

Interactive comment on “Spatiotemporal Changes of Heat Waves and Extreme Temperatures in Main Cities of China from 1955 to 2014” by Kuo Li and Gylilbag Amatus

Anonymous Referee #2

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The manuscript proposes new indices for the study of heat waves and extreme temperature especially for cities in China. I find the manuscript to be interesting and the methodology is novel. Unfortunately, the proposed methodology is not well described, and more details should be added. I find the overall information presented in this paper below the standards of the Natural Hazards and Earth System Sciences and I believe that the paper requires entire modifications and needs to go through the review process again. Indeed, there are some aspects that are weak. The main problem is the proposed methodology for the new indices. More specific: “The physical explanation of the index HWI (line 151, page 7) should be added.” I believe that there is a mistake in the equation of the first index, HWI, (line 151, page

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7). Is the multiplication sign correct of the first parameter for the CD35? I can not understand why it is multiplication and not sum. The rate CD35/92 should be change to AD35/92. “Moreover, I believe that an example should be added. I was tried to create an example for better understanding. Lets say that in a year there are 35 days with temperature greater than 35oC, from these days, there are 15 consecutive days with temp>35oC. Moreover from the initial 35 days, 15 days have temperatures greater than 37 oC (with 10 consecutive days greater than 37 oC) and 5 days have temperatures greater than 40 oC (with 10 consecutive days greater than 40 oC). Based on these data: $HWI=(35/92 \times 15/3+1) \times (15/92+10/3+1) \times (5/92+3/3+1) = HWI=(0.38 \times 5+1) \times (0.163+3.333+1) \times (0.054+1+1)=2.9 \times 4.496 \times 2.054=26.78$ In case there is a mistake in the equation, $HWI=6.38 \times 4.496 \times 2.054=58.92$

Based on the classification of Table 1, it is obvious that there is a mismatch for the range of the index. Please provide the appropriate modifications and explanations. “In the case of AHWI, there is a misunderstanding. It is not clear, how it is possible to be several HWI in a year. HWI use for its calculation the days with temperature greater than 35 (37/40) in the three months (June, July, August 92 days). Based on it, it is not possible to have more than one value per year. Please give some explanations. “Based on the above comment, HYI (line 173, page 8) can be not defined with the proposed way. Below the Authors can find some minor comments and suggestions in case of resubmission. “Initially, I will suggest the description of the classification of the indices (table 1 and table 2) to be removed into methodology. “The analysis of figure 8 is not consistent with the figure 8. The scale of the diagram in figure 8 range from 0 to 900, the station Chongqing presents HWI equal to 800 while in the manuscript it is said “. . .sum value of HWIs in Chongqing reached 13.7. . .” (line 261, page 11). Similarly, the result about Changsha. Please made the appropriate modifications. “The section 3.1 can be changed to “variance of extreme temperature days” since in this paragraph it is analysed the trend of the extreme temperature days but the variance. “The quality of all figures is poor. The labels are too small, and it can not be read. “The authors should add more information about the secondary axis in figure 4 and

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7. The authors claim that the analysis is for 31 main stations in China, in figure 3, 6 and 5 are presented the results of 29 stations, while in figure 7 and 8 are presented the result of 26 stations. Similarly, in map of figure 9 is presented 29 station. Please provide the appropriate modifications.

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