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Interactive comment on "The observed clustering of damaging extra-tropical cyclones in Europe" *by* S. Cusack

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Received and published: 29 January 2016

Formal Review for Natural Hazards and Earth System Sciences

Manuscript identification number: nhessd-3-7457-2015

Title: The observed clustering of damaging extra-tropical cyclones in Europe

Author: S. Cusack

Recommendation: Minor revision

General Comments:

The author presents an interesting study on the clustering of windstorm losses for

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Europe based on different datasets. The manuscript is generally written and fits within the scope of NHESS. I particularly like the idea of using very long time series for this analysis (e.g.,Brazdil) in spite of its inhomogeneities. However, some aspects should be better discussed before the paper can be accepted for publication. I hope the author find the suggestions helpful to revise the manuscript. Based on the above, I would like to recommend a minor revision for the manuscript.

Detailed Comments:

1. Abstract, Page 7458, lines 14+15 and 19-21, and elsewhere: The statement may be true based on the results analysed here but the author actually only looks in detail at RPs up to 10 years – which is fine by itself, given the data. Still, care should be taken not to generalise this result for "clustering increases with intensity for all return periods". I would suggest adding more precise information and staying close to the actual results, e.g., "stronger clustering is found up to a certain return period (10 years)" or ".... within the range 1-10 years return period". It is unclear how clustering for very long return periods actually looks like (large uncertainties), and results by Karremann et al. (2014a) based on GCM data do show that clustering may in some cases actually reach a stabilisation level or even decrease for long return periods. It is unclear why this may happen, it might be simply to do with the length of the datasets – the rarer the events, the more "random" their occurrence may be given the limited sample – or it might have physical reasons - the jet cannot intensify infinitely or remain quasi-stationary for months in a row - but we simply do not know. See also comment #3.

2. Introduction, Page 7459: The introduction about clustering is generally fine but very short. In my opinion, it would be helpful to shortly discuss also these three recent papers

a) Blender et al. (2015) – which provide a different view of clustering (based on the Fractional Poisson processes)

b) Pinto et al. (2014) – who provided a "modern" synoptic and dynamic view of the phe-

nomena, thus explaining the physical reasons for the clustering of windstorm losses.

c) Hunter et al. (2015) – closer look at frequency intensity dependence, role of tele-connections.

3. Results and discussion, page 7466, lines 3-5. There is a bit of confusion here regarding cyclone based results vs (potential) loss based results. The given statement is true for cyclone data as analysed in Mailier et al. (2006), Vitolo et al., (2009) or Pinto et al. (2013). However, this is not necessarily true for potential losses and longer return periods– see Karremann et al. (2014a, 2014b) and comment #1 above. Note also that the latter papers analysed much longer return periods than the former papers, and thus the slightly different conclusion is not necessarily a contradiction. As mentioned in #1, clustering for long return periods is uncertain and may actually decrease. I would suggest writing here two sentences, one focussing on cyclones and one focussing on losses, and shortly discuss the differences. See also page 7467 lines 20-22 and elsewhere

4. General: I believe that the description of "southern countries (off the main storm track)" (e.g., 7458, line 15, and elsewhere) is quite misleading, because the author is actually talking about countries in Central Europe and not the Mediterranean area. I suggest changing the denomination to "Central Europe" or similar. (for "Northern countries" it is clear).

5. Results, page 7469, lines 28-29. Well, this is not unexpected, as similar results were obtained in Karremann et al (2014a) for the longer 505y PRE simulation – clustering can apparently change over time (in longer time scales), hence the "weaker clustering" in general if compared to a period of comparatively high clustering.

6. Summary, page 7471, lines 25ff: the sentence is very long and hard to explain, I would suggest writing two sentences.

7. Summary, page 7472, lines 13-16: another possibility to reduce uncertainties is to

use GCM data as performed by Karremann et al (2014a, 2014b), this should be clearly stated as a valid alternative.

References:

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Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., 3, 7457, 2015.