

General Comments

The manuscript uses the term coastal compound flood incorrectly throughout. In the literature, compound flood always relates to the combination of coastal and pluvial/fluviat flood drivers. Thus, by mentioning compound floods, you are inherently referring to coastal floods, and you should remove the term throughout the document. Similarly, on L26, compound flood is too broadly defined as an event in which two flood drivers occur; this could represent pluvial and fluviat flood drivers, but it is not a compound flood as described in the literature. Please revise the definition of compound flood throughout the entire manuscript. The introduction also lacks novelty and clear research questions, and even when they are present, it reads like a case study report, which is not suitable for publication in an academic journal. For example, the authors justify the need for this study by citing the lack of compound flood assessments in their study area. However, the introduction should focus on identifying a knowledge gap in the literature (in this case, compound flooding or climate change) and proposing 1-3 research questions that, once answered using a novel approach, provide a contribution to the broader field. This is completely missing from the manuscript, so it is unclear what novelty the authors present. Just the fact that someone applies robust methods to estimate compound flood in a new study site is not enough to get published academically. I urge the authors to restructure the introduction by reviewing the current literature, identifying the knowledge gap, proposing research questions, and highlighting the novel approach they develop/apply to answer them. Then, the manuscript could be considered for publication.

The methods are missing key features that would improve clarity. However, the biggest flaw is the lack of calibration/validation of the SFINCS model in the main manuscript (not in the appendix). My point is that, as a reader, I cannot trust the manuscript outcomes and the model results since there is no basis for comparison against real data. If there is no data (as they state), the authors need to perform a sensitivity analysis to determine which model parameters are most sensitive to changes and comment on this so readers can interpret the results carefully. Therefore, I cannot accept the manuscript or interpret the results at this time. The Discussion reads like an extension of the results, providing too much description of the results and even including several additional figures; it provides too much context but too little connection to the literature. This could be driven by the lack of clear research questions in the introduction. I suggest moving most figures and content to the Results section and using the Discussion to interpret the results, connect them to the literature, and answer the research questions.

Specific Comments

- L12: the term “caused by interactions between various flood drivers” is too ambiguous and could cause confusion. Compound flood only occurs when coastal and pluvial/fluvial flood drivers occur. However, this statement allows the interpretation that compound flood can be a combination of pluvial and fluvial flood drivers, and that is not properly defined in the literature. Please modify this.
- L14: remove unnecessary adjectives that are difficult to quantify and not academically accepted, such as “very”, “considerable”, “dramatic”, etc.
- L15: Where is the study area? If the authors refer to the study area, they first need to define it. Also, the authors should focus more on the methods section of the abstract and less on the results. For example, the modeling framework used should be in the abstract.
- L37-49: Remove any content related to your study area from the introduction. This section should be broader in content so it can address the existing literature and expose the current knowledge gaps.
- Figure 1: The authors should show the location of the study site more clearly within Indonesia and also show Indonesia within Southeast Asia so that readers who are not familiar with the area can locate it easily. Also, each subpanel in this figure (and any other similar figures) should have a subpanel ID, such as a, b, c, etc., so the authors can describe what each subpanel is in the figure caption and make reference to it in the main text. Right now, it is not clear what the two smaller inserts on the right represent.
- L70: Be careful with the use of the word “risk,” as you are not considering vulnerability and exposure in this context. You should replace it with hazard.
- Figure 2: Some panels in this figure look very blurry and low quality; please improve.
- L108-112: The authors should comment on the uncertainty and potential error that using results from a coastal model to derive their coastal forcing, rather than observed data, could introduce to their modeling study.
- L125-126: It is not clear how the authors removed the tides from the simulated coastal water levels to result in the storm surge-only levels. Please provide a detailed process of how the authors determined the astronomical tidal levels at this location.
- 126-128: The authors need to justify their selection of a 1-day lag between rainfall and storm surge as separate events as a way to classify them as a compound event. At a minimum, the authors need to cite some literature that justifies this. However, I

believe that this time lag value is a site-specific value, so they will need to further justify the use of a value from another site.

- Figure 3: Need to add numerical values to both y-axes so we can see what the expected values of these forcings.
- L196-197: The authors need to further justify their selection of future land-cover changes, which we know will occur.
- L201: It is not clear if the coastal boundary conditions were given to the model as a point or along a line, and where within the domain they were specified. Please illustrate this in Figure 1.
- L203: Please comment more on this and justify the selection of uniform spatial rainfall and how this can influence your results.
- Section 3.7: I would recommend that the authors display their compound flood zones using the Bilskie and Hagen (2018) approach, as it is recognized in the literature as an acceptable method to create flood zone areas dominated by a certain event.