

Interactive comment on “Pliocene three-dimensional global ocean temperature reconstruction” by H. J. Dowsett et al.

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We thank Jeroen Groeneveld for his comments and suggestions on our submitted manuscript. We will incorporate his suggestions in our revised submission. Here we respond to his major points:

There are few other data sets covering our interval of the Pliocene and none of those are a direct comparisons to the data of Dwyer (2009) or Cronin et al. (2005)). The reviewer mentions a very recent (published after this manuscript was published as a CP Discussion) study by Khelifi et al. (2009). One wonders why these authors did not compare their results to ours or to those of Cronin et al. (2005). We feel that while comparisons of temperature estimates from multiple proxies are generally extremely valuable, especially at single sites, the internal consistency (i.e. single operator, single

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method) of the data used in this global reconstruction based on 27 sites makes the reconstruction more robust than if we were to include additional data from multiple proxies. Regardless, all Pliocene bottom water temperature sites compare favorably to the generic reconstruction we present.

In terms of careful comparison of the benthic foraminifer Mg/Ca technique to that utilizing ostracods, we are unaware of such a comparison, and it is beyond the scope of our submission. Likewise a discussion of the carbonate ion problem, while relevant to the Mg/Ca temperature estimates, is not relevant to how we used existing estimates to create a reconstruction. We feel it is appropriate to refer the reader to the original papers for further details on the method. What this paper presents is a coarse resolution (dictated by GCM requirements of PlioMIP [part of PMIP]) deep water reconstruction, generated using an existing data set, that fits well with the PRISM surface reconstruction. It is not unique but is instead one possible scenario for mid-Piacenzian conditions. It is global, again, because the coupled models require a global input field.

We have revised the manuscript to clarify that most of our data comes from the Atlantic Basin and the remainder of the ocean is based upon the few data points we have and the general scenario created for the Atlantic. We have also included an expanded discussion of the KriTheMg/Ca data and acknowledged some of the potential problems of the data presented in Dwyer (2009) and Cronin et al. (2005).

Again, much thanks is due Jeroen Groeneveld. His comments (as well as the review comments of Mark Williams) will serve to make a more useful presentation of our work.

Interactive comment on Clim. Past Discuss., 5, 1901, 2009.

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