

Supplemental material

Table S1 Physicochemical properties of soils at eight study sites.

Site	Horizon	Depth (cm)	pH		Particle size distribution ^a (%)			Total C (g kg ⁻¹)	Total N (g kg ⁻¹)	C/N ratio	CEC/ Clay (cmol _c kg ⁻¹)	Exchangeable cation (cmol _c kg ⁻¹)			Base saturation ^c (%)
			H ₂ O	KCl	Sand	Silt	Clay	Base ^b	Al	H					
C1	A	0–10	3.5	3.3	45	8	47	30	2.5	12	26	1.3	4.5	2.6	16
	BA	10–25	3.7	3.6	41	7	51	12	1.1	10	14	0.7	3.8	1.3	12
	Bt1	25–50	4.0	3.8	29	7	64	7	0.7	9	17	0.6	3.0	0.6	14
	Bt2	50–75+	4.0	3.7	28	6	67	6	0.7	8	32	0.6	2.4	0.7	16
C2	A1	0–10	4.2	3.9	40	5	55	19	1.6	11	15	2.3	2.3	0.7	43
	A2	10–20	4.2	4.0	39	6	54	14	1.1	12	11	1.6	2.5	0.7	33
	Bt1	20–35	4.8	4.3	29	4	68	9	0.9	11	10	1.8	0.9	0.7	52
	Bt2	35–50	4.3	4.3	25	4	70	7	0.6	11	9	1.1	1.5	0.3	38
	Bt3	50–80+	4.9	4.7	23	3	73	6	0.6	9	9	1.7	0.4	0.4	69
C3	A	0–3	5.0	4.4	27	8	65	32	3.6	9	21	3.9	1.5	0.8	63
	BA	3–20	5.1	4.3	27	7	66	8	1.0	8	19	0.6	0.8	0.6	31
	B1	20–40	5.4	4.8	27	7	66	4	0.5	7	14	1.9	1.5	0.6	48
	B2	40–60	4.9	4.4	23	7	70	4	0.5	8	15	1.5	1.1	0.4	49
	B3	60–85+	5.1	4.5	23	5	72	3	0.4	7	12	2.7	1.1	0.3	66
I1	A	0–5	4.2	3.4	42	31	27	36	2.3	16	48	1.2	6.7	1.8	7
	BA	5–20	4.1	3.7	45	31	24	11	0.9	13	35	0.8	5.5	1.7	6
	B1	20–37	4.1	3.8	43	33	24	7	0.6	11	35	1.1	5.7	2.4	7
	Bt	37–70	4.1	3.8	39	34	27	4	0.4	8	33	0.8	4.6	2.7	6
	BC	70+	4.2	3.8	34	25	40	3	0.4	8	34	0.9	6.7	0.8	6
I2	A	0–5	4.0	3.9	52	25	23	23	1.6	14	37	2.2	3.0	2.7	20
	BA	5–25	3.8	3.8	49	27	24	4	0.5	9	26	0.8	3.9	2.2	7
	B1	25–40	4.0	3.8	43	30	27	4	0.5	7	19	0.8	4.8	1.7	7
	Bt	40+	4.3	3.8	34	35	31	2	0.4	6	16	1.0	7.0	0.7	6

I3	A1	0–2	4.9	4.0	7	21	72	41	3.5	12	28	2.6	1.1	1.7	48
	A2	2–10	4.9	4.0	8	26	66	17	1.6	11	27	1.3	1.2	1.5	33
	B1	10–25	4.9	3.9	8	24	68	14	1.2	11	25	1.3	1.7	1.4	30
	B2	25–40	5.0	3.9	9	23	68	11	1.0	11	23	3.0	1.5	1.2	53
	B3	40–60+	5.2	4.0	8	23	69	11	1.0	11	28	3.7	0.9	1.2	63
M1	A	0–9	3.7	3.0	15	46	39	62	4.0	15	56	1.4	4.4	3.2	15
	BA	9–25	4.0	3.4	15	43	42	13	1.2	11	31	0.4	3.9	1.4	7
	B1	25–35	4.1	3.5	19	35	47	8	1.0	8	25	0.3	4.0	1.4	5
	B2	35–68	4.2	3.6	28	26	47	5	0.7	7	28	0.3	3.6	1.1	6
	B3	68–85+	4.3	3.7	11	33	56	3	0.7	5	31	0.4	3.9	1.1	7
M2	A	0–8	4.2	3.6	2	53	45	30	2.5	12	22	1.0	3.7	1.7	15
	BA	8–22	4.3	3.7	1	52	47	11	1.3	9	16	0.6	3.2	1.4	11
	B1	22–45	4.2	3.6	1	51	48	5	0.6	7	14	0.3	2.8	1.4	7
	B2	45–70	4.3	3.6	1	53	46	3	0.7	5	16	0.3	2.9	1.1	6
	B3	70–85+	4.3	3.7	1	53	46	2	0.6	4	15	0.3	2.8	1.0	6

Data in C1 and C2 were from Shibata et al. (2017). Data in I1 and I2 were from Fujii et al. (2011). The other data were to be submitted.

^a Clay, <0.002 mm; silt, 0.002–0.05 mm; sand, 0.05–2 mm.

^b $\text{Ca}^{2+} + \text{Mg}^{2+} + \text{K}^+ + \text{Na}^+$

^c $(\text{Ca}^{2+} + \text{Mg}^{2+} + \text{K}^+ + \text{Na}^+) / (\text{Ca}^{2+} + \text{Mg}^{2+} + \text{K}^+ + \text{Na}^+ + \text{Al}^{3+} + \text{H}^+)$