

Dear Editor,

Thank you for your time and sending us your decision. We have made corrections to both reviewers as shown below. Corrections made based on suggestions are shown in red. 厳しめ

### Reply to reviewer no. 3

We highly appreciate the time spent for the review comments from the reviewer especially those minor corrections (our type errors) and pointed out many points that clarifications are needed. We are happy that the reviewer is happy and highly evaluated our manuscript. Please find our responses and corrections as shown below.

Reviewer comments	Our answers	Corrected manuscript
<p>- All the manuscript: In fact, in the abstract the authors conclude that “Our modelling approach confirms that beaches on Phra Thong Island were significantly eroded by the 2004 tsunami” but the analysis of the results, as displayed in figure 5, also show a lot of shoreline accretion. In fact, in most locations’ shoreline seems to have experienced a minor accretion (this is especially clear in figure 5a) while significant erosion is only observed at localized sections of the coast. In fact, the large longshore variability remains mostly unresolved, an should be further discussed in the manuscript.</p>	<p>Our expression was bad. We focused on beach erosion in two areas(region (a) and (b)) that have been locally eroded, but not all beaches in Phra Thong Island.</p>	<p>Please see Page 1 Line33-34 ...Our modelling approach <b>suggests</b> that beaches <b>located in two regions</b> on Phra Thong Island were significantly eroded by the 2004 tsunami...</p> <p>Please Page 5 Figure 2 Caption: Figure 2 Terrain data (The black frame shows Region 1 to Region 6, and the black line in Region 6 shows the cross-section where calculation was performed. Dashed squares are the beach where erosion was confirmed from satellite image.)</p>
<p>The first statement of the conclusions “First, it was confirmed by comparing the measured and calculated values of the sediment layer thickness that the location of beach run off identified on Phra Thong Island was reproducible and consistent with sediment transport results”, do not seem to have correspondence with the data presented in the paper.</p>	<p>Corrected</p>	<p>Please see Page 21 Line 507-509</p> <p>First, it was confirmed by comparing <b>simulated results of the shoreline</b> and sediment layer thickness that the location of beach runoff identified on Phra Thong Island was reproducible and consistent with sediment transport results.</p>
<p>In section 3.1.2 “change of shoreline” authors refer that sediment transport models confirm the erosion as portrayed by satellite images, but do not present satellite images before and after the tsunami occurrence. An objective comparison of model performance with satellite date with quantitative error</p>	<p>Thank you for the suggestion. We tried to use images prior the tsunami, but limited resolution of our images caused the difficulty for determing the shoreline. Therefore, shoreline from bathymetry data was added to provide lack information of images.</p>	<p>Please see Page 13 Figure 6 Caption: ...satellite image (<b>30 Jan, 2005</b>), which is overlain by the modelled extent of erosion showing that the modelled results closely match the observed changes. <b>The red line is the calculated shoreline after the tsunami, and the blue line is the shoreline before the tsunami...</b></p>

<p>statistics should also be present (e.g. brier skill score). The display of satellite images just before the tsunamic also would help the reader to have perception if the coastal embayments portrayed in image 6 existed before the tsunami.</p>		
<p>The comparison of tsunami deposit thickness (figures 7 and 8) with the observed sediment layer also casts serious doubts on the model performance. In fact, the locations where the larger deposition were found (&gt; 2000 inland) are the locations where the model predicted no accumulation. Moreover, a scatter plot with estimated layer thickness against observed thickness should be presented, supplemented with objective error statistics. Although authors discuss some discrepancies, this section should be expanded.</p>	<p>We introduced the concept of cumulative sedimentation, and evaluated the scale of the amount of sediment movement generated.</p>	<p>Please see Page 13 Line 350-371 and Figure 7</p> <p>The line of “volume” show the cumulative deposition expressed at each point by the sediment thickness multiplied by the area of the computational grid. In general, the tsunami deposits are greatly affected by local micro-topography(Sugawara et al., 2014; Jaffe et al., 2016), and it is difficult to fit the modelled layer thickness with the observed layer thickness using DEM averaged in a computational grid. Therefore, we introduced the concept of cumulative sedimentation, and evaluated the scale of the amount of sediment movement generated. Although the modelled layer thickness typically overestimates the observed layer thickness by +7%, such low variation suggests a relatively successful reproduction of the observed dataset (Figure 7).</p>
<p>When comparing the model results with validation data, it seems that it would be more useful to present more detailed data, even though at a single site.</p>	<p>Thank you for your comment.</p>	
<p>Concerning model application, there are lot simplifications that can affect model results that are not properly justified or validated. Sediment transport magnitude and consequent morphological changes are largely dependent on the chosen values for the parameters displayed in table 4 . The assumption that some parameters</p>	<p>In tsunami sediment transport model, uncertainty of those parameters were often simplified for simulation.</p> <p>Based on previous studies, those parameters were generally given by fixed value which were also used in this study.</p> <p>Parameters were justified namely critical friction.</p>	<p>Please see Page 10 Section 2.5. and Table 2.</p>

assume a constant should also be justified namely the friction speed (or is this critical friction?) and bottom slope correction factor.		
- Page 1 Line 33: how can authors “confirm” if there is no observational data?	Changed “suggests”	Our modelling approach <del>confirms</del> <b>suggests</b> that beaches ...
- Page 1 Line 73: to support the statement “reproducibility has been confirmed by comparison between the calculated and measured values” a reference is needed.	Corrected	Please Page 3 Line 88-89  Yamashita et al., 2015; <b>Yamashita et al., 2016</b> ; Arimitsu et al., 2017; <b>Yamashita et al., 2017</b> ; Yamashita et al., 2018
- Page 5 Figure 2: a graphical scale or different gridline numbering should ease a better perception of the scale of the figure.	Added	Please Page 5 Figure 2
- Page 9 Line 234: the use of “Manning’s roughness coefficient was fixed at $n = 0.025$ ” contradicts the recognition (1438) that “bottom surface roughness greatly affects sediment transport”	Thank you for your comment on related issue. Fixed value of coefficient were used in this study because of no land use map were available in this area.	Please see Page 10 Line 277-285
- Page 9 Line 228-239: presents some formatting problems	Corrected	Please see Page 10 Line 270-289
- Page 9 Lines 238: is the “limit Shields” is the critical Shields parameter? The authors should differentiate the Shields parameter from bottom shear stress (eq. 10)	Corrected	The <del>limit</del> <b>Critical</b> Shields number ...
- Page 10 Table 2 - The use of significant figures should be improved	Corrected	See Page 11 Table 2