

Interactive comment on “On the apparent CO₂ absorption by alkaline soils” by X. Chen and W. F. Wang

Anonymous Referee #1

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This manuscript reports on a type of arid-zone CO₂ exchange that has only recently been recognized and is still poorly understood. The authors contribute new data that appears to shed light on some of the relevant processes, and the manuscript will represent an interesting addition to the literature. However, the terminology used to describe the water exchange processes needs to be modified, and the use of English in general requires vast improvement in order for the paper to be acceptable.

In the specific comments below, I have attempted to make suggestions to improve the manuscript, with particular emphasis on the English. However, please note that there are many parts of the manuscript where the English is so poor that I could not discern the intended meaning. I strongly believe that proofreading and collaboration by a native speaker is required here.

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Page/Line

2666/02 "demonstrated to be socking away"

2666/04 "Reaction of CO₂ with moisture"

2666/04-06 The use of the term "dew", here and throughout this manuscript, seems inappropriate. Dew, and particularly "dew deposition" or "dewfall", is purely a surface phenomenon. By contrast, the authors clearly are describing hydration of the soil at depths. The authors would do well to read and cite the papers by Kosmas et al. in *Agricultural Water Management* (both Volume 36, 1998, pp 157-168 and Volume 48, 2001, pp 61-78), who have also used lysimetry to show that soil re-hydration occurs in arid landscapes, but describe this process in terms of "water adsorption" rather than dew.

2666/06 "extent to which dew"

2666/11 change "diurnal" to "daytime"

2666/13 "It is shown that the accumulation"

2666/15 "dew amounts ... have an exponential relation"

2666/15 The variable F_c has not been previously defined.

2666/20 km is not a unit of surface area (this error is repeated several times in the manuscript)

2666/21 "have comprehensive perspectives" is extremely vague and should be reworded.

2667/04 "F_c has been primarily attributed"

2667/06 Change "recommended" to "suggested"

2667/12 Change "implies" to "imply"

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2667/12 Change "implication to" to "component of"
2667/23 "km"
2667/29 "by alkaline soils on summer nights"
2668/19 "absorption that frequently occurs"
2669 2-5 This text seems quite odd, unless such a statement is specifically required by the journal (?). The use of the first person singular is inappropriate here.
2669/08 "located at the hinterland of the Eurasian Continent." This is extremely vague and should be replaced by something more helpful to the reader.
2669/11 "annual potential evapotranspiration" (?)
2669/11 "arid growing season" (?). This seems to be contradictory, since the arid season is when no growth occurs.
2669/18-21 Repeats the text at lines 2-5. Delete in one place or the other.
2670/04 "Each measurement campaign was commenced"
2670/05 Delete "value".
2670/05 The 3.5cm depth suggests that the authors are measuring water adsorption rather than purely dew.
2670/12 It does not seem appropriate to use lysimetry data from 2008 and compare them from CO₂ efflux data from 2006 (previous page).
2671/06 "modulator" is not a verb (but is used as such both here and elsewhere in the manuscript).
2672/01 Change "diurnal" to "daytime"
2672/10 "On clear days"

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2672/11 "the increase ... became obscure". Here, the meaning is obscure. I cannot imagine what verb the authors meant to use here.
2673/18 "concluded" is too strong a word here, particularly since dew deposition is not clearly the process being described.
2673/23 Neither of the papers cited here reported events of acid rain, but only speculated about the effect that they *would* have.
2675/03 "the underlying mechanisms"
2679 Figure 1. The figure shows "amounts", whereas the caption suggests that it shows evaporation and accumulation (which would be related to the time rate of change of the amount). This should be made consistent. Furthermore, some of the data show negative "amounts" of dew. This has no clear meaning and should be corrected.
3683 Figure 5. The variable F_x (in the caption) is not described. The variable "dew" should be replaced with a single symbol, perhaps with an appropriate subscript.
2681 Figure 3 conveys very little information indeed. All of these scatter plots appear to be "shotgun blasts", and no correlation is evident.

Interactive comment on Biogeosciences Discuss., 11, 2665, 2014.

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