

# ***Interactive comment on “Towards thresholds of disaster management performance under demographic change: exploring functional relationships using agent-based modelling” by G. Dressler et al.***

## **Anonymous Referee #1**

Received and published: 23 February 2016

The authors present an agent-based simulation on the effectiveness of flood risk management taking the 2002 Central European floods as hypothetical root. Using different scenarios of rural and urban areas they examine the impact of dynamics on the performance of event management. As such, this is a topic of considerable relevance to the readers of Natural Hazards and Earth System Sciences. Therefore, the work should be considered for publication. However, some of the content needs (minor) additional efforts before this manuscript will become acceptable for publication in the considered Special Issue on Vulnerability and Resilience. Please find my remarks below.

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Page 1, Introductory section The first paragraph contains lots of common knowledge, would it be possible to underpin the statements by references?

Page 2, lines 1 ff.: The increase in events is one side, but what about losses? There are some articles around where the increase in losses is controversially discussed for Europe, see e.g. Barredo (2007, 2009).

Page 2, lines 7 ff.: Please insert some sentences on vulnerability and risk here. If the number of events is increasing, but the elements at risk are decreasing, what does this mean for the overall (collective) risk?

Page 2, line 23: This may also be applicable to other regions of Europe, not only Germany. Is there work around on the decrease or increase in assets (for the Netherlands e.g., Jongman et al. (2014), another country report has recently been published by Fuchs et al. (2015))?

Page 4, description of the agent-based model Please refer to the supplementary material more prominently since key information is provided there.

Page 9, line 15: When comparing the description to Fig. 6 some questions came in my mind: If we compare the DMOs with and without full knowledge the difference in the number of disaster spots (10 versus 80) is obvious. But if we compare the DMOs with full knowledge against each other the number of DMOs does not show a large difference in the coping time performance (grey lines in Fig. 6). Does this mean that once DMOs have full knowledge (the “experts” from the local fire brigades) the number of disaster spots is not important [grey lines are plusminus on the same level for each number of DMOs]?

Page 11, discussion section

Section 4.1: Please make some clear statements here (or elsewhere in this section) on the effects of your case study on resilience and vulnerability since this is the umbrella for the envisaged Special Issue. See also Page 12, lines 12 f., from my point of view the

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aspect of resilience (if mentioned here) needs a bit broader explanation in the context of your model.

Page 12, lines 14 ff.: This may go to the very beginning of the entire manuscript since here also the state-of-the art is mentioned.

Overall, the materials presented are definitely worth being included in the target journal. I suggest that the authors perform a minor revision of the manuscript before it will be published.

#### References mentioned

Barredo, J.: Major flood disasters in Europe: 1950-2005, *Natural Hazards*, 42, 125-148, 2007. Barredo, J.: Normalised flood losses in Europe: 1970-2006, *Natural Hazards and Earth System Sciences*, 9, 91-104, 2009. Fuchs, S., Keiler, M., and Zischg, A.: A spatiotemporal multi-hazard exposure assessment based on property data, *Natural Hazards and Earth System Sciences*, 15, 2127-2142, 2015. Jongman, B., Koks, E. E., Husby, T. G., and Ward, P. J.: Increasing flood exposure in the Netherlands: implications for risk financing, *Natural Hazards and Earth System Sciences*, 14, 1245-1255, 2014.

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[Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., doi:10.5194/nhess-2016-48, 2016.](#)

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