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Geoscientific Model Development Discussions

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 #2 for their thoughtful review of our CCSM4/Pliocene manuscript. Our responses 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) The pre-industrial experiment could be better documented. Although, it probably doesn't need a thorough description it would be useful to have the sources of some of the boundary conditions referenced. Particularly topography, land-sea mask, ice sheets, vegetation, aerosols and the initial conditions for sea surface temperatures and sea ice.

Author Response: We have added source information on the PI control simulation.

2) In section 3.4 [Vegetation], the authors reference a paper that relates biome to the plant functional types used with CCSM4. However, these biomes are categorized slightly differently to those in the BIOME4 model used in Salzmann et al., 2008. The paper needs to document how these two are combined. Are the BIOME4 biomes clumped together into Lawrence and Chase [2010] categories or is some attempt at differentiation between BIOME4 types implemented? It sounds like you may have developed a new translation from BIOME4 to CLM4/PFTs, if so then a table documenting this should be included.

Author Response: We changed the wording of this paragraph to try to clarify that we did not do a one-to-one remapping of the BIOME4 biome types to CLM4 PFTs, but rather mapped the spatial correlations of the biomes to the current day distribution of PFTs, and used these correlations to create a map of Pliocene PFT distribution which preserves both the character of the BIOME4 distribution which remaining faithful to the CLM4 PI.

3) In the first paragraph of section 4.4 [Sea surface temperature and salinity] the CCSM4 simulation is compared to proxy temperature reconstructions. I presume that the sites mentioned by their locality are PRISM3 sites as in Fig. 5, but this needs to be made explicit in the text.

Author Response: We added a sentence that explicitly states that we are comparing against PRISM3 proxy records.

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