

Interactive comment on “Changes to the tropical circulation in the mid-Pliocene and their implications for future climate” by Shawn Corvec and Christopher G. Fletcher

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article

General comments:

We would like to thank the reviewer for the comments and suggestions, especially with regards to suggestions for the appropriate citations of the Pliocene literature.

Responses to each comment from reviewer 1:

A number of citations have been added or changed. We have attempted to address

C1

each point made by the reviewer below (comments highlighted in blue, our responses in red):

Comment 1: *Page1/line3: stratigraphic convention is oldest to youngest; reverse your ages and use “Ma” not MY BP:*

Changed to “Ma”.

Comment 2: *Page1/line3: I don’t think you will find anyone calling it an “analogue” anymore. Several papers have been written on the topic. Maybe “scenario” or “imperfect analogue” would be a better choice*

Changed to “imperfect analogue”.

Comment 3: *Page2/line1: Don’t use “epoch” since it is a formal stratigraphic term which would refer to the Pliocene as a whole i.e. Pliocene Epoch. Maybe “interval” would work better?*

Changed to “interval”.

Comment 4: *Page2/line1: 3.3 to 3.0 MA, NOT 3-3.3 MY BP; Again, “Analogue” needs to be replaced.*

Changed to “Ma” and “imperfect analogue”.

Comment 5, 6, 7: *Page 2/line2: “relatively minor difference” | relative to what? What is considered minor?*

Page 2/line4: I don’t think any of the three references you cite are adequate for

the first half of the sentence.

Page2/lines4-5: Even if you want to call a past interval of time an "analogue" to future climate, just having that interval does not guarantee the availability of data. The availability of data depends upon a number of factors. I think you are trying to say something along the lines of 'having a wealth of paleoclimate data available for an interval not unlike what has been projected for the future is useful for validation of climate simulations.' Or something along those lines.

Rewritten as: "...The mPWP was the most recent period where CO₂ concentrations were similar to those levels that are projected to be reached early this century (Raymo et al., 1996) and the continental configuration was highly similar (relative to other paleoclimate intervals further in the past) to present (Dowsett, 2007a). Since a wealth of paleoclimate data is available for the mPWP, and its climate conditions are expected to be similar to the climate of the near-future (Dowsett, 2007a), this interval is considered useful for validation of future climate simulations."

Comment 8: Page2/line9: The way this is written it sounds as though Kamae et al. produced paleoclimate records, and there are a number of other citations, in addition to Dowsett et al. (1996), that could/should be noted.

Kamae et al. reference removed, and changed citations to: (Dowsett et al., 1992, 1994, 1996; Raymo et al., 1996).

Comment 9: Page 4/line13: You need to cite the actual PRISM3 reconstruction which appeared in the journal Stratigraphy in 2010. These were the boundary conditions used. Neither Lunt et al. 2012 nor Dowsett & Robinson (2009) are citations for PRISM3.

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This citation has been changed to Dowsett et al, 2010 (The PRISM (Pliocene palaeoclimate) reconstruction: time for a paradigm shift).

Comment 10: Page4/line19: Again, as written it appears you are citing Haywood et al. (2010, 2011) for PRISM3. These might be good citations for the PlioMIP experimental setup but not for the PRISM3 boundary conditions themselves.

Changed citation to same as above

Comment 10: Page4/lines22-23: It would appear you need a reference here for "warm peak averaging."

The lines now read: "Note that the PRISM3 boundary conditions employ the technique described as "warm peak averaging" by Dowsett and Poore (1991) to represent the average conditions of the warm periods over the approximately 300 Kyr mPWP."

Comment 11: Page4/line26: delete "mini"

Page4/line26: deleted "mini".

Comment 12: Page10/line27: How do the CPLD and PRISM3 SST's differ? Could you show a Δ SST map.

Figure of ANN PRISM3 SST minus CPLD MMM SST included and was added as a third panel to Fig. 1.

Comment 13: How about the actual data points PRISM3 used and not the SST field which is highly interpreted and certainly not that accurate? This would be an

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interesting addition

Sentence has been re-written as: "However, it is striking that the pattern of tropical SST warming produced in CPLD is largely inconsistent with the PRISM3 paleoclimate SST reconstructions (Dowsett et al., 2010, 2009) used as boundary conditions in PRES."