

# ***Interactive comment on “Changing patterns of extreme water levels in urbanizing plain river network region of Taihu Basin, China: characteristics and causes” by Y. Wang et al.***

**Y. Wang et al.**

xyynju@163.com

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Comment 1: The paper attempts to investigate the influence of climate change and human activity on changes of water levels in the plain river network region of Taihu Basin, China. Daily water level data from 8 monitoring stations and for the period 1962-2012 have been used in the analysis. Two time series representing annual maximum water levels and annual minimum water levels have been derived from the daily data for the 8 stations. One single regionalisation series for each of the two variables has then been calculated by averaging the time series from the 8 monitoring stations using the Thiessen polygons method. The resulting two regionalisation series have been analysed using basic statistical methods used in testing the significance of trend changes

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in a time series. I believe that averaging of the 8 time series in one single regional series represents a major flaw in the methodology of the paper. Some of the significant variations in each of the 8 time series could be smoothed out by this averaging and hence false results are obtained from the analysis.

Author answer: We really appreciate this Reviewer's valuable and constructive advice on our manuscript. It will greatly help us to improve the quality of our manuscript. In original manuscript, the analysis is mainly based on the regional water level series. After considering the Reviewer's suggestion, we found it was not appropriate to study extreme water level like that. We will reanalyze extreme water level based on single water level series in our revised manuscript.

Comment 2: Therefore I suggest that the authors redo the analysis on each of the 8 time series separately and use the results of this analysis in answering the main research questions of the paper similar to the approach used by Murphey et al. (2013). Murphy, C., Harrigan, S., Hall, J., and Wilby, R.L. (2013). Climate-driven trends in mean and high flows from a network of reference stations in Ireland. *Hydrological Sciences Journal*, 58 (4) 2013 755. <http://dx.doi.org/10.1080/02626667.2013.782407>.

Author answer: Thanks for this valuable suggestion. We have read this paper carefully, which is very useful for revising our manuscript. According to the Reviewer's advice, we will redo the analysis on each of the 8 hydrological stations separately in our revised manuscript. What's more, some paragraphs also will be rewritten according to the new analysis results.

Comment 3: Mann-Kendall statistic Z and two statistics UF and UB used in Figure 4 need to be described in Section 3.1.1.

Author answer: UF is sometimes used as the normalized variables (removing the mean and divide by the standard deviation). UB is similar to UF, but calculated using the reversed data. This definition will be clearly described in the revised manuscript.

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Comment 4: In section 4.2 the authors need to justify why is the activity period (between 1989-2000) divided into two shorter periods.

Author answer: Thanks for the comment. In original manuscript, we want to analyze the changes in contribution of human activity to the extreme water level in different periods, so the activity period is divided into two shorter periods. However, considering the Reviewer's advice, we will divide the entire period according to decade scale (i.e. 1960-1969, 1970-1979, 1980-1989, 1990-1999, 2000-2012) and reconstruct the relationship equation between climate factors and water level. In addition, these paragraphs also will be rewritten in our revised manuscript.

Comment 5: More international references must be cited in the paper.

Author answer: Thanks for the comment. We will cite more international references to make the paper logical and clear when we revise it.

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