

Interactive comment on “Black carbon contributes to organic matter in young soils in the Morteratsch proglacial area (Switzerland)” by E. Eckmeier et al.

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This novel paper contributes to our knowledge of soil BC, as it is the first to quantify BC in soils developing in areas of recent deglaciation. In one proglacial area in Switzerland, 35 surface soil samples were studied (<2 mm fraction), from 3 to 140 years exposure. Characterization of samples was comprehensive, including C, N, O, H and BC (by BPCA) plus ESEM on three samples with density <1g cm⁻³. Results show considerable scatter, as expected from a field study. The scientific work is sound and the conclusions justified. This work again demonstrates the ubiquity of BC in soils of this region, with likely attribution to a mixture of sources. The work is also of general interest for soil development in glacial forefields. However, as noted below, the manuscript could present the results more effectively, and thus improve its impact.

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Methods. Section 2.1, l. 10-15 talks about a pioneer plant *Oxyrietum digynae*, but this plant is not mentioned in the list of plant communities below Table 1. Similarly, larch/stone pine forests are noted as typical climax vegetation, first after 150 y and then after about 77 y. However, this vegetation type does not seem to be present in the study area.

Results. Section 3.1, l. 14-22. Since the Corg concentrations are closely related to vegetation types, it would be very helpful to the reader to use different symbols in Fig. 2 for at least the main vegetation types. Types 5, 6 and 7 are only represented by one site each, so perhaps could be combined if clutter is too great. Also, it would be helpful to include the ash data in Table 2. One question – did you examine the effect of using Corg (ash free) for Fig. 2, or are they all about the same ash content?

Results. Section 3.2, l. 10. Do you have any insight as to why samples AS6 was so high?

Discussion, l. 18-20. It is difficult for the reader to remember everything. Please put the numerical code for these two vegetations types in brackets after each one.

I much appreciate data for N and C/N, but there is no discussion of these results. Many of the values are very low, indicating old OM; also, what is the impact of N-fixing plants such as alder? Of course the focus of the paper is BC, but it also is of considerable general interest for soil development following deglaciation.

Editing points

Section 2.2, l. 1. ten topsoil samples

Table 2. It would be useful to add “<2 mm” in the caption; also consider adding ash.

Fig 2. As noted previously, use different symbols/colours for the vegetation types.

Figures 4 and 5. Specify whether outlier AS6 was included. Also, while results in Fig. 4 are not analyzed statistically, it would be useful to include the number of samples in

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each category under the time of exposure along the x axis. Related to this, what about ordering Tables 1 and 2 by years of exposure? This is much more useful to the reader than their original field or lab codes.

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