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Ocean Science
Discussions

Interactive comment on "The Pelagic In situ Observation System (PELAGIOS) to reveal biodiversity, behavior and ecology of elusive oceanic fauna" *by* Henk-Jan Hoving et al.

Anonymous Referee #1

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Review of the Ocean Science Ms. No. os-2018-131 The Pelagic In situ Observation System (PELAGIOS) to reveal biodiversity, behavior and ecology of elusive oceanic fauna Authors: Hoving et al.

This manuscript provided interesting results but it still needs revisions to be acceptable for publication. To improve the quality and readability of this paper, the following remarks and suggestions are to be considered in view:

Abstract: This part is fine and there is no real need for corrections.

Introduction: Line 32: "have been sampled with nets". You might want to add a reference (e.g., Wiebe and Benfield (2003): From the Hensen net toward four-dimensional

biological oceanography)

Line 33: "a community typically consisting (. . .)" Add a reference.

Sentence at lines 38-42: "This was particularly true for fragile gelatinous zooplankton. . ." add some references. . .

Line 49-50: "pelagic ROV surveys have been applied to study inter and intra-annual variation in mesopelagic zooplankton communities". You can add the following reference: "Hull et al. (2011) Seasonality and depth distribution of a mesopelagic foraminifer, Hastigerinella digitata, in Monterey Bay, California"

Lines 56-60: I would move the Benfield reference to the first sentence.

Line 60: "Examples of instruments include. . ." You can add the following reference to the Zooglider, an in situ imaging device mounted on a glider (something new compared to the other systems you mention). Reference: Ohman et al. (2018?) Zooglider: An autonomous vehicle for optical and acoustic sensing of zooplankton

Material and Method:

Link at line 123 not working. . .

Sub-section 3.4. I am somehow concerned with the way you convert counts/sec to abundances. Are Poebius abundant enough for this kind of comparison? How do deal with patchiness in this comparison? The regression that you show in Figure 3 show multiple points where no Poebius were detected with the UVP, while observed with the Pelagios? How do you explain this discrepancy? If you remove those points, do you still have a significant regression? Is there another way to estimate the Pelagios sampled volume, independently from the UVP comparison? It is important to make this point crystal clear as you are making a direct comparison with MOCNESS abundance later on. . .

Results:

Line 203-223: Do you need to mention every organism that you encountered? Can you somehow make it shorter? It would be nice to have an illustration of the dominant taxa observed by the device (rather than a simple table). It will provide more information for the reader, and potentially raise interest on your device. If you are limited by the number of figures, it could be a supplementary figure...

Line 214: “typical examples of organisms that cannot be captured by nets”. Do you have proof of that? (i.e., publication).

Line 214: “can be properly quantified by PELAGIOS”. Since you don’t have a baseline for your quantification, you cannot say that your device "properly" quantifies these organisms. You might actually undersampled them by having a small sampling volume. You can just say "efficiently observed".

Line 224-233: Refer to my comment for the Methods section... Everything relies here on your conversion factor... A slight change will affect your abundance estimations and ultimately the comparison with MOCNESS abundances... Also, you say that there is an underestimation by MOCNESS but don’t provide any data/proof to the reader. Can you summarize the information in a table/figure? Also, why only mentioning the example of Beroe? What about the other taxa mentioned previously (e.g., Poebius?). What’s the rationale behind the choice of Beroe?

Sub-section 3.6: Since you made these observations, can you modify Figure 5 (or create a new figure) to provide the visual proof of what you mention in this paragraph?

Discussion:

A general comment regarding this section. There is a lack of references throughout the discussion. We cannot rely only on the author’s sayings. I recommend reviewing this section to have clear reference for every/most points you make. Several points are highlighted below.

Line 250: “tool that fills a gap in the array of observation instruments that exist”. How

does the PELAGIOS fill a gap? What gap? You have to develop your point here. Viewed from a pessimistic point of view, PELAGIOS can appear as another device wanted by an institution locally, but it will probably never be used outside of this institution. For example, in your introduction, you made the comparison with ROV-video transects. In this case the PELAGIOS appears like an interesting "cost-effective" alternative. Compared to other "well-known" in situ imaging systems (e.g., UVP, VPR), the PELAGIOS does not really provide anything new... You have to better make your point.

Lines 255-257: “The data obtained after annotation of the video can be uploaded into databases (e.g., Pangaea) after publication of the results allowing for efficient data sharing and curation”. Any journal requests open-access to published data, you don’t have to write this down... Actually, some open-access alternative offers data sharing before publication... (e.g., Ecotaxa, Plankton portal), so it is not even attractive to write such a sentence....

Line 273: “lateral migration of animals towards Senghor seamount at night”. Reference?

Line 279: “After annotation, the PELAGIOS video transects may be used to reconstruct species-specific distribution patterns, which can be related to environmental gradients”. You have to keep in mind that your device does not provide proper vertical profiles but rather multiple horizontal transects. Compared to other systems (e.g., ISIIS, UVP, VPR, etc.) it does not seem to be the best choice of tool to reconstruct species-specific distribution patterns... You should stress and discuss this point...

Line 294: “Preliminary comparisons of the data obtained with PELAGIOS and with MOCNESS indicate substantial differences in the documented fauna”. See my comments previously... If you don’t have further arguments for a robust comparison, you definitely have to stress the uncertainties of your regression...

Lines 294-306: Not a single reference here... You should include more references in order to provide background information for your argumentation. For example, you did

not mentioned Remsen et al. (2004) paper where similar comparison between imaging device and nets were made. . .

Lines 307-326: I agree with your point that in situ imaging systems can provide useful information for the significance of fragile organisms to pelagic ecosystems & biogeochemical cycles, but your last comparison with the UVP highlights one of the weakness of the PELAGIOS device. Systems like the UVP or the VPR are not the most advanced systems by far. . . but they have extensive datasets (like you show). It would take decade for a new system like the PELAGIOS before providing extensive datasets enabling studies a large/global scales. You

Lines 317-320: "This was illustrated by the discovery of the pelagic polychaete Poeobius sp. during the PELAGIOS video transects in the eastern Atlantic (Christiansen et al., 2018). The observations of the PELAGIOS provided the first evidence for the occurrence of Poeobius sp. in the Atlantic Ocean". Isn't the Christiansen paper about UVP data? So, does PELAGIOS provide the first evidence of Poebius in the NA? Also, you then mention the distribution patterns of Poebius, revealed by UVP/CTD and not PELAGIOS. . . what did PELAGIOS brought to this study (apart from the "discovery"?). If you did not have the UVP/CTD system, would PELAGIOS have been able to provide such information?

Line 330: "The joint deployment of the PELAGIOS and UVP also allowed a quantification of the sampled water volume of the PELAGIOS as described above". See my comments above. . .

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