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Discussions

Interactive comment on "Microhabitat and shrimp abundance within a Norwegian cold-water coral ecosystem" *by* A. Purser et al.

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Response to Reviewer#2 comments and suggestions

We would like to thank the reviewer for taking the time to go through our manuscript and provide the numerous constructive observations. We would like to address these in turn here:

REVIEW COMMENT: I think the density measurements of shrimps in CWC reefs is interesting and will help to show that these reefs are important in many aspects. In this respect the paper form a significant contribution.

RESPONSE: Thank you for this observation. We hope with the paper to present a really suitable method for quantifying abundance of small mobile fauna in cold-water

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coral environments.

REVIEW COMMENT: My main comment is that the text is often very wordy (too many words for saying things). So I hope the authors can make the text more concise, which will make the paper easier to read. The help of an native English speaker certainly will improve the text too. An example of superfluous text is in the Discussion: The start of the chapter and the first sentence of p. 3380 line 7-11 has a lot of overlap.

RESPONSE: Though I am an English native speaker (the 1st author) I agree I may write too wordily in places - sorry about that! Throughout the revised manuscript we have taken care to reduce this, and reduce overlap / repetition.

REVIEW COMMENT: A more technical comments is that I miss an error calculation of the measured area seen (and the effect of the shrimp density measurements). Apparently no lasers were used during the videoing, or they were not used? In the methods it is mentioned that the image coverage was measured by assuming that Lophelia polyp dimensions had a diameter of 1cm. It is not explained what the basis of this assumption was (real measurements of collected corals?), was it based on one polyp in each image (the biggest?) or on an average of a number of polyps? What about images without Lophelia. This should be explained better, and a calculation of the error in making this assumption should be given.

RESPONSE: Size estimations were based on diameters of collected coral polyps from the reef. In the revised paper we have included this information, along with the number and standard deviations of polyps measured. As to how the areas in other frames (those without corals) were estimated, these were based on the fact that the videosled was maintained at the same height as it was above coral areas, therefore with video covering a similar area. Exceptions being when a sudden movement was required to avoid a large rock or structural change (these sudden movements show clear focus blurring, and were discarded from analysis). In the revised manuscript this quantification of coverage area has been better explained.

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REVIEW COMMENT: It mentioned that very heterogene habitats had the highest shrimp densities. Could this also be caused by the fact that the surface area in these images was much larger (more relief, opene space between dense corals), which could mean that had a larger surface where you could see shrimps?

RESPONSE: This is an interesting point and likely correct. There is a greater surface area available. Though we cannot quantify this extra area, we now comment on it in the paper. As far as the main argument of the paper goes, we are interested in the greater number of shrimp in an area, rather than volume – with areas of reef protected by legislation etc. always being designated by area rather than surface area available to fauna. The increase in habitat niche and surface availability in these coral (and dead coral) regions has been better explained in the revised manuscript.

REVIEW COMMENT: Tropical coral reefs are mentioned. Are there any shrimp densities known from these tropical areas, and how do they compare?

RESPONSE: Tropical abundances have now been included for comparison.

REVIEW COMMENT: In table 1 I miss the habitats "soft sediment" and @dead gorgonians" mentioned in the methods.

RESPONSE: This has been rectified. The absence of full frames of these habitat types in the data set is the reason of their exclusion from the table in the initial table version. They are placed in Table 1 now, with the table showing that they were only present in small areas of other habitats, rather than in the data analysed exceeding 50% coverage.

REVIEW COMMENT: Can you indicate in Fig. 3 (detail) where the coral reef actually is. Is the whole area or only part of it?

RESPONSE: We have added lines to the figure to show the extent of the coral.

REVIEW COMMENT: Fig. 4: what are the 2 rectangles?

RESPONSE: The two rectangles relate to another aspect of the BIIGLE system use, and are distracting for the current paper. The figure has been recaptured with these lines absent for the revised manuscript.

We thank again the reviewer for their comments and believe we have addressed them sufficiently in the revised manuscript draft.

Autun Purser (on behalf of co-authors).

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Interactive comment on Biogeosciences Discuss., 10, 3365, 2013.

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