

To the Editors of WCD,

Attached is our point-by-point response and manuscript updates to the reviewer reports of our revised article, *Diurnal cycles of cloud and rainfall over North-east Queensland during the coral bleaching season (egusphere-2026-1019)*. We would like to thank the reviewers again for the time taken to review our revised manuscript.

The reviewers recommended minor revisions to the manuscript. As documented in detail in our responses, we hope that we thereby address the reviewer comments.

Using the same format as our previous response, the original reviewer reports are in black, while all our comments are in blue. We have also numbered all the reviewer comments and our replies for clarity. We have *quoted updates to the text from the manuscript in grey italics*.

We thank you and the reviewers for the time invested into our manuscript and hope that it will reach the high standards of *Weather and Climate Dynamics* upon revision.

Best regards,

Alanah Chapman (on behalf of all authors)

Reviewer 1

Comment 1

L150: Also, Peatman et al. (2021).

[This reference is now included in the text.](#)

Comment 2

Fig 1: "horizontal transect shaded in pink" -> "shaded zonal transect"

[Text has been updated.](#)

Comment 3

L171: Mention how the a and b coefficients were derived.

[A and b constants are derived by the researchers at the Australian Bureau of Meteorology, with a publication under review - this is more clearly stated in the text along with more detail on how the constants are derived, see changes in L153-154:](#)

Constants a and b used in this study (see Appendix A Table A1 for values) are estimated by Pudashine et al. (2026) using rain gauge observations near each radar site. The exception to this is the Willis Island radar, which does not have a co-located in situ rain gauge for calibration (Bowden et al., 2024), and also exhibits the highest proportion of missing temporal data (6.65% of times analyzed), and is therefore associated with larger uncertainty.

Comment 4

L194 etc: 0.001 mm is such a small depth of rain (something like 50-100 times smaller than the width of a human hair!) it is probably not truly measurable. A threshold of 0.05 or 0.1 mm hr⁻¹ would be more commonly used.

[I agree the threshold should probably have been as suggested 0.05 or 0.1 mm hr⁻¹. The threshold is now updated to 0.1 mm hr⁻¹ in the text and updated for Figure 6.](#)

Comment 5

Fig 2: Recommend choosing a different color for the coastline as the blue is similar to what is used in your radar color scale.

[We have updated Fig. 2 to show the coastline in orange rather than blue \(the radar site marker has been changed to black\).](#)

Comment 6

Fig 5: Mention the window length of the smoothed rolling mean. Also, how does this rolling mean work? Do you start with daily means and take the mean over 30 of them (in which case 31 days would be better, so the meaning period is always centered on the day in question)? Or is it done on hourly data, e.g. for 09LT you take the mean from 09LT on day -15 to 08LT on day +15?

[Window length is now clarified in L150.](#)

A rolling mean was constructed by first calculating the daily means (so that the result is a day-of-year climatology for the CBS); then the mean is taken over 31 days (centred on the day in question).

Comment 7

L347: You still refer to larger BT values as "peaks". Now that you state in the figure 6 caption "peaks in the diurnal cycle indicate colder BTs" it is even more important to avoid the word peak when referring to warm BTs, to avoid confusion.

[Text has been updated to remove BT description of 'peaks' in L347.](#)

Comment 8

L391: "regimes" -> "regime"

[Text has been updated.](#)

Reviewer 2

Specific comments

Comment 1

My primary lingering issue would be that the discussion/conclusion should incorporate some details about potential limitations with regards to the analysis and what the scope is for future work based on this work (particularly with how the abstract is concluded). These have been addressed, I believe, in parts of the revised manuscript already, but it would be good to collate them together towards the end as it will 1) be a somewhat logical/useful way to round off the article and also 2) provide ease for readers to find suggestions for recommendations for next steps, where elements remain unexplored,.

[We have adjusted the final paragraphs of the conclusion to address this comment, with changes to L454-462:](#)

While our study does not directly quantify radiative fluxes, ocean heat budgets, or bleaching impacts, these processes are likely modulated by the observed wind regimes and atmospheric structure, and may further influence SST variability. Given the limited observational evidence available, we cannot draw definitive conclusions regarding the local-scale mechanisms controlling convection initiation and propagation. Future research could employ high-resolution numerical modelling to better resolve and understand these processes. Additionally, deploying surface flux measuring instruments over the coastal ocean during the CBS would provide valuable constraints on air-sea interactions and could be integrated with high-resolution coupled atmosphere-ocean models to study the surface energy budget of the GBR during the CBS. Despite these limitations, our findings highlight the importance of incorporating diurnally evolving mesoscale weather processes, especially those linked to background wind regimes and coastal convection, into assessments and forecasts of coral bleaching risk during the austral warm season.

Comment 2

I have some slight issues with the colours used for defining the wind regime directions and the 3 AWSs. For example, in the bar charts in Figure 3, I find the blues representing SE and SW hard to distinguish from one another – similarly in the line plots in Figure 4 (though, with the in-text references to the Figure, it is easier to figure out which line is which). In Figure 6, I have the opposite issue with the yellow being a bit hard to see. I understand this may be a bit pedantic for the authors!

[Colors used in the revised manuscript were chosen using the IBM library from the ‘\[Coloring for Colorblindness\]\(#\)’ site to try and accommodate any readers who are colorblind. That being said, we have changed the colors in Figures 3, 4 and A3 to slightly adjusted colours from the \[Okabe & Ito\]\(#\) library, and we hope this change will make it easier to distinguish between the regimes in the bar chart.](#)

[Additionally we have changed the radar and AWS markers in Fig. 1 to black circles and triangles \(rather than what was previously orange/red overlying green terrain\).](#)

For Figure 6, we have changed the yellow to dark grey so it is easier to distinguish.

Comment 3

Throughout the manuscript, I would double check how much of the content is necessary per paragraph (e.g. if paragraphs can be split or shortened). For example, a new paragraph could be made in Line 36 to separate what we know about diurnal cycles, but then issues within (state-of-the-art) climate models. Additionally, Line 86 to 98 at the end of the introduction could be combined into one paragraph outlining the research questions/aims of the work, and how the study will be performed (e.g. the data that is being used). Similarly, Lines 377-387 could be made more concise (which reads like more of a defence about the schematic, which I think has decent clarity already) - maybe some of this text could be added to the caption, or the authors can check whether all of it is necessary? Essentially, these requests are a 'do another just-in-case proof-read' for succinctness and flow.

We have updated the text based on this comment as follows:

- A new paragraph starting at L36
- New paragraph starting L86, combined with following paragraph
- L377-387 we have chosen to maintain its current structure, as we feel it is necessary for the framing of Fig 9 and its associated limitations
- Paragraph breaks at L230 and L248

Comment 4

Line 244: 'In particular, north-westerly flow is associated with the highest θ_e , and weakest stability, north-easterly flow shows intermediate moistening, and south-easterly flow is characterized by persistently low θ_e and enhanced stability'. This goes back to the proof-read comment above, which will largely be addressed in the final editorial stages, anyway.

Text has been updated.

Comment 5

Line 262: Remove the comments about the specific channel used for Himawari as this is mentioned in the caption/methodology e.g. 'The mean diurnal cycles of satellite-derived brightness temperature (BT) and radar-derived rainfall'

Text has been updated.

Comment 6

Line 264: 'with colder BTs indicating deeper convection, and warmer BTs suggesting shallow cloud or clearer-sky conditions'

Text has been updated.

Comment 7

Line 396: 'by the diurnal cycle'

Text has been updated.