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Interactive comment on “Effects of fire on ash thickness in a Lithuanian grassland and short-term spatio-temporal changes” by P. Pereira et al.

Anonymous Referee #2

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Thank you for requesting me to revise this document. I think it is really high quality and it has great interest to scientific community and I think it would be publishable in its current form after introducing some minor corrections. The evolution of the ashes layer thickness is an interesting scientific question because ashes have a protective role in the regeneration of the burned areas taking active part in the hydrological behaviour of the burned soils and in the evolution of the vegetation cover due to they are an important source of nutrients. This feature is ephemeral because evolves very fast and changes in a few days but is extremely important. Few works study the ashes layer evolution so this work has greater interest. Also, obtaining time- serie data of ash thickness in marked point's plots at different times and analyzing the spatial pattern of

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the variance at each time via geo-statistical tools as variograms is a novel and suitable approach to the analysis of the evolution of ash layer in burned soil researches. The scientific methods are clearly outlined, the results are sufficient to support the interpretation and conclusions. The methods and experiments are enough precise and are reproducible by fellow scientists. There is very detailed information about the statistical and spatial analyst programs and all the descriptive parameters of the models are displayed in tables of results. Overall manuscript the units, symbols and abbreviations are correctly defined and used. The references are appropriate and the authors show a deep understanding of the works more innovative in the study of the layer of ashes. Overall the quality of the presentation is high and is well structured and clear. Also the figures and tables are appropriate in number and have a high quality being very clear. Nevertheless, in my opinion the introduction is too long and sometimes is difficult to follow the arguments. There is too much information and discursive arguments which would fit better if they were in the discussion of the paper. 1.- Title: I am not sure about the Title suitability. I think that the title does not reflect the content of the paper very well. The paper does not analyse the effects of the fire in ash thickness. The authors established indirect relations between ash thickness and colour of it's as an indirect measure of fire intensity, but there are not direct measures or experimental data about the effects of fires in ash thickness. Nevertheless the authors make an important effort in establish spatial models in order to adjust the ash thickness variability to a function in each moments of sampling. This effort results in a very interesting approach but is not sufficiently showed in the title. Also I think that is important to know if the fire is wild or experimental. On my point of view it is less important the location of the experiment. The introduction of "Lithuanian" in the title, perhaps make it more attractive but not gives important data about the experiment as will make it if you say Lithuanian coast or Lithuanian mountain area, etc. Lithuanian grassland it is not an especial landscape or ecosystem. Perhaps if the authors introduce the spatial models and the type of fire in the title would reflect better the content of the paper. One option would be: Short-term spatio-temporal changes and modelling of ash thickness pattern of prescribe fire in

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(lithuanian) grassland. 2.- Abstract: In my opinion the abstract is too long, perhaps if the authors removed some sentences the abstract will improve so much. For example, I think 4-7 lines should be removed. Also I think the summary should be shortened and tidy: 1. Very short arguments in order to introduce the experiment and main objective; 2. Explain the most important characteristics of the fire and plots; 3- The most important results, would suffice. 3.- Introduction: The presentation is well structured and clear. Nevertheless, in my opinion the introduction is too long and sometimes is difficult to follow the arguments. There is too much information and discursive arguments which would be better in the discussion of the paper. In this way, the authors explain the evolution of the burned areas in relation to the ashes properties but sometimes the know-how about this item has contradictory arguments. In these cases in order to make more readable document is better to ordering the arguments in positive and negative effects instead of put them all together. Also, the authors explain too much the relations between ash and evolution of the burned areas put an especial emphasis in the nutrients leached from the ashes, but there are not direct relations between thickness and nutrients from the ashes. These seem to be more related to the type of vegetation burned. In my opinion is better to simplify this part and remove parts of the text. Technical recommendations: 1.-Clarify the legends of the figures 2, 4 , 6 and 7. Do different fillings make reference to different colours from the ashes?. 2.-Overall manuscript the units, symbols and abbreviations are correctly defined and used. Only in the beginning of the discussion (page 15 line 9) the authors use together mm and cm. Finally I'd like to add a comment The sample taken at 34 days from fire shows spatial pattern and seems to be related to the redistribution of ashes by the run off. At this point would be very interesting to research the relation between microtopography forms and thickness of ashes looking for relations with variables derived from DEM as concavity; roughness; distance to the crest, etc., at very detailed scale. To build MDT the authors can use laser scanner technologies.

Interactive comment on Solid Earth Discuss., 4, 1545, 2012.

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