This paper primarily focuses on the application of a subgrid method to simulate compound flooding scenarios, a critical issue in coastal systems that has gained increasing attention in recent years. The method is implemented using the SFINCS model and validated through several examples. While the manuscript is generally well-written and clear, it lacks some important details that could enhance its comprehensiveness.

1- There are now several subgrid (SG) models available in the field, such as CoasToRM and the latest version of HEC-RAS. The authors should cite these models and discuss the key differences, highlighting the advantages of their approach in comparison to these existing models.

References:

"Begmohammadi, Amirhosein, Damrongsak Wirasaet, Ning Lin, J. Casey Dietrich, Diogo Bolster, and Andrew B. Kennedy. "Subgrid modeling for compound flooding in coastal systems." *Coastal Engineering Journal* (2024): 1-18."

"Brunner, G. "HEC-RAS River Analysis System Version 5.0—Hydraulic Reference Manual." *Hydrologic Engineering Center, Davis, California, US* (2016)."

2- Equation (2) shows the upscaled mass conservation equation with additional source terms, S.

How do the authors include infiltration in the model. I think more explanation about infiltration is needed since the vertical infiltration process during the first period of rainfall has more impact on large-scale flooding. What kind of infiltration model is used in subgrid SFINCS? For example, following infiltration model is proposed by Raws et al., 1992;

How do the authors incorporate infiltration into the model? Additional explanation on this aspect is necessary, as the vertical infiltration process during the initial phase of rainfall significantly influences large-scale flooding. What type of infiltration model is employed in the subgrid SFINCS? For instance, Raws et al. (1992) proposed a model that could be relevant here.

$$f = k\,(1 + \frac{(\varphi - \theta)S}{F})$$

where k is the vertical saturated hydraulic conductivity, φ is the soil porosity, θ is the initial water volume content, S is the suction at the vertical wetting front and f is the cumulative infiltration depth.

3- In Equation (2), is the matrix always positive definite?

4- In Section 3: Conceptual Verification Cases—Straight and Meandering Channels, the authors present the meandering river example. They demonstrate that the discharge for 100m, 200m, and 500m subgrid resolutions is inaccurate. Two reasons are cited: that "the channel is effectively schematized as a straight channel with a length of 5000 m. This leads to an overestimation of the true water level slope and resulting in a wet average flux. Secondly, meanders inside a grid cell result in a larger wet fraction, which the model "interprets" as a wide channel, leading to further overestimation." I believe the authors may not have implemented this test case correctly.

Accurate bottom friction is essential for this scenario, which I do not think they accounted for. Please refer to the following papers:

Volp, N. D., Van Prooijen, B. C., & Stelling, G. S. (2013). A finite volume approach for shallow water flow accounting for high-resolution bathymetry and roughness data. Water Resources Research, 49(7), 4126–4135. https://doi.org/10.1002/wrcr.20324.

Kennedy, A. B., Wirasaet, D., Begmohammadi, A., Sherman, T., Bolster, D., & Dietrich, J. C. (2019). Subgrid theory for 756 storm surge modeling. Ocean Modelling, 144, 101491. https://doi.org/10.1016/j.ocemod.2019.101491.

In both papers, they consider this problem as a 1 dimensional channel (The grid they used is larger than the current study). They still get a very good result. Can authors explain the friction scheme used here? Can they make a comment if their friction is equivalent to these two papers?

5- In the Hurricane Harvey example, they mention that the high resolution 25 m model has a fair correlation with observation. Can you quantify that? What do you call fair correlation?

6- There is extensive High Water Mark (HWM) data available for this region from Hurricane Harvey. Would it be possible to compare these high water marks with the model simulations? This comparison could provide a clearer evaluation of the model's performance across different grid resolutions, including the subgrid approach.

7- This section could benefit from additional figures highlighting the difference between model runs that in/exclude rain/infiltration/river discharge input, to distinguish the importance of these drivers for the inland part.

8- Regarding this DEM, is river bathymetry (sufficiently) included in this dataset? Often it is not very accurate in lidar based DEMs, if not treated afterwards. If so, how might that affect the inland flooding results.

9- The SFINCS model can be run on a GPU. Does the subgrid version have the same capability?

10- Figure.9 and related descriptions: Is it possible that hourly rainfall intensity (i.e. hyetograph) is shown with time series of water surface elevation in Fig.7? I think it is helpful for understanding the relationship between the peak of water surface elevation and the precipitation

11- There are a lot of minor problems in writing and equations: for instance, line 241: zu