We thank the reviewer for the insightful comments and detailed suggestions on how to improve the manuscript. We found the comments to be very helpful and 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) As to Title, "System vulnerability and risk assessment of railway systems to flooding" is failed to reflect the characteristics and innovation of the full text, it is suggested to change "System vulnerability and risk assessment of railway systems to flood events based on national and river basin scale in China".

Response: We thank for the reviewer's comments. In the revised manuscript, we have changed the title into "System vulnerability and risk assessment of railway systems to flood events based on national and river basin scale in China"

2) Part 2, the data used in this paper is not clear, they should be listed in one table or more one.

Response: We thank the reviewer for the suggestion. In the revised manuscript, we have added a data table in the appendix document. The added data table is as follows:

Table A1 List of data

Data	*Sources*
GLOFRIS global fluvial flood hazard	*Ward et al., 2013; Winsemius et al., 2013 (https://datacatalog.worldbank.org/search/dataset/0038584)*
River basin map	*http://www.resdc.cn/*
Geographic railway system	*OpenStreetMap (OSM) (https://www.openstreetmap.org/)*
Train timetable data	*Chinese Railway Service Website (https://www.12306.cn/index/)*

3) In discussion, only text is listed in this part, it is suggested to make a comparative analysis by subject in order to strengthen the practicability and expansibility of the proposed method and framework.

Response: We thank the reviewer for the suggestion. In the revised manuscript, we have made a comparative analysis in the discussion part to strengthen the practicability and expansibility of the proposed method and framework. We have added the following description in lines 3-19, page 34 and lines 1-3, page 35:

In the broader context of risk assessments for transportation systems, the simplified method for generating independent flood events offers a practical method for the large-scale assessment of performance losses and indirect risk. Most existing studies used regional- or national-scale flood footprints to assess flood-induced risk. However, in reality the floods shown in such a flood footprint would not all happen at the same time. For comparison, we calculated the performance loss for the Chinese railway system using national-scale flood footprints (2, 5, 10, 25, 50, 100, 250, 500 and 1000 years in whole China) as shown in Fig. 9 a) and b). Results show that the performance loss for both affected train trips and passengers is almost unaffected for national-scale flood footprints with a return period below 25-years. However, performance loss sharply increases when the flood hazard return period exceeds 50-years. More than 90% of trains and passengers would be affected when the flood hazard return period exceeds 100-years. Compared with the performance loss obtained using the generated independent flood events, the results using the national-scale flood footprints are underestimated for small intensity flood events and overestimated for large intensity flood events. Therefore, when assessing possible cascading effects, the use of independent flood events is necessary (Nones and Pescaroli, 2016).

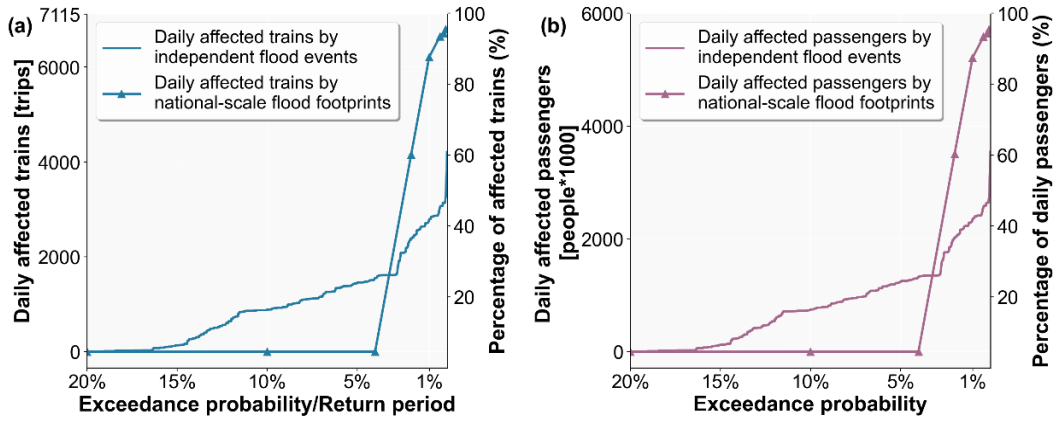

Fig. 9 performance loss for the Chinese railway system using national-scale flood footprints (a) daily affected trains and (b) daily affected passengers