Biogeosciences Discuss.,
https://doi.org/10.5194/bg-2018-237-RC2, 2018

Biogeosciences Discussions
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Interactive comment on "Impact of the 2011 off the Pacific coast of Tohoku earthquake on a deep-sea benthic ecosystem: evidence from living and dead benthic foraminifera on the landward slope of the Japan Trench" *by* Akira Tsujimoto et al.

Anonymous Referee #2

Received and published: 19 July 2018

Tsujimoto et al, have tried to understand changes in benthic foraminifera following a powerful earthquake, by studying temporal changes in foraminiferal assemblage, in sediments deposited pre- and post-earthquake. They have identified disturbed sediments by using radionuclides. Similar studies have been carried out from the same region. The only novelty in this work is that the authors have taken a few cores from deeper region. I've several reservations regarding the methodology as well as the down-core variations in parameters, across the cores. 1. The title of the manuscript needs to be rephrased. Please see annotated manuscript for details. 2. The first

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sentence of the introduction should be reworded. 3. Page 2, Line 11, please specify which fauna? The reference is also missing. 4. Page 2, Line 21, replace 'Their' with 'Foraminiferal'. 5. Can the authors explain the logic behind sampling during two consecutive years (2011 and 2012)? 6. Page 3, Line 14, the authors state that samples were stored at -80C for foraminiferal studies. Such a cold temperature will results in breakage of foraminiferal tests due to thawing. The breakage will thus significantly alter benthic foraminiferal assemblage. 7. The authors followed a strange methodology for foraminiferal analysis. To preserve and identify living benthic foraminifera, the sediments should be stained with rose-Bengal, immediately after collection. Unfortunately, the authors stored the sediments at -80C, oven dried it, sieved by using a 63 um sieve and THEN STAINED THE RESIDUE. I think, it is absolutely wrong. The living assemblage will be significantly underrepresented. 8. Staining the samples for just one day is insufficient. A minimum of couple of weeks of staining is widely recommended. 9. The authors chose a odd mesh size (106 um) to pick benthic foraminifera. The recommended mesh size for benthic foraminiferal study is 63 um. A few authors have also used >125 um fraction. The choice of these authors does not match with either of the widely used mesh size, thus making it difficult to compare their results with other studies. 10. Authors picked 200 or less foraminifera from each sample. Again, the recommended minimum number of specimens to be picked is 300. Therefore, I'm not sure whether the foraminiferal assemblage studied by the authors is a true representative of the natural assemblage. 11. It is not clear, how did the authors calculate foraminiferal density? Did you pick foraminifera from a known weight of sieved fraction? 12. Page 4, Line 4, authors state that they used only those samples that contained >30 individual, for statistical analysis. Does this mean that several samples contained as less as <30 individuals? It is too small a number to draw any meaningful inference from foraminiferal parameters. Please provide the number of specimens picked from each sample. 13. Three out of the four cores have a nearly same mud profile, suggesting no evidence of disturbance. 14. Can the authors provide the details of how far were the cores 4W-2011 and 4W-2012? Both these cores are very close and at nearly same

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depth (just a difference of <20 m). Why was the 210Pb profile, so drastically different in so closely spaced cores? 15. The water depth of both the cores is nearly same, just 20 m difference. I do not agree with the authors that the slope is so different at these two locations, so as to bring such a big difference in geochemical parameters as well sedimentation rate. 16. Page 7, Line 19. Authors report living benthic foraminifera at much deeper depths and provide a strange explanation? Why this argument is not applicable for the other stained benthic foraminifera? How does the authors rule out the possibility that it is a autochthonous living benthic foraminifera? 17. Page 7, Line 36-37. The authors speculate the effect of productivity on benthic foraminifera. Please confirm it with the Corg in the sediments. In its present form, it is just a conjecture.

In view of the serious flaws in the methodology followed for foraminiferal study, I've strong reservations about this work.

Please also note the supplement to this comment:
https://www.biogeosciences-discuss.net/bg-2018-237/bg-2018-237-RC2-supplement.pdf

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