

***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Comment 3: 150: Hannam et al (2009) refers to an unpublished report.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 km². 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

“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 al. 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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