

**Table S1 Measured data of soil organic carbon amount and quality and bulk density (g cm<sup>-3</sup>)**

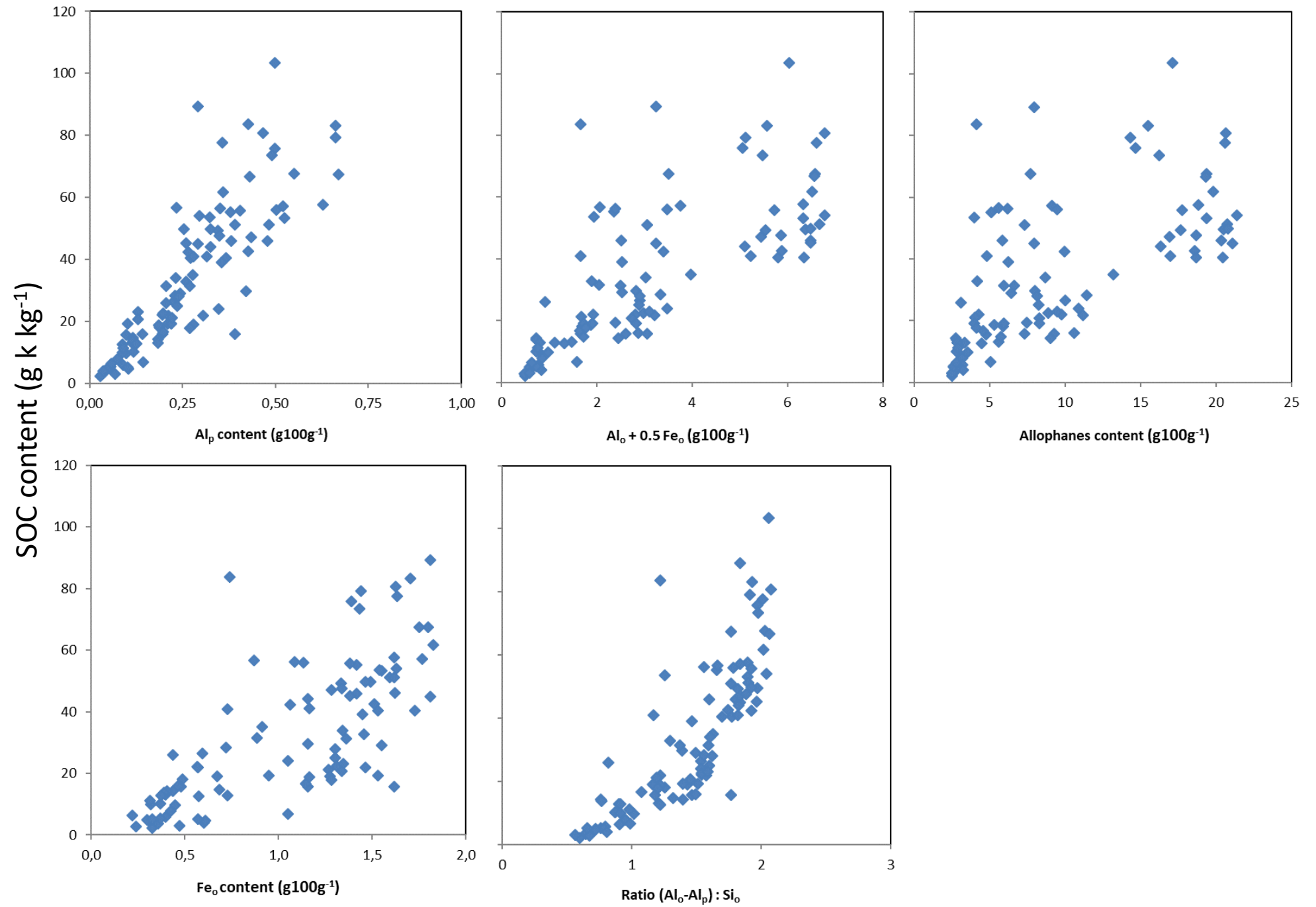
Depth	C content (gC kg <sup>-1</sup> soil)		C/N		Bulk density		C stock (Mg C ha <sup>-1</sup> )	
	mean	<i>sd</i>	mean	<i>sd</i>	mean	<i>sd</i>	mean	<i>sd</i>
0-20	62.6	22.9	12.54	1.15	0.71	0.13	73.3	36.7
20-40	51.5	20.9	12.66	1.16	0.73	0.14	53.8	26.8
40-60	41.7	24.4	13.17	1.01	0.79	0.18	49.4	32.3
60-80	33.3	19.9	13.80	1.17	0.79	0.16	42.5	21.3
80-100	31.6	21.3	14.22	1.11	0.83	0.21	49.7	38.9
100-120	27.6	17.9	14.36	1.45	0.88	0.19	37.6	28.4
120-140	24.7	16.3	13.91	2.33	0.92	0.18	36.1	22.4
140-160	19.4	28.2	13.77	1.63	0.94	0.20	30.7	24.7
160-180	18.5	16.3	13.81	2.18	0.96	0.17	39.1	23.9
180-200	18.8	19.2	14.58	1.58	1.01	0.21	46.8	35.1

