

## ***Interactive comment on “Development of a harmonized soil profile analytical database for Europe: A resource for supporting regional soil management” by Jeppe Aagaard Kristensen et al.***

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Development of a harmonized soil profile analytical database for Europe: A resource for supporting regional soil management

The authors are grateful for the comments provided on the manuscript by Anonymous Referee #1, to which we propose the following replies:

Comment 1: Abstract and elsewhere: Avoid using ‘demonstrated’, rather use shown or illustrated  
Response: noted and amended throughout

Comment 2: 88: but (change to) → in which data from Europe are extracted from . . .

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Response: done

Comment 3: 150: Hannam et al (2009) refers to an unpublished report. Should at least add the URL: Response: thank you for this. URL added to reference

Comment 4: 156-157: undertook a scrutiny → assessed the . . . Reponse: done

Comment 5: 197: URL does not work. Similarly, the EU SPADE 14 database does not seem to be accessible (<https://ec.europa.eu/knowledge4policy/dataset/jrc-esdac-114> and <https://data.europa.eu/euodp/data/dataset/jrc-esdac-114>), but its availability may be considered a prerequisite for publishing this manuscript. Similarly, the landing page for the dataset is non-operational (<https://esdac.jrc.ec.europa.eu/content/spade-14>)  
Response: URL and landing page on ESDAC updated and now operational. Also available on EU Data Portal. URL in text modified to reflect access point in ESDAC.

Comment 6: 199: ‘stakeholder passivity’, probably true, but should this be phrased as such in this manuscript? Response: phrase removed

Comment 7: 200: The manuscript would benefit from a succinct description of these guidelines/or predefined equations. Response: Description of guidelines and equations are provided in subsequent text. For example, see 212  
Comment 8: 211: ‘before publication’, according to the website these are ‘provisional data’ and the associated URL does not work (see above). Response: Final data now available through url

Comment 9: 233: Add abbreviations for texture classes in text (as used in 242-249), e.g. <2um (TEXT2) etc. Alternatively, do these functions need to be defined here at all? Response: abbreviations added

Comment 10: 264: publishing SPADE-14 database. As indicated, not accessible online at the time of this review. 265-270: Response: Now accessible online

Comment 11: 274: The number of 1831 profiles for SPADE 18 is not consistent with Table 2 (1819). Based on a rough calculation, this would amount to some 0.4 profile per 1000 km<sup>2</sup>. 289: Please explain how this would lead to ‘a substantial improvement

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in the accuracy of . . .'. How would this be quantified? Response: sentence redrafted to remove the issue of accuracy

Comment 12: 295: See comment. Database in preparation still? Response: unclear. Full Level 2 database is still being developed. Is comment referring to work of GSP and open access? If so, see edits to conclusion.

Comment 13: 342-354: This calculation gives a capacity, but does not consider whether there are any physical or chemical constraints for growth of specific crops, which would limit the effective 'capacity' (see e.g. <https://doi.org/10.1016/j.geoderma.2018.02.046>). Response: No, physical and chemical constraints were not considered – this is simply an example to show how the SPADE database can be used, in this case just for the root zone capacity.

Comment 14: 360: Commonly, a correction for the occurrence of coarse fragments (> 2mm) is considered in such calculations (<https://www.soil-journal.net/3/61/2017/soil-3-61-2017.pdf>). Is this the case for line 371-372. Response: It was not, thanks for pointing this out. It is now corrected.

Comment 15: 396: This confirms the need to consider the full map unit (STMU) composition in such types of assessments. Response: Agree

Comment 16: 417: Should add <http://dx.doi.org/10.1371/journal.pone.0169748>. Response: Hengl 2017 added as reference.

Comment 17: 421: Actually, it has: <http://dx.doi.org/10.1371/journal.pone.0169748>. Response: Text amended

Comment 18: 243: At global level, using pedotransfer rules (interim update to HWSD), see <http://dx.doi.org/10.1016/j.geoderma.2016.01.034> Response: We are not sure what is intended with this comment(?). Comment 19: 424-430: Not correct as written; should rephrase this. GSM and SoilGrids (now at 250m see above) are not related to the development of the HWSD, rather initiated in realisation of the need to improve on

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"conventional soil maps" using automated dsm procedures. Response: Thanks for this clarification. Text rephrased.

Comment 20: 430: Not really possible as written. HWSD v1.2 was published in 2012. As such it cannot be based on the 'SPADE dataset described in this' manuscript. Response: Text amended to make reference to original HWSD

Comment 21: 444, 446, 450: replace demonstrated by shown or illustrated. Response: done

Comment 22: 454: Alternatively, the increasing predictive capability and accuracy of digital soil mapping approaches should be indicated. Possibly, also make a reference to soil data collection /monitoring efforts such as LUCAS. Consideration of proximally derived soil data in future work other recent developments re. pedology-based and digital soil mapping (<https://doi.org/10.1111/ejss.12790>). Response: Text added to recognise the contribution of LUCAS and precision farming. Reference to LUCAS Soil added.

Comment 23: Figure 1. See 2018, SPADE 18 this paper. The dataset does not seem to be available from JRC ESDAC (<https://esdac.jrc.ec.europa.eu/resource-type/soil-point-data>); searching for 'SPADE 18' gives not results at all. Response: Figure will be amended to show 2019 as this paper. Data now online. Comment 24: As such, the conclusions could be couched in terms of 'desirability of gaining free access (CC-BY) to profile data collected using public funds'. –: In my view, some discussion on 'data sharing', and desirability of open access (CC-BY) to profiles collated using public money, should be included in the discussions as a 'way forward'. See also: <http://dx.doi.org/10.5194/essd-9-1-2017> and <https://doi.org/10.1016/j.grj.2017.06.001>. Possible synergies with the work of the GSP P4 & P5? Response: New section added to conclusion addressing these issues

Comment 25: Remove the PTF regressions. Response: we prefer to maintain the regression equations in 242-250

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