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Comment on nhess-2021-179

Anonymous Referee #1

Referee comment on "ABWiSE v1.0: toward an agent-based approach to simulating wildfire spread" by Jeffrey Katan and Liliana Perez, Nat. Hazards Earth Syst. Sci. Discuss., <https://doi.org/10.5194/nhess-2021-179-RC1>, 2021

This article presents a Agent Based Model for wildfire spread. The article is clearly written, and its importance is highlighted by the growing number of wildfires each year. Under these circumstances, we need more models like this. Hopefully, the authors will make their code available such that it can be used as a base for further improvement by the community. The experimental set-up and validation are clearly explicated, and diagrams are clear. Below are a set of points that can be addressed in a revision:

1. The introduction needs acknowledgement of anthropogenic forest fires. This needs to cover the fact that controlled burning has been used for a long time (and effectively) as a forest management tool and the intensification of forest fires due to climate change which is also anthropogenic.
2. Good summary of fire models. However, the jump to the models is a bit abrupt. A mention of satellite-based forest fire monitoring approaches would help. Here is a great example using MODIS: <https://modis-fire.umd.edu/>
3. "Ultimately, the goal of such a fire simulation model is to predict fire behavior, but presently, the purpose 150 of ABWiSE is to explore how ABM, using simple interactions between agents and a simple atmospheric feedback model, can simulate emerging fire spread patterns." – This needs further explanation. How is predicting fire behavior different from simulating emerging fire spread? What is ABWiSe achieving and what is it leaving out. What are the merits and demerits of the trade-off?
4. Line 185: FWI seems to provide a great resource to test model assumption regarding wind speed. If it is not too complex to incorporate within the current study, this will be a good addition to the paper. Also, is the relationship between RoS and wind speed mentioned in line 205 the same as used in FWI?
5. How does ABWiSE improve upon Prometheus?
6. Can the model be used to simulate fire fighting efforts? For example, given that forest fires can span thousands of acres, what happens when fore fighting efforts are concentrated in some area as opposed to another?
7. Figure 3: Great map. Would it be possible to use a different color scheme to better delineate the different vegetation types?
8. The 4 cases can be presented in a table to improve readability. I kept having to find them in the text to remind me exactly what they were.

