

# ***Interactive comment on* “Evaluating the dependence structure of compound precipitation and wind speed extremes” by Jakob Zscheischler et al.**

## **Anonymous Referee #2**

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This manuscript compares the dependence structure of compound precipitation and wind speed extremes in different sets of data: the ERA5, the dynamically downscaled ERA-Interim using the regional WRF model, the dynamically downscaled CESM with present conditions using the WRF model, and also a dynamically downscaled CESM run for the future. The technique used is an advanced statistical technique on bivariate asymptotic tail dependence. This is an interesting study which deserves publication in ESD. I have a few points on the interpretation of the results, and the limits of this study, that the authors may consider.

First, it seems to me strange to study extremes in a nudged system (ERA-I-WRF). This

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means that there is a modification of the dynamical equations of WRF and the extremes could then be biased. First could you run it without the nudging, and if not this should appear somewhere in your interpretation or conclusions.

A second aspect is the fact that the domain over which downscaling is done looks small (no information provided on this by the way on the specific configuration of running WRF). This should have considerable impact on the extremes in particular for wind but also for precipitation. There were a lot of work done in this context at the beginning of the 21th century on that topic, showing that small domains are considerably constraining the internal dynamics of the regional model, and hence all the statistical properties within the model. This should also play an important role and should be discussed in the conclusions or in the interpretation of the results.

In Figure 1. It would be nice to see the observations too.

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