

Dear authors,

Thanks again for your efforts in improving the manuscript. Two reviewers have again provided comments to the updated version and both didn't raise any major problems. I agree with the reviewers' comments. Addition to that, i suggest the authors to carefully address all the minor issues in the latest comments, especially to improve the visibility of maps and figures. Therefore, I suggest an overall minor revision before it can be accepted for publishing.

Dear Special Issue Editors, dear Dr. Yang,

We are very happy to learn that our efforts to clarify the original idea and motivation of our study in order to improve the initial manuscript are acknowledged. Based on the newly provided comments, we have undertaken another revision, specifically focusing on enhancing the readability of figures. Nonetheless, we felt obliged to carefully address all other comments as well. Thanks to your and the reviewers' comments, the quality of the manuscript could further be improved.

With kind regards,

Leon Scheiber, Mazen Hoballah Jalloul, Christian Jordan, Jan Visscher, Hong Quan Nguyen, and Torsten Schlurmann

RESPONSE TO REPORT #1

The manuscript uses costalDEM, Bathymetric, River Discharge, Tidal, Precipitation and other Open-Access Data to construct the Normalized Flood Severity Index. The purpose of this study is to address the situation that data are difficult to obtain or insufficient in some areas, especially in developing countries. The study has important implications for the study of extreme events in the context of climate change, and for the promotion of compound events of flooding, tides, and sea level rise.

There are several minor issues in the manuscript, the presentation of the map needs to be more precise, and it is suggested to include the location of the study area in the country or region, the extent of the study area.

Thank you for this critical feedback. We admit that our study area should be presented more clearly to the potential reader, especially to those who are not familiar with the situation in HCMC and the greater region. Therefore, we added a new figure (Fig. 1) to clarify the location of (a) the HCMC province in Southern Vietnam and (b) the HCMC urban districts in the larger

province. In addition, the caption references the model domain, which is then depicted in the “urban catchments” figure (now Fig. 3).

The Hotspots of the model are more in line with the actual situation, could the authors do some comparison of the distribution of losses.

Thank you for introducing this perspective to our discussion. It is indeed highly relevant for a systematic and exhausting risk assessment. However, we understand risk (of damages / losses) to be a combination of hazard, exposure and vulnerability as presented and discussed in the recent literature, e.g. SROCC (2019) etc. The proposed normalized flood severity index (I_{NFS}) highlights those areas with significant hazard potential as a consequence of high flood depths and long flood durations, but the estimation of (monetary) losses also requires knowledge about the remaining two components following the original concept. The corresponding socio-economic data were neither acquired, nor processed or discussed in the present study that, instead, promotes the idea of a generic hydro-numerical model to prepare flood estimates to pave the way for exactly those in-depth risk assessments that include all three contributing factors of risk. Any statement regarding the distribution of losses is therefore beyond the scope of this article, yet a worthwhile objective for future studies.

RESPONSE TO REPORT #2

My main comments and suggestions are listed below:

1. I suggest replacing some of the references published in earlier years and increasing the citation ratio of papers published in authoritative journals in the past 5 years.

Thank you for this suggestion. We admit that our list of references is relatively long and includes some references which are considerably older than five years. Nevertheless, we think that we managed to document and critically review the current state of research in this field, accurately. In our opinion, the number of cited articles ($N > 160$) does also reflect the extensive efforts and care we put into reviewing literature, not only about the situation at our study site, Ho Chi Minh City, but also about the status of freely available data and its potential application in numerical modelling. After critically discussing the pros and cons of reducing the list of references among all co-authors, we finally decided against removing individual references. We are convinced that, in this way, we can provide a comprehensive work of references that can be of use to any upcoming study in the field of modelling floods with freely available data and subsequent implementation campaigns for risk reduction. We hence hope for your understanding.

2. I suggest some of the figures or tables in the manuscript could be removed to the supplementary materials and kept the most critical ones in the manuscript.

Thank you for reminding us to be concise in our presentation of methodological steps and results. Based on your meaningful comment, we decided to shift the following figures and tables to the Supplementary Material of this article:

- Supplementary Material A (originally Tab. 1: Freely available DEMs),
- Supplementary Material B (originally Fig. 2: Terrain Data),
- Supplementary Material E (originally Fig. 3: River Bathymetry),
- Supplementary Material F (originally Fig. 5: Comparison of water levels)

3. I suggest adding subheadings to the discussion section to make it easier to understand.

We agree that subheadings are useful to enhance readability and allow easy orientation within the discussion section. Accordingly, we introduced the following subheadings:

4.1 Accuracy of Elevation Data

4.2 Sensitivity of Boundary Conditions

4.3 Significance of Modelling Results

4. This study has concluded many advantages of using open-access data for flood estimations in diverse ways. I suggest complementing some potential disadvantages and plights faced and stating the directions of further research.

While happily implementing the above suggestion of introducing subheadings to the discussion section (chapter 4), we have ensured that already these headings pinpoint the disadvantages (limitations, assumptions or generalizations) of our approach. Furthermore, we have added an introductory paragraph that outlines the general limitations inherent to the individual components of the presented workflow. This section reads as follows (ll. 463-472):

“Like in any other scientific discipline, every hydro-numerical model is subject to limitations. This applies particularly for a model, which exclusively draws on freely available data as envisioned in the presented framework. In this case, each of the model in- and outputs have to be evaluated in terms of their accuracy, reliability and significance. For instance, the topographic data come with a limited spatial resolution and uncertain vertical error. Significant differences between the available hydro-meteorological time series suggest a source of error as well. And finally, the essential validation of modelling results, in many cases, has to be based on citizen and media reports whose scientific standards cannot be taken for granted. Although this has to be seen as a disadvantage compared to studies that have the privilege to build on official and high-resolution data, the majority of inherent limitations can still be rebutted and accepted if taken into account reasonably. Nevertheless, the only valid argument against

infinitely increasing the level of detail of a model remains (acquisitional and computational) cost, so that high-resolution data should always be incorporated where accessible.”

In addition, we also complemented the discussion section with a paragraph on further research needs in the field of flood modelling with open-access data. The chapter now ends as follows (ll. 576-579):

“Nevertheless, independent studies should apply the normalized flood severity index to other regions with comparable risk settings. The envisaged flood estimates may then be juxtaposed with sophisticated loss calculations, in order to further quantify the sensitivity and scrutinize the robustness of the proposed framework.”

5. Some of the figures need to be modified to improve visibility, for example, enlarging or bold the texts in Figures 3b and 3c.

Thank you for this valuable remark. There have, indeed, been some issues with the conversion of individual figures, which impaired readability in the final PDF version of our manuscript. We reviewed our illustrations (with a special focus at Figure 3) and, hopefully, managed that all figures are now rendered correctly.