Responses (unbolded text) follow each comment (bold text)

Editor

The revised version is much more focused on the interactions between fire history and topography. The new statistical approach is more robust and permits better identifying the existing patterns. There are, however, several issues that need to be dealt with:

Thank you for the constructive comments. Below we respond to each one and have made subsequent adjustments to the text of the manuscript. All changed text is indicated with red font in the revised manuscript.

21-22: Please, focus on what you are really studying, that is, the interactions between fire history and topography.

We have revised the line indicated in the abstract to specifically highlight topography, the non-fire factor studied here.

51: Typo: prescribed.

The typo for the word "prescribed" in the Introduction has been corrected.

89: Fifteen: See comment below.
97-100: By looking at the scatter plots, it appears that your sampling was not 15 trees and that most often it was half of that or even less. Not providing the number of samples and implying that you sampled 15 is a very serious omission. You must provide in a SOM a table with the samples you had for each variable. That will help the readers understand why are so variable df in your statistical analysis, as I had indicated in my previous report.
114: Please, see comments above about the number of samples.

Thank you for the comment about sample size per variable. We now include a Table (Table S1) that clarifies the sample size for each variable. This is denoted throughout the Methods. We also note that all the data are published and freely available, as indicated in the Data Availability section.

148: "This method... ". Unclear sentence.

We clarified the canopy spread measurement description.

155: It is unclear what model you have used. Please, provide the model you have tested and specify it in an unambiguous manner (what is a group variable, what is the covariate, etc.), so that anyone can readily interpret your calculations.
167: Please, specify how you dealt with in case of interaction between the covariate and group variables.

The confusion regarding our linear model seems to be an issue of language. We had defaulted to using language as in Zuur (2009), but have now clarified that the continuous independent factor

(elevation) can also be termed "covariate" and the categorical independent factor (i.e., fire history) can also be thought of as the "grouping" variable. We have also included an equation showing the model terms, including the interaction term.

Zuur, A., Ieno, E. N., Walker, N., Saveliev, A. A., & Smith, G. M. (2009). *Mixed effects models and extensions in ecology with R*. Springer Science & Business Media.

180. Figure 3 is not important in your analysis, so you may want to include it as SOM, rather than in the main text. Since differences in exposure were present, you either include them in your general model to see how they affect your results or must devote a section in the discussion to elaborate on the possible implications of this unbalanced design for this variable.

We now include Figure 3 in the supplementary material (Figure S2) as suggested.

186: Soil C decreased with elevation, rather than were lower at lower elevations.

Thank you for catching the error regarding our description of the soil C-elevation trend. This has been fixed to denote that soil C decreased with increasing elevation.

190: I would suggest that you maintain the same order of the figure to present your results and help the reader better follow you.

The order of the Results section has been revised to match the order of Figure 4.

197: Please, move this paragraph up, after "Soil C...), to make it consistent with the Table 3 and Figure 4. You may want to present your data in the order you like, but it is most helpful if you follow some logical order: first physical, then chemical, within the chemical, macro, micro, etc.

The SWR paragraph in the Results section has been moved as suggested.

226: Discuss the implications on your results of having an unbalanced design for exposure. Insolation is normally an important factor in affecting soil processes.

We appreciated the comment about the impact of exposure to solar radiation (insolation) on soil processes. However, we refrain from prescribing the effect of elevational responses on soil variables to a specific mechanism or environmental driver. Instead, we have added text to the Discussion under the subsection "Soil characteristics" noting that further studies are needed to help elucidate the mechanisms driving the responses we observed. Our unbalanced design (see Table S1) would not have impacted these interpretations.

324: Here in the tables below, you should indicate somewhere that elevation is being treated as a covariate.

366: "Linear regression models". Here and in the captions of the tables below indicate what model you are using to account for the fact that you are using a group variable (fire history) and a covariate (elevation).

We now include more information about the models in our Tables 3-7, including noting that elevation was treated as a continuous covariate and fire history was a categorical grouping variable with two levels.

Reviewer 1
Thanks for the revised version of your work. I see the manuscript has been improved thus, and from my point of view, it is ready for being accepted. Sincerely

Thank you for the helpful and constructive comments.