

We thank the editor for the opportunity to revise our manuscript and the reviewers for their valuable feedback. Below, we provide a detailed point-by-point response to the remaining concerns raised by Referee 3, with explanations of how each has been addressed in the revised version.

N:P Ratio: The table title refers to the N:P ratio, yet no such data are presented

The N:P ratio has been removed from the table title.

As previously mentioned, since nutrient values are reported as below detection limits (BDL), the N:P ratio should not be calculated or discussed. Nevertheless, it remains prominently discussed (e.g., lines 249, 274, 277). This is inappropriate and needs to be removed.

This change has been applied throughout the document. The N:P ratio is no longer used as a basis for the discussion.

Reporting of BDL Values: Throughout Table 1 and elsewhere in the manuscript, values listed as “0” should instead be clearly marked as “BDL” to avoid misinterpretation.

The term BDL has been introduced for values previously listed as “0”.

Section 3.4 – $\delta^{15}\text{N}$ Signatures: The heading " $\delta^{15}\text{N}$ Signatures in Particulate Organic Nitrogen Show No Clear Evidence of Nitrogen Fixation" is misleading. As the authors acknowledge in their rebuttal, $\delta^{15}\text{N}$ values reflect mixed signals from multiple nitrogen sources and transformations. Since direct N_2 fixation rates have already been measured, there is no need to draw further conclusions from $\delta^{15}\text{N}$ signatures regarding nitrogen fixation. This section should be reframed accordingly.

The section has been rewritten to base the discussion on $\delta^{15}\text{N}$ signatures, focusing on nitrogen sources and overall biogeochemical processes in the study area.

Redfield vs. Non-Redfield Ratios: My earlier comment on how the observed Redfield or non-Redfield ratios indicate freshly derived POM from an ongoing bloom was not addressed. This interpretation requires a more nuanced discussion. Many recent studies show a wide range of C:N:P ratios across natural communities, independent of degradation. Communities dominated by fast-growing organisms often have low N:P ratios, while slower-growing communities exhibit higher ratios. Degradation plays a secondary role at most. The authors should reflect this complexity in their discussion.

The mentioned concerns have been addressed, and additional literature has been reviewed. A more nuanced discussion of OM composition is now included.

Decimal Notation in Supplementary Table: The supplementary tables use commas (,) as decimal separators. Please revise all numerical formatting to adhere to standard international conventions (periods for decimals) throughout the manuscript.

This has been changed accordingly.