Biogeosciences Discussions

Biogeosciences Discuss., referee comment RC1
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Comment on bg-2022-9

Anonymous Referee #1

Referee comment on "Observing intermittent biological productivity and vertical carbon transports during the spring transition with BGC Argo floats in the western North Pacific" by Chiho Sukigara et al., Biogeosciences Discuss., https://doi.org/10.5194/bg-2022-9-RC1, 2022

This study descibes data from two BGC-Argo float deployments. I really only have two concerns.

1. The study is very descriptive. I'm not sure I learned much about how the ocean works that isn't already well-established. The authors spend a lot of time talking about what exactly happened to the floats, but due to the complexity of the ocean relative to the measurements they have, they tend to just give generic explanations of why things they observed may have happen, which are impossible to verify. And there is very little focus on what was learned. It really reads as 'we made some measurements, this is probably why the measurements look the way they do.' It's really up to the journal whether this meets its standards for publication, but I would strongly encourage the authors to focus much more on what these measurements teach us about how the ocean works that we didn't already know, or what else would be necessary to learn something new about the ocean from these measurements.

2. The Chlorophyll-fluorescence comparison is pretty concerning and either should be re-done, with a better description of the observed relationship and some proper uncertainty calculations given the weakness of whatever relationship the authors will find, or dropped entirely.

Minor comments below.

1 – Should transports be transport?
2 – Pick one of BGC-Argo vs. BGC Argo and stick with it – and at some point the authors should spell out what the BGC acronym refers to
18 – Ocean (physical) structure?
21 – Why no symbol for nitrate?

25 – How deep?
32 – Are deep POC increases statistically significant?
34 – Grammar: ‘to observed’
35 – This is not unique to your study and I’m not sure it belongs in the abstract
40 – Can CO2 be used without explanation, i.e. ‘carbon dioxide (CO_2)’? Also Giering et al. 2020 is not the right reference for this
41 – ‘Events’ isn’t really the right word – processes is better
134 – Was there only one measurement made of euphotic depth?
141 – It should be stated somewhere that the nitrate concentrations actually reflect nitrate+nitrite, then, right?
212 – It’s nice to see that the authors calculated their own bbp-POC relationship
239 – It’s also possible it’s due to errors in the reanalysis product the authors used
262 – This bit about how MLD is defined seems better-suited to the methods? This is also true for other calculations (e.g. quasigeostrophy) in sections 3 and 4
266 – Can you use a shorthand rather than the full 7-digit string, like ‘float A’ & ‘float B’? It will confuse readers because both float numbers are composed of 2s, 9s, 0s, and 3s.
311 – Better not to use acronyms in headings when possible
410 – This is interesting
Figure 2 – This is pretty concerning and draws into question the authors’ chlorophyll measurements. I would like to see an attempt to fit these data with e.g. a saturating function, and an error quantification, given that the fit is so poor. You can’t call your four largest fluorescence values outliers.
Figure 3 – Again, why are you calling these outliers? They even fit the trend! This is much more encouraging. I would strongly recommend recalculating this, using all of your data, and propagating uncertainty from the regression coefficients
Figure 4 – Some of these MLD changes are encouragingly really quite large. I would emphasise this as it’s currently vague in e.g. the abstract whether these are MLD changes of 20m or 200m. I would also try a couple more methods for calculating MLD to show that these results are robust to MLD method, as there are different ways of defining this and this is important to your story
Figure 7 – Can you plot MLD please too?
Figure 7d – fix y-axis scale so all points are plotted