

## Minor recommended corrections

All line references refer to the version of the manuscript with tracked changes.

Please consider the use of mid-Pliocene throughout the manuscript and whether it is stratigraphically correct. From Dowsett et al 2016:

The PRISM time slab or PRISM “interval”, as defined above, occurs within the Piacenzian Age. The Piacenzian is roughly equivalent to the Gauss normal-polarity chron (~ 3.6 to 2.6 Ma). Prior to 2010, the Pliocene Epoch included the Zanclean, Piacenzian, and Gelasian ages. Thus, it was common practice to refer to the PRISM interval as the midPliocene. Changes enacted by the International Commission on Stratigraphy revised the placement of the Pliocene– Pleistocene boundary from the base of the Calabrian Stage (1.801 Ma) to the base of the Gelasian Stage (2.588 Ma) (Gibbard et al., 2010). This change makes it awkward to refer to the mid-Piacenzian PRISM interval as mid-Pliocene (see also Dowsett and Caballero-Gill, 2010). Previous publications referring to the PRISM interval, PRISM time slab, mid-Pliocene warm period (mPWP), or mid-Piacenzian all refer to the same interval of time originally defined by Dowsett and Poore (1991) and revised by Dowsett et al. (2010) as discussed above (Fig.1). **We propose the term mid-Piacenzian be used hereafter.**

Please note that Haywood et al 2020 also use the term mid-Piacenzian (3.264-3.025 million years ago) and the short form MP. It is acknowledged by the editor that a variety of ways of describing this period do exist in the literature, so this is not always straightforward, but where possible it should be kept consistent with Dowsett et al (2016) and Haywood et al (2020).

BP to denote before present is also perhaps unnecessary here as it refers specifically to radiocarbon dating with present being 1950.

Line 111 - what are the characteristics...

Line 117-119 - Wording is a little off. Please consider rephrasing second part of question: How can we deal with the effect of any bias duplication from models within the same 'family' within our analysis?

Could reference Table 1 on line 131 and remove sentence on 139 that says: Refer to Table 1 which shows the components used in the PlioMIP2 Models.

Line 161 - the map is quite small in the version of the manuscript online, it is not easy to see the ocean gateways - can you please make the left-hand map larger in the final figure upload.

Line 164 - there is still a ? Within the sentence, so it looks like there is missing information - please correct.

Line 200 - perhaps the word should be compare rather than confer?

Line 227 - For example, at site ODP1143, which has both UK37 and Mg/Ca data available, Mg/Ca suggests a negative SSTA mid-Pliocene versus preindustrial, result from this proxy is not supported by alkenones.

Please consider the phrasing here - I am not sure what is meant by a negative SSTA mid-Pliocene versus preindustrial. Perhaps you don't need mid-Pliocene versus preindustrial as this is inferred in the Anomaly part of SST?

Line 250: show that reconstructed....

Line 254: we use Monte-Carlo simulations following a similar method used in Kageyama et al. (2021).

Line 262: Here we use letter E to denote discrepancy. I think this is not needed as you already refer to the proxy discrepancy median value (E) in line 254.

What is the figure on page 3 of the supplementary information? It has no legend and doesn't look like it is connected to Fig. S1 or Fig. S2

Line 288 - I am not sure you have previously defined P-E or SOS.

Please check the clarity of figure 4 in the final manuscript carefully. I think the ODP labels and the site numbering for panel b might be difficult to decipher.

Line 301 - which representing the 3 largest warm anomalies needs correcting to either representing the 3 largest warm... or which represents the 3 largest warm....

Line 309-311 referencing the Dong et al 2020 paper would benefit from re-writing as I am not clear of the point that is being made.

Line 326: From hatching and black lines in Fig. 4b, the difference in the distribution of land and sea in the Eoi400 and the E280 simulations is evident. Would be useful if you refer to what the hatching and black lines denote here to help the reader.

Caption for Fig 7 - positive values u indicate westward transport

Fig. 10 - please consider the scale on the colour bar

Line 507: Changes in the WPWP have a direct effect...

Line 526 - impact of ENSO on the Indian Ocean

Page 30 and Section 4.2 - there are five uses of on the one hand/other hand. Please consider alternative phrasing for this section.

Line 608: As in CMIP6 , also PlioMIP2, not all the models are independent from each other. - consider rephrasing to "In PlioMIP2, as in CMIP6, not all models are independent from each other".

Line 657: remove the 'on the one hand' and 'on the other hand' here. It is not needed.