Session K07 – Invited speaker

Impactful wet/windy extremes in Australia

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Abstract: The co-occurrence of extreme rain with extreme wind can result in enhanced impacts to life, property and infrastructure, such as occurred in southeast Queensland in December 2023. While such events have previously been studied in Australia (e.g. Ridder et al. 2022), previous studies typically use percentile-based thresholds that do not fully capture the variation of extreme event occurrence across the country. Here we work with stakeholders across the energy and emergency services sector to identify extreme compound wet/windy events with impacts on life and property, and match these events with observational datasets to develop impact-informed thresholds to better define wet/windy compound extremes. Using these new indices, we then assess how well wet/windy extremes are represented by different observational products including station data and reanalyses. We demonstrate that the recent convection-permitting BARRA-C2 reanalysis shows an improved ability to represent compound wet-windy extremes, particularly those linked to thunderstorm activity, which are poorly represented in coarser-resolution datasets. Based on these new datasets, we then evaluate interannual variability and trends in extreme wet, windy, and wet/windy events across Australia.

REFERENCES

Ridder NN, Pitman AJ, and Ukkola AM (2022) High impact compound events in Australia. *Weather Clim Extrem*. 100457. doi:10.1016/j.wace.2022.100457

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