

Interactive comment on “Biodiversity and trophic ecology of hydrothermal vent fauna associated with tubeworm assemblages on the Juan de Fuca Ridge” by Yann Lelièvre et al.

Anonymous Referee #2

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The manuscript by Lelièvre and colleagues presents interesting information on the structure, biodiversity, and trophic structure of hydrothermal vent sites on the Main Endeavor Field on the Juan De Fuca ridge. This manuscript and their data take a nice holistic approach and compare a variety of different communities that they suggest are different successional stages based on observations there, thus link successional patterns to the greater community and trophic structure that live there. The manuscript is well crafted and they found that predator-prey relationships were not as dominant as the important role of ecosystem engineers in structuring the communities. The research is also important as it provides a nice baseline for future studies that work at these locations, which are near a cabled array system so this is likely to be highly refer-

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enced site in the future. My only complaint is a slightly cursory treatment of the isotopic data and the use of individuals per m^3 instead of m^2 for benthic communities which I believe are muddling some of the results. This is a nice manuscript that advances the field.

One aspect that I think that could improve the paper is a hypothetical diagram that shows how the communities change over time (as suggested that the communities are different temporal stages), the fauna and diversity associated with those stages and the trophic structure as a result. This is a suggestion only, but it would be a wonderful synthesis of the nice integrative topics presented here.

I would say that the introduction could use more specifics about the stable isotopes at vents where there can be pretty significant variation in both C and N at the base of the food web due to symbionts (often negative N) in contrast to other inputs, plus the relatively high N of phytodetritus. It adds a dimension to the isotopic analyses in other systems and without this mention may confuse the reader until it is discussed in the discussion. Simply a sentence or two in the introduction could help the readers have a better foundation for this. L511 in the discussion does point towards it but without specific examples. Simply adding a sentence at line 119 saying that these different sources of primary production vary in $\delta^{15}N$ making clear trophic analysis more complex would be one way to do that.

Results – I am torn on the use of the 3-dimensional space for extrapolating up the total density of fauna. I believe the numbers could be important but really it is a two-2 surface area that is expanded up by ecosystem engineers but limited by the energy input and space, which is more 2-d. At a minimum, a statement and comparison of the 2-d abundance would be an important comparison, especially when comparing different habitats where the increased area of tube worms will decrease the extrapolation up (i.e. fewer fauna per m^2 but with a lower height measurement will come up with a much higher ind. M^{-3} value than one that had a higher density on the per m^2 but since you measured a larger area will be fewer on the m^3 metric).

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I found the treatment of the isotope data not comprehensive enough to support the conclusions made. Specifically, L 362 identifies a shift from bacterivorous to predator guild, but which species belong to which? How is this shown by these data? I also question whether the term “trophic network” is appropriate. Really these data are just presented and then scaled by biomass, which I like, but is not a trophic network per se. Either modify the term or expand the analyses performed to look more at connections. I am not sure that a more in depth analysis would be possible with the heterogeneous and every shifting baseline caused by the diversity of microbial communities so that is not what I am recommending, but instead I would avoid the term trophic network.

Figures 1-3 are very nice. Figures 4 and 5 have too small of font on the axis and the grey background clutters the visuals, especially when numbered, also too small. I do not consider these two figures ready for publication. The grey should be removed, the lines within the text should be removed and ideally a key with the colors and the species should be included so the reader is not forced to delve heavily into the figure legend to know what they are looking at.

Small suggestions:

L37 “Fairly” long tubes comes across as vague. Since the actual values are known, please just include them. L122 – I would suggest adding in “average rate of +3.2” as that is a mean of multiple, often highly variable values. L144 – The sentence that starts on this line seems out of place in this paragraph. It should be either removed or rephrased as to why this builds upon what was said before. L294-296 It seems that these should either be reported in dm^3 or with a different number of significant figures as there was not a m^3 counted. I understand why m^3 was used so suggest just 17×10^6 etc. but also comparing them in a m^2 context. L290- again question whether the right number of significant digits is used on the percentage Line 361 “contributed – 16.4%...” L386 – also sampling approaches. Any of the sampling that has occurred with a mussel pot or a Bushmaster could also lead to differences in diversity simply due to methodology. In addition, not suctioning the area could also lead to lesser diversity

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in other studies. L414 – I question whether a trophic network is the right word here considering the analyses done.

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