

Response letter to the comments of Anonymous Referee #2

Thank you very much for reviewing our article. Please find below our responses and revisions according to your comments. (Comments of Anonymous Referee #2 are formatted in Italics)

General Comments:

The paper addresses a highly relevant topic regarding flood damage modeling for the Railway infrastructure loss. The authors apply the RAIL model, which was proposed in a former study, to the railway network in the Austrian Mur River catchment.

The empirically derived RAIL model is an interesting damage model that connects the damage classes with standardized repair costs. Both the structural damage and the resulting repair costs caused by three flood scenarios were estimated on two different spatial scales (the catchment level and the operational level). The expected annual damage was calculated for each operational section.

The analysis has shown that the RAIL model is basically capable of identifying and localizing risk hot spots at larger spatial scales. One of the advantages of the paper is that the findings were cartographically mapped. The limitations of the flood damage model RAIL and associated uncertainties are discussed. The question of climate change impact on flood risk is also briefly addressed by the authors.

The structure of the paper is logical and meets international standards. The description of the data and the methods used as well as of the results obtained is clear and sufficiently complete. The authors give an adequate overview of the literature with appropriate list of the references.

The paper is acceptable with minor corrections as follows:

Specific comment 1:

All the maps (figure 2-4) should include some geographical information, i.e. the names of settlements and rivers. This information would be helpful for international audience not familiar with Austrian railway network.

Response 1:

Regrettably, we have no access to detailed topographic GIS data of the study area to add to the maps. Therefore, we manually included the locations of the city Graz (capital of the province of Styria) as well as the city Vienna, which should serve as appropriate points of reference.

Specific comment 2:

The captions of the figures 3 and 4 are too long.

Response 2:

We shortened the captions. They now read as follows:

“Estimation of damage potentials. The map shows the RAIL model results for synthetic flood events of return periods of 30 years (left), 100 years (middle) and 300 years (right).” (Figure 3);

“Operational sections of the railway subnetwork. The yellow boxes provide the individual rankings according to the EAD value and the track utilization figure of 2013.” (Figure 4);

Specific comment 3:

The heading of paragraph 3.1 should begin with a capital letter.

Response 3: Thank you for this notice. We corrected the heading accordingly.