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Natural Hazards and Earth System Sciences
Discussions

Interactive comment on "Estimating the risk related to networks: a methodology and an application on a road network" *by* Jürgen Hackl et al.

Anonymous Referee #1

Received and published: 10 April 2018

1. Does the paper address relevant scientific and/or technical questions within the scope of NHESS?

The paper addresses the question of risk related to networks exposed to natural phenomena which is an important issue. However, the paper focuses on application and combination of several physical models in relation with network modelling without really explaining why those models are used and what are the asumptions. The question of models relevance, key issues in modelling are not addressed (why one model in comparison with others existing ones).

2. Does the paper present new data and/or novel concepts, ideas, tools, methods or

results?

Despite of the interest of the research question, the inputs of the approach are not totally clearly described. This could be improved. What is new ? why ?

3. Are these up to international standards?

An extended bibliography has been done indeed. Some references about networks analysis, socio-economic features should be included (. Different criteria can be considered to assess vulnerability, multicriteria decision making methods may be an alternative: this has not been addressed at all. A past intereg project called Paramount has, between others, addressed this kind of issues. . .

4. Are the scientific methods and assumptions valid and outlined clearly?

The purpose of the paper is risk assessment. The difference between hazard, damage assessment is not clearly described. Main issues are: 1) The description of the methodology is finally unclear. A major reconfiguration of the paper should be done: a classical paper structure (intro, state of art in each domain, gaps , developments, results, discussion) would be better. 2) A global chart showing all methods and connections would be welcome : the paper is difficult to read 3) Many symbols are used all over the text, sometimes not clearly defined or with confusing notation (e.g. E for event instead of Expectancy. . .tricky when also dealing with probability). Not all notations defined are used in the text, results etc. . .Is it useful in that case? If a model is described, we expect to know which data have been put inside, which asumptions are done 4) Several models have been used : description are given in appendix but it is very difficult to understand what where the assumptions and data used. Some models are perhaps not the right ones to model the phenomenon addressed (e.g. scouring modelling requires to use hydraulics models considering solid transport) 5) The approach on networks is finally (apparently) quite simple and based only on population gradient. Many others socio-economic factors (industry, rescue, education access etc. . .) are of higher interest to assess indirect risks on networks. Those aspects should be

considered: on the contrary, explain why not developed and speak about limits of the approach.

5. Are the results sufficient to support the interpretations and the conclusions?

Several models are used and combined. Links between them, the way they are used, data are not fully described. Figures are not completely clear and supporting the demonstration (e.g. figure5 aggregated simulation, what is aggregation? How is it done?

6. Does the author reach substantial conclusions?

The conclusion claims that yes but it is not completely convincing. Costs are presented as societal effects. One main output would be that it gathers different phenomena but the way it's done remains not clear : are all events equivalent, is there not a question/issue of importance, relevance? How are the events identified, compared one with another?

7. Is the description of the data used, the methods used, the experiments and calculations made, and the results obtained sufficiently complete and accurate to allow their reproduction by fellow scientists (traceability of results)?

No, it may be impossible to reproduce calculations since basic hypothesis of models used are not described. This is one important suggestion that could be done to better explain and understand the process and the added value of using and combining models.

8.Does the title clearly and unambiguously reflect the contents of the paper?

Redundancy in title (networks): should be changed.

9. Does the abstract provide a concise, complete and unambiguous summary of the work done and the results obtained

The integration should be a major objective but the way all methods are combined is

not clear. The demonstration of the usefulness of the approach is not proved since no comparison with classical approaches is done. Why is it better? How does it help decisions?

10. Are the title and the abstract pertinent, and easy to understand to a wide and diversified audience?

Expectations about risk are high. The focus seems to be more on phenomena and hazards.

11. Are mathematical formulae, symbols, abbreviations and units correctly defined and used? If the formulae, symbols or abbreviations are numerous, are there tables or appendixes listing them?

No, a glossary is given (good) but not all symbols are used. Not useful in that case, some of them are not easily understandable. The reader would have to go to initial bibliography. Data which are used should be described.

12.Is the size, quality and readability of each figure adequate to the type and quantity of data presented? Some figures are difficult to read /interpret (e.g. fig 6) = a set of curves. Think to white and black printing. . .

13. Does the author give proper credit to previous and/or related work, and does he/she indicate clearly his/her own contribution? This paper is a result of aFP7 research project with existing published papers with the same authors). The difference and added value description should be improved

14. Are the number and quality of the references appropriate? Many references but some on the key aspect of indirect vulnerability assessment are missing.

A commented version of the paper (hand-written comments) has been done on paper and can be sent to the authors through editor if wanted.

Please also note the supplement to this comment:

https://www.nat-hazards-earth-syst-sci-discuss.net/nhess-2017-446/nhess-2017-446-RC1-supplement.pdf

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