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Biogeosciences Discussions

Interactive comment on "Biogeochemical characteristics of a long-lived anticyclonic eddy in the eastern South Pacific Ocean" *by* M. Cornejo et al.

Anonymous Referee #2

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Review for Cornejo et al. – MS No bg-2015-180

Title: Biogeochemical characteristics of a long-lived anticyclonic eddy in the eastern South Pacific Ocean

This paper describes biogeochemical characteristics of an intra-thermocline anticyclonic eddy the eastern South Pacific Ocean. More specifically, it shows evidence that coastal material can be efficiently exported far offshore by intra-thermocline anticyclonic eddy, providing hot spot for biological activity. The paper presents very interesting results about one sampled eddy in the region and should be published after revisions. Given the use of the English language and the structure of some parts of the

paper, I suggest major revisions. Otherwise, the scientific quality is very good.

Major points

1 - The paper needs to be corrected by a native English speaker, by preference a scientific person. Sentences were sometimes really hard to understand, the meaning was unclear due to incorrect use of the past tense / passive voice, among other mistakes. Also, I think that the use of some words is surprising for a scientific paper.

Here are some mistakes: Line 20 p 14483: Estimation instead of Estimates. Line 6 p 14484: "Transport water long distance": something missing? Line 12 p 14484: to transporting: -ing? Line 14: at the eddy -> within the eddy?

Also, the term "unfortunately" (line 2 p 14486) does not really fit in a scientific paper. Moreover, for this specific sentence, it is not explained why not being able to calibrate the oxygen sensor is unfortunate. This is not obvious for people that are not used to go at sea.

2 – A quick summary of the findings and an interpretation of how planktonic ecosystem would behave are missing.

3 – The abstract is a little bit messy, and could me more synthetic and straightforward. Indeed, the link between the mesoscale activity in upwelling system and the introduction to the cruise and the low oxygen sampling is quite mysterious. Instead of introducing the low oxygen sampling I would suggest to directly announce that "such typical eddies" has been sampled, and then give properties of this sampled eddy.

4 - Dynamical processes between cyclonic and anticyclonic eddies are different: please state, when necessary, if the described property depends of their polarity (e.g., lines 23, 24 p 14484). Even at the end of the introduction, the reader does not know which eddy polarity was sampled: it only appears on the title. Also, the final quick conclusion does not state again that the studied eddy is anticyclonic. Finally, what would we expect for a cyclonic eddy?

Minor points:

5 – Figures/table comments: - Table 1: I guess that each “cruise” are actually “dataset”. For each of these dataset, I recommend to precise what kind of data (floats, transect, satellite...) it is in a separate column. Moreover, I do not understand how you can provide one latitude and one longitude for a transect, or a cruise that sampled several points. It would be easier to represent all the location dataset in the figure 1a. - General for all figures: Label a, b c ... are hard to see within figures. Put them outside. - Figure 1, caption: Remove “Right panel” which is useless if you reefer to b c d... “stisopycnales”? -Figure 2, caption: “In the area of study” -> in the study area When referring to the color of the lines, be more synthetic, or just put references directly in the figure and reefer to table 1: indeed, all details (CTD data, cruise, transect...) should be given in table 1, and should not be repeated here. You should add the climatological mean (average computed for the study region). - Figure 5, caption: “Coastal eddy generation” (no ‘s) “isoline” instead of isocline - Figure 6, caption: The caption is not clear; I don’t understand which line refers to which quantity. The caption need to be re-written. - Figure 7: Black lines in the upper panel are not the same than in the other two panels while it should be.

6 - Line 24 p14483: ESP is not defined in the abstract

7 - line 1 p 14484: First sentence of the introduction would need some references. The mentioned point has been widely discussed and shown.

8 – line 5 p 14484 “Alongshore current in the coastal region”: this is redundant information.

9 - Line 4 p14487: AVISO website should be given in acknowledgement

10 - Line 19 p14487: References to Fig1a and not Fig1

11 - Line 18-19 p14487: - names of stations are incomprehensive and not useful for the reader (same comment for Table 1 and Figure 1): use it only once in the text and/or

rename them. If they are necessary, the exact name can be given in the acknowledgement.

12 - Line 1 p 14488: what is the reference of “the grid”?

13 - Line 20 p 144488: reefer precisely to Fig 1b 1c 1d.

14 - Line 5 p 14490: references needed for “transport of suboxic water from coastal OMZ”.

15 – Line 7 p14490: Why is it “speculative” since you cite several studies that show your statement in the following sentence.

16 - Line 10 p14491: what are you trying to emphasize. I do not get the subtleties between ‘although‘ ‘to be taken with a grain of salt‘ ‘it highlight‘. Be simple and specific.

Interactive comment on Biogeosciences Discuss., 12, 14481, 2015.