

Dear editor,

We thank both of the reviewers for taking another good look at the manuscript and are happy to see both are supportive of publication. Below, we indicate how we made our final changes based on the remaining suggestions by reviewer #1. Reviewer #2 did not provide any comments.

In addition to these corrections, we have included the novel BayMBT calibration for the MBT_{SME} proxy (Dearing Crampton-Flood et al., 2020) in addition to the calibration by De Jonge et al. (2014) in Figure 7, and briefly discussed the implication at the end of the proxy comparison section 5.3.2.

Sincerely, also on behalf of my co-authors,

Appy Sluijs

Anonymous Reviewer #1

Some minor comments are below:

Line 223: I suggest to remove the word “assumed” since these diagnostic GDGT distributions (predominantly GDGT-1 to -3) have been observed in many studies from methane-impacted environments (e.g. Pancost et al., 2001) and based on this rationale, MI was developed. Rather add “which preferentially produce GDGT-1, 2 and 3”;

Reply. We have specified this and added the Pancost et al. (2001) reference.

Line 286: calculate from TEX86 using;

Reply. We think ‘calculated’ is correct here.

Line 289: limits of the TEX86-RI relationship;

Reply. done.

Line 304: brGDGT-IIa’;

Reply. corrected.

Line 306: brGMGT-H1048;

Reply. corrected.

Line 329: duplicate parenthesis;

Reply. corrected.

Line 350: does this mean that the original BIT is slightly higher than the newly measured BIT? Then I assume “0.05” higher rather “0.5” which this will be a huge difference;

Reply. We have deleted this confusing number; the different slope mentioned in the sentence is clear.

Line 398-399: interval 371-369: “also: stands out;

Reply. We chose to keep the 371.0 and 369.0 as was because the decimals matter. We included ‘also’..

Line 416-417: “cyclization” same as line 416. Also is the degree of cyclization interpreted using RI (Figure 6e, red)?

Reply. We chose to retain both ‘cyclization’ to keep the sentence clear; we added ‘e’ to ‘Figure 6e’.

Line 421: section 2.2.6;

Reply. done.

Line 460: seen in GDGT-2 and;

Reply. Changed to isoGDGT-2.

Line 610: H-MBT (H1020c, H1034b);

Reply. Corrected.

Fig.3

Based on provided supplement data, I find that the two regression lines of TEX86 and BIT are both somewhat different from Figure 3.

To show this, I simply plotted the TEX86 relationship (new vs. original) from the data spreadsheet – column BQ (for newly measured TEX86 data, excluding five outliers mentioned in the author’s response) and column DC (for original TEX86 data) – which gives regression of $y=0.836x+0.077$ ($R^2=0.83$; see figure below). Slightly lower slope than 1 indicates that the newly TEX86 is slightly higher the original TEX86, which is also shown in the TEX86 vs. depth plot (MS Figure 3 left; red generally higher than blue). For BIT, regression gives $y=1.055x+0.021$ ($R^2=0.97$) – column BR (new BIT) vs. column DB (original BIT). Please verify if the regression curve needed to be corrected.

Reply. We thank the reviewer for noticing; there was indeed a mistake in both the regressions, apparently due to a software error. We have now corrected this in Figure 3 and adapted the first paragraph of the results section accordingly.