Second review of BG-2018-46

I have now completed a second review of the manuscript now re-titled "Macrofaunal burrowing Enhance Deep-sea Carbonate Lithification on the Southwest Indian Ridge".

The authors have taken the previous round of reviewer comments seriously and the manuscript is much improved. That said, there are still two outstanding issues that were raised in the original review that prevent acceptance in its current form.

First, many minor grammatical errors remain – I have made suggestions for correcting some of the most glaring errors below in the specific comments. I appreciate that special attention has been made to the English in this current revision, and it is indeed improved. However, it still requires further proof-reading for English before it can be considered ready for print. I implore the authors to consider an external proofreading service or other solution that will ensure that the grammer is up to par.

The second and more important issue relates to the statistical analyses of the change in density surrounding the burrows. While the authors provide R-squared values for their fits, they do not plot the fits, nor their confidence bounds. Instead the current figure simply has lines connecting the points, however the points are not in increasing order, so the lines bounce all around in a zig-zag manner. What I am hoping to see is the regression line drawn through the data along with the confidence bounds. See https://www.mathworks.com/help/stats/polyconf.html for an example where both the fit line and confidence bounds are shown overlaid upon the data. The basic statistical question is <u>not</u> "does each slope have a robust fit", which is what the authors currently provide. Instead, the basic statistical question at hand is "are the two slopes significantly different"? This is at the heart of the manuscript – whether bioturbation has a statistically significant influence on density (and thus carbonate lithification).

I don't think these should be prohibitively difficult for the authors to address, and I continue to hold the opinion that this work should be eventually suitable for publication in *Biogeosciences*. In my opinion we aren't there yet – but definitely getting closer.

<u>Specific comments</u>

Pg. 1, Line 10: "blanketing the seafloor of the"

Pg. 1, Line 12: "in this carbonate lithified area"

Pg. 1, Line 13: "were examined" … also "enhances".

Pg. 2, Line 18: This is a bit awkward, I recommend "We examined this intriguing occurrence of non-burial carbonate… and highlight the interactions…"

Pg. 2, Line 28: "substantially in"

Pg. 3, Line 19: "which is a public"

Pg. 3, Line 27: "The MATAB function polyfit was used"

Title of section 5.2: "around burrows"

Pg. 5, lines 29–31: There are multiple grammatical problems in this sentence.

Pg. 6, Line 4: "from SEM images"

Pg. 6, Line 20: "hydrothermal systems and detrital input"

Pg. 7, Line 24: "bulk samples are"

Pg. 7, Line 31: "deep-sea environments"

Pg. 8, Line 7: "of the studied carbonate area"

Pg. 8, Line 9: "phases", then line 10: "this is not likely to occur here"

Pg. 8, Line 12: "However, the carbonate samples studied here have never been buried"

Pg. 8, Line 15: "Moreover, ecological niches"

Pg. 8, Line 18: The beginning of this paragraph has grammatical problems.

Conclusion: Multiple grammatical issues.

Figure 5: There are lines connecting the points that show a zig-zag pattern as they trace the order of the points without any sorting. In other words, they are simply connecting the points in a random order. These lines should be removed and the actual fits presented (the trendlines that go through these point clouds, which are not currently shown).