

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 #3

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General comments This paper presents the concept of the soil-it-is programme. The main thrust of the paper is that soil is a self-organising system and it aims to relate physical and chemical parameters to the dynamics of structural generation. I believe that the systems perspective that is promoted here is an important one and I applaud the authors for highlighting the importance of the interaction between physical, chemical and biological processes as a driving factor. However, the paper falls short of its potential contribution because of vagueness (and occasional inaccuracy) in some of

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the terminology and in the description of the new synthesis. The paper seems to review a lot of rather old results and does not make clear exactly what is the "new paradigm". A major deficiency of the work is the bias towards soil chemistry and the almost total lack of any discussion of biological processes in soil which are known to play a very important role in affecting physical properties and structure. There is a lot of discussion about surrogate measures of structural complexity, and very little mention of direct measures of soil structure.

Specific comments The concept of self-organisation is introduced on line 6 p2636 in an incomplete manner. When it is first introduced, it is important to be precise about what the concept actually means for soil.

The new concept is not properly articulated on line 11 page 2637. Can the authors explain clearly what exactly is new here?

In line 25 p2639 why are physical/chemical interactions key? Earlier on it is claimed that biophysical processes are central to self-organisation.

It is claimed in line 11 of page 2640 that the loss of clay binding implies loss of higher-level organisation. I don't agree with this conclusion. Piles of sand or rice are self-organising and yet there are no particle bonds at all.

The units of organic carbon are missing when it is first introduced in line 20 of page 2640

Section 3.3 would benefit from highlighting what is new here. At present it comes across as old ideas dressed up in a vague new concept.

Dp and Do are not defined when they are introduced in line 15 p2644

In line 3 of page 2645, structure is said to mimic a sieved soil. This implies a length scale (of sieving) above which structure is important. Can the authors clarify why this is the case, and what is the length scale?

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In section 4.1, can the authors explain the logical link between water repellency and the overall self-organisation concept? This part does not link well with the rest of the paper.

Could the authors rewrite section 5 to clarify the roadmap? At present it articulates what the map must do, without clearly providing one. Figure 14 really doesn't explain anything to me a least.

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