SOIL Discuss., 1, C283–C289, 2014
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SOIL Discussions
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Interactive comment on "Editorial "The Interdisciplinary Nature of SOIL"" *by* E. C. Brevik et al.

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Received and published: 6 December 2014

Reviewer 2 Comments

The editorial could still emphasize the interdisciplinary nature in a much wider sense than just the natural and environmental sciences. While there is clearly a tension between introducing a new journal for the wider soil and natural science community and global soil-related issues, this could be solved much better by identifying the role of soil for the challenges faced by humanity in the 21st century (food security, climate, land tenure,: : :) in the introduction, followed by short chapters on the topics of SOIL listed on the webpage (Soils and plants; Soils and water; Soils and atmosphere;: : :) and highlighting their relevance for the global issues identified above, including a

short identification of research gaps. This would explain the position and focus of the journal and the need for further, holistic, research. Following "big" soil topics would also show much more clearly why SOIL is actually required in the journal landscape. Based on the identification of these relevant topics, the editorial could then conclude with an outline of the mentioned "interdisciplinary framework to understand soil", may be even amended with a figure illustrating the proposed new perspective on soil (and of SOIL).

Response: Changes in wording have been made in several parts of the manuscript to better bring out the broad interdisciplinary aspects. Above and beyond the natural and environmental sciences, we have provided examples from the social sciences (i.e., anthropology, economics, and sociology), engineering, and the medical sciences. We do not feel it is possible to cover every single one of the topics listed on the journal webpage within its own section and keep this editorial appropriately brief. We also have a conflicting recommendation from reviewer 1 that we should cut some of the current sections out of the paper as opposed to adding more, as suggested here. The middle ground seems to be keeping the current sections that address together all the "topics of soil". We think we have strong and as succinct sections now after revising them. We would also like to note that we have full review papers appearing in the first issue that will, between them, cover all of the topics listed on the webpage.

1. Abstract and Introduction: the focus on the natural sciences is too narrow for the 21st century meaning of interdisciplinary work.

Response: Wording has been added to the abstract and introduction to expand the fields explicitly mentioned beyond the natural sciences.

2. Introduction: the comparison of soil scientists and SOIL with people like Leonardo da Vinci is a bit ambitious, especially in the light of the narrow interpretation of interdisciplinary research.

Response: Wording in the paper has been reworked to highlight potential contributions

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from fields beyond the natural/environmental sciences.

3. Some text is repetitive, e.g. in lines 10 to 15 of the first page.

Response: The section has been reworded to eliminate the repetitiveness.

4. The topical sections (2 to 8) should match the topics identified on the webpage (Soils and plants; Soils and Water; Soils and Atmosphere;: : :.) linking the editorial to the scope of the journal and explaining it.

Response: Each of the sections contains information on one or more of the topics identified on the webpage, and between them the sections cover all the topics. Space limitations preclude separate sections in this editorial for each topic.

5. Each topic (sections 2 to 8) is relevant, but the texts read much like an introduction to these topics in a text book for undergrads. The connection to key global issues (food security,...), an explanation of the relevance of soils in these issues and the importance of each specific topic is largely missing in each of these sections. The order of the sections also appears arbitrary, for example "Threat to Soils“ would seem to be the most important than to me. The selection of topics is also arbitrary, for example no mention of soil information is made, which for many global and development issues is the most relevant at this stage.

Response: Referrals to key global issues were added in the different sections to make the links clearer for the reader. We wish to note that this is not a review paper and thus the sections are not meant to be a comprehensive summary of current knowledge. There was no intent to rank topics in some order of importance as we believe all topics are equally important.

We assure the reviewer that there was nothing arbitrary about the order of the sections. Sections 2-4 focus primarily on some of the links between soils and natural sciences. There are more soils/natural science sections than there are other sections; it is also true that more work has been done in this area than has been done looking at links

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between soils and social sciences, medical sciences, etc. Section 5 focuses on links between soils and the medical sciences, which also forms a bridge between the natural sciences (upon which the medical sciences are based) and the social sciences (which are very important to modern medical sciences as well). Section 6 focuses on connections between soils and social sciences. Section 7 discusses the ways that threats we encounter in the natural environment, threats created by human activity, also create social challenges, providing aspects of both the natural and social sciences. And finally, Section 8 addresses how a topic many would likely view as a traditional soil science subject is in fact interdisciplinary in its nature, and how continued investigation of the topic can fit into SOIL if the interdisciplinary aspects are brought forward. Wording has been added to the Introduction to make this structure clear, as the reviewer's comments indicate it was not clear.

6. Some chapters need more structure and a conceptual outline, for example chapter 2 and 4 are quite long and the rationale for what is presented remains unclear. Some sort of concept linking back to the scope of SOIL structuring each topic would be helpful.

Response: Two sentences have been added to the Introduction to clarify the logic behind the structure of the editorial. Most of the sections have also received varying degrees of rewriting in an attempt to address this comment.

