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Natural Hazards and Earth System Sciences
Discussions

Interactive comment on "Using cellular automata to simulate wildfire propagation and to assist in fire prevention and fighting" *by* Joana G. Freire and Carlos C. DaCamara

Anonymous Referee #1

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This paper presents an application of a cellular automata model to simulate wildfire propagation. The CA modeling is presented as a useful tool to support decision-makers during fire events, providing information about the location of future fire spread and allowing them to design a proper solution to reduce the propagation of fires.

The paper is well structured and well written. However, I would suggest the authors do an effort to slightly reduce the length of section 2.1 in order to further improve the readability of the manuscript.

From the methodological point of view, the paper proposes an advance of the model proposed by Alexandridis in 2008. In the modified model, a stronger relevance is given

to the role of wind speed in fire propagation. The proposed model seems to give better results, at least for the case study presented in the paper.

My only concerns are related to the model uncertainty. All the results are presented in terms of probability. The latter results from the ensemble of 100 models run. It would be of extreme interest to map model uncertainty; without any information about it, it would be very difficult to use the proposed model as a decision-making support tool. About the relevance of uncertainty there is a number of relevant papers in literature; as a first reading, I suggest Fischhoff and Davis 2014. Communicating scientific uncertainty. Proceedings of the National Academy of Sciences 111: 13664-13671. Moreover, it would be interesting to have a sensitivity analysis concerning the variation of certain a priori fixed parameters, as the c1, c2 and as a coefficient of the model (which are now settled based on the values proposed by Alexandridis). Similarly, it could be interesting to further explore the sensitivity of the result to the choice of the 0.2 probability threshold applied in section 4.2.

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