

## ***Interactive comment on “Short Communication: Humans and the missing C-sink: erosion and burial of soil carbon through time” by T. Hoffmann et al.***

**J. M. Garcia-Ruiz (Referee)**

humberto@ipe.csic.es

Received and published: 27 August 2013

This paper is an excellent contribution to understand the main scientific problems that affect the carbon cycle in relation to soil erosion. The role of soil erosion on the carbon cycle is under discussion, the results depending on the residence time, the role of sediment sinks and the capacity of plant cover to recolonize eroded areas. To my opinion, this paper merits immediate publication for helping to address future research lines, not only on the carbon cycle but also (and particularly) on soil erosion. The paper is a short article with a review of the main problems, which are very well organized and discussed. I only would like a more profound presentation and discussion of the effects

C131

of soil erosion on vegetation and their possibilities to sequester carbon. Mediterranean landscapes show how soil erosion has wasted most soil (and consequently the previous C content has been stored in alluvial plains, alluvial fans and sea sediment), but plant recovery is very slow and never reaches the volume than before the period of soil erosion. Could the authors explain how this problem affects the carbon cycle in the short and the long term? On the other hand, deforestation of many environments (particularly the subalpine belt of the mountains) favours livestock grazing, which most probably accelerates the carbon cycle and probably its incorporation to atmosphere. As for the literature cited, I think the authors made a considerable effort to cite the most significant papers about the topic studied. Nevertheless, it would be possible to include a reference (and maybe a comment) to the following paper?: Lal, R., Pimentel, D. 2008. Soil erosion: A carbon sink or source. *Science* 319, 1040-1042. This paper considers, with solid arguments, that soil erosion is mainly a carbon source. Although its perspective is very partial and considers the problem mostly in the short term, I think a reference to it is necessary. Technical questions: The authors need to review the writing of the references. For instance, on page 10, line 21, please, write Germany with capital. Also, on page 10, line 41, a comma is necessary before the name of the journal.

---

Interactive comment on Earth Surf. Dynam. Discuss., 1, 93, 2013.

C132