

Review on “A new Database of Extreme European Winter Windstorms” by C.M. Flynn, J. Moemken, J. G. Pinto and G. Messori.

Overall this is an interesting paper and well written. The study provides a useful database of wind footprints based on different meteorological input data that will likely be beneficial to both academic researchers and to stakeholders such as (re-)insurance companies. I do not have any major criticisms of this manuscript but I do have a number of minor comments which should be addressed. These are detailed below in order of line number rather than severity.

Minor Comments

1. Abstract. Currently this primarily states what has been done in this study and there is very little mention of the key results. I suggest that a sentence or two about the main differences in the wind footprints and identified top50 storms between the four different input datasets is included here.
2. Lines 16-17. “...allows to characterise the impact horizontal resolution can have on footprint identification and severity assessment”. This is somewhat misleading as it is not just the horizontal resolution that differs between the 4 different input data sets. However, as CCLM_ERA5_CEU-3 and CCLM_ERA5_EUR-11 are the same model but run on different domains at different resolutions, this statement does hold if only those two input data sources are considered.
3. Lines 47-49. Please check the language / grammar here. Something does not seem correct.
4. Lines 99 – 103. At the start of section 2.1 the various diagnostics are introduced but not explained and I was left to wonder what they were. These are explained in section 2.3. I suggest adding something like “explained in more detail in section 2.3” to these lines.
5. Section 2.2. Could the domains covered by the four different input data sets be shown on a map? It is quite hard to mentally visualise these using just the latitude / longitude values especially when they are not presented together in the text.
6. Line 160-161. As the loss index depends on the exceedance of the 98th percentile of the daily maximum wind gusts, I think it would be interesting and informative to include a figure showing how the 98th percentile varies between the four different input data sets. If such a figure was included, this would also nicely show the spatial extent of the different domains hence addressing point number 5 above.
7. Line 171. As the loss index depends on the population density, could maps of this be also included in the manuscript?
8. Lines 234-235. How is the footprint size index, N , computed?
9. Line 242. Is the link here provided the correct one? It goes to the main climate data store homepage. Please check this. It may also be better to add this as a proper reference as is done on line 221.
10. Lines 252 – 256. I struggle to understand why the C3S wind footprints need to be masked. I think this is because I do not fully understand the explanation in lines 245 – 251 of how this dataset was produced. Can this please be clarified by adding some more details here.
11. Lines 284-285 and 296-297, “29 storms were identified within all four input sources”. This is potentially misleading as it is very likely that some of the 47 storms that were identified in at least one but not all input data sets were actually present in the input data sets but they were not in the top 50 storms. I suggest the quoted text above is revised. However, it would also be very interesting to know where the 76 unique storms ranked in each of the 4 input datasets or if they were not detected at all (e.g. no wind gusts exceeding the 98th percentile). This could be included by adding a table similar to table 2.
12. Line 302-303. Is this unexpected result due to compensating effects? e.g. CCLM_ERA5_CEU-3 has a smaller domain (potentially fewer storms) but higher resolution (more storms)?

13. Section 3.2 The comparison between the first 10- and second 10-years seems a bit arbitrary and the differences are likely not statistically robust. This analysis requires better motivation. Additionally, some more robust statistical analysis would strengthen this aspect of the manuscript. For example, temporal trends could be estimates or tipping points in the time series could be searched for.
14. Line 416 “the three databases”. Is “three” a typo here? I’m not sure which databases are being referred to here.
15. Lines 425 – 428. First, it is not clear exactly how the mean of the footprint difference are computed. Is it that the mean of all 50 storms in each data set is computed and then the difference is taken between these means? Or is the difference between each data set done for each storm first, then the mean taken? Second, could the mean absolute error be used in addition as this would avoid the cancellation of errors problem as noted in line 429.
16. Section 3.4.2. The first paragraph of this section is more of a comparison between the spatial variability in the footprint and in the absolute wind gusts. This makes the heading of this subsection inaccurate. Possibly the authors want to re-consider the structure of this part of the manuscript.
17. Lines 459 and 460. It would be helpful to refer to specific figures / figure panels here.
18. Line 462. “in contrast to the mean footprint differences of small magnitude and variable sign”. In Figure 7, top right panel, there is more red than blue so I disagree with the expression “variable sign” in this sentence.
19. Figure 2. Are the wind gusts from C3S plotted after the masking has been performed? Please add this information to the caption.
20. Figures 3, 4 and 5. These are missing y-labels. Additionally, they are rather noisy and hard to read. Would these be better as bar charts? Adding grid lines would also help.
21. Figure 5. Rather than having data gaps when there is no storm activity, could this somehow be indicated on the figure? e.g. extend the y-axis to lower values and have a y-tick mark stating “undefined” and then plot the data against that value on the y-axis?
22. Figure 6. This is very difficult to read. The pale-yellow colour for C3S is almost impossible to see. Could this figure be stretched in the y-direction to give more space for each bar?
23. Figure 8. Could the white space between the panels be reduced and the panel size increased?
24. Figures 9 -12. The top left panel in each of these figures is missing a colour bar. In Figure 9 and 10, these panels are repeats of panels from Figures 1 and 2, however, I still think a colour bar needs to be included in these figures.