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Climate of the Past Discussions

Interactive comment on "Estimate of climate sensitivity from carbonate microfossils dated near the Eocene-Oligocene global cooling" *by* M. W. Asten

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I thank T. Schneider von Deimling for the thoughtful discussion of factors affecting the accuracy of this estimate in a global context. Obviously I agree strongly with the statements that estimating climate sensitivity from paleo records is a fascinating research area, and that paleo-based estimates of climate sensitivity should always be viewed with caution. I have endeavoured to sound those cautions in my discussion. As stated in other discussion on this page, I see this result as a starting point which will be subject to confirmation or change as other high-resolution datasets become available for the post-EOT time.

I suggest that the criticism " very likely to represent a gross underestimation of involved uncertainties – ranging from uncertainty in transferring proxy information into reconstructed temperatures to uncertainty from scaling local deep sea temperature estimates to global mean surface values" is somewhat overstated, since the relationship between delta18O and temperature is well understood (although there are additional uncertainties relating to ice-volume correction as discussed in the paper). The matter of scaling deep-sea temperature estimates to global mean surface values is more open to debate, but given the relationships established by other authors for the Pleistocene, and given the proposition (not contradicted by any facts thus far) that similar global temperature and continental patterns apply for the post-EOT as for the warm phases of the Pleistocene, I argue that the assumptions made are valid for the purpose, although future measurements may contradict or confirm the proposition.

The correspondent is correct to point out that the lower half of the derived CS range as given in my paper is hard to reconcile with the current state of knowledge, but it would be wrong to discard numerical data where part of the error range disagrees with current understanding. Rather, (and perhaps subject to more CS estimates becoming available for this post-EOT event) we should be looking at other feedback factors or forcings which may have influenced global conditions at that time.

Interactive comment on Clim. Past Discuss., 8, 4923, 2012.