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Review of Acoustic data enlighten East Pacific ecosystems (Stanislas Bebin)

Summarize the main results of the article in a few sentences:

This article, present the biomass analyze and its behavior, thanks to acoustic data. Backscattering signals processing (in multi frequencies/monofrequency), reveal several biomass layers. These biomasses are then compared to environmental drivers (SST, chlorophyll, sunlight, moonlight), helping to refine the nature of the biomass.

Answer the following questions about the structure of the paper:

Overall content:

1. Is the overall purpose of the study and /or central question clear?

Yes, this study wants to attest, acoustic data is a way to collect information about marine biomasses, to improve models.

2. Does the interpretation of the findings answer the overall question of the paper?

Yes, the paper shows there are possible links between acoustic data and biomass characters known.

3. Is every paragraph and sentence in the paper relevant to the overall question?

Yes, all paragraphs and sentences are relevant.

4. Are there portions of the text that could be omitted?

I think that the first paragraph of the result section is not needed: *"The noise filters [...] from the seabed."* It is too descriptive and don't bring lot of information.

3rd last paragraph of p3: *"However, they revealed interesting patterns (Figure 3) ~~Figure 3 illustrates the daily migration of large populations from the deep sea to the surface, driven by the sun elevation angle. (We don't need to remind what Figure 3 is, it has a legend)~~ These*, daily migrations are well documented by Bianchi et al. (2013), but this example is interesting since we can distinguish different layers of organisms that migrate. For instance, during the second daily migration on this figure, we can observe at least five different migrating layers."

"Figures 2 (below), 8, 9 and 10 (Supplementary Material) illustrate the obtained maps indicating the spatial occurrence of the different MFI groups and the corresponding SL values" Same thing, Figure 2, 8, 9, 10 have a legend.

"On Figure 10 which corresponds to the non-swim-bladder fishes" Same thing

5. Is the overall organization of the paper clear and effective?

Yes, but there is one strange thing, the figure references. References of Figure 5, 6 and 7 came before Figure 1 ... All figures in the "Supplementary Material", maybe need to be referenced like Appendix and not like Figure.

Individual sections:

1. Does the title adequately represent the content of the paper?

Yes.

2. Does the abstract clearly and concisely summarize the paper and state the main results? Does it contain all needed information (context, need, task, object, findings and conclusion)?

All the information for an Abstract are here, it is maybe a bit too long. The third paragraph can be neglected. It is almost the same thing of the fourth paragraph.

3. Does the introduction provide enough context to the readers? Does it state the need for the work? Does it state clearly what has been done to address it?

The context is well explained in paragraph 1 of the introduction. The lack of biomass data (paragraph 2), and the use of acoustic data (paragraph 3) to get it, states the need of work. And the last paragraph explains how they did.

4. Does this paper put the progress it reports in the context of existing published work? Is there adequate referencing and introductory discussion?

Yes, into the paragraph 2 and 3 of the Introduction.

5. Are the material and methods used in the study clearly explained? Can you point out what is special, unexpected, or different in the approach compared to existing published work? Does it contain too many technical details?

This part is greatly details, all technical terms are explained. Figure 5 and 6 can be rather put inside noise paragraphs, than in result section. Or else, let in the appendix, with noise paragraphs following them.

6. Is the results sections(s) clearly and concisely written? Are there logical and smooth transitions between sections, subsections and between paragraphs?

In the result section, the first paragraph is not needed, and the second paragraph has to be in the methods section in my opinion.

Last paragraph in p4: *"We implemented filters to remove them but we decided not to use them for different reasons"*. Reasons are not explain, too general.

Apart from that, all results are clear and concise.

7. Does the conclusion clearly state the most important outcome of the work? Does it address the questions stated in the Introduction? Does the conclusion just summarize the results or does it interpret the findings and explain what they mean?

Yes, the conclusion answers the introduction question: findings present preliminary results to the collect of biomass data.

The conclusion does both, summarize and interpret findings: How they do, what they obtain, and limits.

8. Are the interpretations and conclusions adequately supported by the evidence presented? That is, are the assumptions valid, is the methodology sound, is the evidence adequate, and do the conclusions logically follow?

Yes, it is

9. Are all parts of the text, references, graphics and tables necessary for the new results and main points to be understood?

Yes, but in my mind the Figure 7, needs to be inside the text and not in Supplementary Material. This figure is use several times in the paper and does not take a lot of space. It is useful for understand the indicator from backscattering.

10. Are the graphics and tables clear and their captions self-explanatory?

Yes

• Sentences and Wording

1. Can you find grammatical mistakes?

2nd paragraph of the abstract:

"This is why acoustic data appears to be a large source of information to better constrain these models"

2. Can you point to sentences that loose you (too long/complex) and do you have suggestions for improvement?

Sentences are not too long and complex

3. Are generally the action in verbs, characters in subjects and subjects near verbs? Can you find counter-examples? Can you point out misused nominalizations?

