

Authors response to the Associate Editor report

Title: The impact of the South-East Madagascar bloom on the oceanic CO<sub>2</sub> sink

Author(s): Nicolas Metzl et al.

MS No.: bg-2021-283

MS type: Research article

Iteration: Minor revision

;;;;;;;;;;;; Associate Editor report

Dear authors,

many thanks for addressing the referee comments. Both referees agree that the study is well suited for publication in Biogeosciences, however, both referees equally raise concern regarding parts of this study being linked to a paper currently in review.

As explained in the referee response document, the Chau et al (in review) study comprises an update of a past study (Denvil-Sommer et al 2019), which I am well familiar with and which has appeared in the peer-reviewed literature. Therefore, I am not concerned regarding this update not being tight to a published manuscript yet. I would however suggest that the authors make it clear in this manuscript (for the readers of this study) that they present an improvement of a previously peer-reviewed method. I believe that this would increase the readers confidence.

Additionally, as BG is striving to improve the accessibility of colour figures for readers with colour vision deficiencies, please have a look at the BG figure guidelines (<https://www.biogeosciences.net/submission.html#figurestables>).

Overall, based on the referee comments, I believe that minor revisions are required before the manuscript can be considered for publication.

Best regards  
Peter Landschützer

;;;;;;;;;;;; Our response:

Dear Editor, dear Peter,

Thanks you for your positive comments on our manuscript.

The manuscript has been revised with main revisions listed below:

In Section 3, we have specified that the model from Chau et al, (2022 now accepted in BG) is an updated version of the previous CMEMS-FFNN model by Denvil-Sommer et al (2019), now added in references.

We have added reference to a very recent paper by Ramanantsoa et al (2021) as suggested by reviewer 2. This article is now referenced in several places in the manuscript when describing the current fields and specifically when identifying the retroflexion of the SEMC.

As suggested by reviewer 2, we also added a note in section 5.3 concerning the relatively low variability of the annual CO<sub>2</sub> sink estimated by the CMEMS-FFNN model during other blooms compared to the strong bloom that occurred in 2019-2020.

As we suggested in our reply to the reviews, we decided to add a new figure in Supp Mat (now Figure S4, ADCP data recorded during the OISO-30 cruise and a map of the currents in January 2020, not presented in the submitted manuscript). The Figure numbers in the Supp. Mat and the main text have been revised accordingly.

As suggested by reviewer 1 we added gridded of Latitude/longitude in all maps.

We have also changed the colors for all figures following the Color Blindness Simulator as suggested by BG (revised figures in the main MS and the Supplement). We hope the new colors will be correct for all readers (including colorblind readers) and the main results are clear for everyone.

The revised paper and the Supplement are submitted as well as a version with track-changes for the text (few lines revised that should be clearly identified).

We hope these changes are completed and the manuscript suitable for publication.

Thank you again to handle this manuscript and for your positive decision

Sincerely,

Nicolas Metzl on behalf of all co-authors