Review of: *A globally-applicable framework for compound flood hazard modeling,* **Eilander et al.**

General Comments:

This article presents a new flood modelling framework, focusing on compound flood hazard from fluvial, pluvial and coastal flooding. It is well written and provides appropriate detail around the methodology. The model, which uses global inputs to build a local scale flood model will be a valuable tool to investigate compound flooding.

The models appear to have skill on par with other models built on global data, although additional case studies and/or validations would be nice to see how the framework performs in a range of different situations.

I would recommend the article for publication with minor modifications:

Specific Comments:

1. As above, case studies for a different location would strengthen the validation.

2. Validation observations:

   The observations used in the validation are based on single snapshots for each event.

   ○ Firstly it would be useful to add some context at where these snapshots fit into the event (how close are they to the fluvial/ coastal flooding peaks for example).

   ○ Similarly, can you comment on how the timing of the observations influences the validation? E.g., Would the results in Table 4 -3 showing reduced sensitivity to coastal drivers be connected to the time of observations being before/after the coastal flooding had receded?

   ○ Are there any alternative observations of the flood hazard for the same events you could use (e.g. extents from Copernicus EMS)?

3. It seems like there are only river inputs at the boundaries of the domain, is this correct?

   Does that mean in the coupled framework, the pluvial rain/runoff on-grid implementation is relied on to convey water in tributaries completely within the domain?

   Is there likely to be an underestimation of river flows due to this (for example if this framework is used to simulate larger domains)?

Technical comments/ corrections:

1. Abstract: You refer to 'local scale' models (L13) to refer to models built with high quality local information, but then refer to the SFINCS model as a 'local model' in L22 and L24. Could you reword this to make it clear these are referring to different things?

2. L17: 'loosely coupled' is not clear, consider rewording.

3. L135: This is a little confusing. It would be useful to know that the total water height consists of two components (L138-140) first. Also that the ERA5 data comes from the ECMWF Ocean Wave Model.

4. L144: It's not too clear where the gauge locations are here.

5. Table 1: Are you using MERIT DEM or the MERIT-hydro hydrologically adjusted elevations?

6. L255: should this final sentence have a separate bullet point?

7. L302: is the 'gridded discharge dataset' referring to CaMa-flood?

8. L307: add: maximum relative error <u>in upstream area</u>

9. Figure 6: Panels are mislabelled

10. L552: The zenodo link doesn't work (but does if the final slash is removed).