

Interactive comment on “Quantifying processes contributing to coastal hazards to inform coastal climate resilience assessments, demonstrated for the Caribbean Sea” by Svetlana Jevrejeva et al.

Anonymous Referee #2

Received and published: 19 April 2020

The manuscript details a methodology for regional assessment of coastal impacts due to waves, storm surges and sea level rise. The study focuses on Caribbean SIDS (Small Island Developing States), which are particularly vulnerable to coastal climate change, since they strongly rely on the preservation of the coastal zone and they are also prone to natural disasters. The adopted approach can provide information for the design and implementation of the requisite coastal adaptation strategies. I recommend the publication of the manuscript following some clarifications and minor corrections.

The terms risk, exposure and vulnerability are used in a confusing way (e.g. Pg. 1 lines 18-19: “We introduce a Combined Vulnerability Index, which allows a quantitative

C1

assessment of relative risk across the region, showing that sea level rise is the most important risk factor everywhere” and Pg. 13 lines 404-405: “we can calculate an external physical exposure factor, including the rate of sea level rise, the wave climate and tidal range, which we here refer to as a Combined Vulnerability Index (CBVI)”). Please clarify better these concepts.

An analysis was made regarding hurricane induced storm surges and a Combined Vulnerability Index (CBVI) is proposed for marine hazards; however storm surges are not included on the proposed CBVI. Could the authors comment on that?

The names of the countries and the locations mentioned in section 2 should be added in Figure 1.

Figure 5 does not include very important information for the manuscript; it could be transferred in the supplementary material or it could be combined with figure 6.

The caption in Figure 7 (Pg.27, line 686) mentions “Locations of wave buoys used for model validation are marked as filled red circles” but the locations are missing from the figure.

The map in Figure 7 looks deformed, the scale of the figure should be corrected.

Caption of figure 8 (Pg. 28, lines 696-697): It is not clear that Fig. 8c and 8d concern Hurricane Tomas.

Figure 11 is not very clear, needs to be improved.

Figure S11 and Table S11 of the supplementary material is not mentioned in the manuscript.

Pg. 9, lines 250-251: “Future sea level projections for RCP8.5, including the low probability/high impact scenario (the 95th percentile) are shown on Figure S14”. It's Figure S15 not Figure S14.

Pg. 10, line 307: “Fig. 11 show maximum non-tidal residual envelopes for the case

C2

study events discussed in Section 3.3.1". It's Fig. 10 that depicts the non-tidal residual envelopes, not Fig. 11.

Caption of figure 6 (Pg. 26, line 680): Please correct the typing error "(whereas the global mean trend is $3.00 \pm 0.4 \text{ mm yr}^{-1}$ is removed)"

Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., <https://doi.org/10.5194/nhess-2020-46>, 2020.