Biogeosciences
Discussions

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Interactive comment on "Distribution of black carbon in Ponderosa pine litter and soils following the High Park wildfire" *by* C. M. Boot et al.

Anonymous Referee #1

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Overall a nice paper which will contribute to our understanding of the situation of post-fire landscapes. The experimental (fully factorial block design is nice and adds statistical power to the experiment. Some detail on already published methods section could be reduced, and I would recommend to refocus and polish the Discussion section: - "... BC incorporation processes at depth via water flow and biotic infiltration processes". I was not sure which " biotic infiltration processes" you consider.

- The attempt to relate the ratio B5AC to B6CA to "age" is not substantiated, but if you think so you should explain why you think so

- Is the last paragraph of the Discussion section necessary? "The distribution of BC on a landscape .....transport into the soils bias dissolution and translocation". It did not become clear to me how these conclusions relate to your actual results. Or are these

(admittedly reasonable) speculations, but still speculations.

Then some more minor remarks: P 16800 L1: communicate clearly and avoid ambiguous wording, such as "heterogeneous product of burned biomass", "critical component of black carbon cycle" L 10: replace "developed and implemented the BPCA method" simply with "used the BPCA method". I could not see "development" of the BPCA method. It basically reproduces an existing and published method (Wiedemeier et al, 2013). building on previous work (Rodionov et al, 2006, Brodowski et al., Glaser et al.). Adapt wording throughout the text. L15: Explain why you think that none of the post-fire BC has been incorporated to the soil L16: Please explain why you choose to use the ratio B5CA:B6CA, and why you think it can be linked to condensation, age and processing. L25: "is arguably the least understood component of terrestrial C cycle" is spurious, there are many other components (microbial etc.), which we do not understand too well yet. Rephrase.

P16801 L14: "BC particles are composed of a refractory aromatic core and a reactive, oxidized patina" – this may not always be true, especially when considering fresh char. Please rephrase. L11-20: include some more recent publications, e.g. Keiluweit et al., 2010, Wiedemeier et al., 2014 L28: surface topography and geomorphology. Specify why you think that there is a difference between the two.

P16802 L11: the list of methods is not extensive, therefore use "or" instead of "and".

P16803 L4-6: Probably you mean BC stocks and not BPCA stocks L17: Could you add the WRB names for the soils?

P16804-P16807: Shorten significantly 16808: "BPCA method validation" seems to be a simple quality check.

P16810 L6: BPCA are molecular markers, not biomarkers. L7: . . . higher proportion of more condensed BC

P16814 L20: The conclusion's section is extremely short and probably not complete.

Figure 1 Since you investigate the effect of topography, an elevation map would be more appropriate than airborne/satellite pictures.

Figure 3 Maybe separate litter visually a bit better from the two soil bars in order to guide the reader.

Table S1-S6 Remove the F-values and make sure you show what is mentioned in the caption, e.g. Table S5, B4CA:B6CA is not shown in the table.

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