

To: Prof. Damian L. Arévalo-Martínez
Editor, Ocean Science

We would like to thank the reviewer and the editor again for the careful consideration of our manuscript (paper # egusphere-2025-1445) and the positive view of it (a ‘Minor revision’).

Below please find our detailed reply to the last few comments made by Reviewer 2 (in bold).

Respectfully,
Tom Reich (on behalf of all co-authors)

The authors answered the comments thoroughly. I do not have any major comments, but three minor ones remain:

1) L. 231 “excluding sporadic measurements” – can you give details which data points you excluded and why?

Response: We did not remove any BP data points from the dataset, nor did we exclude them from the statistical correlation analyses. The sentence was meant to emphasize that, apart from a few cases where aphotic BP values were relatively high, BP was generally low and of similar magnitude, showing no significant correlation with aphotic DCF.

The sentence was revised for better clarity: “...Aphotic BP rates were usually of similar magnitude and typically $<0.1 \mu\text{g C L}^{-1} \text{ d}^{-1}$ (Fig 1C)...” (Lines 231-232).

2) Fig. 5: It still looks odd to me that bacteria add $35 \text{ g C m}^{-2} \text{ yr}^{-1}$ to the DOC pool and respire $144 \text{ g C m}^{-2} \text{ yr}^{-1}$, while there is no arrow indicating DOC uptake. If this figure is supposed to show microbial carbon exchange as indicated in the caption, I think it is missing a central process and should be adapted accordingly.

Response: We thank the reviewer for this comment. First, bacterial respiration was not directly measured in this study but was instead estimated from BP and BGE. We address

the associated uncertainties in detail and note that direct measurements are warranted in future studies (e.g., lines 398-404). In addition, the ‘BP arrow’ in the original illustration was incorrectly oriented. BP represents the utilization of DOC by prokaryotes rather than serving as a source of it. We thank the reviewer for highlighting this error, which has now been corrected in the revised figure.

Title: This should be doublechecked by a native speaker, but should't it read "Dark carbon fixation contributes to MEETING the bacterial organic carbon demand ..."? (also in line 24)

Response: The title was revised for a better clarity: “Contribution of dark inorganic carbon fixation to bacterial carbon demand in the oligotrophic Southeastern Mediterranean Sea” and wording was changed in the abstract “Here, we investigated the role of photic and aphotic dark inorganic carbon fixation rates (DCF) and its contribution to bacterial carbon demand in the southeastern Mediterranean Sea during the mixed and stratified periods.” (Lines 22-25).