Comment on cp-2022-60
Anonymous Referee #2

Referee comment on "Late Neogene nannofossil assemblages as tracers of ocean circulation and paleoproductivity over the NW Australian shelf" by Boris Theofanis Karatsolis and Jorijntje Henderiks, Clim. Past Discuss., https://doi.org/10.5194/cp-2022-60-RC2, 2022

The Karastolis and Hendericks study is an interesting contribution in a region and period that need to improve knowledge, particularly.

The use of CN offers a unique opportunity to characterize surface water masses and to monitor their evolution during the Mio-Pliocene transition interval.

The state of the art is well stablished and objectives of interest.

The chosen technique is appropriate, based on previous initiatives. The use of sphenoliths as main taxonomic group linked to stratification is fine, although should be more correct to include too discoasters (although its proportion is low). Others species cold be also considered in the interpretation. In fact there are some that are present in the plots but not mentioned/considered. If they are not taken into account, there is no point in including them.

One aspect repeatedly used is seasonality. In the text it is discussed that with this resolution a direct correspondence with present day conditions it is not feasible.

In this sense, should be more correct talking about persistent conditions (e.g. stratification), rather than enhance seasonality.

In fact, the signal that is manifested is the dominant one in a sufficiently broad period to refer its dynamics to seasonality (although it is obvious that these processes may be the
triggers), but there are not enough arguments to focus these changes on seasonal variation only.

I suggest a modification in this sense, avoiding such a direct reference to seasonality.

Other aspect that must be considered in Discussion and Conclusions, is provide more clear information about the ITF and LC, marked as objective, trying to ling the signal observed with characteristics of LC (for example). In fact this is considered, but plots should be explained in this sense, in order to follow better the arguments. Discussion refers the features in a general way without focusing on the evolution of those water masses. In this sense, I cannot see clearly the utility of the H Index (not linked to these features) and the CA (also superfluous. With the available data (T) and stratification index, should be possible to identify/define the involved water-masses, and consequently its evolution along the considered period.

Concerning the potential mechanisms related to paleoenvironmental aspects (3 options), the authors should consider the most reasonable possibility, taking into account the available data.

The comments referred in line 395 is too speculative: should provide extra information to propose this mechanism, or afford the explanation in a more general way (mixing!).

Section 4.3 refer an interesting global feature. Here is considered lightly, being necessary a better explanation of the processes and records. The link with the rest of the text is not clear, need better justification.