

## ***Interactive comment on “Modelling Vulnerability to Severe Weather” by Tobias Pardowitz***

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The paper “Modelling Vulnerability to Severe Weather” exploits a dataset of fire brigade callouts in the metropolitan area of Berlin for the period of 2002-2012 to identify factors describing the local vulnerability and thus influencing the local risk for weather impacts.

The paper is quite interesting and the research was well planned. The statistical elaborations of data are carried out in a rigorous way. The language is appropriate and fluent, except for some small imperfections listed in the following. Nevertheless, there are some points that could be improved:

1) I think that the paper should have a more appropriate title. Maybe the title should focus on the statistical model that is the basis of the research, more than on a concept as wide as vulnerability.

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2) The types of phenomena described by keywords could be more delineated by the Author. The sense of “Traffic obstruction”, i.e., is not completely clear for me. In addition, a more detailed explanation of the sense of keywords could help the reader to understand the meaning of the different association of phenomena and their seasonality.

3) Personally, I think that “building density” is less significant than building coverage, and the analysis of this last one simply complicated the discussion without a clear usefulness. Nevertheless, this is a personal opinion and maybe I did not realised the actual importance of this parameter.

4) There is a point that I ask to the Author because it is not clear for me. Damage to houses/roads (as obtained by insurance data) are used together with fire brigade callouts. In the first type of data, I think that only data of damage to “goods” are included. On the contrary, I can imagine that in the fire brigade database also callouts concerning people in difficulties are included (i.e. people in cars trapped by water or by trees hurled by wind). Did you take into account this difference?

5) Because the paper seems quite long, I suggest, as general comment, to summarise some of the most important findings in a sketch or in a table. In fact, due to the multitude of variables analysed, the reader at the end of the paper is a little bit confused, even if interested.

6) I suggest to the Author to introduce, in future development of the research, data on population density. I understand that the focus is not damage to people but it must to be taken into account that population density could better approximate a sort of “total value” of the different sectors of the territory, made of people+goods that are both an object of fire brigade operations. A certain number of calls to fire brigade can be often related to dangerous situations involving people and not goods. Actually, to be strict, one should take into account the number of floor of each building and the traffic volume on the different roads, but this great amount of parameters could be very difficult to

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manage. On the contrary, population density, assessed for sub sectors of the study area, is a single value, easy to assess and elaborate.

7) Legends of the figures could be simplified by putting “km per km. . .” in the caption of the figures and leaving simply the values of intervals in the figures.

8) Page 2, line 7 eliminate brackets

9) Page 4 line 10: As a first predictor, the number of houses per grid cell on a regular 1x1km grid is derived. I suggest to change houses with buildings.

10) Page 4 line 11: As discussed later, even though these quantities are highly correlated both predictors are valuable to be considered since enabling the distinction between high density city centre with very large buildings in comparison to suburban areas with high numbers of detached houses. Put comma after correlated.

11) Page 7 line 22: In general, a rather good agreement in the patterns of the number of operations per zip code area and the number of insurance claims. Please check this sentence: it seems that there is something lacking.

12) Page 8 line 3: For some events (Kyrill, Lothar07 and Aram) considerable correlation for water related operations while for the others there is no correlation at all. Please check this sentence: it seems that there is something lacking, and put a comma after events.

13) Page 8 line 6: change berlin in Berlin

14) Page 8 line 30: . . .or treefall are distributed rather different. Maybe “differently” instead that different

15) Page 8 line 35: This is not unexpected since major impacts due to treefall is not expected in wooden. Please, put a comma after unexpected.

16) Page 9 line 16: For the predictor variables listed in Table 3 the spatial. . . Please, put a comma after 3.

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