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Hydrology and Earth System Sciences Discussions

Interactive comment on "Soil Infrastructure, Interfaces and Translocation Processes in Inner Space (Soil-it-is): towards a road map for the constraints and crossroads of soil architecture and biophysical processes" *by* L. W. de Jonge et al.

Anonymous Referee #2

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Soil infrastructure, interfaces and translocation processes in inner space (soil it is): towards a road map for the constraints and crossroads of soil architecture and biophysical processes.

This is an interesting article where the authors review data on various soil processes and how these relate in particular to organic matter content, providing evidence for critical organic matter contents for soils. The review of the data in this way are cer-

tainly worth publishing and may offer new insights and ideas for further research. I do have however got some problems with the opening paragraphs of this article where the authors relate their findings to self-organization of soils without a proper description of what this entails. As far as I can see self-organization of soils is a concept which stimulates research but as of yet without real evidence to support it beyond the long established feed-back mechanism in soil processes. Hence I am not convinced by the statements the authors make relating to thresholds for self-organization. Without evidence for self-organization or a precise definition of this you can not introduce thresholds for self-organization. Moreover, in my opinion, relating this work to self-organization isn't required and only confuses the reader: the results are nicely presented without relating to this concept. My suggestions to the authors is therefore to either strengthen the description of self-organization or to delete reference to this in the paper.

Specific comments: Your refer to the soil it is 'concept', 'approach', 'vision' and 'phenomena'. Clearly the inconsistent usage of such phrases doesn't help the reader trying to understand.

P 2635. 14. I disagree that we only have an empirical knowledge on how soil behaves. 2636. 9-14. what do you mean with functional architecture? Is there something like non-functional architecture? I reckon all architecture is functional in soil. Please also explain why this is a 'prerequisite'

2636 17. 'fails to support self-organization'. I do not understand this statement. If there is such a thing as self-organization (and the authors haven't introduced their definition) then why does this mean that when soil organizes to a new equilibrium this is no longer self-organized. I think the authors are confusing sustainable with self-organized.

2637.lin 5. Please define soil infrastructure Line 8. I can't see how you can have thresholds for self-organization. I accept that it may evolve to a new, possibly undesirable equilibrium, but is that a threshold for self-organization?

Section 2: self organization: If the authors decide to keep the reference to self-organization, I suggest that they elaborate this section and are far more specific in particular in relation to the processes they subsequently describe. At the moment they cite a theoretical concept but do not provide evidence for the self-organization; it is therefore difficult to see how you can discuss thresholds for self-organization. As indicated previously, I do not believe that the authors need this constant reference to self-organization in their article.

2640 line 11. Again, I do not understand what a collaps of self-organization is and how you can provide evidence for this.

P 2641. I would like to see s.e. with these data in stead of approx. signs.

P 2642 line 5. the Dexter concept may give a measure for this, but I don't think it explains.

P 2642 line 16. How can self-organization be under thread? I can see that it moves away from a desirable equilibrium.

2644 line 17. Why would this structure be more complex? What is a more complex structure? Line 26. the relationship isn't linear; it is non-linear! Your graph displays the LOG of the relationship which is linear indeed.

Equation 9: the units don't make sense; are adsorbed solids not in g cm-3?

Fig. 1. I don't think that the extrapolation of the regression line is acceptable. No evidence for the lower levels, and insufficient evidence to assume it is linear over the entire region.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 6, 2633, 2009.