

## **Author's response**

We express our sincere gratitude to the editor and referees for their valuable feedback and comments during the initial phase of our manuscript review. We have made every effort to incorporate as many of their suggestions as possible in our revised manuscript. In this regard, we present a detailed summary of the key modifications made in response to the reviewers' comments.

### Minor revisions:

- We have made several modifications to the language used in our manuscript to enhance its clarity, precision, and readability. One such change was the substitution of the term "prospective" with "a priori" and "potential" where appropriate, in order to convey the intended meaning more accurately.
- We fixed problems related to some references, the incorrect use of the word "First" in Figure 10, and the title of the last table.

### Major revisions:

- We have reformulated our abstract to provide more comprehensive information about the study. We have improved the clarity of the introductory section of the abstract to provide a clearer and more concise summary of the research. In particular, we have included more specific details about the objectives, the methods, and the main findings and conclusions. This will enable readers to better understand the key contributions of the paper and its relevance to the field.
- We have emphasized the justification for using HEC-LifeSim v. 1.0.1. Although we attempted to use the most recent version of the model, we encountered technical issues that prevented us from running the simulation successfully. We acknowledge that the model developers are aware of these bugs and plan to address them in future releases.
- We recognized that the use of the term "pioneer" could lead to misinterpretations and, as suggested, it was considered important to remove it from our conclusions. By using the term "jointly" in the introduction, we make it clear that our study examined both consequences in a unified and integrated manner.
- We clarified the explicit source of data used in the study by including the following sentence: "The Mirai accident occurred on January 10, 2007, and its description,

including all available details regarding flood wave propagation, reservoir characteristics, and impacts, was obtained from Rocha (2015)”.

- We have emphasized the research conducted by O'Brien and Julien, providing explicit details on how they arrived at their conclusion that non-Newtonian flow occurs when the volumetric solid concentration is higher than 20%. By providing this additional information, we make it clear to readers how we arrived at our own conclusions.
- We added two additional tables in the paper. The first table includes the inputs used in the HEC-LifeSim model, which may facilitate the reader in identifying the parametrization of the model and should enhance the transparency and replicability of the research approach. The second table includes the economic damage estimates and indemnity values associated with the accident. This table summarizes the damage estimates and provides a clear overview of the economic impact of the event.
- We inserted additional information to the hydraulic results discussion section to clarify the differences between the observed and simulated flood extents. Specifically, we noted that the discrepancies were mainly in areas without buildings, except for a central region where we made adaptations in the vulnerability and exposure analyses in order to compensate uncertainty. This clarification underscores our objective of simulating an alternative scenario based on these analyses.
- We have added this sentence that provides a clearer and more detailed explanation of Sorensen and Mileti's work: “These authors analysed many disaster cases with data available for evacuation, not only about floods but mainly about chemical and fire accidents, adjusting models through the historical cases and defining coefficients to represent a certain type of existing warning system and population characteristics”.
- And finally, we expanded the conclusion section in several ways. Firstly, we added a summary of the case study. Secondly, we discussed the significance of uncertainty analyses in flood modeling, emphasizing the importance of exploring and addressing uncertainties in the simulation results. This discussion reinforced our decision to execute an alternative exposure and vulnerability scenario. Thirdly, we improved the description of the main results, making it more accessible to readers. This helped to highlight the key findings of our study, including the outcomes of the

analysis of warning and evacuation efficiency. These enhancements provide a more comprehensive and impactful conclusion to our study and can help guide future research in this area.

For concluding, all details related to these modifications are described in the attached version of the paper.

Best regards.

April 2, 2023, Belo Horizonte, Brazil

Author: André Felipe Rocha da Silva

Author: Julian Cardoso Eleutério