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Earth Surface Dynamics Discussions

Interactive comment on "Preservation of terrestrial organic carbon in marine sediments off shore Taiwan: mountain building and atmospheric carbon dioxide sequestration" *by* S.-J. Kao et al.

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This is an interesting manuscript with data that contributes to our knowledge of terrestrial organic matter input to the ocean. It also raises a number of interesting questions about this problem. The comments below are keyed as (x,y) referring to page x and line y.

1. What exactly do "this" (181, 1) and "it" (181, 7) refer to? I think it would help if this was specifically stated. 2. The sentence "In Taiwan, . . ." (181, 21) does not appear to be a complete sentence. I think this can be fixed by replacing "where" (after the comma) with "they". If not, then the authors should make the more appropriate correction(s).

3. (181, 25) What does "They" refer to? I think it would help to specifically identify this here. 4. The sentence "To assess . . ." (183, 13) was very confusing as written. Here is a version that I think sounds better.

To assess longer-term preservation, a box core was collected by R/V Ocean Researcher-1 in September and October 2009 at station K1 (160 m water depth), located at the thalweg of the Gaoping Canyon (Fig. 1). The core was sub-sampled at different depths (Table S3).

5. If the marine sediment samples referred to on p. 186, lines 5-6 are from core K1 why is the sample size 15 (and not 3)? 6. (186, 24) – ". . . result in a linear trend . . ." (add "a"). 7. One thing that wasn't clear to me, but which I thought might be interesting/important here is how (or if) the composition and concentration of suspended river sediments varies with discharge. For example, a positive relationship such as in Fig. 2b could be obtained if the concentration of non-fossil OC in river suspended sediments is simply a constant across flow rates. But if this concentration changed with flow rate then I think you would still see a positive relationship. I have the idea that the slope and the y-intercept of a plot like the one in Fig. 2b could be used to address this question, but I haven't worked through the math. Also does the relative concentration of fossil vs. non-fossil OC change in the suspended sediments with river discharge? If this is discussed in the text, I missed it. 8. For completeness I think you might note that on p. 188, line 9 you are talking about the fraction of non-fossil OC in river suspended sediments. 9. (189, 4) – I would add a comma between "fraction" and "in". 10. (191, 21 – 24) – This long sentence seems incomplete. In particular, the phrase after the comma on line 24 seems to be missing something. 11. (191, 26-27) – Some additional explanation is needed for how this >70% preservation efficiency is obtained from the model output. 12. The discussion here only considers preservation with respect to land-to-sea transport and deposition in the sediments. It doesn't really consider losses that might occur with sediment burial and diagenesis. I think this should be mentioned and perhaps briefly discussed. 13. (193,13) – I think I understand what they are re-

ferring to here as the cause for this increase in OC burial efficiency, but I think some additional explanation might help other readers. Also, just so I'm sure of things, are they referring to burial efficiency of all OC in the sediments (i.e., the sum of marine, fossil terrestrial, and non-fossil terrestrial). 14. (193, 24) – Again for completeness (and to avoid any confusion) tell us what type of OC is being referred to here with this burial flux value. 15. In Figure 3, the symbols for the marine box core and sediment trap are too similar to make a clear distinction between the two. I would fix this. In the figure legend I would say, "River suspended sediment" (versus load) to be consistent with the rest of the manuscript. Also, are the river suspended sediment values in Fig. 3A the same values from Fig. 2A? If so, you might state this explicitly (also in Fig. 3B). 16. Fig. 3B where do all the data points for the canyon sediments come from? This relates (I think) to comment 5 above. 17. I wonder if Table S2 (and perhaps S5) should be included in the main text (versus in the Supplementary Material).

Interactive comment on Earth Surf. Dynam. Discuss., 1, 177, 2013.