Natural Hazards
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Discussions

Interactive comment on "An approach to build an event set of European wind storms based on ECMWF EPS" *by* R. Osinski et al.

This manuscript presents a new study on Atlantic-European wind storms based on surface wind forecasts from the European Center of Medium-Range Weather Forecast (ECMWF) Ensemble Prediction System (EPS). I consider the subject is very interesting, presents a novel approach to research on high impacting wind storms; therefore it is adequate to be published on NHESS. The manuscript is mostly well-structured and clearly written, even though it still needs the review of grammatical and typographical errors (which I will not sign) as well as the clarification of some aspects. I would recommend the publication of the manuscript after the authors carefully address the following issues:

- Introduction ends abruptly. Particularly the last sentence is very vague and needs further explanation. What do you mean by "jumps and trends as well as biases"?

- Data and Methods. The strongness of this work is, in my opinion, the new methodology here presented which shows how the EPS may be used to characterize extreme storms. Thus, the methodology should be better explained. It is not clear how the datasets are built. Do you apply the tracking algorithm developed by Leckebush et al. (2008) to a gridded 10 m wind time series, for each ensemble, for the period 1992-2010 (Table 1)? For the reader which is not used to EPS data this should be further clarified. Please see comment concerning Figure 6.

Section 3.1 – The variables in equation (1) should be defined. What is Ak? Furthermore, the section does not explain which properties are used to characterize storms as the section title suggests. Only SSI? Cf. Table 2. What is the definition of the "Size" of the storm?

Section 3.2 (and section 3.2.2) – The quantile-quantile mapping approach (pg 1237, ln 10-13) should be further explained. Eventually some figures could be presented as appendix or as supplementary material. As stated above, the methodology should be clearly explained as it is the main novelty of this study.

Section 4.2 – This section is dedicated to Emma storm. Figure 7 and its description (pg 1240, ln 10-16) deserve more attention. Probably it could be included on section 4.3.

Figure 7 raised to me the major concerns on this work/methodology, in view of risk assessment: "help to better estimate potential storms risk"(cf pg 1240, ln 14-16) as well as the evaluation of the "potential for an occurrence of storms more extreme than observed" (cf conclusions, pg 1247, ln 1). As the authors stated on discussing Fig. 2 even though differences in the tail of wind speed seem small, they are impacting the results on SSI (which is the cubic of excess over percentiles). Results of SSI on Fig. 7 exceed too much those on ERA-Interim – which should be "considered as the reality". There is an obvious improvement when making the statistics of a larger subset but how realistic are forecasted storm properties? What is the effect of the term Ak

on the SSI calculation on EPS members? The authors should further discuss this question in terms of risk potential. Would you find a similar level of agreement if you would perform the same analysis presented on Figures 14 to 15 only to the dataset of extreme storms?

In general, results are poorly discussed. Sections are too short and Figures could be further described.

Specific comments:

Section 5.3 – Figure is not referred.

Section 5.5 – definition of "wind field size"?

Table 3 – how have errors been computed ?

Figure 1 – which land boxes? A figure would be useful.

Figure 3 – Plots are too small. Caption: "right axis"?

Figure 5- As in Fig. 4, the ERA-Interim reference would help (perhaps with an extra filled column or a line as in Fig. 4)

Figure 6 – Caption refers 50 EPS members initialized for 28 February and 25 February. This raised the doubt on the used datasets. How do you build the storms datasets? And the SSI datasets? This should be further explained.

Figure 7 – Which is the first winter represented on the Figure? 2000-2001? Please insert ticks indicating "2001-01" and other winters.

Figure 12 – Normed? Normalized? How have these been performed?