



## ***Interactive comment on “Simulating the mid-Pliocene Warm Period with the CCSM4 model” by N. A. Rosenbloom et al.***

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Many thanks to Reviewer #1 for their thoughtful review of our CCSM4/Pliocene manuscript. Our response to your concerns are embedded below.

Again, thank you for your time and effort in improving this manuscript.

Nan Rosenbloom, on behalf of the authors.

1) Referee: Page 4271, line 23-24. The statement here is confusing. CAM4 still can run as a spectral atmosphere model in the low resolution version of CCSM4/CESM, though the dynamic core is changed in the high resolution CAM4.

Author Response: We agree that this definition can be misleading. To clarify the sec-

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tion, we specify that we use the DEFAULT version of CAM4, which is finite volume (FV), not spectral.

2) Referee: Page 4275-4276. The statement about the initialization of the MP experiment is confusing. From page 4275, line 7, it seems that the MP experiment is a branch experiment from the PI control run. However, actually, the MP experiment is a hybrid experiment, since the authors changed the initial conditions of POP in the MP experiment. I suggest the authors move the initialization section after the land ice section, and put the initialization of atmosphere, land, sea ice and ocean together in one section.

Author Response: We agree that using the word 'branched' is imprecise in this context, since technically we performed a hybrid experiment as the reviewer points out. Therefore we added the word 'hybrid' to this sentence:

“We branched from the PI control simulation at model year 801, running our hybrid mPWP simulation with the fully coupled CCSM4 model for 500 . . .”

We have also reorganized the mPWP and PI initialization sections to be more coherent as suggested by the reviewer.

3) Referee Page 4275, line 16. Since the authors change the land-sea mask of the Hudson Bay, they should mention in the paper if they also change the mapping weight files.

Author Response: We added wording to reflect that we created new coupler mapping files.

4) Referee: Page 4276, line 9-11. The statement of river routine is confusing. Do they add some new routines on the new land points of Hudson Bay?

Author Response: We do not change the runoff mapping in the River Transport Model (RTM) when we convert Hudson Bay from ocean to land. However, RTM automatically routes the water from the new land points to the nearest ocean grid cells in the Labrador

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Sea.

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Interactive comment on Geosci. Model Dev. Discuss., 5, 4269, 2012.

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