

Interactive comment on “Uncertainty indication in soil function maps ndash; Transparent and easy-to-use information to support sustainable use of soil resources” by Lucie Greiner et al.

Lucie Greiner et al.

lucie.greiner@agroscope.admin.ch

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Response to

Interactive comment by W. Towers on “Uncertainty indication in soil function maps - Transparent and easy-to-use information to support sustainable use of soil resources” by Lucie Greiner et al.

We thank Willie Towers for his valuable feedback, we refer to the comments below and to adjustments in the manuscript.

C1

RC = referee comment

AR = authors response

P = page

L = line

General Feedback

Comment 1

RC: The paper relies heavily on the output from the DSM exercise which models data from 418 data points in the study area (170 square kilometres). From my experience this study area is data heavy - over 2 observations to a metre depth per square kilometre. Are these data from a specific grid survey or does it represent the density of observations across Switzerland? This poses the question of whether this approach can be replicated across larger areas to the same degree of detail.

AR: The DSM approach is described in detail in Nussbaum et al. (2017).

Soil organic matter for 50-100 cm depth was available for 418 data points in our study area. We tried to clarify this sentence, see supplement (manuscript P9L11). For other soil properties there were more data points. The region is indeed data heavy and the approach cannot be replicated to larger areas to the same degree of detail. We propose to include this fact in the limitations-section in the conclusions, see manuscript P21L23 ff. in the supplement.

Comment 2

RC: The DSM appears to have been conducted independently of soil type; what was the reason (s) for this?

AR: Soil function assessment methods are based on soil properties and Nussbaum et al. (2017) aimed at generating soil property maps. We now emphasize this fact in the manuscript P8L8, see supplement.

C2

Comment 3

RC: The study area is a curious shape. It would have been beneficial if it had been a river catchment or an administrative area and was it chosen, at least in part, because of data availability?

AR: Several project partners within the Swiss National Research Programme "Soil as a resource" (www.nrp68.ch) worked in the presented study area. The curious extent of the study area is due to criteria, which had to be met covering the needs of the project partners. Beside other criteria, the area had to be covered by APEX Swiss Earth Observatory Network (www.seon.uzh.ch) flights, which gathered spectroscopic data. We shortly explain the extent in the manuscript P4L5 ff., see supplement.

Comment 4

RC: The DSM was carried out using soil legacy data for which no detail is provided. The paper would benefit from some information on the age, purpose and the attributes within these data; it would make the paper more transparent and the reader would understand the opportunities and limitations of such data. Are they still fit for purpose? Don't worry, it is an issue for soil science everywhere!

AR: We agree and provide some detail in the manuscript P8L15 ff., see supplement and refer to Nussbaum et al. (2017) for more detail.

Comment 5

RC: Use the term 'sub-functions' throughout, they are not the high level functions.

AR: Corrected, see supplement.

Comment 6

RC: Some figures are very good e.g. Figures 4, 6 and 7 whereas others are too small (3, 5) and do not encourage scrutiny and I would suggest screening out the areas that are not assessed (mainly forestry) on Figure 1.

AR: We enlarged Figures 3 and 5, see supplement, and would want to visualize settlements and forests in the study area, even though not assessed, for a better overview in Figure 1.

C3

Comment 7

RC: Table 1 stretches across two pages and much of the title would be better as a footnote below it.

AR: Changed.

Comment 8

RC: I appreciate the problem but some sections are quite difficult to read as they are 'acronym heavy' e.g. Section 2.4. The use of acronyms for the models and their outputs add to this but I cannot suggest a better way I'm afraid.

AR: We agree, used descriptions instead of acronyms only, structured parts of section 2.4. and hope, this facilitates reading, see manuscript P10L10 ff.

Feedback in manuscript

P1L23

RC: Soil functional assessment? This needs spelled out as many readers might only read the abstract.

AR: Corrected, see supplement.

P2L12

RC: Reference should also be made EU Soil Thematic Strategy to demonstrate their policy and societal relevance.

AR: We agree and included the reference in the manuscript P2L16 ff., see supplement.

P3L22

RC: Figure 1?

AR: Corrected.

P3L26

C4

RC: variable
AR: Corrected.

P3L28
RC: growing season?
AR: Corrected.

P3L29
RC: *The study area is a very contrived shape; has it been chosen because of data availability? A catchment or administrative area would have been more appropriate.*
AR: See response to comment 3.

P6L12
RC: *It is a little unusual to refer forward in a paper.*
AR: That is true. We deleted the reference. It could be more confusing than helpful and it is not necessary to understand Table 1.

P9L4
RC: *Does this really involve that much computing capacity? 4 variables in 418 data points.*
AR: See response to comment 1, we tried to clarify the misunderstanding of 418 data points and included the number of raster cells in our study area in the manuscript at P9L17, see supplement.

P10L17
RC: *This paragraph is quite difficult to follow and 'digest'. Indeed the paper has a lot of acronyms throughout.*
AR: See response to comment 8.

Reference

C5

Nussbaum, M., Walthert, L., Fraefel, M., Greiner, L. and Papritz, A.: Mapping of soil properties at high resolution in Switzerland using boosted geosadditive models, SOIL , 2017, 1–32, doi:10.5194/soil-2017-13, 2017.

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