*n*= 10 for C content, C :N and bulk density until 160-180 cm, *n*=9 for 180-200 cm and *n*=3 for C stocks; *sd*= standard deviation

**Table S2 Measured data of ammonium oxalate extractable Al, Si, Fe (Al<sub>o</sub>, Si<sub>o</sub>, and Fe<sub>o</sub>) and of sodium pyrophosphate extractable Al, Si, Fe (Al<sub>p</sub>, Si<sub>p</sub> and Fe<sub>p</sub>)**

Depth	Al <sub>o</sub> (g kg <sup>-1</sup> soil)		Al <sub>p</sub> (g kg <sup>-1</sup> soil)		Fe <sub>o</sub> (g kg <sup>-1</sup> soil)		Fe <sub>p</sub> (g kg <sup>-1</sup> soil)		Si <sub>o</sub> (g kg <sup>-1</sup> soil)		Si <sub>p</sub> (g kg <sup>-1</sup> soil)	
	m	<i>sd</i>	m	<i>sd</i>	m	<i>sd</i>	m	<i>sd</i>	m	<i>sd</i>	m	<i>sd</i>
0-20	27.9	16.4	4.4	1.5	13.0	4.6	1.3	0.7	13.4	6.9	5.6	0.3
20-40	27.5	16.1	3.6	1.6	12.7	5.1	0.9	0.6	13.4	6.3	5.5	0.2
40-60	28.3	19.1	3.4	1.3	11.5	5.1	1.0	0.8	14.4	7.4	5.6	0.4
60-80	27.4	19.6	2.7	1.6	11.4	5.4	0.6	0.6	14.5	8.1	5.5	0.2
80-100	26.9	20.2	2.5	1.3	10.4	4.8	0.7	0.9	14.7	8.7	5.5	0.3
100-120	25.3	19.7	2.2	1.1	9.9	4.9	0.5	0.7	14.1	8.4	5.5	0.2
120-140	24.4	20.5	2.1	1.3	9.2	5.2	0.5	0.6	14.1	9.2	5.4	0.2
140-160	21.8	19.6	1.7	1.3	8.4	5.1	0.4	0.5	13.2	8.7	5.5	0.1
160-180	20.2	20.7	1.4	1.0	8.8	5.2	0.1	0.1	12.7	9.4	5.4	0.2
180-200	21.6	21.1	1.5	1.2	9.1	5.0	0.3	0.6	13.2	9.6	5.5	0.1

*n*=10 except for 180-200 cm depth, *m*=mean, *sd*= standard deviation



**Table S4 Soil water content with depth and with their spectral cluster. P-value express results from t-test between samples from the two cluster classes (Welsh, two sided alternative). For a given cluster, means followed by the same letters do not differ significantly at p=0.05.**

Water content g H <sub>2</sub> O 100g <sup>-1</sup> soil	All		Cluster A		Cluster H	
	Mean	Sd	Mean	Sd	Mean	Sd
0-20	55.1	14.2	56.8	14.2	46.2	10.4
20-40	59.3	26.5	63.0	28.3	45.9	11.9
40-60	52.8	11.5	56.4	10.1	42.4	9.0
60-80	50.6	11.7	54.4	10.0	39.2	8.4
80-100	50.2	17.6	56.1	17.3	36.2	7.6
100-120	51.4	18.5	58.8	17.4	35.9	8.8
120-140	44.6	14.5	51.6	13.4	33.3	7.5
140-160	45.3	17.4	56.8	13.5	35.1	13.8
160-180	43.4	22.8	56.2	27.5	32.5	8.5
180-200	47.8	29.4	61.1	20.4	38.5	31.6