

Review of manuscript SOILD-2-449-2015 (Assessing the performance of a plastic optical fiber turbidity sensor for measuring post-fire erosion from plot to catchment scale)

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General comments

This 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, 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.

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.

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 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.

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

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).

Detailed comments

Page	Line	Comment
451	4	Substitute “there remain important research gaps” with “important research gaps exist”.
452	3	“Aimed” or “aims”? I think you talk about your own study, so “aims”.
	6	Re-write: “wants to”.
	8-10	Soil texture determined in the field or by feel method? Did the authors did the test? I think this statement is not necessary and should be removed?
453	14-19	This paragraph should b emoved to methods. What is the location of study sites (add exact individual coordinates if possible)? What is the distance between them? What is the slope and aspect? What is the age of the unburnt eucalypt plantation, independently of the period without fires? Is the study catchment in the burnt area one of the previous sites, does it include some of them or completely independent?
	23	What is “ca”?
454	3	Re-write: “Polyacrylamide has” or “Polyacrylamides have”.
	11	Re-write: “instrumentation was completed”.
	11-13	This is not acceptable: has the reader to find and read four articles to know all details of experimental set-ups? Please, provide all relevant details here, including these citations if you like.
	18	So, we have 4 burnt eucalypt plantations on schists, one burnt pine plantation on schists, one long-unburnt eucalypt plantation on schist and one catchment. But: How many samples per site/catchment (if any)? Not clear in the previous text. What are the sampling dates (“the first year after the wildfire” is not enough). What is the S site (OK, in the figure, but not mentioned previously in the text)?
	24	Re-write: “filter paper”.
	25	Previously dry or field moist? May look obvious, but it is not.
456	3	In absence of a test for comparison of medians, we cannot accept some of the statements here. The same problem exists for sections 4.1.2, 4.2.1 and 4.2.2.
457	1	Re-write: “Among-site”.
462	2-24	I strongly suggest re-writing conclusions grouping all text in one paragraph, avoiding items lists.

Tables

- Table 1** Use capitals for first letters through the table.
Substitute “no. samples” with “N”.
“OM” has not been used in the main text and is not defined in the caption.
- Table 2** See coments for Table 1.
- Table 3** See coments for Table 1.

Figures

- Figure 2** Use capitals:
“Normalized ...”.
“Sediment concentration ...”.
Abbreviations in the caption do not correspond with the legend in the figures (eg, “PAM” versus “S_PAM”).
- Figure 4** Abbreviations in the caption do not correspond with the legend in the figures (eg, “CTRL” versus “S_CTRL”).
I suggest using “(slope)” instead of “_slope” or “microplot” instead of “_micro” in the legend. Legend must be re-written.
- Figure 6** You have pretty space. Why not writing “eucalypts” instead of “euc.”?
Explain why points and line for “catchment” are different.
However, I would delete points for catchment, as only function lines are represented for the rest of variables.
Is it possible to add some graphical measure of exactitude or confidence for lines?