Response to Reviewer #2

(Comments by Reviewer #2: https://doi.org/10.5194/egusphere-2023-2862-RC2)

We would like to thank Reviewer #2 for taking the time to review our manuscript entitled "Exploring the use of seasonal forecasts to adapt flood insurance premiums" (*https://doi.org/10.5194/egusphere-2023-2862)*. We appreciate the insightful and helpful comments. Please find a point-by-point response below.

General comments:

Dear Authors, first thank you for your study on how seasonal flood forecasts can be integrated into the calculation of flood insurance premiums. You have done an excellent job of presenting your research and findings clearly and concisely. Overall, I believe that this manuscript makes an important contribution to our understanding of an underexplored area of flood risk management. With some minor revisions and additions, this paper has the potential to be an impactful publication in its field.

Response:

We would like to thank the reviewer for the very positive general comment.

Specific comments (RC)

Comment #1

The section detailing the methods, data used, and the explanation of the seasonal forecasting model could be expanded to enhance clarity. Specifically, information on the lead time of the forecasts, the sources of predictability, and how these elements influence the model's accuracy and reliability should be more thoroughly explained.

Response #1

In the revised version of our paper, we enhanced the explanation of the methods and data in section '3 Methods and Data'. We now state the periods of the predictor and the predictand and the sources of predictability more explicitly, as follows:

"In this paper, we use the results of Steirou et al. (2022) for the German streamflow stations. To illustrate the idea of seasonal forecasting of flood peaks and damage, we limit our study to one of the 14 indices of Steirou et al. (2022). Specifically, we estimate the probability distribution of flood peaks in winter (Dec–Feb) where the GEV location parameter is conditioned on the precipitation in the season-ahead (Sep–Nov). Thus, the winter flood peak related to a given return period varies as function of autumn precipitation; for instance, more precipitation in autumn increases the catchment wetness, thus increasing the peak of the 200-year flood (Jongman et al., 2014). The source of predictability of the seasonal forecasting

model is thus the memory of the catchment which influences the antecedent conditions of flooding in the next season."

We have added additional text on the model's accuracy and reliability in the sub-section '4.3 Limitations and recommendations'.

Comment #2

The discussion section would benefit from an expanded exploration of human drivers within the model chain.

Response #2

We added the following text to sub-section '4.3 Limitations and recommendations':

"Fourthly, our model assumes that vulnerability is constant in time and that climate is the only driver of changes in flood hazard. It thus ignores other changes in time, such as improved flood protection and early warning systems. While such time-varying effects could be included in principle, their addition would substantially increase the uncertainty."

Comment #3

Figure 2 Clarity: It is mentioned that rivers should be displayed with blue lines in Figure 2, but they are not visible.

Response #3

Corrected.

Comment #4

L260 – I suggest avoiding commenting on results that are not shown.

Response #4

We add an appendix to show these results, i.e. maps of variability of the autumn precipitation and the variability of the observed flood peaks.

Comment #5

L265 - Statistical Significance?

Response #5

P-value to quantify statistical significance is added.