Dear Editor,

Please find enclosed the manuscript files with the corrections you suggested. To make the figures more readable by color-blind people, we modified:

- The continuous color scale in panels a, b, d and e of figures 6 and 7 (plus similar SM figures), replacing the "Spectral" palette by the "YlGnBu" palette (from the R package Color Brewer).
- The discrete color scale in figures 1, 2, 5 and 8–10 (plus SM figures), used to distinguish ocean biomes. In this case, we have chosen two shades of blue plus red and golden tones.

We followed the recommendations exposed here and checked all the figures using Color Blindness Simulator. We are thankful for your suggestion, which clearly improved the figures, and made them more harmonious in the case of fig. 6 and 7.

We also modified Fig. 3 and edited one sentence (L315) to better describe the comparison between POC estimated from BGC-Argo and satellite data. The underlying calculations and datasets, as well as the message of the paper, remain unchanged. These slight modifications are described below:

Figure 3: We added in the caption: "*Satellite data not shown for months when more than half of the ocean pixels could not be observed because of low solar elevation at high latitudes.*"

It is well known that ocean color remote sensing is limited by incident sunlight at low solar elevation (discussed in 4.1). In consequence, satellites cannot "see" the full domain sampled by BGC-Argo floats or simulated by the model during some months at high latitudes. For this reason, and to avoid misleading visual comparison, in the previous version of Fig. 3 we had removed the satellite POC data points for the months 1 and 12 in the NASPG region, which were deemed less representative of the full domain. Here we applied a more stringent criterion and additionally removed satellite POC data points for month 11 in the NASPG and months 1 and 12 in the Subantarctic biomes, as explained in the caption. Note that satellites see 100% of the domain in the Mediterranean and STG biomes in all months, and 95–100% of the domain during months 3–9 and 2–10, respectively, in the NASPG and Subantarctic biomes. Finally, note that this issue affects only the display of data. Our quantitative comparisons between observed and modeled datasets are based, in all cases, on fully-coincident domains, i.e. on the same number of grid cells (see next point).

L315: The sentence

"Satellite TPOC was in poor agreement with both PISCES and BGC-Argo TPOC outside the apex of the bloom, exceeding BGC-Argo TPOC by up to seven-fold (fourfold) in the NASPG (Subantarctic), as discussed in section 4.1."

was replaced by

"Satellite TPOC was in poor agreement with both PISCES and BGC-Argo TPOC outside the apex of the bloom. During the winter semester (months 10-12 and 1-3), and considering only the subset of pixels observed by both satellites and floats, satellite TPOC exceeded BGC-Argo TPOC by a factor of 6.1 (3.3) in the NASPG (Subantarctic), as discussed in section 4.1."

Thus, the text now provides more precise quantities, representative of all the pixels concurrently observed by satellites and BGC-Argo over a longer period. The new text better supports our claim that available satellite products strongly overestimate sea-surface POC under certain conditions.

We thank you for your positive evaluation of the paper, and hope that this new version will fulfill all the requirements for publication in *Biogeosciences*.

Martí Galí

on behalf of all coauthors