

Reply to reviewer 2 (Anonymous):

We thank the reviewer for his positive comments about WoSIS and his specific comments. The latter have been addressed below (sub AR, author responses) in the order they appear in the reviewer's (RC) comments.

The revised manuscript, which also incorporates our responses to Reviewer #1, will be uploaded separately.

RC1: 'Small methodological changes (e.g. progress in identifying standardized analytical methods) from prior version accompanied by substantial increase in holdings by approximately 100k additional profiles. Question: do authors consider that outreach by ISRIC or the prior ESSD publication have had positive influence on number of soil profiles? If so, they should give credit?'

AR1: By its nature, WoSIS is a compilation of datasets provided by many organisations worldwide for the greater benefit of the international community, for which we are grateful. Many of these datasets themselves are compilations of soil profiles described/analysed by a multitude of persons and institutes. In practice, it has proven unfeasible to consistently list/acknowledge all these 'persons/contributors' individually. Hence, to the best of our knowledge/ability, we acknowledge and thank the dataset providers in a generic sense (see: <https://www.isric.org/explore/wosis/wosis-contributing-institutions-and-experts>). In general, more specifics may be found in the corresponding databases and related technical bulletins.

RC2: 'Not sure what ESSD expects but this reader would have expected complete narrative (e.g. through section 10 Acknowledgements) followed by references followed by Appendices.'

AR2: We have structured the various section as indicated on the 'Manuscript composition' page of the Journal. Please see https://www.earth-system-science-data.net/for_authors/manuscript_preparation.html

RC3: 'Page 1 line 12 and repeated instances throughout: Please standardize capitalization of elements/nutrients. E.g. here we find: carbon, Nitrogen, Phosphorus. Later (page 7 lines 21, 22) we find: carbon, nitrogen, Phosphorus. If soil data community uses a standard capitalization scheme, please apply it. Otherwise, please apply your own scheme consistently.'

AR3: This was also observed by reviewer 1 and has been corrected (made consistent) in the text.

RC4: 'Page 1 line 15: what does "aggregates" mean in this context? The term does NOT appear anywhere else in the manuscript so this reader does not see justification nor explanation for its use here.'

AR4: Thanks, the word aggregate has been removed.

RC5: 'Page 2 line 11: "800 thousand" write in numeric or text format but not both.'

AR5: Indeed, quite awkward; this has been corrected.

RC6: 'Page 2 line 17: "soil spectral libraries" What is a 'spectral' library? No information provided."

AR6: This is a commonly accepted term in soil science; the two references cited provide details. Basically, soil spectral libraries consist of 'proximally-sensed (e.g. VNIR or NIR (near infrared)) spectra for a given series of soil samples analysed using commonly used (wet-chemistry) methods for each property'. For clarification, the text has been rephrased as follows:

Ultimately, WoSIS aims to provide consistent harmonised soil data, derived from a wide range of legacy holdings as well as from more recently developed soil datasets derived from proximal-sensing (i.e. using soil spectral libraries, see Terhoeven-Urselmans et al., 2010; Viscarra Rossel et al., 2016), in an interoperable

RC7: 'Page 7 line 10: "duplicates with the least comprehensive component of attribute data" should use the hyphenated phrase 'least-comprehensive'? Page 9 lines 7,8: "laboratory-specific measurement uncertainty for a single method, respectively multiple analytical methods, requires several measurement" something missing or awkward here? Page 14 line 8: "196 thousand" please fix this unacceptable hybrid notation Page 14 line 10: increase holding by notification, recruitment, outreach? This sentence sounds too passive. Page 14 line 11: "increasingly consider data derived by soil spectroscopy" here the authors intend to reference IR spectroscopy and related laboratory methods? Some clarification needed for non-specialists in soil chemistry. Does this also apply back at page 2 (see comment above).

AR7: The various typos have been corrected; we also used a 'more active' phrasing for the data acquisition work, keeping in mind that many data providers are still unable to share (some) of their data due to existing license or other restrictions.

Re. Page 9 lines 7,8: added 'will' for clarification.

Re. 'p14, line 11': rephrased as:

The second WoSIS snapshot provides consistent, standardised data for some 196,000 profiles worldwide. However, as described, there are still important gaps in terms of their geographic distribution as well range of soil taxonomic units and soil properties represented. These issues will be addressed in future releases, depending largely on the success of our targeted request and searches for new data providers and/or partners worldwide.

Re. spectral methods, please see clarification above.

RC7: 'Page 14 lines 11, 12: "long-term time series at defined locations" Some time series stations must exist in the collection to date? How would the authors define minimum time span and suitable data quality? What parameters might users need to find such stations? Does the current database in fact offer sufficient information to allow a user to find a time series station? If not, future addition or identification of these time series stations will require additional database field/parameter?'

AR7: As indicated, so far there are no time series in the standardized set as most observations come from routine soil surveys. Hence, the indication in the manuscript that time-series sets are being sought. Once available (shared), such observations can easily be referenced by their location

(X,Y), depth of sampling (upper and lower limit), soil property (with methods and units of measurement) as well year/date of observation (for monitoring round).

RC8: 'The Appendices prove very useful. As mentioned above, would rather see them at the end. Distinguish between those Appendices that represent standard on-going features (definitions) used in the database (e.g. Appendix A) and those that will update with future reports / snapshots (e.g. Appendices C, D)?'

AR8: As indicated, the structure of the manuscript is according to ESSD's guidelines. The range of properties considered for standardization is scheduled to increase (App. A) with each snapshot (e.g. soil nutrient, soil biology); similarly, the actual number of observations (App. C and D) will substantially change with each subsequent version of the snapshot.