

Review of “Unravelling the wind impact of clusters of storms, a case study over the French insurer Generali” by Hasbini et al. 2026 submitted to NHESS

In this study windstorm claims from the Generali France loss portfolio are attributed to single ECTs within and outside of a storm cluster. To quantify the amount of impactful storms within a storm cluster and to associated claims to a single storm of the cluster, the authors combine cyclone tracks determined from the ERA5 reanalysis (extended winter seasons 1979-2024) and applying a serial clustering with a claim portfolio from Generali France (spanning from 1998-2024). This study shows that within cluster the storms are more intense compared to single impactful storms. Moreover, cluster of storms are responsible for 85% of the total losses. The manuscript is clearly written and will be of interest to many readers of NHESS. It will make a valuable contribution to the literature on windstorm losses. I have some comments and some technical comments that should be straightforward for the authors to address, but otherwise I think this manuscript is suitable for publication.

We thank the reviewer for the constructive feedback and comments over the manuscript. We have addressed most of the comments in the revised version of the manuscript.

Specific comments

Title: ‘clusters of storms’; maybe write storms clusters instead. ‘over’; do you mean over the French domain or for Generali?

We mean that we restricted the analysis to the impact over Generali France. We rephrased the title to make it clearer.

L42: ‘the general population’; I suggest writing something like: ‘the whole range of ECT’.

We rephrased this to “complete extratropical cyclone sample”

L102: ‘... improves understanding of the physical characteristics of impactful storms and the specific features of storms occurring within cluster.’ This is a bit high fetched as the study doesn’t really characterize physical processes (besides minimum core pressure and maximum relative vorticity) of the storms and features of storms within clusters. Please adapted this accordingly.

We agree with this comment and we rephrased this section.

L110: Same here ‘Do damaging storms embedded within clusters exhibit distinct physical characteristics compared to isolated storms?’ Where in the manuscript is this question answered. I find only results regarding storm intensity (minimum core pressure and maximum relative vorticity) and duration but not about distinct physical characteristics. The framing of this question is misleading, please change it.

We agree that the physical characterization of the storms is not the main question of the paper. We rephrased it.

L132: Why are you using two different time periods the tracks are from 1979-2024 and the claim data portfolio is from 1998-2024. I think this should be consistent or argued why it is not used consistent.

We agree that the use of two different periods may be confusing and we will clarify this more explicitly in the manuscript. The storm track dataset is available for the full 1979–2024 period, whereas the insurance claim portfolio only covers 1998–2024. Consequently, all analyses directly involving damages are restricted to the common 1998–2024 period.

The longer 1979–2024 storm-track record is nevertheless used to provide a more robust climatological characterization of the hazard, including the frequency of storms and storm clusters as well as their spatial density distribution. Using the extended period increases the sample size of storms and clusters and therefore allows for a more stable representation of the underlying hazard climatology. This broader climatological context helps interpret the damage-related results obtained for the shorter 1998–2024 period.

To avoid ambiguity, we will revise the manuscript to clearly distinguish between analyses based on the full storm-track climatology (1979–2024) and those involving insurance losses (1998–2024).

L153: I am a bit confused by the method of defining storm footprints, first why is a 12-hour temporal window around the trackpoint used. The gust associated with a cyclone should occur around its center at the time of the center being there. A time window longer than the resolution of the tracking seems a bit long. For 6 hourly trackpoint data I would suggest to not use more than +/- 6 hours. Secondly, in L155f I don't understand what is meant with an additional moving radius around the center of maximal vorticity, isn't that what was described in Line 153?

We agree that the choice of the temporal window requires further clarification. The purpose of the $\pm 12h$ aims to consider potential temporal mismatches between the tracked cyclone center and the associated damaging wind footprint.

In particular, for some fast-moving storms such as Lothar (in Dec. 1999), the tracking algorithm may stop identifying the cyclone while the system is still affecting France. As a consequence, the latest track positions do not always fully capture the final phase of the associated wind gust impacts. Therefore, the extended temporal window was introduced to ensure that delayed or spatially displaced impacts linked to the storm are still encompassed in the footprint definition. However, we acknowledge that a $\pm 12h$ window may appear relatively long compared to the 6-hourly temporal resolution of the tracking dataset.

The figure below illustrates the sensitivity of the results to this choice for storm Lothar. It compares wind footprints obtained using 6-hour and 12-hour windows. We see that the more restrictive 6-hour window fails to capture the highest wind gusts, whereas the extended window provides a more complete representation of the storm footprint while still not being contaminated by the wind gusts of storm Martin.

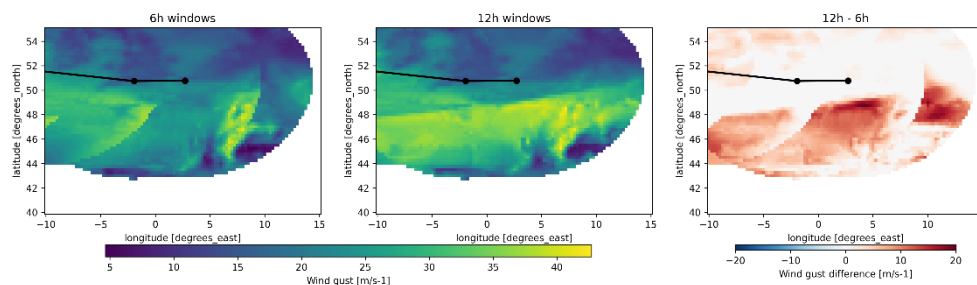


Figure 1: Footprints of storm Lothar with a 6h (a) and 12h (b) temporal window. (c) shows the difference between the 12h and 6h footprints

Regarding Lines 155f, we agree with the reviewer that the wording is confusing. The “Additionally” statement does not describe a separate procedure but simply restates the footprint definition

introduced previously. We will revise this section to remove the redundancy and clarify the methodology.

L325: I am a bit confused, what are constant euros compared to 2015 constant euros? Are you here reporting values for the year 2023 once in occurred euro and once in 2015 constant euros or values for the year 2023 and 2015?

The year 2015 is chosen as the reference given by the INSEE (referenced in the article). This means that all the reported costs are transformed as if they occurred in 2015. The conversion coefficient is given by the INSEE.

L376: Here the footprint size of 1300km is used? Can you add the radius for the footprint that is used here, again? If not the 1300km radius was used but the 700km radius, did I miss it or is the 1300km radius never used? Then the question why explaining it in section 2.1?

Yes, the 1300km is used through the whole manuscript for defining footprints. We can add it there for clarification as well as in the section in which we introduced the mention of the footprints. The 700km radius is used only for the definition of the storm clusters.

Fig 8 may be cited earlier in the text.

We added a reference to the figure earlier in the subsection describing the Klaus event.

Technical comments

Abstract L2: 'clusters of storms' could maybe be 'storm clusters'.

We will rephrase it accordingly.

L11: 'while the remaining storms collectively contribute the residual losses.' needs to read: 'while the remaining storms collectively contribute to the residual losses.'

We will correct this in the revised manuscript.

L13: Extratropical cyclones don't have a 'population', I would suggest using a different word. (See also L465)

We rephrased this.

L20: space between '€' and 'of' missing.

We added the spaces.

L305: There is a 'and' missing between 'storm intensity and track density'

We corrected this.

Sometimes Figures are cited in the text like 'Figure' or 'Fig.' please cite consistently.

We updated with respect to the NHESS guidelines. This should be streamlined by the Copernicus editorial office.

L591: In the citation Lothar in (1999) missing.

We added the missing parenthesis.