

Interactive comment on “Assessing the performance of a plastic optical fiber turbidity sensor for measuring post-fire erosion from plot to catchment scale” by J. J. Keizer et al.

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General comments

Referee: The paper studies the impact of fire on soil erosion processes, focusing on sediment concentrations in runoff flow and streamflow samples at different scales, considering different erosion control treatments. Results are relevant and the objective falls within the scope of SOIL. The paper introduces the use of a novel device, a plastic optical fiber turbidity sensor, which is a new innovative tool for the study of sediment transport between soil and water bodies. Although turbidity sensors have long been used,

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the technique proposed in this study makes the experimental design more simple and the study much more relevant in a broad context. In my opinion, the study addresses soil problem within a multidisciplinary context and this is beneficial for SOIL, not only because of the introduction of new methodologies, but the study of soil processes in connection with other compartments of the ecosystem.

Authors: Thank you for your positive overall appreciation of our work

Referee: Although objectives are clearly exposed (page 452, lines 3-15), I have some concerns. My ask is: do authors want to test a new (interesting) tool so that they design an experiment or do authors want to study a problem using a new innovative tool? From the text, it looks the first option, but should be the second one. This problem affects the abstract partially and the title, which I strongly encourage to change.

Authors: In answer to your question, we wanted to test a new tool and used an ongoing field study to do so. However, we can agree that it could have been equally valid and, possibly even more interesting, to study post-fire soil erosion using our tool, comparing the erosion estimates obtained with the tool with those obtained with classical laboratory methods. Nevertheless, the sample sets that were analysed with the sensor did not cover all the runoff samples that were collected at a study site during a complete study period and, in particular, the first year after the fire. Therefore, we will duly consider a follow-up study comparing erosion estimates based on our sensor and on classical laboratory methods.

Referee: The experimental design and scientific methods are valid, although I miss some more details. In general, section 3 needs a subsection titled “Experimental design”. Some sentences are not acceptable (see page 454, lines 11-13) and need a more detailed description (see detailed comments). In general, section 3 is wordy and some parts difficult to understand.

Authors: As requested by the referee, in the revised ms we will substitute the sentence on lines 11-13 on pg 454 and add further details on the experimental set-up and on

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field data and sample collection. Furthermore, we will revise the wording of section 3 carefully and try to simplify parts that may be difficult to understand.

Referee: Authors have chosen to combine “results” and “discussion” in one section. This is not my favorite option, but I find that the final result is very good in some cases, not so in others. I mean: only three references in section 4.1.2; only two in 4.2.1; only one in 4.2.2; only one in 4.3. So, discussion, in my opinion, needs more support and a deeper review of previous literature.

Authors: We can agree with the referee that the combination of results and discussion into a single section is often a question of taste. Nevertheless, we strongly feel that combining them is the preferred option, as by the very nature of this study the discussion is strongly focussed on the results of this specific work. In other words, comparison with similar studies is typically of limited interest as these concern other samples as well as other sensors. This also explains the, admittedly, limited number of references in the referred sections.

Referee: Conclusions are correctly enounced, although I suggest grouping them in a paragraph, not

Authors: As in the case of the previous comment, we believe that the presentation of conclusions in the format of a list or in the format of running text is very much a question of personal taste. Since the other referees have not objected to the current format, we prefer to leave this section of the ms as it is.

Referee: All figures and tables are useful and necessary, although I have observed some formal deficiencies. Most of them concerning the use of capital letters, abbreviations (eg, “om” instead of “OM”) and their meaning (organic matter, not defined in the caption nor in the main text).

Authors: Thanks for pointing out some formal deficiencies in the figures and tables, which we will be glad to correct in the revised ms

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Detailed comments

Please see supplement

Please also note the supplement to this comment:

<http://www.soil-discuss.net/2/C364/2015/soild-2-C364-2015-supplement.pdf>

Interactive comment on SOIL Discuss., 2, 449, 2015.

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