Natural Hazards
and Earth System
Sciences

Open Access

EGU

Discussions

Interactive comment on "Investigating beach erosion related with its recovery at Phra Thong Island, Thailand caused by the 2004 Indian Ocean tsunami" *by* Ryota Masaya et al.

Anonymous Referee #4

Received and published: 7 October 2019

This paper attempts to investigate erosion and deposition process as impacts of the 2004 Indian Ocean tsunami. Two sets of numerical modelling were used, namely TUNAMI N2 and STM. The overall quality of the paper needs to be revised. Here are my major comments to the paper: 1. It is not clear how the TUNAMI N2 and STM were coupled. The authors need to provide more detailed information such as conformity of grid size, time step, and bathymetric-topography data. Furthermore, it is not clear whether the bed level in the TUNAMI N2 were also updated after sediment transport or not. 2. The reasons to run the simulation for 6 hours is not clear. Any data show the tsunami propagation at this area lasted in 6 hours? 3. The manning coefficient was treated uniform. Is the coefficient sensitive to the results? No specific sensitivity

analysis was done in this research. 4. This paper also attempts to bring recovery process of the beach, which I do not see where the recovery has taken place. Usually, beach recovery process takes years after a tsunami or storm surges. The impacts of the tsunami was performed by the models, but recovery process of the beach is not. Please see Section 4.1. How could the author relate these two processes? Lack of information of the method to observe the recovery and proofs of the recovery made this sub-topic not relevant to be discussed in this paper.

5. Backwash created deposition at the offshore area instead of erosion in other study area. But, this study revealed the opposite. Author needs to review some more cases that could give different result.

These are among literatures that proved differently:

Jiang, C., Chen, J., Yao, Y., Liu, J., and Deng, Y.: Study on threshold motion of sediment and bedload transport by tsunami waves, Ocean Eng., 100, 97–106, 2015.

Syamsidik, Al'ala, M., Fritz, H. M., Fahmi, M., and Hafli, T. M.: Numerical simulations of the 2004 Indian Ocean tsunami deposits' thicknesses and emplacements, Nat. Hazards Earth Syst. Sci., 19, 1265–1280, https://doi.org/10.5194/nhess-19-1265-2019, 2019.

Please discuss them when necessary.

My minor comments are as follows: 1. Diffusion coefficient in Equation 6 has different symbol in the paragraph explaining the equation; 2. Figure 10, three figures in the last row have no clear explanation: to what time these figures were meant to? Please provide sufficient information and discuss this properly.