Nat. Hazards Earth Syst. Sci. Discuss., 1, C1097–C1102, 2013
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Natural Hazards and Earth System Sciences
Discussions

Interactive comment on "Precipitation dominates fire occurrence in Greece (1900–2010): its dual role in fuel build-up and dryness" *by* F. Xystrakis et al.

F. Xystrakis et al.

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Dear reviewer #3 Firstly, we would like to thank you for your valuable comments which significantly improve the quality of the manuscript and thus will be taken into consideration in our revised manuscript. In the following parts you may find our reply to your comments

COMMENT: Page 698, Lines 21-22: The following sentence requires additional explanation/clarification: "Time-series severely deviating from normal distribution were log transformed and the linear model was applied to the transformed values."

REPLY: The sentence will be rephrased. The transformation of time series actually involves the transformation of the values of the variable burned area in order to reduce the effect of some extreme values of area burned in the analysis. The effect of the logarithmic transformation in the values of the variable 'area burned' is shown Figure 1 that follows the text. We rephrase the ambiguous phrase as follows: '. . . the variable 'area burned' was log transformed in order to reduce the effect of some very large values in the analyses. The linear regression model was then applied to the transformed values'

COMMENT: Page 699, Line 6: It seems that the term "fire occurrence" is erroneously used here since you did not work with the number of fires but with burned areas.

REPLY: We will change the term 'fire occurrence' with the correct term 'area burned'

COMMENT: Page 704, Lines 11-15: The conclusion drawn about extreme fires is not supported by the analysis. You can talk about the overall difficulty of the fire season which is reflected in the total burned area. High burned area does not necessarily come from one or two extreme fires

REPLY: Other studies in Greece (Dimitrakopoulos et al., 2011; Xystrakis and Koutsias, 2013; Koutsias et al., 2013) provide indications that total precipitation (especially during fire season) stands as the dominant factor correlated with annual area burned. Similarly in our study, it is apparent that years with strongly positive values (definition of strongly positive is provided in the manuscript) of area burned are characterized by strongly low values of fire-season precipitation. Additionally, years with strongly negative values of area burned were years of strongly positive precipitation, something which is not apparent with the rest of the examined weather variables. There is certainly a great amount of variation which is not explained by precipitation alone and, moreover, there is a certain degree of collinearity among variables, since certain years with strongly negative precipitation values are years with strongly positive air temperature values. Additionally, one could argue that the use of additional variables as for

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example climatic indices (fire weather index, standardized precipitation, components of the soil water balance model) could reveal stronger correlations with the occurrence of strongly positive or negative values of area burned. Although the above mentioned are sources of uncertainty we believe that our overall analyses and outputs allow us to argue that precipitation controls the occurrence of years with strongly positive or strongly negative area burned. A short paragraph describing sources of uncertainty and possible pitfalls has been added in the discussion part. The possibility though to present in details weaknesses and strengths of the study is limited.

COMMENT: Page 694, Line 14: Change to: "...coincide with large burnt area."

REPLY: it was changed to 'area burned' for consistency with the text.

COMMENT: Page 694, Line 17: Replace "fire spread" with "fire danger" Page 694, Line 17: we have replaced the ambiguous term fire spread with 'area burned'.

COMMENT: Page 694, Line 20: Change to: "Wildfires are considered as one of the major forces..."

REPLY: It has been changed according to your suggestion

COMMENT: Page 694, Line 22: Change to: "... where extremely large burned area (430 000 ha) were associated with extreme values..."

REPLY: (should be page 696 line 22): It has been changed according to your suggestion

COMMENT: Page 697, Line 9: Change to: "This analysis aims to improve our understanding..."

REPLY: It has been changed according to your suggestion

COMMENT: Page 698, Line 17: Change to: "...are presently lacking or are abstract..."

REPLY: It has been changed according to your suggestion

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COMMENT: Page 698, Lines 3-4 : Suggested change to: "...are responsible for the breaks in the time-series, which, as a result, covers 86 of the 117 yr between 1894 and 2010."

REPLY: It has been changed according to your suggestion

COMMENT: Page 698, Line 6: Change to: "...during that period ..."

REPLY: It has been changed according to your suggestion

COMMENT: Page 698, Line 6: Change to: "... so the values of total area burned became directly comparable..."

REPLY: It has been changed according to your suggestion

COMMENT: Page 698, Line 15: It is not clear how data were handled when only annual totals of precipitation were available. Obviously this should create time-series breaks in regard to the seasonal values.

