

In this study, the authors use a teleconnection pattern-based approach to detect ENSO-related signals in the 'Australian extratropical cyclone'. By projecting daily low-frequency Z500 components onto composited patterns associated with EP El Nino, CP El Nino, and La Nina events, they identify periods during which ENSO-related teleconnection patterns are well established in the Southern Hemisphere extratropics. They then use these periods as a refined sample space for calculating cyclone day frequency (CDF).

I highly appreciate the approach of separating into pattern and non-pattern days. I would advise the authors to further explore the relationship between OLR anomalies and wavetrains (see my specific comments below). On the other hand, the relevance of Tasman Sea cyclones to Australian rainfall has not been directly evaluated. It is worth highlighting that other weather systems might also be modified by ENSO, and Figure 13 strongly suggests that the impact of ENSO stretches far beyond cyclones over the Tasman Sea. If starting from a cyclone-centric perspective, it is true that there are no significant changes to cyclone frequency over the Australian continent itself; however, if the focus is shifted to rainfall, then other weather systems over the continent may be altered.

That said, I have reservations about the current title, which includes "Australian Extratropical Cyclones". The paper does not investigate cyclones over the continent, but focuses exclusively on cyclones over the Tasman Sea. This remains confusing. I recommend that the authors decide whether their primary focus is on Australian rainfall or Tasman Sea cyclones. It might be worthwhile splitting the paper into two parts. The first part could focus on the synoptic patterns related to ENSO, their frequency, and their dependency on OLR anomalies, potentially extending the analysis to other seasons. The second part could then investigate the weather systems that matter the most for the specific region of interest (which might not be cyclones).

Specific Comments:

I.194: My interpretation is that Equation 4 represents the thermodynamic ENSO effect on cyclones, while Equation 3 represents a combination of both dynamical and thermodynamic effects. Most plots show not significant impact on the non-pattern days, which indicates that in the absence of the wavetrain, ENSO's impacts is non-significant.

I.227: My reading of the EP and CP patterns is that they both excite the same wavetrain originating from the central tropical Pacific. However, the EP El Nino composite exhibits a second, stronger pattern in the Australian region of the opposite polarity, which partially weakens the wavetrain from the central Pacific. As you discuss later in relation to Figure 3, both of these wavetrains are present in EP and CP events, but the Australian wavetrain is stronger in EP events and the Pacific one is stronger in CP El Nino events. Perhaps the concept of these two distinct wavetrains can be introduced here in Figure 1 to support your discussion on the non-stationary impacts of ENSO on the circulation.

Fig2: Have you considered whether the presence or absence of these ENSO-related patterns is driven by pulses in tropical convection or by preconditioning within the extratropical circulation itself?

I.243: Is there a clear relationship with the intensity of the ENSO events? I suggest displaying the corresponding ENSO index in Figure 2. I believe the message conveyed in lines 252-253 and line 279 is highly valuable for seasonal forecasting.

I.311: I suggest indicating the pulses of tropical convection as panel (b) in Figure 2.

Fig.5: How do the OLR patterns look on the remaining days for both the left and right columns? In other words, how persistent is the ENSO-related OLR pattern? More interestingly, are the Z500 anomalies explained by pulses in OLR or by the specific "phase" of the extratropical circulation or both? For the Z500 pattern-based analysis, the El Nino composites show strong anomalies in the extratropical Indian Ocean that are not statistically significant. This lack of significance might be due to spatial shifts in the exact location of the extrema, which potentially points to the coupling between ENSO OLR anomalies and the extratropical circulation.

Fig 7f and 8f: The CDF and EGR anomalies in the La Nina composites are not limited to the Australian-Pacific sector but extend significantly upstream over the Indian Ocean, whereas the Z500 anomalies do not. Could you reconcile this apparent discrepancy?

L.326: The RWS maps in Figure 5 appear quite noisy, making it difficult to discern how much these extratropical anomalies are directly tied to tropical convection versus local atmospheric noise. I suggest finding a method to filter or isolate only the RWS components that are directly forced by tropical OLR anomalies. You could potentially narrow the focus to the robust, opposing anomalies over southeast Australia during El Nino and La Nina, which seem to exhibit the cleanest signals. Furthermore, the large averaging region used for the correlations in Table 2 mixes opposing positive and negative RWS anomalies. This spatial cancellation is not ideal and may obscure the true relationship; focusing on smaller, more specific regions would be a better approach.

I.393: It is unclear why the extended SON season was used. Initially, I assumed the extension was necessary for, e.g., a proper 10-day persistence calculation so that days near the start or end of SON were averaged correctly, but Section 2.4 indicates a fixed 121 days per season. Please justify.

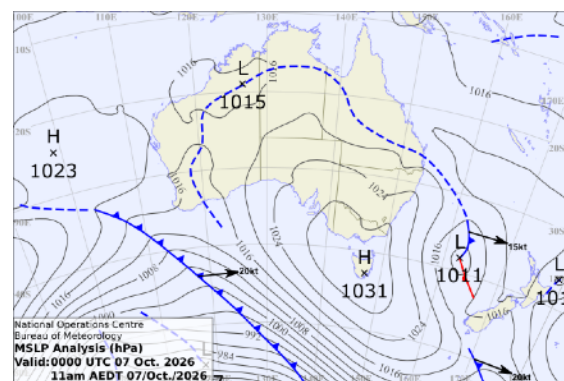
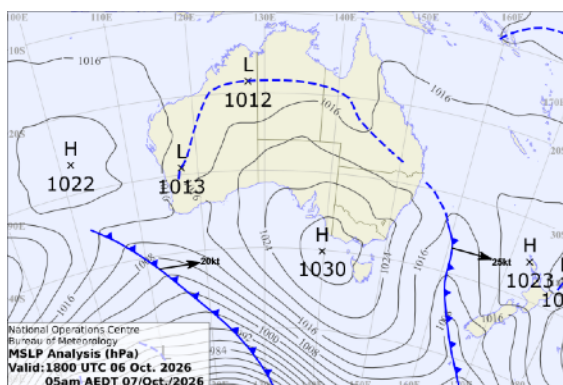
I.404: The statement "cyclones active in this region may differ from midlatitude baroclinic eddies" could be better contextualised. E.g., see Peles and Lachmy 2023 (<https://doi.org/10.1175/JAS-D-22-0201.1>) regarding the more shallow vertical structure of low-latitude eddies that decouples the upper and lower levels. Additionally, in contrast to the CDF, the climatology of the EGR is not shown, making it difficult to judge how these anomalies compare to the climatological background.

