

Interactive comment on “Sediment transport on the inner shelf off Khao Lak (Andaman Sea, Thailand) during the 2004 Indian Ocean tsunami and former storm events: evidence from foraminiferal transfer functions” by Y. Milker et al.

Anonymous Referee #1

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This paper addresses relevant scientific questions within the scope of NHESS. It concentrate on the reconstruction of re-deposition processes based on data on the provenance of benthic foraminifers associated with the deposits of the 2004 Indian Ocean tsunami and earlier storm events from the inner shelf off Khao Lak. In order to achieve this the Authors recorded the modern sediment samples in non-tsunamigenic as a recent calibration data set for generating a transfer function for water depth that was applied to the fossil faunas investigated from two cores. Unlike most micropaleontological, studies which have been based on qualitative information of bathymetric species

C302

ranges the methodology applied in the present study enabled obtaining quantitative accurate bathymetric information for the first time. In the light of the above, the present manuscript adds important and innovative approach that is valuable for modeling studies of tsunami waves and thus represents a very significant contribution to the understanding of natural hazards. The paper is generally well written and sufficiently illustrated. The scientific data is presented in a clear, concise, well-structured way and the results discussed in an appropriate and balanced way. Only a few minor scientific questions/issues ("specific comments"), summarized below and some technical corrections should be addressed prior to publication.

Specific comments: 1 Introduction *Page 4 lines 8-9: Since your major conclusion is dealing with similar results obtained by transfer function for tsunami and storm waves then you should probably add a paragraph (I think in line 10, page 3, you can add it) about our knowledge, so far, regarding the differentiation between these high-energy events or diagnostic criteria per each of them, even though onshore, and alternatively similar results to your, obtain in other studies by other methods.

4 Results The Storm layers and the 2004 tsunami deposits detected in the two cores were mostly represented by one or two samples, thus if it's possible (not compulsory) to add a few sample (mainly to the thick layers) which will add reinforcement to the interpretations and the conclusions.

3 Material and methods 3.1 Surface sediment samples and sediment cores * Page 5 lines 20-21: Your fossil data set is represented by 17 samples in total (9+8) but when you specify (the same page, lines 22-24) how many samples are characterized by coarse grained and fine sediments there is one extra sample (?) - please check.

* Page 5 line 25: "Two surface samples were taken onshore..." - What is the elevation (MSL) of these samples (was not mentioned in table 1)? Why are the samples not shown in Fig. 1? I don't understand this sentence: Are you sure that it's correct to use these samples to investigate re-deposited specimens during the tsunami 2004. Three

C303

years had passed since the tsunami event; I think these samples represent the recent sediment onshore. OR maybe you meant that you want to compare the recent relocated species with the tsunami identified in the core...in that case you should rewrite this sentence. On the other hand...I didn't see that you used these two samples, neither in the results nor in the discussion (???)

3.2 Lithology and structure of sediments and sediment cores * Page 6 line 1: I suggest changing this title maybe to: "Lithology and sediments characteristics" *More importantly this section should be moved to the results. * Page 6 line 6: Where the Grain size results can be seen (table? supplements?)?

5 Discussion * Page 17 line 6: "The paleo-water depths estimated in the storm layers are 15.32 +/- 1.54 m for the storm layer in lithological unit 4..." –Although this sample was estimated as bad analogue based on the WA-PLS?!

* Page 18 lines 1-8: in core 030310-C3 you are interpreting the occurrence of *A. radiata* in high percentages and the *Peneroplis pertusus* absence as the uprush event ALTHOUGH in the lower part of lithological unit 2 both species have relatively elevated percentages (the latter species has in general lower % of <3). How do you explain this?

Technical corrections: 2 Study area *Page 4 line 24: Add space ("31.5 and33 psu")

3 Material and methods 3.1 Surface sediment samples and sediment cores * Page 5 line 19: "and 15.5 m water depth (core 050310-C4, length 56 cm)" According to table 1 the water depth of core 050310-C4 is 15.3 m- please correct.

5 Discussion * Page 16 line 13: delete "and" * Page 18 line 15: "Our paleo-water depth estimates in core 030310-C3, retrieved from 15.3 m water depth" – should be "9.5 m"

References *Jones (1994) (page 7) is not found in the ref. list *Mojtahid et al., 2010 (page 17) is not found in the ref. list * Page 16: Horii et al., 2007—???

Figure captions * Figure 1: Delete the two cores which you are not address-
C304

ing/mentioning in the manuscript (051207-32 and 050310-C6)

Figure 3: How did you choose which species to show graphically? Did you follow any rule to group these species? Do the species are the most significant species > 10% abundant (although two species do not follow this rule)? or does the selection was based on observation? RDA results?...Explain in the captions.

Figure 6: "Distribution of the most important fossil benthic. ..." – Based on what?

Figure 8 (page 30): "Sediment core images with their lithological units (see also Fig. 3)." — You probably meant Fig. 2. Also, it's hard to distinguish between the light blue circles and the blue circles- please give other symbol.

Please also note the supplement to this comment:

<http://www.nat-hazards-earth-syst-sci-discuss.net/1/C302/2013/nhessd-1-C302-2013-supplement.pdf>

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