

SOIL Discuss., referee comment RC2
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Comment on soil-2020-84

Anonymous Referee #2

Referee comment on "Middle Bronze Age land use practices in the northwestern Alpine foreland – a multi-proxy study of colluvial deposits, archaeological features and peat bogs" by Sascha Scherer et al., SOIL Discuss., <https://doi.org/10.5194/soil-2020-84-RC2>, 2021

General comments: The manuscript is concise and professionally written with clearly defined research objectives. Overall, the data supports their conclusions and I think the paper will make a nice contribution to the journal. The paper is highly interdisciplinary, but I believe it contains enough soils data for publication in SOIL. The concentration of heavy metals, PAHs, and urease enzymes along with their spatial distributions in soils should be of general interest to soil scientists/soil researchers as these all have applications outside of the pedoarchaeology/geoarchaeology subdiscipline. The morphology of the soils is also adequately describe/classified, and along with the numerical age control and micromorphology, should be of considerable interest in soil genesis.

The paper is well edited, and the number of figures and tables seems appropriate.

Since SOIL is an international journal it would be nice to see these soils keyed out using the U.S. soil taxonomic system. Perhaps not all the way to the family level but at least to the great group.

While the limited discussion of the geochronology is appropriate for this type of publication, I do have a few general comments:

OSL dating of colluvial/slope wash deposits is often problematic due to incomplete bleaching and short transport distances. Scatter in equivalent dose distribution plots from such contexts typically show a significant number of high-dose rate grains making accurate age determinations difficult. I would be interested in learning more about how the dose rate was determined considering many of the samples were collected from soil horizons near stratigraphic boundaries. The paper does a good job of acknowledging this fact and the independent age control provided by the ^{14}C dates suggests that a number of the luminescence dates are in fact true depositional dates. The two dating methods do not align perfectly but they are in the correct stratigraphic order and overlap enough to show that colluvial deposition likely took place during the BA. The influence of plowing on the luminescence signal in ABR SA2 is particularly intriguing, and I think could be an interesting avenue of future research.

Concerning the radiocarbon chronology, while the summed probability density of the calibrated ages is compelling, the sample population is relatively small and consequently, the shape of the SPD plot is likely related (at least partially) to the shape of the calibration curve. The 400 BC radiocarbon plateau (Hallstatt plateau), although post bronze age, is particularly problematic and may be responsible for the peak in the SPD. Just a note of caution when interpreting the summed distributions.