

Clim. Past Discuss., referee comment RC2
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Comment on cp-2021-107

Anonymous Referee #2

Referee comment on "Sea ice changes in the southwest Pacific sector of the Southern Ocean during the last 140 000 years" by Jacob Jones et al., Clim. Past Discuss., <https://doi.org/10.5194/cp-2021-107-RC2>, 2021

This is a well written manuscript that uses new diatom assemblage data in a transfer function to reconstruct both winter sea-ice and summer sea surface temperatures in the Pacific Sector of the Southern Ocean during the last 140,000 years. Given the relative scarcity of such records for this region over this interval, the findings are likely to provide key to aiding future investigations that examine both the paleoceanography and carbon dynamics of the Southern Ocean.

Overall, I have only a few minor issues with the manuscript and look forward to hopefully seeing this work published in the near future.

- sSST is sometimes written as SSST throughout the manuscript.
- From this paper alone, it is not clear what the percentage changes in SIC (%wSIC) represents. Does a value of 40% indicate that the amount of sea-ice is 40% of modern sea-ice concentrations or some other reference point? Or does it indicate that only 40% of the region around the core site is covered by sea-ice at this time? Furthermore, does %wSIC give any indication about what thickness of sea-ice is present? A couple of sentences in the methods section clarifying what "%wSIC" is would address this issue.
- Line 117-119: make it clear that these are modern(?) positions of sea ice extent and the subtropical/polar front.
- Line 235: what proportion of the overall numbers of frustules counted in each sample are in the transfer function training set? If the number (percentage) is low (<60%?) in any sample, are the sSST and %wSIC values compromised?
- Line 308/309: is the Ferry et al (2015) data available for you to run through your transfer function?