

# ***Interactive comment on* “Evaluating forest fire probability under the influence of human activity based on remote sensing and GIS” by Wei Yang and Xiaoli Jiang**

## **Anonymous Referee #3**

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The study presents an attempt to calculate fire probability to a large area in China, using GIS and remote sensing data. Despite the effort done and the eventual usefulness of the study to that particular context, there are several concerns regarding the robustness and quality of the research. As it is, the paper should be rejected (please see details below). To be reconsidered for publication, the authors would have to make substantial changes. The analysis is rather weak to adequately support the conclusions given and there is confusion in the concepts throughout the text.

Detailed comments: - there is a major confusion between fire probability and fire risk, which are not the same. The discussion only mentions fire risk, but the analysis is only

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probability. Concepts are not clear.

- In the abstract indicators is confused with dimensions or aspects; need to clarify what type of measurement is being provided, in the end is a classification in 5 categories.

- More results are needed in the abstract; for example, what is the proportion of the study area in the high and very high classes, i.e., the most hazardous ones?

Introduction Purpose too general. Need to expand on the specific objectives and on the usefulness of the approach, particularly for the area where it is being applied. Introduction is missing the context of fire in the study area/country or region considered, and why is this important there. Has fire probability been analysed there before?

- The authors present ideas as "widely used" but then only provide 1 single reference; introduction needs better scientific support.

Methods - The description of unit areas has to be harmonized (km/hm/ha??).

- The description of the study area refers to very low mean temperatures and does not provide a value for annual rainfall. The number of fires in such a large region is very small, all this does not support the claim that forest fires are a concern for the region. Is it really important there? Some costs are presented for loss of trees (which depends on type and use of trees), but further arguments are needed to defend this view.

Table 1 - Need to add detailed source of data (institution providing them, links...). Also, the units of measurement for each variable are needed

- How many years were used for the multi-year average of rainfall (to calculate drought?)

- The weighting of the variables is not properly supported; were preliminary tests done? Was it expert opinion?

- Min and max values of NDVI - For the study area? in a certain time interval?

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- The last 2 columns of Table 2 are not needed, repetitive. The reason for the scores given to each variable needs to be explained, as this changes the results.

- The natural breaks method to classify a variable does not allow the application of the same classes in another region; have other classes been tested (mean/SD?)

- I understood that the independent variables were obtained for 2017, at least the remote sensing ones. However, the number of fires (dependent variable) is from 2000 to 2005. There is a time lapse here that affects the results, particularly with regards to vegetation and drought conditions. It has to be taken into account, as vegetation and weather factors are not representative of that fire period. This has to be changed

Results - The analysis of the distance is rather weak, although the authors have kept a part of the data for validation. The number of fires per distance to settlements and roads depends as well on the availability of vegetation within those distances; at 1 km distance to settlements, is there enough vegetation to burn? Is it farmland, grasses or other? A deeper analysis of landcover around settlements and roads needs to be done. Also, distance classes have different intervals, it affects the results (nr. fires)?

- Table 4 presents the results for regions/cities, but no further info has been provided regarding these administrative areas; what is the proportion of forest area in each region? How is the spatial distribution of fires in each region? Further conclusions cannot be drawn from here.

Discussion - Weak discussion. Even the concepts are confused, probability is not risk (L260, Different fire risk distributions at the city scale). Why city scale? Have urbanised areas been removed from the analysis? Forest fires do not occur in urban settings. Arguments are not fully supported by the analysis done

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