

Dear Editor,

Thank you for reviewing the revised manuscript and evaluating the reviewers' feedback on our responses and the modifications applied to the manuscript. Please find our point-by-point response to the reviews below this letter and the revised version of our manuscript uploaded.

With regards,
Authors

ANSWER FOR ANONYMOUS REFEREE #1

Dear Referee #1,

Thank you for evaluating the revision of the manuscript and providing further recommendations. Please find our answers below, following your suggestions. The changes applied to the manuscript text are highlighted in blue. Line numbering indicated as, e.g., "RL30" refers to the line number 30 in the revised manuscript with track changes.

COMMENT 1:

In the first paragraph of the introduction, the authors should be more precise. The increased availability of data is not related to the proposal of the Soil Monitoring Law . However, the increased importance of soils in different policy agendas takes place within the EU Green Deal which had an important impact. Just read the document of Montanarella et al (2021) on the importance of soils in the EU Green Deal. That impact had an effect in increased availability of soil data. Of course, LUCAS and other open accesses large scale datasets have been pioneer in this trend.

ANSWER 1:

Thank you for the information, we have corrected the sentence accordingly in RL30-32:
"The availability of raw and derived soil datasets, specifically soil hydraulic data, has increased significantly in Europe over the last 10 years as a results of [the European Green Deal through initiatives and strategies aimed at promoting sustainable land use, soil health, and environmental protection \(Montanarella and Panagos, 2021\).](#)"

COMMENT 2:

L51: you can also add the harvest cycle among the factors.

ANSWER 2:

Thank you, it has been added in RL52.

COMMENT 3:

In table 6, why mean (or median values) are not mentioned? Can you please explain how you calculate the Weighted rank?

ANSWER 3:

Table 6 follows the logic of tables showing the prediction performance (Tables 7, 10-14.) and therefore it includes error metrics. The following description on weighted rank has been added under Table 6 in LR317-319:

****Rank based on the Kruskal-Wallis test, 1 denotes the best performing method.***** Sample-number-weighted average results of the Kruskal-Wallis test.

COMMENT 4:

Table 9. Is it possible to bring the USA units (the Sharpley and Williams) in the metric system? This will allow to compare the results.

ANSWER 4:

Yes, we have highlighted in the caption of Table 9 that K values are provided in both U.S. Customary Unit ($\frac{t \cdot arce \cdot h}{hundreds\ of\ acre \cdot foot - tonf \cdot inch}$) and SI Unit ($\frac{t \cdot ha \cdot h}{ha \cdot MJ \cdot mm}$) in RL417-418, and edited the table to make it more evident that the results of both methods are given in the table in both units:

Table 9. Descriptive statistics of soil erodibility factor values computed with the Sharpley and Williams (1990) and Renard et al. (1997) equations on the topsoil samples of the EU-HYDI dataset (N = 11,287) provided in U.S. Customary Unit ($\frac{t \cdot arce \cdot h}{hundreds\ of\ acre \cdot foot - tonf \cdot inch}$) and SI Unit ($\frac{t \cdot ha \cdot h}{ha \cdot MJ \cdot mm}$).

Method	USLE K factor in different units						
	Unit	Min	Max	Range	Mean	Median	Standard deviation
Sharpley and Williams (1990)	$\left(\frac{t \cdot arce \cdot h}{hundreds\ of\ acre \cdot foot - tonf \cdot inch}\right)$	0.00	0.48	0.48	0.27	0.27	0.09
	$\left(\frac{t \cdot ha \cdot h}{ha \cdot MJ \cdot mm}\right)$	0.000	0.063	0.063	0.036	0.035	0.012
Renard et al. (1997)	$\left(\frac{t \cdot arce \cdot h}{hundreds\ of\ acre \cdot foot - tonf \cdot inch}\right)$	0.05	0.33	0.29	0.24	0.27	0.09
	$\left(\frac{t \cdot ha \cdot h}{ha \cdot MJ \cdot mm}\right)$	0.006	0.044	0.038	0.032	0.035	0.012

With regards,
Authors

ANSWER FOR DIANA VIEIRA

Dear Diana Vieira,

Thank you for reviewing our responses and the modifications applied to the manuscript. Your suggestions helped us significantly improve our manuscript.

With regards,
Authors