Response to Associate Editor

Manuscript Title: Biogeography and community structure of abyssal scavenging Amphipoda (Crustacea) in the Pacific Ocean.

Ref: bg-2018-347

Journal: BioGeosciences

Dear Professor Vanreusel

Many thanks for taking the time to point out the textual errors remaining in the manuscript. I have addressed all 15 of your concerns. Details can be found below and within the manuscript, changes are highlighted in green.

Yours Sincerely

Tasnim Patel.

1. There is no evidence that disturbance affect amphipod biodiversity since there is no statistical support for the observation of a lower alpha diversity at DEA. In addition there are also basin related factors likely responsible for this observation. Furthermore the geographical and habitat range covered during CCZ sampling is much wider than at DEA which may explain the differences.

Therefore replace the sentence in the abstract "we further provide evidence that disturbance proxies…and the site geographically closest to it" by the following sentence

" Overall diversity was lowest at DEA site (simpson index = 0,62) compared to the CCZ (SI= 0?72), but local differences within each basin were observed too".

Our reply: Line 35 onward has been rephrased.

2. Fig 1 legend says that wide boxes represent APEI's and grey boxes the claim areas whereas it is opposite

Our reply: Line 154 colours have been reversed.

3. Use license areas (only correct term) in stead of claim areas or contractor claims through the text

Our reply: Ammended throughout.

4. Line 174 says that three contractor claims were sampled while 4 (license areas) were sampled.

Our reply: Line 174 Corrected.

5. Table 1: add coordinates of sampling sites and add if nodules are present or not for each station (information available in cruise report)

Our reply: Line 205, table has been amended to include co ordinates. Nodule information is not known for 2 stations as others did not sample here and the traps were not video guided.

6. Remove Table 2a since information is provided in text and in table 2b already

Our reply: Removed.

7. Figure 3 Remove regression line since it is not significant. Remove that there is a moderate correlation in line 323 since the correlation is not significant

Our reply: Removed (Line 340)

8. The rarefraction in Fig 4 shows that diversity is highest at D1 and D2 which contrasts with the lower simpson indices and the conclusions that the disturbed sites have a reduced biodiversity. Correct this through the text and explain why both biodiversity estimates give different results (if correct).

Our reply: Sites D1 and D2 had a higher number of species, but many were either singletons or doubletons (one or two individuals collected only). The overall assemblage at these stations was dominated by *A. gerulicorbis*, possibly because it was the first/fastest species to recolonise post-disturbance.

Line 355 now reads: "A higher number of species were collected at D1 and D2, however many of these were singletons or doubletons, with A. gerulicorbis dominating at both stations."

9. Correct deep-sea to deep sea when used as a subject

Our reply: Corrected throughout.

10. Line 415. There is no verb in the sentence "Regarding amphipods, only …

Our reply: This is a remnant from a deleted paragraph and makes no sense on its own. It has been deleted.

11. Line 449 to 453. I do not understand the explanation that in the comparison of CCZ with DEA, the productivity gradient present at CCZ is used as an argument. The difference in productivity between both basins should be used as an argument instead.

Our reply: The idea was that the productivity gradient causing more oligotrophic waters could affect scavenger biodiversity, as it does with the polychaetes collected via the box core. We have added that the difference between basins could also be a factor (line 465).

12. Line 470 to 472 and line 484 to 486 reduced biodiversity in DEA is not supported by rarefraction curves? Explain why not? Same as in point 1. The conclusion that disturbance is responsible is too strong here. There can be other reasons which should be explained better here.

Our reply: We hope the reply given in point 8 is sufficient for point 12 as well?

13. The wording clustering or separation to describe the MDS results is not appropriate since not supported by SIMPROF. Rephrase the following sentences Line 511: D1 and D2 are not more separated than the other stations since all C and D stations seems to be scattered over the MDS. Line 514 Also C1 to C5 do not form one cluster, neither do C6 C7 and C8.

Our reply: The authors agree and have rephrased these sentences.

"However, despite the dispersive and resilient nature of scavenging amphipods, their biodiversity could have been affected by the disturbance experiment as evidenced by the NMDS (Figure 6), where the disturbed area (D1) and the area closest to it (D2) show a different Bray-Curtis Index to the remaining three reference sites (D3, D4 and D5)."

And

"In the CCZ, stations C1, C2, C3, C4 and C5 show a different Bray-Curtis Index in comparison to stations C6, C7 and C8 (Figure 6)."

14. Line 592 I do not understand how the unsaturated curves can suggest that the effect of mining could be even more pronounced? Or this is better explained or it is removed.

Our reply: Yes this statement was ill-supported by data and has been removed.

15. Check the reference list. References are missing (sweetman et al, and possibly others). Editing is not standardised

Our reply: Reference list has been re-checked.