

Interactive comment on “A cross-scale study for compound flooding processes during Hurricane Florence” by Fei Ye et al.

Anonymous Referee #1

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Thank you for this opportunity to review this manuscript. This is a very well writing manuscript. The authors present an interesting compound flood case study during Hurricane Florence (2018). I enjoyed reading the manuscript. However, I have a few questions/comments as listed below.

1. The model is not calibrated. The authors selected a few constant values as the friction values at various locations in the models based on previous studies. Although the authors tried to justify this by saying “in favour of simplicity”, I am not convinced that a model without calibration will be of great value. 2. Is the NWM model calibrated? If yes, please give details. 3. With such detailed 3D modelling of such a large area, what the efficiency of the model is like? E.g. what is the computational time for a flood event lasting for a specific period of time (e.g.3 days)? What is the specs of the computing

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facility used? 4. Line 252: The authors reported the average MAE. But often it is the peak error that is important. What is the peak error, when and where did it occur? What is the potential impact of this peak error? 5. Figure 11: The figure shows modelling errors of up to ± 4 meters at various locations. Do the authors have an explanation on the large errors at these locations (apart from just saying calibration can improve model performance)? - The authors did a good job explaining model performance in relation to grid resolution. A similar explanation here will be good. 6. What is the return period of flooding at various locations during this event? A comparison on the return period for floods caused with or without compounding effect will give readers a clearer picture of the impact of the compound effect. 7. Figure 14: Please see comments on Figure 11.

Minor comments: 1. Figure 15. I understand this figure is used to show the impact from different compound flood driver. It is difficult to interpret the results. The caption can include some accompany text on how the figure can be interpreted (what the proportion values imply).

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