Projections and uncertainties of winter windstorm damage in Europe in a changing climate – Authors' response 2

The authors of the manuscript *Projections and uncertainties of winter windstorm damage in Europe in a changing climate* would like to thank once more the two anonymous reviewers and the editor for their very helpful comments and suggestions and the time they spent helping us to improve our manuscript. Please find our detailed responses to the reviewers' comments and suggestions below.

The changes have been included into the manuscript (indicated in blue in the annotated manuscript). All line indications refer to the new (annotated) version of the manuscript.

Reviewer 1:

Comment 1:
I noticed that the authors included a reference to Little et al 2023 in the introduction, which is a very relevant recent paper. It would be good if they could give a brief sentence about how their results compare with the results of that study, particularly at the end of the results section where other studies are compared and contrasted. There seem to be some differences in the projections over northwestern Europe, which could be associated with the different models used.

Response:
Thank you very much for this helpful suggestion. We added a more detailed comparison of the results from the two studies at the end of the section *3.2.1 Regional projections and climate model uncertainty* (lines 452-462 in the revised manuscript):

In particular, our results are in line with the findings of Little et al. (2023) in terms of the spatial pattern and intensity of the changes. However, we find somewhat different results, in some regions, compared to other studies. For instance, Donat et al. (2011) and Pinto et al. (2012) find a pattern of damages extending over Poland, whereas we find a pattern of damages extending further north, with decreased damages over Poland. We also find a weaker signal for a positive change in storm damage over the British Isles and northwestern Europe than Little et al. (2023). This difference in the results is probably partly associated with the fact that they obtain their projections of future storm damage by scaling future changes in storm severity with projected increases in population, which accounts for about 50% of the projected changes in storm damage over those regions. Another plausible explanation for the difference in the results lies in the different multi-model ensembles used in the different studies. Finally, we note that the potential increase of the damages in the Balkan region has not been observed in previous studies, but that Little et al. (2023) also finds some signal for an increase in the meteorological storm severity index over this region for the SSP585 scenario.

Reviewer 2:

Comment 1:
The schematic in Figure 1 could be improved. There are two panels labelled with the letter a) which is not used in the caption.

Response:
Thank you for this remark. We removed the unused captions from Figure 1 and updated the figure on the revised manuscript.

Comment 2:
I find the concept of Delta Climate useful to communicate the results of the study to a broad audience, however, its definition should be provided early in the manuscript (note that the term is used also in Figure 1) and more details on the definition should be provided.

Response:
Thank you for the suggestion. We added an extra clarification on the term Delta Climate at the beginning of the section *2 Data & Methods* (lines 97-101 in the revised manuscript):

Climate change effects are studied by comparing damages computed for a future (2070-2100) versus a historical (1980-2010) period while keeping exposure and vulnerability invariant in time. We present our results as the difference between the damages computed for the future and the damages computed for the historical reference period, divided by the damages computed for the historical reference period. We call this approach Delta Climate, as it informs on the change in winter storm damage associated with changing climate conditions but disregarding future changes in exposure and vulnerability.

Additionally, a detailed definition of the Delta Climate is given in the caption of Figure 1.

Comment 3:
Line 491, the statement 'On average, damage events under future climate conditions are 66% more damaging than historical damage events' is not clear, it appears that it refers to ECFs shown in Fig.7 and not to simulated events.

Response:
Many thanks for this helpful comment. We changed the formulation to help clarify this part of the results section (lines 505-507 in the revised manuscript):

The average difference between the median EFCs of the two bootstrapped distributions obtained for the future and historical climates reveals an average increase in intensity of future-climate storm damage of 66% with respect to historical storm damage.

Comment 4:
Line 522, 'In particular, we find..', here you put forward some numbers in your conclusions but the associated uncertainty is mentioned but not discussed quantitatively. Can you clarify what are the implications of the uncertainty for these numbers?

Response:
Thank you for the suggestion. We added an extra sentence to clarify the implications of the uncertainty for these numbers in the *Summary, discussion, and conclusion* section (lines 541-546 in the revised manuscript):

In order to illustrate the uncertainty in the multi-model distribution we here provide the 25th and 75th percentiles, respectively: We find changes in average annual damage of -19% and +74% for the British Isles, -35% and +55% for Western Europe, -8.9% and +44% for Scandinavia, -25% and +44% for Central Europe, -41% and -3% for the Iberian Peninsula, -30% and +1% for the Mediterranean, -55% and +15% for Eastern Europe, and -24% and +60% for the results aggregated over the entire European domain. Hence, fewer than 75% of the climate models agree on the sign of the change in all regions apart from the Iberian Peninsula.