

# ***Interactive comment on “Are seamounts refuge areas for fauna from polymetallic nodule fields?” by Daphne Cuvelier et al.***

## **Anonymous Referee #2**

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The paper by Cuvelier et al is an interesting analysis of ROV observations in the CCZ. They test the seamount refugia hypothesis to the extent possible with sparse semi-quantitative transect data. The results are somewhat equivocal but the authors provide many caveat and qualifications in the text. Overall their main conclusion that seamounts are unlikely refuges for taxa living on minable nodule fields is likely accurate because its quite clear that faunal overlap is low between these habitats. There are a few comments below that could be addressed to improve the paper.

Major comments 1) The appendix fig1 is a very important figure to place all the observations into context. I would move it from an appendix to a regular figure for the paper or as new panels in existing Fig. 1. 2) The data presentation used to compare nodule transects to seamount transects should be refined. Right now figure 3 por-

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trays averages of densities for fine taxa which, based on the finding of very low overlap between transects, means little - averaging a large number for one transect with low or zero numbers in other transects. Rather the data should be presented at broader taxonomic categories (as in Appendix table 1) with average (and standard deviation) densities and # of morphospecies. This would also follow the language in the results section better. Data on each fine morphospecies (level of taxonomy in Fig3) could be presented an an appendix and by transect. 3) Once data is pooled at higher taxa levels, statistical comparisons could be drawn to compare the average # morphospecies and average density between nodule and seamount transects. 4) The authors conclude that the ratio of hard/soft habitat may explain some of the faunal trends they observe. Can't this ratio be determined from the transects? If possible add this metric to help explain faunal communities along or between the transects.

Specific comments line 82 - Explain why the north or northwestern flanks of the seamounts were chosen for the transects. line - 97-99 - Provide the range of altitude, speed that were kept constant. line 208-209 - this statement appears true when examining the higher taxa pooled data in appendix table 1. however in the cited fig 3, its hard to actually make this comparison because averages at finer taxonomic categories are highly variable due to lack of fine taxa overlap between transects. line 267 - Start the sentence with, "Amongst the seamount transects,..." line 269 - The point of this sentence is not clear as it opposes the trend you find. Clarify. lines 296-306 - Nice to see a paragraph which lays out what future transecting should look like. The paragraph mentioned that wider depth ranges should be included and the data and literature certainly support that. Might it also be wise to have transects that move along countours so there are many replicate obsrevations at a given depth, instead of conducting uphill transects? Adding a sentence or two addressing across slope vs with slope transecting would be worthwhile. line 308 - The sentence should be slightly reworded based on the authros findings to "Seamounts were shown to share FEW fauna with surrounding habitats...." Line 316 - this topic sentence needs to be improved. Rather than simply reiterating the results section can this paragraph be rewritten and

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a topic sentence created that summarizes the functional differences between taxa on seamounts vs nodules?. See literature by Rowden et al that look at functional variation of taxa on seamounts and neighboring areas. E.g. Rowden et al 2010 Marine Ecology Table 1 - Add "SM:" before Mann Borgese figure 3 - given that there is so little overlap in the morphospecies between each sampled transect Figure 3 is a bit hard to interpret. Error bars would help. Its great that the taxonomic diversity is presented but this might be better in the appendix. Instead, appendix table 1 which presents higher taxa and # morphospecies might be the better data to show in the main paper. Here densities at higher levels can be better compared. Averaging the abundances across the transects seems ill advised given the differences observed between each one. Figure 6 - It is not clear what data is being presented here. Are these only taxa present on both seamounts and nodules? Please clarify in the figure caption.

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