RESPONSE TO REVIEW #2

We highly appreciate time and effort the reviewers put into studying and reviewing our manuscript, thank you for initiating this exchange! After carefully reading and discussing your remarks, we have thoroughly revised and improved the manuscript accordingly. Please find our responses (blue) and revised text blocks (*blue, italic*) below your comments (**black, bold**). Please note that, in the meantime, we had the invaluable opportunity to visit the study site in person and subsequently incorporated some newly gathered ground truth data in the numerical modelling scheme. Moreover, we included a few minor changes that might not refer directly to specific reviewer comments, but are meant to enhance the readability and hence understanding of our approach and findings according to a native speaker.

General Comments

This study presents an interesting topic on low-regret climate change adaption for flood hazard in Ho Chi Minh City of Vietnam. The study has compared the effectiveness of three techniques in flood adaption strategies including: (1) a large-scale protection project using a ring dike; (2) a small-scale rainwater detention scheme; and (3) a combined application of both strategies.

We are delighted to hear that the reviewer considers the presented study an interesting topic and carefully revised our manuscript according to the provided comments. The specific points below helped us to clarify important aspects of our approach and, in the end, improved the readability and quality of the manuscript.

The authors should consider the following specific points:

1. **Please include a flowchart of data processing in the manuscript for better understanding of the framework of this study.**

   Corresponding to the fourth comment of this review and in response of the first review, we first improved the readability of Figure 2 by simplifying some of the depicted elements and ensured that no information is lost during PDF conversion. In a second step, we intensively discussed the option of providing a separate flowchart to specify the individual processing steps for setting up the numerical model, but decided against it for the following reason: Beside juxtaposing the hydraulic effects of two (seemingly adverse) adaptation concepts and quantifying how flood intensities across the model domain could be reduced, the third objective of this study was to evaluate the low-regret character of these options and discuss implications in decision-making processes with all relevant stakeholders (ll. 130-135). Especially this third objective requires a sound focus and well-defined research scope, which confirmed us to strictly divide the description of our methodology on the one hand,

and contextualization of results on the other, into two separate manuscripts in the same Special Issue of NHESS. The suggested flowchart of data processing forms part of the first of these companion papers and was submitted by Hoballah Jalloul et al. (in review). However, we fully understand that there is a need for more clarity in this point and added an explicit in-text reference here. This should allow (numerically) interested readers to follow up on the methodology, while maintaining a flood risk management perspective in this study. The description of the model setup (referring to Fig. 2 b) now ends as follows:

"For a more detailed explanation regarding the processing of input data as well as the calibration/validation of the employed model, please be referred to the independent publication by Hoballah Jalloul et al. (in review), which discusses the general validity of open-access data in numerical analyses more profoundly."

2. **How the Normalized Flood Severity Index (NFSI) was generated from the input parameters?**

We acknowledge the lack of clarity with regard to the Normalized Flood Severity Index (NFSI) as a consequence of our attempt to balance the readability for non-experts in the field by simplifying technical terms. We also understand that readers should get all information that are relevant to understand the implications arising from the definition of this variable and its significance for risk assessment. Accordingly, we added the following mathematical definition of the NFSI to this manuscript:

"For a given pair of coordinates, the NFSI is calculated as the product of these two conventional flood intensity proxies divided by the product of the 95 % percentiles of the same proxies as follows:

$$NFSI(x,y)(\%) = \frac{z_{max}(x,y) * DoT(x,y)}{z_{95\%}(x,y) * DoT_{95\%}(x,y)} * 100 \quad (1)$$

where $z_{max}(x,y)$ refers to the maximum simulated flood depth at coordinates x and y and $DoT(x,y)$ refers to the inundation duration over the pre-defined threshold at the same coordinates."

For further details, an in-text reference should now direct the interested reader to the companion paper by Hoballah Jalloul et al. (in review), which further elaborates on the methodological details:

"A detailed explanation of the rationale behind the NFSI and its validation can be found in an independent publication by Hoballah Jalloul et al., (in review)."

3. **Line 162: Using reported data in 2010 for validation of the model is out of date. Please use the most recent field data for evaluation.**

   The reviewer raises an important point here, rightly suggesting that validation data from 2010 might be outdated meanwhile. In practice, the decision for this specific data set had to be based on the co-occurrence of all boundary conditions (discharge, tidal water-levels, precipitation) with independent verification data in the form of credible reports of urban inundations at a considerable number of locations. In combination with the goal of using open-access data alone, suitable events were limited to a handful of options. While three of the available data sets (2010/2013) served as calibration data, the remaining event with the most data points (2010) was used for validation. We agree that more recent validation data would be highly desirable, but did not see any opportunity to acquire such data without unreasonable efforts. To document this predicament, we added the following explanation to the revised manuscript (ll. 164-169):

   "Although verification data from 2010 might seem outdated meanwhile, the practical choice for this event had to be based on the co-occurrence of all boundary conditions (incl. discharge, tidal water-levels and precipitation) with credible reports of urban inundations at a considerable number of locations. In combination with the goal of using open-access data alone, suitable events were limited to a handful of options. While three of these data sets (2010/2013) served as calibration data, the remaining event with the most data points (2010) was used for validation."

4. **Figure 2: all of the legends in this figure should be more clearly presented.**

   This feedback is very helpful as it seems that illustrations originally saved in 600 dpi resolution were compressed during PDF conversion. We will make sure that all figures are provided in sufficient quality in the revised manuscript. Based on this comment, we also revisited mentioned Figure 2 and decided to simplify some of the depicted model in- and outputs for a more intuitive perception of the illustrated workflow.