

# ***Interactive comment on “Pliocene Model Intercomparison Project (PlioMIP): experimental design and boundary conditions (Experiment 1)” by A. M. Haywood et al.***

## **Anonymous Referee #1**

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This paper describes the experimental design and boundary conditions for a coordinated model-intercomparison project (MIP) on the so-called mid-Pliocene warm period. It will be part of a GMD special issue, which will contain papers by participating modelling groups describing their specific application of these guidelines and basic model results. Documenting a MIP in this way is an excellent idea and will much help in subsequent MIP papers on focussed research themes. The paper is well written and generally clear. It should provide a useful 'manual' for groups wanting to participate in this MIP. However, there are some aspects of the experimental design which will leave a prospective participant with a lot of questions. Here the paper should provide better answers, especially if the authors want to add to the excellent websites that already

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exists on the mid-Pliocene MIP.

Main points of criticism

1) the choice of the period. Please provide a figure with some proxy timeseries that illustrates that the mid-Pliocene indeed stands out as a warm period. How should we place this period (2.97-3.29 MaBP - very precise!!) in the course of time?

2) what do the data represent? a mean over the full 300,000 year period? how well is the dating constrained. More information here would be useful to guide model-data intercomparison and the interpretation of possible model-data discrepancies

3) how will the neglect of orbital variations in the experimental design influence model-data comparisons? this obviously relates to point 2.

4) the implementation of modified vegetation leaves many questions!

How will changes in vegetation affect albedo's?

How will inter-model differences in modern vegetation affect the MIP? it is obviously not possible to apply the anomaly approach here, or is it?

The provided BIOME maps seem to lack anthropogenic classes (crops, irrigated soils) for the pre-indsutrial control, this will already introduce major inter-model differences in certain areas

5) the same holds for other land surface characteristics like soils and lakes, river routing, etc

Why switch to a standard/minimum solution here instead of a preferred/alternate?

Why not provide the standard solution for river routes, so that groups could see how much impact the mid-Pliocene change in topography has? What do geological data tell about changes in river systems?

6) Experiment II is announced as being ocean-atmosphere, but a next step of vegetation-atmosphere runs seems more warranted, given the large ambiguities in defining land surface/vegetation boundary conditions!!

Smaller points:

1) title of the paper is a bit awkward

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- 2) please provide references or websites for the data synthesis projects mentioned on p1219, line 6
- 3) comment on the use of a different period (3.6-2.6MaBP) for the vegetation reconstruction
- 4) mention the spin-up of 20 years and analysis period of 30 years instead of the integration length of 50 years in Table 1
- 5) there is an error in the ice-sheets boundary condition given in Table 1
- 6) Model spin-up (below aerosols): why give this entry here?
- 7) Figures 3-8 are way too small in my printed copy. Why shift land-sea mask in Fig. 4 as compared to other figures
- 8) indicate differences compared to unchanged modern land-sea mask in Fig. 3 left.
- 9) to end with a positive note: figures 6+7 with the actual data points are great! very useful information. What are the boxes in figure 7?

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Interactive comment on Geosci. Model Dev. Discuss., 2, 1215, 2009.

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