

General comments

The authors should include a limitation section/subsection highlighting all the potential errors that the authors faced when developing this model so that other research may build upon this. Currently, the model's limitations are all over the manuscript, but it will benefit the reader if they are all summarized in a section. For example, the following are some limitations collected through the manuscript

- The authors assumed that channel runoff volume would not affect the hydrodynamics of the river due to its small volume compared to the riverine volume.
- The authors assume that within 10 months, all the possible compound flood scenarios occurred.
- Lack of drainage system in the hydrodynamic model for the urban region of the domain.
- The accuracy of the machine learning model depends on the accuracy of the hydrodynamic model.

Specific Comments

“A new paradigm that combines deterministic and machine learning components has been proposed and implemented to tackle data and computational limitations in environmental modeling (Krasnopolsky and Fox-Rabinovitz, 2006; Goldstein and Coco, 2015). However, to the best of our knowledge, no previous modeling frameworks have developed a deterministic model to train a machine learning model for compound flooding studies. As a common practice, compound flood modeling typically uses the coupling of two or more hydrodynamic, hydraulic, or hydrological models (Hsiao et al., 2021; Santiago-Collazo et al., 2021; Ikeuchi et al., 2017). The coupling could be one-way, two-way, or dynamic coupling. Another approach is deep learning and data fusion (Muñoz et al., 2021), and data assimilation (Muñoz et al., 2022).”

What type of environmental modeling did the authors refer to? There are many examples, such as subsurface flow, pollutant transport, etc. Please give examples within the same sentence.

2.3 Hydrodynamic model setup and calibration

In how many locations did the authors impose the runoff in the model? It only refers to “some channels entering the domain”, but it is important to specify the amount as a minimum and preferably show their locations on a map.

The value of 0.32 given in parenthesis when talking about the correlation between the SWAT model and the observation is unclear. Is this 0.32 referring to r-squared value, RMSE, etc.? Be more specific in the manuscript text.

The location of the upstream riverine boundary condition is missing details. For example, how far away was this boundary from the coast? In any compound flood model, the upstream riverine boundary condition should be inland enough that any water level variation due to tides is negligible. Thus, only riverine forces are the ones driving the flow downstream. The authors should mention in the manuscript text that the distance from these locations' coasts is minimal.

The authors claim that the channel runoff volume is much less than the river discharge. How much less is it? It needs to be quantified in the manuscript.

RMSE and NSE acronyms are not defined before their appearance in this new subsection. I strongly recommend the authors create a small subsection describing the performance criteria used to verify the model. In this way, the authors could properly define each metric (e.g., NSE, R2, RMSE), including the equations used.

The authors mentioned that they sampled 6,000 points from their predicted water levels but did not mention how it was sampled. Did the authors use a random sampling technique or a probabilistic distribution to select these 6,000 points? Please specify this in the manuscript text.

Add the proper citation to reference the GFMS rather than the URL in the text.

Response to comments on Line 92-93

The authors should include the response to the reviewer in the manuscript text with respect to the coupling details between SWAT and SLIM

Response to comments on Line 93-95

The authors should include the figure in response to the reviewer on the manuscript since it gives a better perspective of the hydrologic processes in the study area,