Recommender 2 review

Answer to the recommender review

Changes in the text

essd-2025-418 "Soil information and soil property maps for the Kurdistan region, Dohuk governorate (Iraq)"

Bellat et al.

Review by Anonymous Referee #2, 14 Nov 2025

This manuscript focuses on regional digital soil mapping in Iraq, using 532 soil samples and 85 covariates to produce soil maps via machine learning. While the modeling approaches are generally appropriate, the work falls short in two critical aspects: (1) Limited Geographical Scope: The investigated region is quite small. Consequently, the resulting dataset has limited implications and applicability for the broader scientific community, despite its location is in Iraq. (2) Limited Novelty: The modeling framework adopted is standard practice in digital soil mapping and lacks significant methodological novelty. Given these limitations, specifically the dataset's limited scope and the conventional nature of the modeling, this work does not meet the high standards for originality and impact required for publication in Earth System Science Data.

We sincerely appreciate the time referee 2 took to read the preprint and highlight the adapted modelling approach in our paper. The reviewer identified two critical aspects of our preprint.

1) Indeed, the studied area (2,280 km2) is “relatively small” regarding other datasets available in ESSD. However, in other case, regional to local data are also available (e.g. Lorenz et al., 2021; Ardizzone et al., 2023; Błaszczyk et al. 2024). We do think that high-quality regional datasets are necessary to feed and improve other larger datasets. Furthermore, as referee 2 expressed, data on the Iraq region are critically lacking. No regional data set – from any kind of observations - is available on Iraq in the whole *ESSD* (accessed on 14/11/2025). We do think that underrepresented regions of the globe do need and deserve high-quality, standardised data, as the one proposed in this paper and, more generally, in *ESSD*. Qualitative data presented in the preprint (soil classes map) is also hardly expendable at a large scale, as regional patterns can not always be transposed. Finally, the comparison with the *SoilGrid.2.0* product used in the study also highlights the poor quality of such global products when dealing with local problems. Henceforth, we do think a high-quality local dataset is needed and would also demonstrate the scientific interest of major reviews, such as *ESSD*, for a scientifically under-studied country.

2) When mentioning the lack of novelty in the approach, we do understand the criticisms of referee 2, as no “new” method is developed. However, we do think the novelty lies in the combination of known techniques and our unique pipeline/workflow. This study is fully reproducible from the sampling strategy to the final map produced. By combining the sampling strategy, campaign results, FTIR and laboratory measurements, FTIR model predictions, and DSM models, we propose a unique new approach inspired by Malone et al. (2022) but never applied in real conditions at a regional scale.

We do hope that these answers will incite referee 2 to reconsider the reasons for our application to *ESSD* journal.

References used:

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Citation: https://doi.org/10.5194/essd-2025-418-RC2