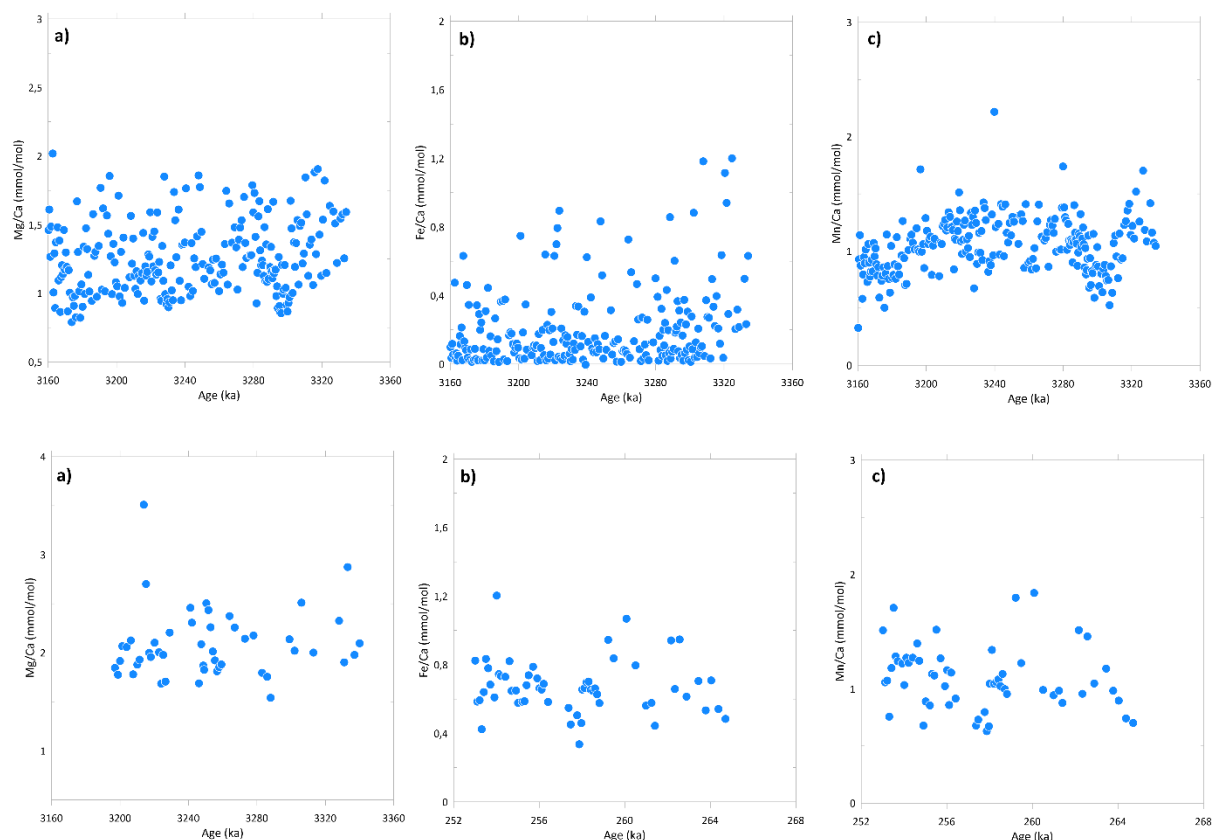


In this manuscript, Braaten et al. present a multi-proxy record of deep ocean temperature and d18O of seawater over the mid-Pliocene warm period and the M2 glaciation in the North Atlantic and Equatorial Pacific. I found the manuscript well written, and they presented compelling evidence that the Atlantic and the Pacific were quite different in temperature and d18O of seawater. The implications of their records are that the characteristics of deep-water formation were very different during the Pliocene with the northern component water being very warm and very salty.

I have two moderate requests for the authors.

In the supplemental, the authors present cross plots of the El/Ca to investigate possible contamination. Could you also please include the El/Ca and Mg/Ca with time on the x-axis? Are there temporal trends in the Mg/Ca data that could be explained by contamination? The reconstructed temperatures here and Jakob et al., 2020 are quite high so it would be helpful to know if there are temporal patterns.

Please see figure below (upper panels are from Site 849, lower panels from U1308) with Mg/Ca, Fe/Ca and Mn/Ca vs. time. We do not observe any obvious temporal trends in the Mg/Ca data that can be explained by the minor element ratios. At Site 849, there is a slight downcore increasing trend in both the Fe/Ca and Mn/Ca values, but this is less evident in the Mg/Ca values.



The authors did a nice job of propagating the error on the clumped isotope measurements, but the Mg/Ca did not have the same consideration. Could you please estimate the error on the temperature and d18Osw calculations? I usually use PSUSolver by Thirumalai et al 2016 (doi:10.1002/2016PA002970) which you can find here:

<https://www.mathworks.com/matlabcentral/fileexchange/59565-paleo-seawater-uncertainty-solver>

We thank the reviewer for suggestion and will add the propagated errors on the calculated Mg/Ca temperatures and $\delta^{18}\text{O}_{\text{sw}}$ to Figs. 2, 3 and 5.

Minor comment:

Figure 2, (d) panel labeled for eNd

Thank you for spotting this, we will fix the axis label on Fig. 2d.