7. The referencing between sections chapters varies strongly, without explanation.

Response: Some references have been added and some have been dropped to help address this concern.

8. If citing papers to illustrate the relevance of a topic, some numbers would be useful to put a process/property in perspective.

Response: It would have been useful if the reviewer would have provided some examples of what they meant by this. There are many references to many ideas in this paper, where did the reviewer think numbers would be useful to put things into perspective?

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9. Some sections, like 4 on "Soil and Water“ go into much detail, others don’t.

Response: Rewriting to various degrees has been done to all of the sections to have a better balance between the sections.

10. Section 4 wavers between research history and results, but lacks a new message. Talking about hydrophobicity, but ignoring results e.g. of the recent research on fire effects on soil hydrophobicity illustrates the far too narrow focus of the editorial.

Response: This section has been rewritten to bring some broader perspectives to the section as opposed to just the very detailed or narrow focus.

11. Section 5, 7 and 8 are very short compared to the others and lack major topics, one could think of e.g. the "One Health“ initiative worth mentioning because it aims at linking environmental, animal and human health.

Response: All sections are between $1\frac{1}{2}$ and $2\frac{1}{2}$ double spaced pages in the Word draft, most are between 2 and $2\frac{1}{2}$ pages. They were each given similar space in the article, and space was utilized as was felt necessary to address each topic.

A brief discussion of the One Health Initiative has been added to Section 5.

12. Section 6 is fairly long, but still does not achieve what it wants to illustrate: the patterns of land use described there are not social, but simply illustrate that farmers knew how to match soil and crop, which is largely independent of societal structure (if one ignores some recent "-isms"). Mentioning the potential to work with "socioeconmists“ reads a bit like an attempt to get an interdisciplinary element in the text. This should happen much earlier and not by simply merging every non-natural scientist into one group. This just underpins the problem of the authors connecting soil to a community outside the natural sciences.

Response: The earliest history of agriculture likely involved humans favoring and domesticating desired plants that naturally grew in the regions they lived in (Bronson, 1977). Furthermore, it is known that environmental conditions, which include soils, in-

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fluence social, cultural, and economic development (Wagner, 1977). These references go back 37 years, which we would not consider "recent". The food and agricultural cultures that developed in any given region were dependent on the soils and climate of the region and the crops that would grow in them. Therefore, we do not see Section 6 as simply illustrating that farmers knew how to match soils and crops. The soils have a major part in determining the crops that could be grown, and that in turn affected the cultures and economies that developed. Some additional wording has been added to this section to clarify this.

References Bronson, B. 1977. The earliest farming: Demography as cause and consequence. In: Origins of agriculture. C.A. Reed (ed). Walter de Gruyter, Berlin. p. 23-48.

Wagner, P.L. 1977. The concept of environmental determinism in cultural evolution. In: Origins of agriculture. C.A. Reed (ed). Walter de Gruyter, Berlin. p. 49-74.

13. The relevance of soil in war would probably fall more into the topic of food security, the examples given here are part of strategic geography or military environmental engineering, but do not consider soil as a substrate for plants etc., but just whether a horse or tank can move on it.

Response: There is no question that soils have food security relevance as relates to war. However, food security is a link that many soil scientists and others in related fields would probably already readily arrive at and fall within the traditional soils-agricultural area. Also, a true interdisciplinary perspective on soils needs to go beyond just soil as a substrate for plants etc. The examples given in this section move into areas we are not as certain would readily come to mind for many. The soils and war example given here is, as the reviewer acknowledges, taking the soils topic into the realms of geography (which is a social science) and engineering (which is not a natural or environmental science). Hence, the way we approached this discussion of soils and war is actually an example of moving beyond the natural sciences, which should satisfy

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some of the reviewer's desire to see that broader perspective come forth in this editorial and hopefully in SOIL in the future.

14. Section 8 illustrates a problem of the text: it remains unclear why soil structure is actually an important research topic beyond soil science, e.g. for climate, food security etc. Some new findings and research gaps are listed, but the need for interdisciplinary research is not explained.

Response: To be an appropriate topic for SOIL, the research doesn't have to be the application of soil science to other fields. It could be research that focuses on the use of knowledge and principles from other fields to advance soil science; that does also qualify as interdisciplinary research. The soil structure section does demonstrate this, and some minor rewording has been done at the beginning of this section to hopefully make this clear. Furthermore, we would argue that tying soil structure studies to research areas such as hydrology and erosion, soil microbial dynamics, biogeochemical cycles, degradation studies and conservation measures, and greenhouse gas emissions should demonstrate to most people with knowledge of soil science that there are ties to topics such as food security and climate issues (areas explicitly mentioned by the reviewer).

15. The conclusions should give some hint what and how "holistic research" should look like and how SOIL wants to contribute.

Response: There is some rewording in the conclusions to bring this out, and in particular to make it clear that this interdisciplinary vision goes beyond just soils and natural/environmental science connections.

Interactive comment on SOIL Discuss., 1, 429, 2014.