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Biogeosciences Discussions

Interactive comment on "Two thresholds determine climatic control of forest-fire size in Europe" *by* L. Loepfe et al.

Anonymous Referee #1

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General Comments Paper examines possibilities to model the non-linear dependence between large forest fires and fuel moisture. As well, the impact of fuel amount on the occurrence of fires is been discussed. The subject studied is very relevant. However, the authors should have considered use of some other/additional data sources and interpretation of some of the results requires further clarification.

Specific comments: 1. Data E-OBS data is a valuable and important dataset used in many applications. However, due to relatively sparse network in some regions in Europe especially precipitation analyses are not that accurate and this is reflected also to analyses of parameters that use E-OBS as input data. It is very obvious that some of the small scale spatial variation shown in Fig. 5 are not real but rather caused by inaccuracies in the precipitation analyses. This should be discussed in the manuscript.

The estimation of available fuel amount is based only on annual precipitation. However, the forest growth is dependent on many other factors like for example human influence (activity of forest industry and effectiveness of forest regeneration, scale of urbanization etc.), soil, temperature (length of growing season, amount of temperature sum, harshness of winters etc.). If the impact of available fuel amount is included into the study it is very recommendable to use data that describes the fuel potential more realistically than annual precipitation alone. There exist model simulation depicting current and future vegetation in Europe, as well; forest inventory data gives the real observed situation.

2. Results It would be important to know the frequency distribution of DC in the dataset used. For example, is the frequency of DC values around 400 smaller than at around 200? This perhaps could explain why there are less large fires observed at DC value 400 than at 200 (Fig. 2). It would be interesting to see a figure depicting the frequency distribution of DC and add discussion on the subject. Current statistical tools enable complicated analyses. However, there is also a risk that the output based on these analyses does not reflect the real physical world. In this study the fitting of fire data to DC data produces interesting looking dependency (Fig. 4.). However, there is high risk that the wave-like variation is not real but only noise caused by the analyzing method.

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