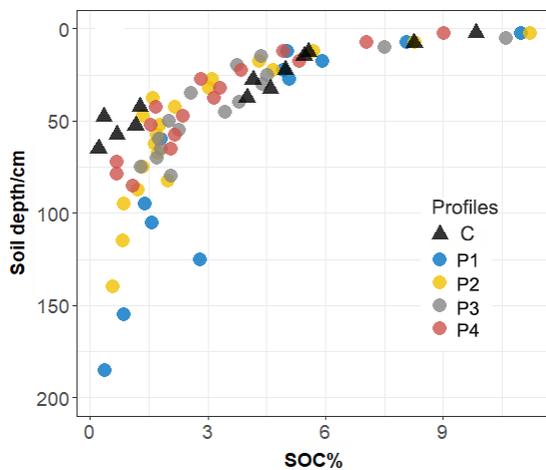


1 **Support information**

2 *S1 - Identification of buried soil layers*

3 We combined the depth profile of SOC contents, soil weathering degree, and field
4 investigation to diagnose the buried soil layers. The Rb/Sr ratio was applied as a proxy
5 for chemical weathering intensity since both elements fractionate during the weathering
6 processes due to their different chemical behavior. Because of the relative inertness of
7 Rb compared to Sr, a higher ratio of Rb/Sr indicates a higher degree of soil weathering
8 and higher age (An et al., 2018). The SOC contents (Fig. S1) of P1 for 95-125 cm, P2
9 for 65-85 cm, P3 for 50-65 cm and P4 for 55-70 cm depth layers were higher than at
10 the corresponding depths of the control profiles (C). In addition, relative higher
11 weathering degree was also observed for the depth layers with higher SOC contents
12 (except for P4) (Rb/Sr ratios, Fig. S2). In combination with the field investigation (Fig.
13 S3), we interpreted these layers as buried A horizons.

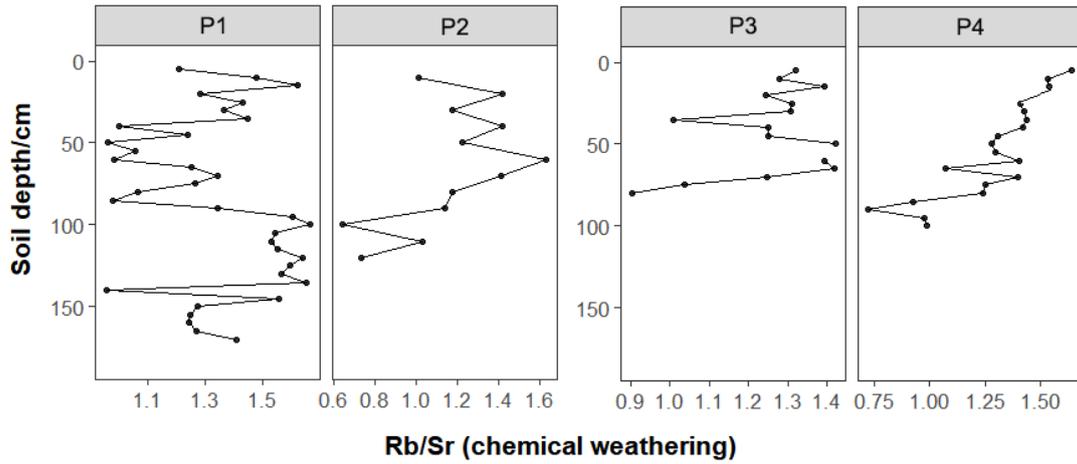


14

15 **Fig. S1** Depth profile of SOC concentration (%). C=control profiles, P1-P4 are sampled terraces
16 from the trench.

17

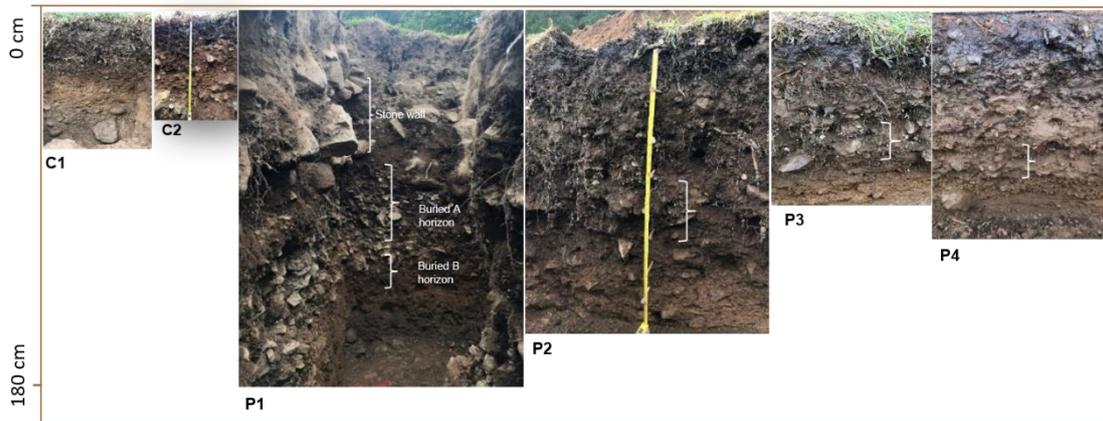
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19

20 **Fig. S2** Chemical weathering degree indicated by Rb/Sr ratio (An et al., 2018). Wider ratios indicate
 21 a higher degree of chemical weathering, interpreted in this study with the burial of former topsoil
 22 (which is generally more weathered than corresponding subsoil).

23



24

25 **Fig. S3** Photographs of soil profiles in the field were used as a supplement to diagnose the buried
 26 soil layers.