

## **Review Portal et al. WCD**

The paper by Portal et al. addresses an important thematic that in general deserves more attention by the community, which is the identification of dynamical drivers of compound extremes. In the paper, the authors focused on Mediterranean cyclones and compound rain-wind, wave-wind extremes, within the reanalysis period 1980-2019. They introduce a new definition of cyclone's impact area and assess how three different dynamical features contribute to the occurrence of the extremes. Then, they also quantify the most frequent cyclone type linked to the extremes and provide a discussion of their results.

The paper is sound, well written and therefore suitable for publication in WCD. Below you find some major and minor comments that I hope the authors will address in the review process.

### Major comments:

Figure 1(a) it is difficult to distinguish between the Rain-Wind and Wave-Wind. Instead of hatchings you may consider to use two colors and maybe try to zoom over the Mediterranean.

Figure 2 I suggest to express the compound frequencies as percentages (%). This will be easier to understand. If I understood correctly, you can simply multiply the current values by 100, in order to get the % of days with compound extremes within each season. Same for Figures 3,4,5,7

Figure 4(d)-(f). Please consider doing a statistical test to assess whether the frequency of compound extremes during cyclones is significantly different that the frequency of compound extremes when cyclones do not occur. You can try for example a proportion test. Same for Figure 7(d)-(f).

### Minor comments:

L7 "weather compounds" is not clear.

L15 "of wave-wind extremes" not clear. Maybe "and wave-wind extremes".

L22 Please don't cite Wikipedia. I suggest to look first for peer-reviewed papers and then online newspaper articles from for example BBC, CNN, the Guardian.

L25 "compound extreme event"

L31 you may consider to add <https://rmets.onlinelibrary.wiley.com/doi/full/10.1002/qj.3757>

L49 I prefer to say "to compound extremes" instead of "to weather compounding". The latter terminology sounds a bit awkward and does not strictly refer to extremes.

L66 "compounding" or "compound"?

L69-79 please move it before L63, so that the description of the Sections will be in sequential order. You can also consider to convert L63-68 into sentences, i.e. not questions.

L88-89 "Moreover, the results...". Here in the Methods, I would simply state that you tested other percentile thresholds, also without referring to the figures. Then in the Results section, after you presented the plots, you can state "The above results are not sensitive to the....etc" also referring to the SM figure.

L122 "1979 to 2020". Didn't you use "1980 to 2019"?

L133 "weather compounds" please amend with "compounds" or "compound extremes"

L138 "schematic" or "scheme"?

L141-151 introduce the dynamical features in the same order as L137. Or vice versa.

L152 same as above.

L187-191 move to Results or Discussion section.

L211 "(Fig. 2)". Remove it

L213 “compounds” and add full stop.

L222 “weather compounds” change here and all over the text as mentioned before