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Natural Hazards and Earth System Sciences
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Discussions

Interactive comment on "Tree-ring response to the 1995 M_w 7.2 Kobe earthquake, southwest Japan" *by* Sujian Lin and Aiming Lin

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Reply and correspondence to #2 anonymous Reviewer's comments

We appreciate #2 anonymous reviewer for his/her critical comments on our paper submitted to Natural Hazards and Earth System Sciences. The reviewer mainly claims that only one sample used in this study is not enough for a scientific dendrogeomorphology paper because the tree ring growth may be effected by whether conditions, such as drought or a late growing season and soil stress. This comment is the same as the #1 reviewer' comment without new subject matter. We have replied previously to the same comment made by #1 reviewer that a basic comparison of the (mean) chronology with observational climate (and perhaps other) data is necessary. To clarify this point, we

will add one figure (Fig.S1 attached below) to discuss the relationship between the climate (precipitation and temperature in the study area during 1980∼2015. As shown in the figure, both the precipitation and temperature largely increased in the period 1997-2000 but the tree-ring width shows dramatic reduction in the period of 1995-2000. This fact indicates that the annual change of precipitation and temperature in the study area does not directly influence the tree-ring growth of the sample tree developed on the fault scarp, and therefore demonstrate that the changes in the tree-ring width was not caused by the climatic change but by the influence of the 1995 seismic faulting event. The reviewer also claimed "I would never allow a graduate student to submit a paper based on an N= 1, and frankly was astonished to see a paper submitted to this journal based on one tree-ring sample." We agree with that only one sample is generally not enough for a scientific paper. But we had observed immediately two days after the 1995 Kobe earthquake that the trees were damaged by the earthquake and then confirmed that most of damaged trees were withered after three months of the earthquake as documented in the text. We have waited for more than 20 years and selected one damaged tree sample that was marked immediately after the 1995 earthquake to confirm this tree was damaged and survived on the co-seismic fault scarp as we observed immediately after the earthquake. To the best of our knowledge, we have not found a study excluding our previous study (Lin and Lin, 1998) that demonstrated the tree ring growth recorded a seismic faulting event to date. The direct observations carried out immediately after the earthquakes and the analysis of tree ring width within a 20 years-period confirmed that the sampled tree was truly damaged by the 1995 earthquake on the co-seismic fault scarp. If the reviewer could kindly advise his/her graduate student to continue a scientific experiment with patience for a 20-years-period, we believe that this student would grow up a good researcher.

Figure S1. Graphs showing that relationship between the changes of precipitation and temperature and the tree-ring width. (a) Annual change of precipitation and temperature in the central-western Awaji Island (data from Japan Meteorological Agency, 2017). (b) A growth grave for the tree rings.

Please also note the supplement to this comment:
https://www.nat-hazards-earth-syst-sci-discuss.net/nhess-2017-381/nhess-2017-381-AC2-supplement.pdf

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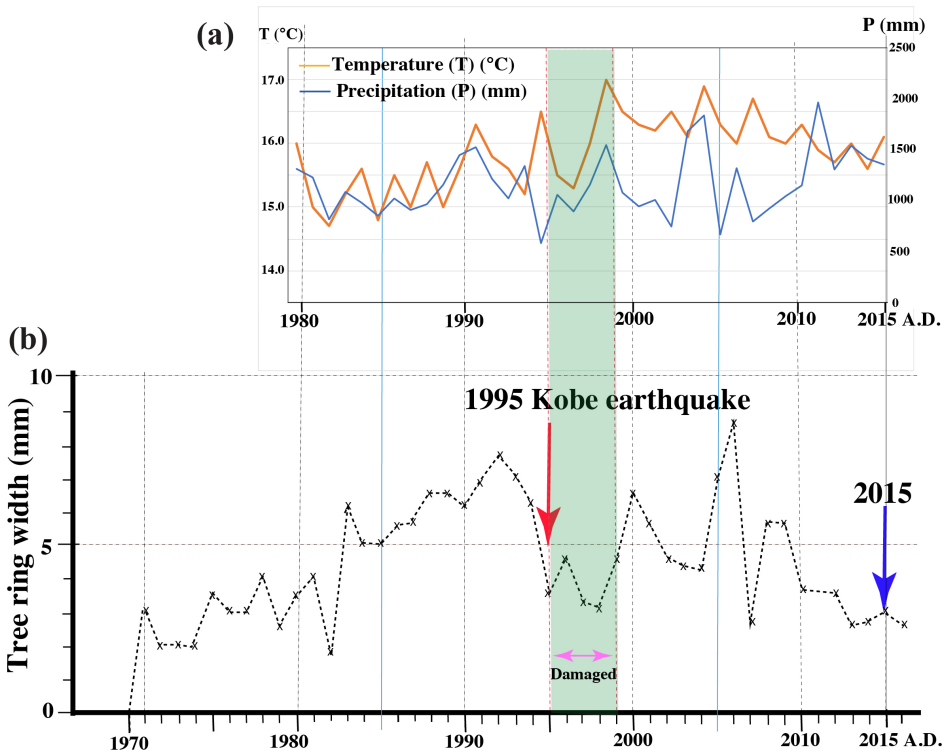

Fig. 1. Figure S1. Graphs showing that relationship between the changes of precipitation and temperature and the tree-ring width.