

Interactive comment on “Towards an efficient storm surge and inundation forecasting system over the Bengal delta: Chasing the super-cyclone Amphan” by Md Jamal Uddin Khan et al.

Anonymous Referee #1

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Major comments: Page 1: Line 18: It is mentioned as 'Amphan struck the coasts of Bangladesh and India'. But from figure 1, it is clear that the track has crossed the Indian coast and passes through the Bangladesh mainland, but not actually crossed the Bangladesh coast. Modify the sentence accordingly. Page 3: Line 57: 'reduced-physics modeling', what it means? It seems Murty et al. 2017 used the ADCIRC+SWAN model to investigate the wave, surge interaction in the shallow waters. Page 4: Lines 96-98: Explaining the tide surge interaction. I suggest citing the article Srinivasa Kumar et al. 2015 entitled 'Modeling Storm Surge and it's Associated Inland Inundation Extent Due to Very Severe Cyclonic Storm Phailin' here. Their work was clearly investigated how the phase of the tide alters the surge height and inundation

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extent. I feel this citation suits here. However, this is up to the author's choice. Page 7: Line 164: What is the resolution of the mentioned bathymetry? Whether the 77,000 points are really sufficient to cover the entire Bengal and Bangladesh coasts especially while computing the inundation extent? Page 8: Line 173: Is this the whole Bay of Bengal or part of it? Because the latitude extents given in the brackets don't cover the entire BoB. Please check. Page 8: Line 175: 250m resolution near the coast is acceptable for the surge computations. However, is it sufficient for the inland inundation computations? Page 8: Line 176: Mentioned here that the model domain and mesh are shown in figure 9, but no figure in the draft shows the mesh and domain. It seems the figure is missed. The domain and mesh figure are important for the readers and hence it should be provided. Page 8: Line 178: Mentioned here as 'wave model, is coupled online with SCHISM'. What does it mean? Whether the wave model also uses the same unstructured mesh or it uses the structured mesh? Whether both the models are running at a time (i.e., in parallel)? or running the wave model and then transfer the wave boundary condition to the surge model? These points are to be briefly explained. The given citation Roland et al., 2012 can be used for the complete details. Page 8: Line 200: Given that the blended wind field is used. What is the horizontal resolution of the wind and pressure fields? It seems the tide is also included in the computations. What is the spinup time used in the study to get the actual tide levels at the coast? What is the source of the buoy data used in the study? Figure 4: There is a clear mismatch between observation and modeled total water level at the given locations especially at Angtihara and Tajumuddin. This might be due to the lack of spinup for tide simulation. The reason given here is 'The local bathymetric error and friction parameterization might be the source of the discrepancy'. But the same model used by Krien et al. while using the digitized sounding points has computed the better tide amplitudes. Please check the spinup time. As mentioned if Angtihara is located in a data-scarce location inside Sundarbans mangrove forest, remove the plot. Provide the water level - tide (surge residual) plots (time series) too, to support the statement in the line numbers 246-247, page 11. Inundation section: The methodology is to be

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clearer. Though Lewis et al. is cited for the details, a brief description is required here. Whether the model mesh extends on to the land or not? if so up to what extent (i.e., up to which topography contour)? or whether the water level values at the coast are used and extrapolated the inundation extents?

Please also note the supplement to this comment:

<https://nhess.copernicus.org/preprints/nhess-2020-340/nhess-2020-340-RC1-supplement.pdf>

Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., <https://doi.org/10.5194/nhess-2020-340>, 2020.

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