

Interactive comment on “Responses of an abyssal meiobenthic community to short-term burial with crushed nodule particles in the South-East Pacific” by Lisa Mevenkamp et al.

Anonymous Referee #3

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General comments: This study explores a really challenging question, that of how deep sea meiofauna respond to mining operations. It is an increasingly vital question as we learn more about the diversity and importance of deep sea meiofauna and as deep sea mining operations expand. I applaud the authors efforts to tackle this problem and I think this study should be published but with some clarification and moderate revisions.

My biggest issues with the article center around their methodology and interpretation of depositing nodule sediment onto existing sediment. First, there is no indication that I can see of where this nodule sediment came from? How far from the “regular” sediment

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on which it was deposited was it collected? Are these nearby habitats or hundreds of miles apart? Also, why did the authors choose to deposit nodule sediment alone when in their description of nodule mining practices it seems that there is removal of nodule sediment, disturbance of underlying or neighboring sediment, and deposition of nodule particles mixed with suspended sediment and redeposited. It seems the mining operations are after the nodule sediment in particular, so why would they ever redeposit it onto non-nodule sediment? Unless by accident? Please clarify where the nodule sediment came from and why its direct deposition onto non-nodule sediment was chosen as the primary methodology as this doesn't seem to mimic any aspect of the mining operations under question.

Also, the authors mention (with citations) in the discussion that meiofauna does inhabit the nodule sediment, yet there seems to be no taking this into account when interpreting the behavior of the meiofauna upon burial. Was the nodule sediment sterilized? Was it presumed that the meiofauna washed out upon transport? It seems like the primary interpretation of the presence of meiofauna in the nodule sediment at the end of the study is that it was colonized from the buried sediment below due to upward movement, but couldn't there have been a meiofaunal community in the nodule sediment upon deposition? If you didn't remove the meiofauna or examine it beforehand, how do you know that meiofauna found in it afterward came from the buried sediment?

Specific comments:

Page 2, line 1: “70s” should be “1970's”

Page 2, line 17: Here is where you describe mining operations and what happens to nodule sediment and “regular” sediment. You even mention how a large scale mining operation “is expected to directly impact the nodule associated fauna” so then it seems confusing that you then proceed to assume there is no fauna there until you place it on other sediment in your study.

Page 4, line 8: Please specify here where the crushed nodule substrate came from

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and how/if it was treated.

Page 7, line 1: Citations would be helpful for all of these diversity indices and to specify which Simpson index.

Page 13, line 10: Please clarify here why you think that all the meiofauna in the nodule sediment came from the lower layer (“adjusting their vertical position in the sediment”).

Page 14, line 25: Here you mention a study that showed a decrease in nematode densities “attributed to limited upward migration directly after the disturb (as was seen in our experiment)...” but previously you had indicated that there was considerable vertical migration from the lower sediment. Please clarify this.

Page 15, line 27: Here you indicate that your study found that the addition of crushed nodule substrate “changed the relative abundance of feeding types in the new surface layer...” yet you don’t seem to have examined the nematodes in the surface layer (nodules) before depositing it, so how can you know this?

Interactive comment on Biogeosciences Discuss., <https://doi.org/10.5194/bg-2018-489>, 2018.