ESSD response to Anonymous Referee #1
09/02/2022

Overview:

The paper presents a data set of net primary production (PP) concentrated in an area of 2 degrees lat x 2 degrees lon, with data also from a wider 4 degrees lat x 5 degrees lon area, in North Sea covering a period of 19 months from November 2017 to May 2019. The data derive from the integration of in situ, satellite and glider observations. Therefore the calibrated data derive form the single point measurements along the obliquous glider trajectories, which is what is normally done using glider data. The procedure for obtaining depth integrated primary production values, which is one of the final products, is similar to that by Hemsley et al, 2015, cited by the authors, which is turn based on different bio- optical models to obtain: E_d^+, $E_d(z,\lambda)$, and PP itself.

1. So far I could not access to the data base, because I always got 'service unavailable', therefore I don't know if any technical annex is available.

   We apologise to the reviewer for this. We believe that the issue is related to the splitting of the following URL between lines during typesetting:

   https://www.bodc.ac.uk/data/published_data_library/catalogue/10.5285/b58e83f0-d8f3-4a83-e053-6c86abc0bbb5/)

   We have corrected this in the paper by providing the DOI link, as opposed to the full URL.

2. It would be useful to add some technical details, such as the descent angle and the depth range of glider oscillation. I assumed a descent angle of 28° which, for a 0-1000 me excursion, would mean a spatial span of ~400 m for each down-up trajectory.

   A new table, table 2 has been added. This contains the requested information on the specifics of each dive mission.

3. I am a little perplex, not having any spectral data, of using a spectral model for PP. I am aware that it was used also by Hemsley et al, but it looks like a sort of vicious circle. I am wondering if, considering the errors inherent in each of the used models, how the results would compare with those of a simpler, non- spectral model. However the effort may pave the way to the use of spectral sensor which might be available soon on ARGO profilers. Another possible analysis would be to compare their PP results with the backscattering derived POM, for the gliders that are equipped with the sensor.

   We appreciate the reviewers point and agree that a methodological comparison between spectral and non-spectral primary production models would be of interest to both the glider and ARGO communities. However, comparing our results with the output from other models is beyond the scope of this analysis and beyond the remit of ESSD papers.

4. My other perplexity is about publishing this data set on ESSD. Not too much for the limited spatio-temporal span but because it seems to me that the main contribution of the study is that of having implemented a flexible, automatic procedure which may be used in many other contexts. This procedure, for what I read is made available by the authors. A Journal like Enviornmental Science and Technology could be, in my opinion, more appropriate. However, I think that this is mostly an editorial choice.

We thank the reviewer for this comment. However, while we acknowledge that the methodology developed to product this data set receives significant attention in the manuscript (a point noted by other reviewers), we still consider the main thrust to be the data set itself as it is unprecedented for the region. As such, we maintain that this paper falls with ESSD's editorial scope.