

The presentation quality was very high. There was a lot of data to communicate in the figures. With a bit of study, they proved clear and informative. The results and conclusions were very clear, if the discussion a little short.

We are pleased that the reviewer found the manuscript interesting to read and we would like to thank them for the helpful comments. Please see below our comments on the discussion.

specific comments

There were some interesting details on correcting glider data, correcting the pH sensor for drift and validation of sensors with bottle data. There could have been a clearer description at the start of the paper on the motivation to calculate NCP in two ways and on the significance of the discrepancies found. However, the paper successfully argued for augmenting long time series data with targeted short duration profilers and there are only minor changes required.

In an effort to be clearer, we will add the following on line 9:

“ ... using two similar methodologies.”

and on line 18:

“ ... but also demonstrates the difficulty in estimating N, ...”

technical corrections

L.11 slight change in wording: ‘calculation of advective’

We have changed this to:

“... allowed the calculation of advective O₂ and DIC fluxes.”

L.24: Reference required for processes and climate change?

We will include the following reference:

Bauer, James E., et al. "The changing carbon cycle of the coastal ocean." *Nature* 504.7478 (2013): 61-70.

L.30: Reference for Revelle factor

We will add the following reference on this line:

Broecker, Wallace S., et al. "Fate of fossil fuel carbon dioxide and the global carbon budget." *Science* 206.4417 (1979): 409-418.

L.45: reference on significance of POC and DOC changes? (explain acronyms here)

We will change the text to as follows:

“Significant increases of Particulate and Dissolved Organic Carbon (POC and DOC) concentrations have been observed during bloom events (e.g. Carlson et al. (1998)).”

L.108: not sure what B2,C refers to here?

We will update the text to reference Appendix B2.

L.173: Interesting observation on the differences in PP and NCP were not explored?

The focus of this study is to estimate NCP using glider observations over a spatial domain. Chlorophyll *a* concentrations can be both an indicator of biomass (accumulated production) and productivity (instantaneous rates), and we use them in a qualitative manner here as indicator of likely patterns in primary productivity, and not to quantitatively compare PP with NCP. We suspect that any differences may be related to differences in phasing, temporal and spatial aggregation scales, but there are too many unknowns involved to draw firm conclusions. Nevertheless, like the reviewer, we consider it to be an interesting observation.

L.111: change yer to year

We will correct this in the revised version.

L.123: Use acronym here?

We will use 'POC' here.

L.268: the non-Redfield ratios were interesting but not really discussed further (the discussion section is in fact quite small)

There were a few words missing on l. 262 and 264. We will insert "for phosphorus" after "0.4 to 0.7 mmol m⁻² d⁻¹" (l. 262) and "(based on phosphorus)" after "72 mmol m⁻² d⁻¹" (l. 264).

We found that the last two sentences on l. 266 and 267, partially contradicted the previous one, i.e., as far as the nutrient drawdown is concerned, the N(DIC) values are in reasonable agreement with the N- and P-based values (within the uncertainties and considering the omission of advective nutrient fluxes). We will therefore rephrase this as:

"The values are in reasonable agreement with the *N*(DIC) values derived for the bloom period between 19 March and 3 April of (85±98) to (128±90) mmol m⁻² d⁻¹), indicating nutrient consumption in line with the assumed stoichiometric ratio." and delete the sentence beginning "However, the N-based value ...".

The subsequent sentence will be moved to the next paragraph and the word "even" removed, i.e.

"The discrepancy between expected and observed stoichiometry is larger for the O₂-based N values, especially for the glider-based observations."

The subsequent discussion is as exhaustive as we feel we can justify from our current understanding. However, we will add another citation to note that other studies have also found deviations from Redfield ratios for nitrate and oxygen-based NCP (Hull et al. (2021)

Hull, Tom, et al. "Simultaneous assessment of oxygen-and nitrate-based net community production in a temperate shelf sea from a single ocean glider." *Biogeosciences* 18.23 (2021): 6167-6180.

L.295: is this change in concentration (just written as 'c')?

Yes. For clarity we will change this to 'concentrations'.

L.312: what do you mean by vane?

We meant 'wane', but we will now use 'diminish' instead.

L.401: close the brackets

We will do this in the revised version.