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Interactive comment on “The XWS open access catalogue of extreme European windstorms from 1979–2012” by J. F. Roberts et al.

Anonymous Referee #2

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Review of

The XWS open access catalogue of extreme European windstorms from 1979–2012

By J. F. Roberts et alii

General Comments

The study describes the generation of a catalogue for extreme extra-tropical cyclones with high relevance for potential damages, similar to analogue event sets for tropical cyclone systems. The general idea of a freely available information data base for the most relevant events is in principle a good approach and is worth to be published. Different metrics of assessing the severity of a cyclone are analysed and finally a catalogue is

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produced including track information (position) and footprint characteristics out of dynamical downscaling applications (event based simulations). Due to underprediction of high gusts for low altitude stations, a statistical method of footprint re-calibration is presented and applied. The manuscript is well written and easy to follow. Nevertheless, three major points should be addressed before publication.

Recommendation: Major revisions

Major Comments:

- 1) For the dynamical downscaling of severe events the UK MetUM (in 0.22 degree resolution) was used in a forecast mode with initialisation 6 hours prior to the event target time (00+24 UTC). Why this setup using forecasts? In extreme storm situations forecasts may be of less skill (especially to the exact location and timing of wind gusts or rapidly developing pressure changes) with a high storm-to-storm variability. Why not using event simulations in a climate mode, i.e. forced every 6h from re-analysis data? This would minimise the potential track and intensity error. How does this error influence the findings of the several used indices? Is it with this setup at all possible to separate between forecast error and just a regional model error as targeted with the re-calibration?
- 2) The footprints are produced from dynamical downscaling. Two question complexes should be answered here: a) Selection of events: To the understanding of the reviewer the severity of an event is accessed via simulated values from the downscaled fields. The cyclone tracking algorithm from Hodges (1995) is applied to 3 hourly ERA Interim data, which will result in 5730 CYCLOCLES. For all of these events, 72h downscaled forecasts are simulated and footprints created? I guess the majority of these cyclones will have nothing to do with damage producing wind storm relevant for this catalogue. In most of the cases the related thresholds (e.g. 25m/s) will probably not be passed and no real footprint will emerge. (Are the 5730 events from a hemispheric identification or just from the outer box from Fig.1?) Or was the selection of events done from

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calculating the index values from ERA Interim data prior to the downscaling effort? How would this change the selection? b) For the index Sf98 the local 98th percentile of the wind speed is needed. If only episodes are available, how did you calculate the local percentile value? If only storm situations were used to do so, the threshold is biased from too many strong wind events, not being representative for the normal (all year) wind climate at this point. Without a long term simulation e.g. 10-20 years it will not be possible to derive stable percentile values. Further on, was all year or winter half year used as a basis to calculate the percentile value?

3) Underprediction of the simulated gust wind speeds with this model simulation The reviewer fully acknowledges the comments made by Pinto to this manuscript online and would like to see the authors to address this problem properly. This will include a clear discussion of the potential suitability and limitations of this catalogue.

Minor Comments:

1) A modified version of the Hodges (1995, 1999) cyclone tracking algorithm was used for 3 hourly data. Could the authors please show how this modifies the tracking results and how this fits with 6h tracking? Could the authors give an indication which parameters of the tracking were changed and how this will affect the results?

2) At several places the authors refer to the work from Klawa & Ulbrich (2003) in order to motivate their definition of a percentile based index. However, it should be noted and discussed that this work was for surface wind values and not for 925hPa wind. Also the paper from Leckebusch et al. (2008) where this approach was further developed to generate the storm severity index (SSI), surface near values were used. Thus, it should be clearly noted that this is a deviation from this approach and the real effect of this is not tested here.

3) Chapter 3.1 uses as a threshold 25m/s, in section 5.1. the re-calibration is done for wind fields above 20 m/s. Why not a consistent threshold?

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4) The 50 storms in the catalogue were discussed as damage relevant in the domain. Does this mean these are the most important events from a European accumulated perspective? For individual regions the ranking could be quite different? Could you please include damage figures in Table 1. Could you comment on the regional differences and how this may influence the choice of events? An extreme event in Spain does not necessarily have to have the same wind based damage potential to result in similar damages at the ground.

5) What is the sorting criterion of Table 1? Who are “insurance experts”? Is this based on insured or overall (economic) losses? (If it is based on loss estimates.)

Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., 2, 2011, 2014.

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