

Biogeosciences Discuss., referee comment RC3
<https://doi.org/10.5194/bg-2022-127-RC3>, 2022
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Comment on bg-2022-127

Anonymous Referee #3

Referee comment on "Unique benthic foraminiferal communities (stained) in diverse environments of sub-Antarctic fjords, South Georgia" by Wojciech Majewski et al., Biogeosciences Discuss., <https://doi.org/10.5194/bg-2022-127-RC3>, 2022

In this paper, Majewski et al. present data on stained benthic foraminifera collected at different fjords on South Georgia. The foraminiferal data are interpreted in the context of several environmental parameters (grain size and sorting, total organic carbon, total sulfur, and bulk organic matter $\delta^{13}C$), which differ depending on the location of the fjord where samples were collected (i.e., close to shore vs. outer part of the fjord). The manuscript is well written and easy to follow. Reviewer #1 requested the authors to go back and recount the samples, so to reach at least 300 specimens per sample. I agree with Reviewer #1 that that was a necessary revision to reach sound quantitative foraminiferal estimates and allow for robust statistical analyses. I think that the manuscript can be published in Biogeosciences, although I have some comments, which I would classify as minor/moderate revisions, which I hope will help the authors improve the clarity of their work. Specifically:

Lines 44-46: references needed.

Line 116: from Table 1, it looks like CTD measurements are available from 19 stations (not 20).

Line 143: why not all van Veen Grab samples were analyzed for grain size?

Lines 161-162: "or stations SG-12, SG-13, SG-14, SG-16, and SG-28, specimens from both replicates were picked and further analyzed." Were replicates treated in the same way as the other samples? At line 134 the authors say: "Replicates from the remaining stations were archived.", so it might be worth clearly stating how the replicates were treated, to avoid confusion.

Line 200: Station SG-02 is not reported in Figures 1 and 2 or in Table 1.

Lines 283-287: this information belong to the Discussion section.

Section 3.2.1 The authors should refer to the dataset they compiled and that they are planning to submit to Pangaea after the paper has been accepted for publication (although I recommend starting the process early rather than later because it might take a while for the dataset to be published in the repository).

Lines 310-311. I recommend adding a reference to the photos of these species in Supp. Figure S1-S6.

Line 369. Can the authors provide an estimate/opinion about how much the reduced staining time could have biased their results? They already provide a nice discussion on how they think that the modification they made to the FOBIMO protocol did not affect their results, but something similar is missing with respect to the substantial decrease in incubation time with Rose Bengal.

I would be nice if the authors were to add a (small) section regarding the applicability of their results, possibly to fossil data, as well as suggestions for future research directions.

Table 1 – header 'Date' – please specify the year. Station SG-13, please revise date format. Also, can the authors add additional columns to specify which samples were analyzed for grain size, TC, TOC, TS, and $d^{13}C$ of bulk organic matter?

Legend Figures 3, 4, 5, 6, and 9. "outer Cunberland Bay" – it should be Cumberland.

Figure 2. I wonder if this figure would be more helpful if the data were grouped by sampling position with respect to the fjord (i.e., near shore, mid-fjord, outer fjord) rather than sampling area (i.e., Antarctic, Fortuna, Cumberland, Stromness bays). In case, Section 3.1.1 should be revised accordingly.

Figure 5b. Can the authors include TOC data on this figure to better show the relationship between TOC and organic matter $d^{13}C$?

Figure 6. I am having a bit of a hard time deciphering the maps (?) on the y-axis of the

plots. If the authors think that these are important, then I suggest adding them to the site of the plots, making them bigger, and explaining their meaning in the figure caption.

Caption Figure 8. FA should be defined.

Table S3 is not cited anywhere in the text.