I.421: Regarding "Cyclones are considered as passing through the Tasman Sea...": should this definition be moved to the Methods section? I understand that you are addressing cyclone tracks here rather than the CDF described in the Methods. However, tracking, as far as I understand, requires the cyclone center to be located directly within the region of interest. In reality, many more cyclones likely impact the region while their centers remain outside it. I believe these external systems would also be modified by ENSO.

I.416: A higher CDF over the Tasman Sea does not necessarily imply that rainfall anomalies over the Australian continent are directly linked to these Tasman cyclones. Please verify this connection (I would assume that cyclones situated directly over the continent provide more continental rain, though this is speculation at this stage). That said, the difference between the cyclone composites might be more statistically significant simply because there are more systems, which may justify your specific focus on the

Tasman region. Also consider that a cyclone center does not need to be positioned directly over the continent or the Tasman Sea to generate regional moisture flux and uplift.

I.433: I cannot agree with the assertion that cyclone activity over the Tasman Sea can be substantially attributed to local subtropical systems. For example, a cyclone that developed over the Tasman Sea during the time of this review was dynamically strongly linked to the weather over the Southern Ocean, which becomes particularly evident when analysing upper-level PV. Restricting the analysis to the surface level may create a misleading impression that these systems are purely local in origin. Furthermore, as is evident from the charts, weather in the subtropical latitudes is often better characterised by fronts rather than closed cyclones; it might be worthwhile to incorporate fronts into your analysis.



I.448: Why do you show cyclogenesis frequency rather than the overall frequency of cyclones here? Additionally, why is there no uncertainty estimate provided in Figure 10a? Is the difference between CP El Nino and La Nina in Figure 10a statistically significant?

I.457: Please verify the data in Figure 10c. How can the mean value sit outside the interquartile range?

I.471: How do you know that the suppressed ascent is driving changes in the cyclones, rather than less active cyclones weakening the mean ascent? To demonstrate this causal direction, you may need to isolate ENSO-pattern days with and without cyclones to show whether suppressed ascent still occurs on non-cyclone days compared to the climatology.

I.472: Classic tropical cyclogenesis frameworks do not typically list background large-scale ascent as a primary prerequisite for TC development. Please clarify this sentence to reflect the actual thermodynamic mechanisms at play, or provide a specific reference that demonstrates background large-scale ascent is a primary prerequisite for TC genesis.

I.480: Given the differences observed in vorticity between the composites, it would be useful to display the vorticity within the cyclones alongside their minimum core pressure in Figure 10.

I.483: I do not believe your current analysis allows for a clear separation of cause and effect—specifically, whether ENSO directly modulates the local processes, or whether differences in individual cyclone characteristics drive these fields.

I.487, I.504: I am confused by the statement here: Figure 11 shows moisture anomalies restricted to the Tasman Sea but not over the continent. While the w500 field does show significant vertical motion anomalies over the continent, it remains unclear to what extent these are physically linked to cyclones over the Tasman Sea (it would be helpful to see non-pattern days for w500).

I recommend either examining the impact of cyclones situated directly over the continent, even though there are fewer systems there than over the Tasman Sea, or considering alternative weather systems since Figure 7 shows no significant differences in CDF over the continent.

I.507: There appears to be an inconsistent switching between CDFs and Tasman cyclone tracks. The text starts with CDF, shifts to analysing cyclones that have their center over the Tasman Sea, and then switches back to any cyclone covering 10% of the Tasman Sea box. Is there a physical or methodological justification for utilising these different classifications?

Fig13: Please display the entire continent to remain consistent with your previous plots, and include significance.

I.536: This disagreement further supports the idea that Tasman cyclones are not the primary drivers of broad Australian rainfall changes, which aligns with my earlier comments.

I.550: The phrase "also play a role" sounds like an underestimation of the weather systems operating outside the Tasman Sea. What I find particularly important is that even the non-cyclone-related composites (Fig. 13, right column) exhibit anomalies of the same sign. This indicates that the influence of ENSO is broader than its impact on Tasman Sea cyclones alone.

Minor Comments:

I.187: Remove "actually" and "can be interpreted as".

I.205: Remove "composites" - Z500 is an example of variables, not '500 composites'

I.230-232: I'm not sure I understand why weaker composite anomalies mean that they do not fully capture the regional signature; please clarify.

I.346: Remove "well-known".

Fig.6: I am not sure if this warrants a separate figure. I suggest overlaying these data onto the anomaly plots as contour lines, which would make it easier to see where the anomalies sit relative to the climatological storm tracks.

Fig5 and 7: These figures span different longitude ranges. I suggest making them similar.

I.487: By this stage in the manuscript, readers are already familiar with how the composites are organised; you do not need to re-introduce their structure each time.

Fig11: Please explicitly specify moisture flux divergence in the subtitles ("moisture flux div").

I.469: Remove "anomalously"; the term "suppressed ascent" already inherently implies an anomaly.