

# ***Interactive comment on “Current and Future Climate Compound-Event Flood Impact on Coastal Critical Infrastructures” by Mariam Khanam et al.***

**Anonymous Referee #1**

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This paper studies how compound flood hazards can affect critical infrastructure in coastal Connecticut. It is a good attempt to quantitatively evaluate the changes of flood risk for different compound scenarios, which provides a good perspective to investigate the potential impacts of flooding on critical infrastructures such as substations when considering multi flood drivers. However, the analysis of the results are not thorough and some descriptions are quite confusing, especially in the part of discussions. Besides, there are some obvious mistakes and typos in this paper. For publishing in NHESS, this paper in its current form requires major revisions and editing. Detailed comments are listed below: Comments: 1. The literature review for frequency-based effect estimate of compound-event flooding (Line 69-76) is obscure. What is the missing link in the current research and why most of the studies failed to or avoided to

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explore the frequency and risk assessment of the compound flooding? It seems in this study the authors designed several compound scenarios to consider the probability of precipitation and surge as a solution to the shortcoming associated with compound flood risk assessment. If this is the case, more details on the related theories and methodologies should be presented in the introduction. 2. In section 2.3, it is better to use a table to describe these compound scenarios and their related hurricanes, SLR, tide conditions and other attributes. 3. In section 2.4, which site does Figure 5 present for? The red rectangle shows a window of 48 hrs, not 24 hrs. What criterion is used for selecting the window size? 4. In Lines such as 230, 237, Table 4 should be Table 5. 5. Figure 8 shows the inundated period for each site, however, it cannot be seen that any data show 20% or 90% for SD1 or SD5 in the subgraphs of CI7 and CI8. 6. The section of concluding remarks should be enhanced. The current conclusions are not intensive enough to show the findings of this paper. At least some quantitative analysis can be summarized and presented for readers to better understand how this work promotes the current risk assessments of compound flood hazards. 7. There are some mistakes in grammar and spelling and the authors also did not pay enough attention to punctuation, which makes this manuscript more like a draft.

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