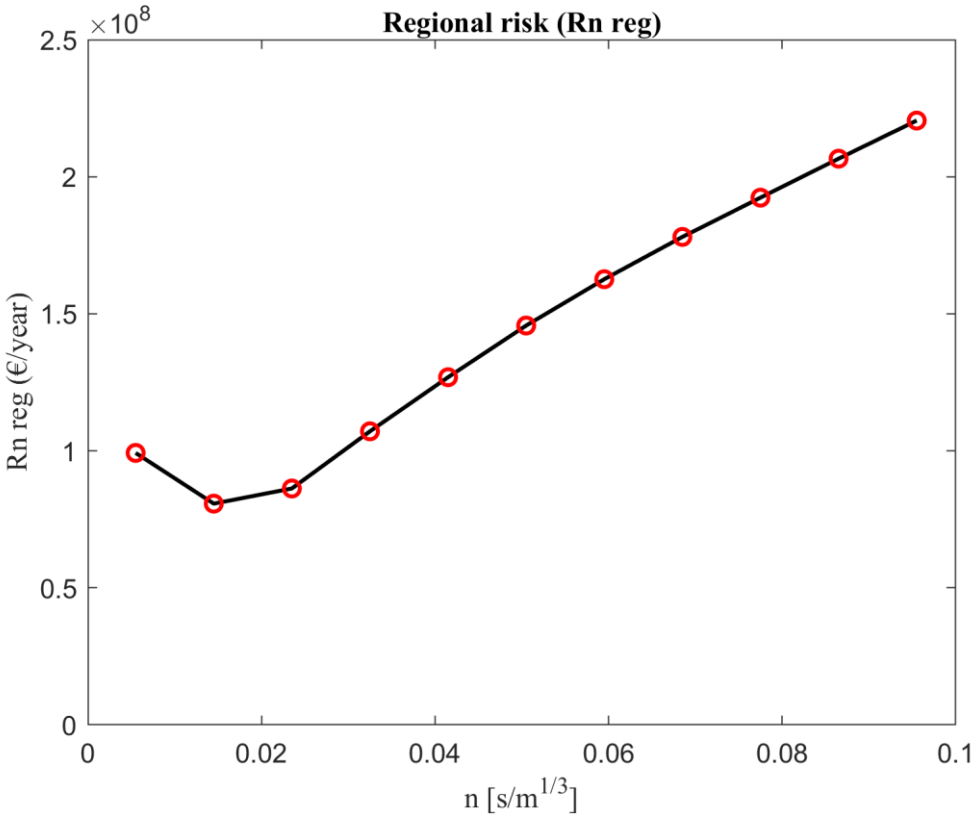
Pavesi et al have presented an estimation of expected regional flood risk taking into account uncertainty within the Manning coefficient. While the uncertainty is considered for only one parameter, the framework resented by the authors can be used to account for other uncertainties. The analysis provided is rigorous and comprehensive, and I only have a few minor comments to further improve the manuscript.

Dear reviewer,

Thank you for your careful and insightful review of our manuscript. We greatly appreciate the time and effort you have taken to provide such detailed comments and suggestions.

1. Is the same Manning coefficient used across the entire spatial domain in a single simulation? *Yes, it is.*
2. If the same Manning coefficient is used across the entire spatial region, it will be interesting to see a plot of regional risk R_n with respect to Manning coefficient.



*In the figure, Rn generally increases with increasing manning, because in the hazard model (RESCUE) the higher the roughness, the higher the water levels. The vulnerability curves vary with water depth and therefore the damage increases with increasing manning. Consequently, Rn also increases. The fact that the manning value of 5*10^-3 ($s/m^{1/3}$) has a higher Rn than the immediately following values is due to the way the supercritical flow condition is treated in the RESCUE model.*

How Rn varies with the Manning could be added in the Results section in the following way:

"In general Rn increases with increasing Manning's roughness because greater roughness leads to higher water depth. The water depth increases monotonically with the damage in the damage model adopted."