REPLY: Time series were provided with a monthly time-step. The 'annual basis' was erroneously written in the manuscript.

COMMENT: Page 701, Line 21: Is the word "However" appropriate here? I think the meaning calls for "Similarly" instead of "However"

REPLY: Indeed, the word 'similarly' should be placed here, as it has been done in the revised version.

COMMENT: Page 702, Line 28: Change to:"...annual area burned due to fuel build up..."

REPLY: It has been changed according to your suggestion

COMMENT: Page 703, Line 5: Change to: "Koutsias et al. (2013), the development of Greece in this period"

REPLY: It has been changed according to your suggestion

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COMMENT: Page 704, Line 25: Change to: "... during heat waves. However,..."

REPLY: It has been changed according to your suggestion

References cited: Dimitrakopoulos, A., Gogi, C., Stamatelos, G., and Mitsopoulos, I.: Statistical analysis of the fire environment of large forest fires (> 1000 ha) in Greece, Polish Journal of Environmental Studies, 20, 327-332, 2011.

Koutsias, N., Xanthopoulos, G., Founda, D., Xystrakis, F., Nioti, F., Pleniou, M., Mallinis, G., and Arianoutsou, M.: On the relationships between forest fires and weather conditions in Greece from long-term national observations (1894–2010), International Journal of Wildland Fire, 22, 493-507, http://dx.doi.org/10.1071/WF12003, 2013.

Xystrakis, F., and Koutsias, N.: Differences of fire activity and their underlying factors among vegetation formations in Greece, iForest - Biogeosciences and Forestry, 6, 132-140, 10.3832ifor0837-006, 2013.

Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., 1, 693, 2013.

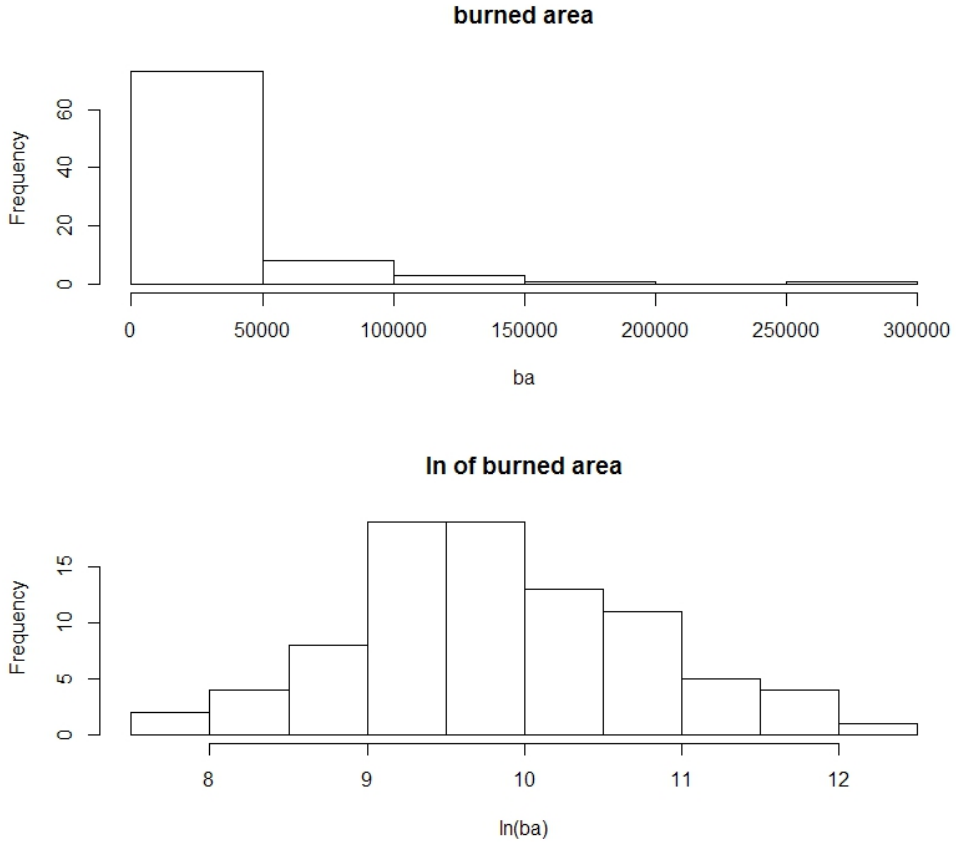

Fig. 1. Histogram of untransformed (above) and log-transformed (below) values of 'area burned'.

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Interactive Comment