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Biogeosciences Discussions
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Interactive comment on "Composition of eroded carbon during its journey through a tropical watershed: a clue to the question whether it is source or sink of CO_2" *by* C. Rumpel et al.

Anonymous Referee #1

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1. The manuscript is generally well written, sometimes a bit lacking the focus (e.g. introduction, see below). It is obvious that the authors are capable of writing well. However, some sentences (see below) do not make sense, which gives the impression of partly careless preparation. 2. The main study design is not clear to me. There are plots or rather investigations on different scales. It is not obvious, that larger scales actually mean longer transport and thus longer degradation time. I would like to see a figure where the sampling sites along the tributary of the Mekong can be seen, so that the reader can follow distances between sampling points. From the description it is not clear, if and how suspended sediments where sampled. Further I was wondering how the organic material is actually captured within the stream. Did you use sediment

traps? Or suspended sediment samplers? If you just used buckets, what was your measurement frequency and how can you quantify your sediment discharge (as you claim in paragraph 2.4). If you talk about transport along the watershed, do you mean within the stream? Are you talking about suspended sediments? 3. How do you know that from small to large scales there is no additional source of carbon contributing to your EOM in the stream? These new sources might have different composition. 4. The aim of a comparison of horizontal and vertical transport of EOM is not clear to me. The degradation of molecules during horizontal transport is obviously a very different process to the transport and degradation of SOC within a soil profile. In the latter case there is no detachment and transport in the sense of erosion involved. Thus, these are hardly processes which can be compared directly and even if so, I cannot see the sense, usefulness or aim of this comparison. 5. Stabilisation of EOM along the transport gradient does not necessarily mean quantitative degradation of the organic matter involved. In your title you raise the question of eroded carbon being a source or sink to CO2. But I am not so sure that your data really indicates degradation of carbon and release of CO2. Alteration of organic molecules does not necessarily means substantial loss of CO2.

Abstract: Methods and measurement design is missing. Last sentence (line 9 -12) not clear. Why would radiocarbon measurements indicate that the transformation of the soil carbon was not during pedogenesis but during transport along the watershed?

Introduction: Line 5 – 22: reads like a collection of literature results and it is not really clear what the message is. What is the aim and focus of this paragraph? Line 1 (next page): SOC transport leads to massive soil loss? Does not make sense.

Methods Line 15: Alfisols: could you also give WRB classification, please? Line 23: sentence does not make sense. The climate is marked by a study area? Paragraph 2.2 line 11: “Thus the different observation points. . .” which different observation points? How does your study design look like? Where are your observations points? Please include a figure with distances between sampling points. Paragraph 2.4: how did you

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capture sediments? Sediment traps? Suspended sediment samplers? Line 16-18: delete and just state, that you use g/m2 to compare the different scales.

Results: Line 7: different C/N: significant differences? Which test did you use? Line 12: larger scale = longer transport? Line 23 – 26: sentence not clear Last page line16: sentence? . . .illustrated by an increasing..? Line 21: initial not initially. . .

Table 1: could you give MRT in addition to C14 activities?

Figures: fonts are much too small. Not readable!

Interactive comment on Biogeosciences Discuss., 10, 18175, 2013.