

Interactive comment on “Australian net (1950s–1990) soil organic carbon erosion: implications for CO₂ emission and land–atmosphere modelling” by A. Chappell et al.

Anonymous Referee #2

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This is an estimate of the net amount of organic carbon lost by the continent as eroded soil material in the last decades. Such studies are very useful, due to the great uncertainty on the actual role of erosion in the global carbon cycle. The authors make simple hypotheses (that may omit more complex processes associated to the erosion-deposition process, such as associated biodegradation changes or burial), but the study benefits from important and solid datasets obtained by national reconnaissance surveys of soil erosion and soil carbon inventories. This is finally a very valuable contribution to the debate on the possible role of soil carbon erosion in the present carbon balance. I therefore consider this manuscript as acceptable for publication in Biogeoscience discussions.

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I suggest minor revisions: - More clarity on the spatial calculations is needed. How were the terms OCd and Pd (eq 2) determined at net deposition sites outside the large dust-deposition area (Figure 2 shows median net soil redistribution but we imagine that the median value hides locally net deposition and net erosion sites). The section 2.5 "Estimation of net (1950s–1990) soil organic carbon redistribution" should therefore be expanded beyond the sentence "the depositional locations to be linked to their sources". - The sum of eroded C of the net erosion pixels, and the sum of deposited C in the net deposition pixels could be added in the text to enlighten the reader and facilitate the critical reading of the data. - Unit of SOC net redistribution as a proportion of SOC stock (f in fig. 2) is apparently %·yr⁻¹.

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