

**Review of the resubmitted manuscript “Dissolved Inorganic Nutrients in the Western Mediterranean Sea (2004-2017)” by Belgacem et al.**

I thank the authors for responding to my requests. Below are some comments on the replies.

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*I appreciate having access to the original data (i.e. prior to adjustment), but that does not preclude the need to link to the individual cruise files. These can be in a common format on a dedicated place, or it could be links to the original data file in a repository (NOEC, SeaDataNet, or similar). That has value since for instance some of these cruises probably have associated “other” data, such as oxygen etc. that might be of use for the user. I recommend to establish links to the original data files.*

*This last comment does also go for the meta-data of the cruises. I guess in most cases this would include reference to a cruise report. I could not find any such references, please add links to cruise reports.*

We agree that it is important to have easy access to the original, individual data files and metadata. Some of the cruise metadata such as cruise reports are available on <http://www.seaforecast.cnr.it/reports/>, but not all. We will add cruise reports for the missing cruises and submit all the individual cruise files to the SeaDataNet repository.

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The response is good, and I accept that having the individual cruise files at SeaDataNet is an acceptable solution. However, this is only stated as an intention, nowhere in the manuscript do I see any mention to the seaforecast site nor to SeaDataNet. Before the article can be published these links and the content within those links needs to be established.

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*Although it seems that the low-nutrient water of the Mediterranean might be less prone to bias due to freezing, the result from this study seem to suggest something different with all three variables being adjusted preferentially upward or downward. That might be an interesting result. Or maybe this is a function of bias in the measurements??*

We agree it could be due to bias in the measurement, we did not generalize it to all cruises. We tried to understand and find out what was the source of bias in the observations and the storage time was one of them. Freezing is not the main cause of the bias if samples were well preserved and unfrozen. One of the main reasons for the upward and downward biases would be the lack of use of Reference Material for Nutrients in those cruises as also noted in CARINA (Tanhua, T., Brown, P. J., and Key, R. M.: CARINA: nutrient data in the Atlantic Ocean, Earth Syst. Sci. Data, 1, 7–24, <https://doi.org/10.5194/essd-1-7-2009>, 2009. ) or the most recent global comparability exercise (Aoyama, M.: Global certified-reference-material- or reference-material-scaled nutrient gridded dataset GND13, Earth Syst. Sci. Data, 12, 487–499, <https://doi.org/10.5194/essd-12-487-2020>, 2020)

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I do not see any evidence in the manuscript that support your statement that “Freezing is not the main cause of the bias if samples were well preserved and unfrozen”. Instead I see statements related to silicate that freezing does have an impact. I know that there is (anecdotal) indications that the freezing of samples does not affect the low nutrient waters of the Mediterranean as much as other basins. I was asking for a short discussion of this in the manuscript. Why are all adjustments in Figure 5 downward? Same for Figure 7.

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*It would be useful to have a directory of crossover plots for all cruises. The method of GLODAP and CARINA could be taken as an example, but a repository on the web where the crossoverplots can be downloaded would go a long way. This would allow users to judge the validity of the adjustments.*

Yes, we want to make available the crossover plots following the crossover and adjustment Data Repository for CARINA or GLODAP, however it cannot be done easily, before the paper is published, we will work on making it available with the cruise reports.

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Same thing here, I do not think that stating an intention is sufficient.

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*Line 221: The 2\_ influence radius is probably fine for the Atlantic Ocean, but mostly not for the Mediterranean Sea. How did the author handle crossovers that were influenced by observations from nearby other sub-basins where a different nutrient concentration could be expected?*

The reviewer is correct that we did not separate the analysis by sub-basin. The choice of the 2° was also partly for practical reasons since the number of reference cruises is too low to allow to restrict this radius. If we had more reference cruises, we could have reduced the 2° influence radius, but given that we only have 5, a relatively large influence radius is the only way to ensure statistically relevant results.

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This is not a satisfactory answer. I can accept the 2° radius of influence, but not that you are potentially comparing observations in two different sub-basins.