

Nat. Hazards Earth Syst. Sci. Discuss., referee comment RC1
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Comment on nhess-2021-251

Anonymous Referee #1

Referee comment on "Tropical cyclone storm surge probabilities for the east coast of the United States: a cyclone-based perspective" by Katherine L. Towey et al., Nat. Hazards Earth Syst. Sci. Discuss., <https://doi.org/10.5194/nhess-2021-251-RC1>, 2021

Review of the paper "Tropical cyclone storm surge probabilities for the east coast of the United States: a cyclone-based perspective" by Towey et al, 2021.

Here the Authors analyze how much of surges characteristics in selected locations along the East US coast may explain by TCs producing them or crossing the areas nearby. The work is quite very interesting and absolutely worthwhile to be published. However sometimes the text and above all, the methodology are not very clear and the use of terms such as "noisy" is somehow misleading. Thus I think that text can be published after some major revisions.

Line 20-22: please reformulate

Lines 25-29 : I would merge these two sentences together

Line 35 : I would avoid to use the term "scenario" because as far as I understand you are talking about "atmospheric configuration"

Line 45-47 : Could you please explain what you mean with "noisy"?

Line 49: Again...what do you mean with "noisy"? how is this relationship? Linear? Please explain better

Line 62 : As the sentence is formulated, it looks like that storm surges affect TC characteristics. Is it like that? Please explain.

Line 86-87: Could you please explain why it is not important in the statistics neglecting the wave setup? Do you have a reference for that?

2.2 Methods section

A1) maybe I miss the point in the text but do you explain somewhere in text the choice of the radius for the search of TC in the circle centered on the location of the surge? In Figure 2 you talked about 250 km, why do not you choice 400 or 500 km?

A2) I do not understand well the method. You consider all the TCs crossing a radius in a

certain distance from the location and you associated the closest one to the event in the day of each maximum daily storm surge, do you? If so it is not very clear from text. If you have two closed systems crossing the area (probably something rare or impossible) how do you find that one responsible for the event?

A2) Why do you choose a liner fit as best fit and not for example an exponential fit as done in the references in the introduction?

Line 154 : I think that the use of term noise is misleading. I would just state that the propagation speed is less important than other variables

Line 161-164 : not very clear this sentence, please rephrase

Section 3.1

I would avoid to say "strong enough predictor" or "better predictor". What I see is that the variables that you consider are not able to explain completely the variability observed for the storm surges . Please reformulate

Line 215-17 : not very clear... do you mean TC stronger than the climatology of the systems crossing the area?

Line 303-305: Not very clear..as far as I see, you correlate storm surges and TCs characteristics not the opposite. Again the adjective noisy here is not correct in the sense that relationship between surge feature and TC, I think, is not linear not noisy. Please rephrase