

(note: line numbers refer to the tracked version of the manuscript)

Reviewer 1

The authors have incorporated the majority of changes required in the first round of revision. I only have minor comments related to mainly technical corrections:

L 37: Please add "[...] drought" to the end of the sentence after "agricultural", otherwise it sounds incomplete.

- This has now been added. Thank you for identifying.

L 45: I am not sure where the "Despite this" is referring to, please consider reformulating.

- This sentence has been restructured as: "Despite the requirement to understand soil moisture dynamics when characterising compound hot and dry events, precipitation-based metrics are often utilised as a means to quantify the dry phase in these events (e.g. Bevacqua et al., 2022; De Luca and Donat, 2023; Zscheischler and Seneviratne, 2017), taken together with long accumulation periods."

Figures 2, 3, 6, 7: The updated Figures still do not contain increased font sizes; while this only a technical correction, I think it is important to implement in the revised version of the manuscript.

- These have been re-iterated again with another increase in font size over the last iteration, while bold text has been introduced into Figures 3 and 7 to emphasise the labelling.

Section 4.1: I do not see how this section is necessary in the discussion part, because it rather reads like a conclusion. The authors may want to consider either deleting or moving this part.

- These sections are more designed as lead-in for the following subsection (4.2 is the same). Following this suggestion, both 4.1 and 4.2 have been removed. Thank you for the suggestion.

L 564: Weird sentence structure, consider reformulating.

- This now reads: Regional differences in compound event characteristics are evident, with the wet, west coast regions of the country showing a stronger pattern compared to the nationwide metrics.

Section 5: In the beginning of this section, the authors may want to consider to shortly repeating the main objectives of their study for the reader to orientate.

- The conclusion has now been reworked. In particular lines 557-560, 565-567 and 584-585. Thank you for the suggestion.

Figure S1: The authors may want to consider moving this Figure to the main manuscript as it is quite helpful for an overview of the workflow.

- This is now included as Figure 1 in the main manuscript.

Reviewer 2

The revised manuscript is well structured, and the application to New Zealand provides a valuable case study given its diverse hydroclimatic regimes. The manuscript has clear merit and is potentially suitable for publication. However, several important issues remain regarding the framing of novelty, methodological justification, interpretation of results, and broader applicability. I therefore recommend a minor revision before the manuscript can be considered for publication.

- The manuscript presents a well-executed application of copula-based methods, particularly vine copulas, to characterize compound and seesaw events. While this is a valuable contribution, the novelty appears to be somewhat overstated. It would improve the manuscript if the authors could slightly tone down the novelty claim and emphasize the comparative insights gained from applying these methods to compound and seesaw event detection.
 - The word novel has been removed, which has primarily involved a re-work of the abstract (lines 12-13), and the method section (lines 126-128) where the emphasis is instead placed on the comparative nature of the study, as suggested, rather than on the novel introduction of the indices.
- The study uses a fixed 30-day accumulation period to construct standardized indices. While this choice is reasonable, compound and seesaw events are inherently scale-dependent, and their characteristics may vary across temporal scales. It would strengthen the manuscript if the authors could include a brief quantitative discussion of sensitivity to different accumulation periods (beyond the supplementary figures), or explicitly acknowledge this limitation and its potential implications for the results.
 - A brief quantification discussion is now included in the methods, primarily at lines 126-128.
- The analysis is based entirely on ERA5-Land data and derived indices, without comparison to independent observations, impact datasets, or known historical events. While this does not diminish the methodological contribution, it does limit confidence in the real-world applicability of the findings. It would be helpful if the authors could clearly acknowledge this limitation and briefly discuss how the lack of validation may affect the interpretation of the results.
 - An additional discussion has now been included at lines 255-258. We wish to acknowledge that in an ideal scenario that the inclusion of this information would be made. However, with a lack of recognised events, a sample size of sufficient strength to enable statistical quantification is unlikely to be possible due to the limited recognition of these compound and seesaw events (i.e. would change the discussion to whether event x is a compound event or not). It is hoped that this index and methodology will enable a rethinking of historical events in a New Zealand context that will enable future comparison to historical events and statistical testing to be performed.
- The manuscript provides a strong statistical analysis; however, the interpretation remains largely statistical, with limited discussion of underlying physical mechanisms. Even a concise

qualitative or seasonal perspective on these processes would add valuable context and improve the overall interpretation.

- As noted in the summary (lines 628-633), the focus of future research should be directed towards understanding these primary drivers. The scope of this work limits the ability to discuss such wide ranging drivers i.e. atmospheric rivers, extratropical cyclones, stationary highs etc. Additional sentences have been added for both compound (502-505) and seesaw (line 581) to further acknowledge the implications of the work as is noted.
- The focus on New Zealand is appropriate and well justified, but the manuscript occasionally implies broader applicability of the findings. Since the analysis is limited to a single region and validation outside this domain is beyond the scope of the study, it would be beneficial to include this in the limitations section. This could clarify that the results may not directly generalize to other hydroclimatic regimes and that claims of transferability should be interpreted with appropriate caution.
 - This has been expanded on in the methods section (lines 95-102).
- The Discussion section has improved, but still contains some repetition of results rather than a deeper interpretation. The manuscript would benefit from a more focused discussion that emphasizes interpretation, links findings more directly to the stated objectives, and highlights broader implications, while reducing redundancy.
 - Following comments from Reviewer One, the discussion has been further refined by removing redundant content. In particular the initial text in Sections 4.1 and 4.2 has been removed.