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Natural Hazards and Earth System Sciences
Discussions

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.

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We want to thank both referees for their constructive and relevant comments, which touch several issues of the manuscript. We believe we are able to address these concerns. Our response to the individual comments by the referees is given below. The original comments are highlighted and are followed by our response. Additionally to the corrections suggested by the referees we have made slight corrections of the species and core names in Table 2, Figures 2 and 5.

J. Hohenegger (Referee #2)

"This is a very interesting paper using a multiple of multivariate statistical methods to estimate sediment transport, which can only be precise in some degrees by organisms like foraminifera with a restricted depth distribution. In this case, symbiont-bearing benthic foraminifera are the most useful, because they are restricted to the photic zone and show extremely narrow depth zonations caused by the dependence on the two factors light and hydrodynamics. Thus their tests act as good indicators for both factors, which decrease with depth. But, their restricted distribution depends also on the trophication and almost all species avoid mixotrophic (and of course eutrophic) environments. This factor possibly explains the differences between both cores, where in the first larger foraminifera are abundant, becoming rare in the second core. This could be the fact that the estimation of transport by tsunami is less indicative for the second core in comparison to the first one. This possibly is caused by the fact by comparing depth distribution in surface sediments and interpret them for the core samples using transfer functions. This could be cause the bias in the estimation of onslope transport between both localities, because the one core originate from more oligotrophic conditions, while the second core clearly hints to mixotrophic conditions at least. Furthermore, foraminiferal downslope transport beside storm events, only by wave action, also strongly influence the distribution and masks the real depth distribution (see papers by Yordanova and Hohenegger and Briguglio et al.). Thus, the method for experiencing transport by tsunamis is new and correct, but the explanation must be taken more carefully incorporating the aspects explained before. All in all, this paper uses modern methods (e.g. transfer functions supported by jackknife and bootstrap statistics) and gets interesting results. It could be made clearer that the differences between the cores in transport estimation and wave height could be caused by the strong differences in the environments. Therefore, I recommend publication with minor corrections."

We want to thank the referee for these helpful comments. We carefully have thought about the referees and his colleagues' observations and interpretations regarding

the specific environmental requirements of larger benthic foraminifera and their re-deposition potential under “normal” wave activity. Finally, we have re-written parts of our interpretation by incorporating the ideas and observations mentioned here.

Only a very few remarks and corrections to the text:

“p.10, line 27: B. schlumbergeri is not mentioned before being a Borelis.”

Corrected.

“p. 11, line 10: write N. praecinctus “

Corrected.

“p. 16, line 22: which type of age dating will be or was performed? ‘Preliminary’ is insufficient.”

We used measurements of 210Pb activity of a nearby core (Sakuna et al., 2012) and correlated them to the presented sediment cores to determine sediment accumulation rates.

“p. 32, Fig. 1: There are 4 cores marked by fitted circles, not the investigated and mentioned 2 cores!”

The cores not mentioned in the manuscript has been removed from Fig. 1.

Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., 1, 2397, 2013.