

## ***Interactive comment on “Fine scale assessment of cross boundary wildfire events in the Western US” by Palaiologos Palaiologou et al.***

### **Anonymous Referee #2**

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This work extends previous fire transmission works to a larger spatial scale, using methods developed by some of the same authors.

The paper is well written, and most of it is very clear. The design of the research is well done, the methods are suited for the purpose, and the major findings are well supported by the results and other studies referenced by the authors.

General comments:

1. I understand that the same simulation methods described here have been used in other works and you want to avoid unnecessary repetitions. Nevertheless, as you mentioned, the spatial scale of the simulations presented in this work is unprecedented, and researchers working on similar topics\tools will surely want to understand how they

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were done. For example: what was the total number of simulations, and what was the spatial resolution of the data used? Adding to this comment, I think it is important to mention that multiple fire seasons are simulated (and not only individual wildfires).

2. At the end of the Introduction you depict three very clear specific questions that you want to address in this work. Then you add that “the results were used to understand how anthropogenic actions influence (...) fire transmission, notably parcel geometry, landownership composition and landscape fragmentation (...).” Where is this shown in the results? For example the analysis of “checkerboard vs. large boundary lines between two land tenures. Additionally, in what sense is “parcel geometry” a “anthropogenic action”? Regardless, if this analysis is\was really performed my suggestion is that you add it to a 4th question.

3. The statistical model of human\natural ignitions needs to be clarified. This is an important part of your work because part of your results (and conclusions) depend on the predicted cause of ignitions. How well does this model work? Did you calculate performance statistics? Did you use a set to calibrate the model and another to validate? A complex model is not synonymous of a good model. Please provide a clear(er) equation of the model so that all interested readers can understand and replicate if necessary.

4. What is the difference between a “fireshed” and “community fireshed”? Did you use both?

5. Using simulations is an interesting and powerful approach for issues such as the ones studied in this work. However, in my opinion, this should be accompanied whenever possible, by an analysis of the observed patterns. In a general sense, this work disregards much of that “connection to reality”. For example, a calibration exercise is not even mentioned. Another example: the patterns of fire transmission reported in 3.1 could be accompanied by an historical analysis to understand how well did the model predict historical fire transmission.

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6. After reading the 1st paragraph of the Discussion: it would be interesting to look at the results in terms of normalized incidence instead of total area (i.e. burned area / total area of a given type of cover). For example, national forests have highest predicted burned area because there is a large incidence or because they have the highest cover area?

7. Why do you think small parcels tend to receive higher amounts of incoming fire?

Specific comments:

P2, L30: the fireshed P3, Study Area and land tenures: please mention here the size of your study area. P3, L23-26: don't understand the sentence. P4, L6: maybe here it would be good to indicate what is the proportion of the total burned area comprised by these fires that you characterize. P5. In 2.4, what is the purpose of applying a kernel function to fit (...see the rest in Lines 17-19)? P5, L19: how was the NTFI calculated? What is the reference? P6, L2: I dont understand the purpose of Scott and Burgan's reference. P7, L21: remove "spatially". Redundant. P8, L1: dont understand, probably because NTF index was not explained in the manuscript. P10, L6: if you use "was", follow it by "large differences were". P10, L23: I believe it is "shrub fuels account for three quarter of the fuel models in some states". P11, L29: Why do you need probabilistic estimations? No reason provided to the reader. P12, L7-9: something wrong with the sentence. P12, L13: extend? P12, L15-18: something wrong with the sentence. P13, L23: what does "reduction of fire deficit" mean?

Figure 9: need to mention that the figure concerns fireshed characteristics, otherwise revise the location of the Figure in the document.

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