Interactive comment on "Variability of phyto- and zooplankton communities in the Mauritanian coastal upwelling between 2003 and 2008" *by* Oscar E. Romero et al.

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Variability of phyto- and zooplankton communities in the Mauritanian coastal upwelling between 2003 and 2008 (bg-2019-314)

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As required by BG, the response to the Referees is structured in the following sequence: (1) comments from Referees (RC), (2) author's response (AR), (3) author's changes in manuscript (ACM).

1) Comments from Dr. M. Bringué's 1.1) General comments

RC: One aspect I would like to see discussed further is the possibility of the trap record missing on some parts of the pelagic food web dynamics. All major groups (along with lithogenic particles) are recorded simultaneously, which seems to indicate co-occurrence. We also observed the same patterns in the Cariaco Basin (Bringué et al. 2019, Progress in Oceanography 171: 175-211). I think part of the issue was well discussed in section 5.1, but there seems to be a decoupling between Chla and the trap record (RDA in Fig. 5 suggests that). Could it be that planktonic groups are only exported to the depths when 'ballasting minerals' are present (biogenic carbonates and silica, or lithogenics brought in by winds), but we are missing on all primary and secondary production that takes place without those denser particles? It would not undermine the data or findings, I just think it is worth discussing.

AR: We agree with Dr. Bringué on the possible 'ballasting minerals' impact on the downward flux of primary and secondary producers. This issue was partially addressed in our first submitted version (l. 516-522), but we will extend and clarify this paragraph. This issue has been already addressed in several of our previous publication dealing with the seasonal and interannual variability of fluxes off Mauritania (e.g., Fischer et al., 2016, Biogeosciences, 13, 3071; Romero and Fischer, 2017, Prog. Oceanogr. 159, 31; Fischer et al., 2019, Global Biogeochem. Cy., 33, 1100–1128).

ACM: to be added in the revised version, Fischer et al. (2019) observed that individual high BSi maxima revealed a peak‐to‐peak correlation with winter–spring dust fluxes This was interpreted to indicate a strong coupling between dust deposition (lithogenic flux) and the efficiency of the biological pump under both dry (winter‐spring) and wet depositional conditions (summer) off Mauritania. Based on these observations, Fischer et al. (2019) proposed that the ballasted, organic‐rich aggregates built in surface waters immediately react to any additional dust supply with aggregation followed by rapid sedimentation. This was supported by experimental studies on aggregate ballasting and scavenging by v.d. Jagt et al. (2018, Limnol.

Oceanogr. 63, 1386).

RC: 2. Section 3.4: We usually need to justify the use of RDA by running a DCCA first (or at least a DCA on species data) – the length of the first gradient informs you on the linear vs unimodal character of the variability in the species data matrix. <2: linear and RDA is appropriate. 2-4: both ordination methods work. >4: unimodal and CCA should be used. See Canoco manual for instance. You also need to specify how the significance of the RDA ordination was tested (e.g., Monte-Carlo permutations and how permutations were done – should be the 'transect' option in Canoco because samples represent a time series; and whether the whole ordination is tested or just the first 1 or 2 axes...). AR & ACM: To determine if a linear or unimodal based ordination method should be applied on the data we performed a Detrended Correspondence Analysis previous to statistical analysis. Results of this analysis revealed a total length of gradient of 1.2 sd which indicates a linear species respond on environmental gradients. The methods PCA and RDA have been accordingly performed. Significance of the environmental variables have been tested with a Monte-Carlo permutation test with unrestricted permutations.

RC: In general, the manuscript would benefit from being revised by a native English speaker; I provide some suggestions that may help.

AR & ACM: Dr. Bringué's language corrections are much appreciated and will be introduced. The corrected manuscript will be reviewed by a native speaker before submission.

RF: The notation m-2d-1 should be changed throughout the manuscript and figures to include the minus signs in superscript.

AR & ACM: This will be accordingly rephrased throughout the MS. 1.2) Detailed comments/suggestions All suggested language corrections will be considered.

RC: L. 109-111: Consider the following publications (Bringué et al. 2019, Progress in

Oceanography 171: 175-211) that also provided multi-year records of several phytoplanktonic and (micro)zooplanktonic groups in a highly productive coastal ecosystem.

AR: this suggestion, together with Referee #2's suggestion on 'multiannual records of microplankton and biogeochemical fluxes' will be considered in the revised version. Unfortunately, there are not many long-term (longer than five years), continuous sediment trap experiments published.

ACM: in addition to Bringué et al. (2019), we will add and shortly discuss Deuser et al. (1995, Deep-Sea Res. I 42, 1923); Jickells et al. (1998, Global Biogeochem. Cy. 12, 311); and Kawahata et al. (2000, Deep-Sea Res. I 47, 2061).

RC: L. 298: Wind directions: please specify how the variable is defined (e.g., 360° from N? or relative to coastline?) This is important to understand what the ordination in the RDA of Fig. 5 means.

AR: In terms of angle measurement in degrees, 0°/360° corresponds to North, 90° to East, 180° to South and 270° to West.

ACM: This will be added to the caption of Figure 7.

RC: Figure 4: Unless the authors are planning to place this figure in one column only, the figure would greatly benefit from a legend, explaining what each color represents next to each panel. It is very difficult to refer to the caption to read the figure.

AR: this suggestion is accepted.

ACM: The names of taxa or group of taxa will be added to the right-hand side of each panel in the corrected Figure 4.

RC: Figure 5: The authors need to specify what the color-coding for labels means, as well as black vs grey arrows. I also suggest the following: - Use the abbreviation 'Chl-a' to be consistent with the text (in figure and L. 1156),

AR & ACM: we are afraid this was an unwilling problem while uploading the figure

during the submission process. We submitted an earlier version of this figure. All labels and arrows should have been in black. This will be accordingly corrected in the resubmission. Chl-a abbreviation: will be rephrased accordingly.

RC: Figure 6: "C-up phot" in figure should be 'Co-up phot'.

AR & ACM: This will be accordingly re-named.

RC: Table 1: Vertical lines are usually omitted.

AR: this suggestion is accepted.

ACM: Vertical lines in Table 1 will be omitted.