



EGUsphere, referee comment RC2  
<https://doi.org/10.5194/egusphere-2022-844-RC2>, 2022  
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## **Comment on egusphere-2022-844**

Anonymous Referee #2

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Referee comment on "Paleoecology and evolutionary response of planktonic foraminifera to the mid-Pliocene Warm Period and Plio-Pleistocene bipolar ice sheet expansion" by Adam Woodhouse et al., EGU Sphere, <https://doi.org/10.5194/egusphere-2022-844-RC2>, 2022

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In this paper Woodhouse et al., use stable isotopes, faunal analyses and morphometrics to investigate changes in ocean structure from the Pliocene to present. In general, the paper is well-executed, and the figures are well constructed.

**Main Point.** The main themes of the paper, the stable isotopes and morphometrics of the ~3.5 to 3 Ma period and the long-term faunal analyses over the last five million years feel a little disjointed. Some of the emphasis on framing the Northern Hemisphere Glaciation doesn't seem to fit with the stable isotope/morphometric data. I understand you're trying to put this high-resolution dataset into some global context but, with respect to with ice sheet stability, the dataset doesn't extend over our canonical understanding of Northern Hemisphere Glaciation at around 2.7 Ma. Although certainly many have argued that Northern Hemisphere Glaciation started before the mid-Pliocene Warm Period (e.g. Mudelsee and Raymo, 2005). I think the paper could be framed with more emphasis on understanding the mid-Pliocene warm period and how that's different from today. The mid-Pliocene is an IPCC modelling target because CO<sub>2</sub> levels are similar to today and global temperature were warmer than today (2-3C). Given those conditions, the upper ocean structure during your high-resolution analyses is really different from today with the cold water/thermocline species and what is the potential change would be in the future.

**Minor Points.** Figures 2 and 5: Could you confirm these are colour-blind friendly? If not, could you use different line dashes or hatch marks to differentiate (would be good for black and white printing as well).

Correct the xlsx tabs on the supplemental All Species datasheet (currently says benthic).