

Biogeosciences Discuss., author comment AC1  
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## Reply on RC2

Gerard J. M. Versteegh et al.

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Author comment on "Performance of temperature and productivity proxies based on long-chain alkane-1, mid-chain diols at test: a 5-year sediment trap record from the Mauritanian upwelling" by Gerard J. M. Versteegh et al., Biogeosciences Discuss., <https://doi.org/10.5194/bg-2021-309-AC1>, 2022

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We followed all suggestions for improvement. Below you will find a detailed list of all changes. Referee comments in bold, the figure mentioned is in the attached supplement.

**This manuscript entitled : "Performance of long-chain mid-chain diol based temperature and productivity proxies at test: a five-years sediment trap record from the Mauritanian upwelling" presents a really interesting and impressive dataset with the aim of investigating the main diol indexes.**

**Overall the manuscript is well-written and engaging and the authors present valuable data and solid discussion .**

**However, there are a few areas where further detail would be beneficial to the reader. The authors will find hereafter a few suggestions and questions which I hope will help improve some parts of the discussion.**

- **I think that the conclusions and the title don't reflect clearly the conclusions of the study. Are the authors saying that for instance the LDI proxy is not suited for upwelling environments' temperature reconstructions? If so then why not say it more clearly?**

We stated this more clearly now.

- **Figure 1 – could the authors add some seasonal SST maps for the same area? It would help visualise the SST changes regionally.**

Since the sea surface temperature distribution in the region is very dynamic, we added one-day snapshots of the SST distribution for the beginning of each season rather than season average distributions. The snapshots clearly illustrate the brief warm summer periods separated by long periods with cool SST as seen in what is now Fig. 3b, see also Fig. RC2-1 below.

- **Error bars are missing in the text and on the figures. For instance if we take into account the LDI calibration error bars (plus or minus 2°C) then the SSTSAT and SSTLDI values overlap better (not talking about lead and lags). The same for Uk temperatures.**

The LDI to SST calibration error bars are based on a global calibration and include areas with as strong relation between SST and LDI but also areas where this relation is weak. These 'global' error bars are of limited value in a specific region. Furthermore, the data points in the trap record are not independent, they are arranged in a time series. The 95% confidence limit of the regression of  $SST_{LDI}$  to  $SST_{SAT}$  is 3.8°C which is about twice that of the global calibration. We also added confidence limits to the other SST proxies in what is now Fig. 6, all based on the CBeu dataset.

- **Line 340: with the error bars, is that statement needs to be revised?**

done we added that: 'considering the error bars, this is a reasonable approximation'

- **Line 246 – define subsurface**

done (everything below the surface, > 0 m water depth)

- **Line 260 – dust events: please explain briefly what is measured and how. I know that it is detailed in Romero et al 2020 but it would help to have a few words in the manuscript.**

We added that the data are derived from the synoptic weather data of the Nouadhibou Airport weather station.

- **Line 261 typo– Mauritanien and not Mauretaniien**

Corrected.

**Please proof read carefully the manuscript for typos and English.**

- **Line 393-395. I don't understand this sentence**

We rephrased this sentence.

- **Line 422 'perfectly sinusoidal'? 'anti-correlation'**

Corrected, and we removed also the '-' in 'anti-correlation'.

- **Line 422-425. This paragraph is too long and unclear. Please rephrase**

We shortened this paragraph.

- **Section 4.5 – could there be a lateral transport of alkenones (other regional source of alkenones) that could explain the observed differences? Have the authors considered that possibility?**

We added the option of lateral transport.

Please also note the supplement to this comment:

<https://bg.copernicus.org/preprints/bg-2021-309/bg-2021-309-AC1-supplement.pdf>