

Interactive comment on “Developing fragility functions for aquaculture rafts and eelgrass in the case of the 2011 Great East Japan tsunami” by Anawat Suppasri et al.

Anonymous Referee #2

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Comments on the paper “Developing Fragility Functions for Aquaculture Rafts and Eelgrass in the case of the 2011 Great East Japan Tsunami” by Suppasri and co-authors

General Comments: The paper by Suppasri et al. addresses the tsunami damage on offshore systems through developing fragility functions for aquaculture rafts and eelgrass. To this end, the authors use the satellite data at two target areas damaged by the 2011 Great East Japan tsunami together with the numerical modelling of tsunami characteristics and the linear regression analysis. the phenomenon of tsunami waves overtopping the coastal protective structures through physical dam-break experiments. The authors conclude that the flow velocity is the main factor controlling the damage on

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offshore marine plants regardless of the water level. While the MS is of great interest as it is the first attempt of establishing a method to quantify the damage on aquaculture rafts and eelgrass, I find that some points need to be carefully improved. Specific Comments: In terms of the MS structure and writing, the paper is of good quality; it is well structured and is easily readable. In terms of scientific content, in order to get the paper acceptable for publication in NHSS journal, the following comments should be carefully considered:

My main criticism of this work concerns the way the authors investigate the damage on the aquaculture rafts and therefore the damage classes attributed. In Sect 3.1 (p6, 1187-1188) they mention that “The remaining aquaculture rafts were classified as undamaged, whereas the disappeared aquaculture rafts were classified as damaged”, which I assume very simplistic for a quantitative damage assessment that require the consideration of different levels of damage (none, slight, moderate, high, and very high). This also applies to the Figs. 12 and 15, where the authors present their results of damage probability as function of flow velocity; but which kind of damage they refer to? A slight damage that can be easily repaired? Or a complete destruction? In other words, damaged and not damaged, is a kind of information that not help that much in tsunami recovery procedure. In the light of this comment, the authors are asked: first to provide a comprehensive classification of possible damages on the aquaculture rafts (damage classes definition), second to associate a specific damage class to each offshore marine system, and third, to develop fragility function for each damage class/level.

Minor suggestions regarding the Figures presentation: . Fig3: for Regions 1, 2, and 3 there are frames with geographical coordinates that do not much the limits of your grids. Please delete them . Fig4: In the legend specify which are the simulated and the measured tsunami heights . Fig 5: It is hard to distinguish between the wave height/flow velocity and some topographic elevations, both have yellow colour. Change the colour palette of one of them.

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