projects in other countries considering that most of the world's reservoirs adopt fixed flood control level which is the upper limit for reservoir water level in flood season and they can also raise it a bit to create more benefits, and when they conduct such calculations, certainly they should follow their own regulations. (4) In figure 4, the fitting curve is not completely consistent with the actual distribution, but fitting is not always 100% accurate. What we want to draw from the fitting graph is in which period flood is the most prone to occur and then separate the flood season accordingly, and the lag during June on the graph has little impact on the flood season separation as we combine June and July into one sub-season. The scatter plot used to draw figure 4 is uploaded. We used POT method to take flood samples and plot the following graph, based on which we calculated flood frequency in every 10-day period and then obtained figure 4. (5) The labelling problem in table 1 is relevant, and we committed these mistakes due to our habitual Chinese expression. Thanks for this warm reminder. Thanks for the informative comments from all referees, which are of great help to our paper and to our future research.

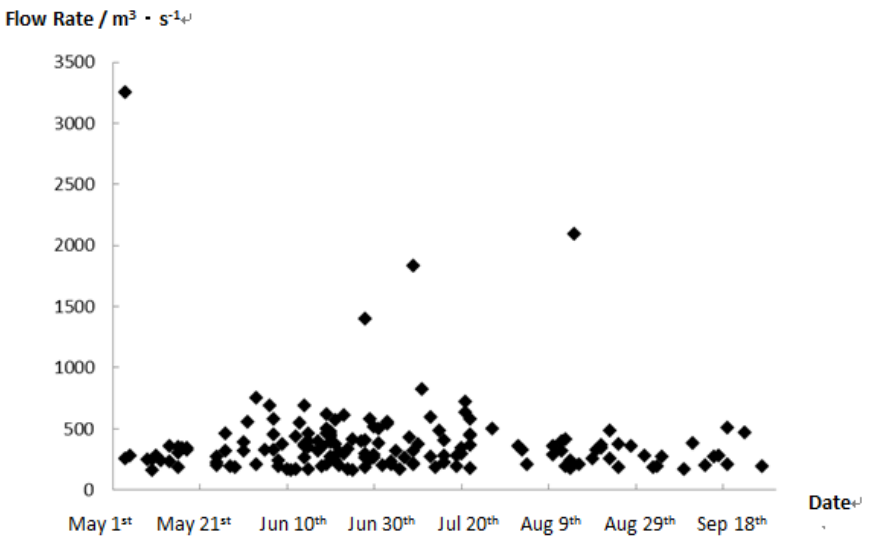

Fig. 1. scatter plot of flood occurrence time based on POT method