Last paragraph of p2: "Once processed, we ~~could start analyzing~~ analyzed our data with the multi-frequency indicators." Action in verb

Last sentence of column 1, p3: "~~On Figure 2, (it seems that)~~ there is a correlation between SL maps, SST (more biomass occurrence for low SST) and chlorophyll for the three different depths (Figure 2)." The main idea is the correlation not Figure 2.

1st paragraph of p5: "Indeed, ~~Figure 4 shows that~~ a very strong layer of backscatter, around 50 meters deep, moves downward during nighttime (Figure 4)." The main subject is the layer of backscatter not Figure 4.

4. Is the writing cohesive? Does it flow well? Is the part of the sentence that links to the previous sentence at the beginning or the end?

2nd paragraph of the abstract:

"Models are tools to study CC influence over these communities up to high trophic levels. These models need to be constrained by data, which are difficult to get because the ocean is really hard to observe and sample. This is why acoustic data appear to be a large source of information to better constrain these models, because they can give information about the ocean's interior."

→ In this paragraph, the first and last sentence do not match and it is not really cohesive ("The CC influence" is an old information, so we need to put it at the beginning of the sentence, contrary to "study by model", same thing with "constrain these model"/"acoustic data").

~~"Models are tools to study The CC influence over these communities up to high trophic levels are study by models. These models need to be constrained by data, which are difficult to get because the ocean is really hard to observe and sample. To constrain these models, This is why acoustic data appears to be a large source of information about ocean's interior to better constrain these models, because they can give information about the ocean's interior."~~

1st paragraph of p4:

"Interestingly, we also observed night migrations on open-ocean cruises. Indeed, Figure 4 shows that a very strong layer of backscatter, around 50 meters deep, moves downward during nighttime. This migration seems caused by the variation of the moonlight since we see a link between the elevation of the moon and the depth of the layer. The dotted lines (indicating when the moon rises above the horizon) seem to correspond to the beginning of these night migrations."

- In this paragraph, results repeating itself some time, consequently it does not flow well. In addition, it is a bit non cohesive.

"Interestingly, we ~~also~~ observed ~~on open-ocean cruises~~ ~~night migrations on open-ocean cruises~~. ~~Indeed, Figure 4 shows that~~ a very strong layer of backscatter, around 50 meters deep, ~~moving~~ downward during nighttime. This migration ~~seems caused by the variation of the moonlight since we see a~~ is linked ~~between to~~ the elevation of the moon and the depth of the layer. ~~The moon rise~~ ~~The dotted lines (indicating when the moon rises above the horizon)~~ seem to correspond to the beginning of these night migrations (Figure 4, dotted line)."

5. Are the paragraphs coherent? Do the first and last sentences of paragraphs match? Can you find counter-examples?

Yes

6. Is there an abusive use of passive voice?

No

7. Can you find a lot of useless words/phrases?

1st paragraph of Introduction section: *"But with global warming, this ecosystem is ~~very~~ likely to undergo important changes which will affect its own functioning, and therefore the services it provides."*

2nd paragraph of Introduction section: *"However, data of biomass distribution are scarce ~~because, except for the upper layer,~~ the ocean is impossible to observe and ~~really~~ difficult to sample, ~~except for the upper layer.~~"*

Last paragraph of Introduction section: *"[...] we implemented indicators that allowed us ~~the~~ to see the occurrence of biomass along the water column[...]"*

2nd paragraph of p6: *"Even if parameters are suggested in the literature and ~~because~~ each echogram is made under varying conditions, an adjustment of parameters is required to better process the echograms and therefore improve the detection of biological patterns."*

3rd paragraph of p6: *"This why MFI groups have big error bars ~~on~~ (Figure 7, right)"*

8. Can you find complex words that could be replaced by simpler ones?

I do not find complex word

9. Can you find too complex subjects?

Same thing for complex subjects

10. Can you find inadequately used adverbs/ repetition/ excessive hedging?

These two main layers are **very likely** to indicate daily migration of fishes.

We think that these aggregations are due to the ascent of nutrient-rich anoxic deep waters along the shelf slope

These are **probably very** productive waters, full of zooplankton and different kind of fishes.

On Figure 2, **it seems** that there is a correlation between SL maps, SST (more biomass occurrence for low SST) and chlorophyll for the three different depths.

The fact that we can see a strong SL at all the depths is **probably** due to the daily migration we referred to before.

11. Is the use of tenses (past/present/future) adequate?

I think that the use of tenses is okay.

- **Other comments?**