3. Line 120 - DTM is defined after its first usage.

Thank you, it is definited in line 130 so it needs to be changed.

4. Line 155 - It would be helpful for the reader if the authors elaborated on justification for their assumption - Uncertainty in Manning coefficient is considered as representative of most of the uncertainty characterizing the hydraulic modeling of flood risk.

As explained in Annis et al. (2020) floodplain roughness is the main factor of uncertainty impacting the hydraulic modeling. This is represented in RESCUE-FR by the Manning coefficient. The uncertainty in the Manning coefficient is considered to be representative of most of the uncertainty that characterises the hydraulic modelling of flood risk, because within the Manning uncertainty evaluated in the RESCUE-FR framework, different components of uncertainty are taken into account, such as the uncertainty in the DTM elevation, which affects the bottom channel slope and the extent of flood prone areas. Indeed, as explained in Johnson et al. (2019), low relief areas in a HAND-based model affect the results in terms of flood extents. This is because the HAND layers will be unable to accurately capture flooding extents due to essentially 0 relief. This can be taken into account considering lower Manning (left tail of the normal distribution of the Manning parameter). In addition, higher manning can also be interpreted as the probability that the reach will contract due to the possible presence of infrastructure that can change the water depth. In this sense, the uncertainty in the Manning coefficient is considered to be representative of most of the uncertainty that characterizes hydraulic modelling of flood risk.

This concept can be added to the paper as follows:

"Floodplain roughness is the main factor of uncertainty impacting the hydraulic modeling Annis et al. (2020). This is represented in RESCUE-FR by the Manning coefficient. It represents a significant proportion of the overall uncertainty in hydraulic flood risk modelling, as it incorporates factors such as variations in terrain elevation, the extent of flood prone areas and potential channel restrictions due to the presence of infrastructure."

5. Line 178 - The choice of normal distribution for Manning coefficient appears arbitrary. The authors have only stated that uniform distribution used by Pavesi et al. (2022) resulted in overestimation of water depth, hence they selected the normal distribution. The appropriate distribution should be chosen based on the inherent uncertainty of the parameter, instead of the distribution's impact on the result. Is there any literature that can be referenced for the appropriate probability distribution of Manning coefficient?

We are not aware of reliable estimates of the appropriate pdf for Manning. As explained in Stephens et al. (2020) there is no theoretical calculation of friction parameters, the use of empirical formulae, visual inspection and expert judgement makes quantitative prescriptions of this parameter inherently subjective. In Papaioannou et al. (2017), there is a comparison between the distribution of local manning values obtained from empirical formulae and different distributions (normal, lognormal, gamma, beta, etc.) on a local area in Greece. In terms of different goodness of fit statistics, different distributions can be chosen and the results between lognormal, gamma, normal and beta distributions are not so different, so the chosen distribution is basically a modeller's choice. In a large area it is difficult to obtain an empirical Manning distribution and to assess the inherent uncertainty of the parameter fitting different distributions. For this and the other reasons described in the paper, a simmetric normal distribution was chosen.

To clarify this concept, we could add the following statement to the paper:

"In general, there is no widely accepted probability distribution for the Manning coefficient, as its estimation relies heavily on empirical formulae and expert judgement, making it inherently subjective (Stephens et al., 2020). Comparative studies such as Papaioannou et al. (2017) show that normal, lognormal, gamma and beta distributions can all be used with minimal difference in results, leaving the choice of distribution to the expert judgement of the modeller."

6. Line 182 - Parenthesis around DTM are unnecessary.

7. Line 205 - between all the country in which -> among all the countries for which

8. Line 207 - Is there supposed to be `and` between GDP and PPS?

In Huizinga, (2007) it is defined in this way 'GDP per capita PPS'.

9. Line 308 - classed -> classes. *Thank you.*

10. Line 285 - What is the purpose of this statement? - Where Q100 is the 1 − 1/100 = 0.99 quantile of the probability distribution of the peak discharge.

It is to remark how Q100 is defined.

Thank you for your careful scrutiny of our manuscript.

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