

We thank the reviewer for the insightful comments and valuable remarks that helped us to improve the manuscript. The comments are very helpful and we have incorporated them into the revised manuscript. In the following, the texts with blue font are the reviewer's original comments, the texts with normal font are authors' responses and the texts with italic font are authors' responses in the revised manuscript. Our detailed responses are as follows:

1) In 2.1.2, I can't figure out 'why only one event occurs per year in each basin', please describe it more clearly.

**Response:** We apologize for the unclear description and thanks for your suggestions. In this work, we assume that only one event occurs per year in each basin since the intensity of events is equal to or larger than 1-year. In the revised manuscript, we have rewritten Sect 2.1.2 in line 20, page 11 and line 1, page 12.

*In this work, we assume that only one event occurs per year in each basin since we assume the intensity of events is equal to or larger than 1-year.*

2) In 2.3, in a railway system, different railways levels do exist and are designed differently in accordance with the hazard map. Why in this work use the same failure threshold to present it?

**Response:** We thank you for your suggestions. In China, the evidence is that the bridges and embankments for the first-class railway (Backbone railway and quasi-high-speed railway) and second-class railway (Secondary backbone railways and connecting lines), a flood designed protection standard of 100-year return period is used (CRPH, 2016). And in China, since the end of the 21st century, most of the third-class railways (local railway) have been updated to first-class. In addition, the work has analyzed how the risk is influenced by varying the values used for the vulnerability parameters. These results are shown in the sensitivity and uncertainty part of the manuscript in the Sect 3.4 in lines 11-20, page 30, page 31 and lines 1-5, page 32.

3) I think the results in the Appendix need more description.

**Response:** We thank for your suggestions. In the revised manuscript, we have added more description in the article in lines 1-3, page 10 and lines 10-19, page 18 and lines 1-9, page 28 and lines 11-20, page 30 and lines 7-16, page 31.