Biogeosciences Discussions

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Reply on CC1

Mercedes Román Dobarco et al.

Author comment on "Mapping soil organic carbon fractions for Australia, their stocks, and uncertainty" by Mercedes Román Dobarco et al., Biogeosciences Discuss., https://doi.org/10.5194/bg-2022-207-AC1, 2022

Dear Barnon,

Thank you for your comments and encouragement! We are glad that researchers from different disciplines give input for this paper. We try to clarify your concerns below:

1. The reviewer is right to ask how the values of the uncertainty for a spatial aggregate (here, by biome) would have been obtained. The uncertainty of a spatial average or total is not the average of the uncertainty at all points in the aggregate (as it is for the mean values), because this would lead to unrealistically small values of uncertainty since errors within the aggregate would cancel out. To obtain the uncertainty of a spatial aggregate, one need to account for spatial autocorrelation of map errors using, for example, a correlation function of the residuals and block kriging of the error. In Table 3, however, we do not report uncertainty estimates, but only the summary statistics of the calibration points by biome. The standard deviation values refer to the standard deviation of the observed SOC fraction data. We will clarify this in the revised manuscript.

2. You are right, a comparison with the previous SOC fraction products (Soil and Landscape Grid of Australia v1) (Viscarra-Rossel et al., 2019) is missing. We will incorporate a comparison between the three maps in the revised version of the manuscript. Both products used different datasets and mapping methodologies, so we expect to see broad differences.

Viscarra Rossel, R. A., Lee, J., Behrens, T., Luo, Z., Baldock, J., & Richards, A. (2019). Continental-scale soil carbon composition and vulnerability modulated by regional environmental controls. Nature Geoscience. https://doi.org/10.1038/s41561-019-0373-z

The comparison between previous and current versions of bulk SOC maps has been done in a separate paper (Wadoux et al., under review), but we mention it briefly in the discussion.

Kind regards,

Mercedes