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Interactive comment on "How will organic carbon stocks in mineral soils evolve under future climate? Global projections using RothC for a range of climate change scenarios" *by* P. Gottschalk et al.

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In their paper "How will organic carbon stocks in mineral soils evolve under future climate? Global projections using RothC for a range of climate change scenarios" Pia Gottschalk and co-authors provide estimates on future mineral soil carbon stocks for different climate scenarios and world regions.

Two points in their study may need further attention. First, it seems that carbon in NPP is considered to equal C input to soil (section 2.5). While this may correctly

approximate conditions in natural ecosystems, managed ecosystems are characterized by a substantial organic matter export mainly as harvest (e.g. Schulze et al. 2009). Given that currently ca. 12% of the global land area of ca. 13.4 Gha is cropped and ca. 26% used as pastures, the role of carbon exports needs to be addressed or, in case I misunderstood, the procedure of how inputs were derived from NPP data needs to be explained in more detail. In addition, the RothC model simulates the upper 0.3 m of soil. According to which assumption were NPP model-based C inputs distributed within the soil profile?

Second, for the year 1970 global SOC contents (0-0.3 m) were derived from RothC equilibrium runs in reverse mode to match SOC stocks as published in the literature. How do the corresponding C input rates calculated by RothC compare with those of the scenarios using Image or Miami NPP? Ideally, the latter models would give similar inputs to soil as RothC for the pre-1971 period.

Reference Schulze, E. D., Luyssaert, S., Ciais, P., Freibauer, A., Janssens, I. A., Soussana, J. F., Smith, P., Grace, J., Levin, I., Thiruchittampalam, B., Heimann, M., Dolman, A. J., Valentini, R., Bousquet, P., Peylin, P., Peters, W., Rodenbeck, C., Etiope, G., Vuichard, N., Wattenbach, M., Nabuurs, G. J., Poussi, Z., Nieschulze, J., and Gash, J. H.: Importance of methane and nitrous oxide for Europe's terrestrial greenhouse-gas balance, Nature Geoscience, 2, 842-850, 10.1038/ngeo686, 2009.

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