

Interactive comment on “A comparison of a two-dimensional depth averaged flow model and a three-dimensional RANS model for predicting tsunami inundation and fluid forces” by Xinsheng Qin et al.

Anonymous Referee #3

Received and published: 17 July 2018

General comments The main goal of the paper is to present comparisons of two hydrodynamical models. The numerical simulations are focused on tsunami wave propagation, specially at the inland inundation and impact on individual structures scales. Besides model-to-model comparisons, the performance of the models are evaluated with directional wave basin data, published elsewhere. The variables analysed included the flow depth (water level), the velocity field and the momentum flux. This way two tools are now better known and can be used by planners and coastal managers. The results are interesting and useful for NHES readers. The paper is well written overall.

C1

I recommend publication with a few corrections and clarifications. Specific comments
The authors gave sound explanations concerning the NLSWE and RANS models (either directly or through the pertinent references): the mathematical basis, the options and simplifications of the configurations adopted, the settings and the boundary and initial conditions. The results are, basically, presented by figures. It would be important to estimated some quantitative scores, in particular for the variables that are observed directly (water levels and velocities). These objective measures of the performance of each model will allow to understand their specifics. Particularly, it will be easier to separate what the authors called "near and post-impact" which, as it is right now, seems rather arbitrary. Technical corrections Through the whole text - a comma before "and".
Pag 2 and 4 - The fourth paragraph of pag 2 (the one starting with "The scale...") is repeated *ipsis verbis* in pag 4 (second paragraph).
Pag 5 - Manning's coefficients are not friction factors (nondimensional numbers). They have dimensions. The value of the Manning coefficient should reflect the type of material of the bottom used in the Laboratory (the simulations were at the model scale) and not justified with a reference.
Pag 16 - In the second paragraph the two steps methodology should be clarified. What end of the domain are referring ?
Pag 18 - In the sentence after equation (23) it should be l not u' for the definition of turbulence intensity.
Pag 20 - There is an inconsistency. There is text between 4.3 and 4.3.1 (contrary to between 4.2 and 4.2.1).
Pag 30 - The first conclusion should be rephrased. The words "only" and "while" are misleading in this context.
Pag 30 - In the third conclusion what it is the meaning of "correct value" ? It is a model-to-model comparison.

Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., <https://doi.org/10.5194/nhess-2018-150>, 2018.

C2