

Interactive comment on “Soil organic carbon stocks are systematically overestimated by misuse of the parameters bulk density and stone content” by Christopher Poeplau et al.

Anonymous Referee #1

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Dear Editor,

In the submitted manuscript, Dr. C. Popleau and co-authors compared four methods to calculate the soil carbon stocks and quite easily demonstrated that three of them overestimated from 2 to 10% the carbon content. Moreover, in stony soils, the overestimation was up to 100%. They used the German Agricultural Soil Inventory dataset to test the calculation method.

GENERAL COMMENTS Since soils represent the largest carbon reservoir of the terrestrial ecosystems, its correct estimation is essential to model the interactions between the pedosphere and the vegetation and predict the effects of climate change on ecosystems. The manuscript addresses an important topic which surely falls within the

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scopes of SOIL. The problems highlighted by the authors are not new to the scientific community however, probably for the first time, different methods of soil carbon stock calculation were compared by application to a common dataset therefore allowing to quantify the bias introduced by each of them. The manuscript is well structured, objectives are clear and methods are sound. The results are well supported by the data. I therefore recommend acceptance after some minor corrections are made.

SPECIFIC COMMENTS Add something about soil classification, to which soil types do the soils belong to? Since you have 2350 sites, give at least some general information on more common soil types and parent material. Why did you choose to select the soils with a SOC <8.7%? Or is this this 8.7% the maximum SOC value of the selected plots? Table S1. Try to sort the data and indicate the land use type: Forest, Cropland, Grassland. Based on this classification, you can then derive if the overestimation of soil C stock was prevalent in a certain land use type. Maybe one of the four calculation methods was used more frequently in a certain land use type? Check if this is feasible. lines 107-108: why statistical analyses were not conducted? I'm not sure I understood, rephrase the sentence or explain in a different way. Or delete it if not pertinent with the rest of the manuscript.

TECHNICAL CORRECTIONS *line 70: delete "where identified". *line 79: list the terms in the order they appear in the equation. i.e. SOC stocki, SOC con fine soil, etc. *lines 95-101: I would suggest not to repeat the equations which were already reported in the page before, but to cite them instead. *Figure 1: add a top x axis title "Volumetric stone classes".

Interactive comment on SOIL Discuss., doi:10.5194/soil-2016-78, 2016.

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