

Supplementary material

Table A1 Average OC stocks (av.), standard deviation (s.d.), coefficient of variation (CV) and minimum detectable difference (MDD, n = 100 samples, $\alpha = 0.05$, $\beta = 0.2$; value in parenthesis is percentage of average stock) of OC stocks for individual soil layers. Left-hand data refer to definite soil volumes, as the soil samples were taken by depth increments. Values to the right were calculated for a definite soil masses per unit area. Average soil mass per soil layer were chosen according to weight intervals.

Soil layer	OC stocks per unit area by volume				OC stocks per unit area by equivalent soil masses			
	OC stocks		Soil layer	OC stocks	Soil layer	OC stocks	Soil layer	OC stocks
	av.	s.d.						
m ³	kg OC m ⁻²	%	kg OC m ⁻²	kg soil m ⁻²	kg OC m ⁻²	%	kg OC m ⁻²	
<i>Hainich, Germany, deciduous forest, 51°04'N, 10°27'E, 800mm, Eutric Cambisol</i>								
<i>Oi</i>	0.73	0.27	37	0.09 (12)				
<i>Oe</i>	0.43	0.23	54	0.08 (19)				
0-05	2.33	0.41	18	0.13 (6)	0-39	2.31	0.45	20
.05-.10	1.81	0.38	21	0.12 (7)	39-88	1.82	0.39	22
.10-.20	2.78	0.53	19	0.17 (6)	88-205	2.76	0.49	18
.20-.30	1.92	0.46	24	0.15 (8)	205-332	1.91	0.45	24
.30-.40	1.35	0.49	37	0.16 (12)	332-455	1.30	0.46	35
.40-.50	0.93	0.54	58	0.18 (19)				
.50-.60	0.77	0.56	72	0.18 (23)				
<i>Hesse, France, deciduous forest, 48°40'N, 07°05'E, 820mm, Stagnic Luvisol</i>								
<i>Oi</i>	0.29	0.07	26	0.02 (7)				
<i>Oe</i>	0.30	0.23	77	0.08 (27)				
0-05	1.16	0.28	24	0.09 (8)	0-42	1.15	0.33	28
.05-.10	0.94	0.17	18	0.06 (6)	42-96	0.96	0.22	23
.10-.20	1.57	0.30	19	0.10 (6)	96-212	1.56	0.36	23
.20-.30	1.21	0.30	25	0.10 (8)	212-338	1.20	0.35	29
.30-.40	0.85	0.28	33	0.09 (11)	338-476	0.87	0.33	38
.40-.50	0.57	0.24	43	0.08 (14)				
.50-.60	0.41	0.19	46	0.06 (15)				
<i>Soroe, Denmark, deciduous forest, 55° 29'N, 11° 38'E, 660mm, Gleyic Cambisol</i>								
<i>Oi</i>	0.27	0.08	29	0.03 (11)				
<i>Oe</i>	0.35	0.20	57	0.07 (20)				
0-05	1.93	0.49	25	0.16 (8)	0-39	1.93	0.61	32
.05-.10	1.71	0.52	30	0.17 (10)	39-88	1.73	0.64	37
.10-.20	2.56	1.09	42	0.35 (14)	88-197	2.55	1.23	48
.20-.30	1.59	0.90	56	0.29 (18)	197-331	1.61	0.81	50
.30-.40	0.95	0.52	54	0.17 (18)	331-477	0.90	0.30	33
.40-.50	0.60	0.27	44	0.09 (15)				
.50-.60	0.48	0.25	52	0.08 (17)				
<i>LeBray, France, coniferous forest, 44°43'N, 0°46'E, 900mm, Anthric Ortsteinic Podzol</i>								
<i>Oi</i>	0.63	0.36	58	0.12 (19)				
<i>Oe+Oa</i>	2.41	1.40	58	0.45 (19)				
0-05	1.71	0.46	27	0.15 (9)	0-44	1.72	0.55	32
.05-.10	1.65	0.52	32	0.17 (10)	44-98	1.68	0.62	37
.10-.20	3.64	1.08	30	0.35 (10)	98-212	3.49	1.13	32
.20-.30	2.95	1.02	35	0.33 (11)	212-345	3.02	1.21	40

.30-.40	2.33	1.07	46	0.35 (15)	345-491	3.25	1.52	47	0.49
.40-.50	1.91	1.34	70	0.43 (23)					
.50-.60	1.60	1.41	88	0.46 (29)					
<i>Laqueuille, France, grassland, 45°38'N, 02°44'E, 1313mm, Umbric Andosol</i>									
0-05	3.03	0.45	15	0.15 (5)	0-23	3.01	0.29	10	0.09
.05-.10	3.45	0.36	10	0.12 (3)	23-58	3.40	0.35	10	0.11
.10-.20	5.17	0.65	13	0.21 (4)	58-136	5.18	0.63	12	0.20
.20-.30	4.10	0.63	15	0.20 (5)	136-215	4.07	0.61	15	0.20
.30-.40	3.16	0.76	24	0.25 (8)	215-293	3.12	0.72	23	0.23
.40-.50	2.33	0.79	34	0.26 (11)					
.50-.60	1.88	0.95	50	0.31 (17)					
<i>Bugac, Hungary, grassland, 46.8 °E 18.9°, 500mm, Eutric Arenosol</i>									
0-05	2.87	0.49	17	0.16 (6)	0-40	2.85	0.67	23	0.22
.05-.10	2.39	0.48	20	0.16 (7)	40-101	2.32	0.49	21	0.16
.10-.20	2.63	0.80	31	0.26 (10)	101-255	2.66	0.82	31	0.27
.20-.30	1.31	0.42	32	0.14 (10)	255-414	1.33	0.41	31	0.13
.30-.40	0.98	0.36	37	0.12 (12)	414-573	1.02	0.35	35	0.11
.40-.50	1.00	0.40	40	0.13 (13)					
.50-.60	1.06	0.44	42	0.14 (13)					
<i>Easter Bush, UK, grassland, 55° 52'N, 3°10'W, 890mm, Stagnic Cambisol</i>									
0-05	2.03	0.29	14	0.09 (5)	0-46	2.00	0.27	14	0.09
.05-.10	1.69	0.25	15	0.08 (5)	46-107	1.70	0.25	15	0.08
.10-.20	2.98	0.38	13	0.13 (4)	107-240	2.95	0.37	13	0.12
.20-.30	2.63	0.41	15	0.13 (5)	240-376	2.52	0.43	17	0.14
.30-.40	1.32	0.42	32	0.14 (10)	376-518	1.37	0.38	28	0.12
.40-.50	0.88	0.28	32	0.09 (10)					
.50-.60	0.85	0.30	35	0.10 (13)					
<i>Carlow, Ireland, cropland, 52°51'N, 6°54'W, 804 mm, Eutric Cambisol</i>									
0-05	0.97	0.25	26	0.08 (8)	0-43	0.98	0.16	17	0.05
.05-.10	1.01	0.20	20	0.07 (6)	43-88	1.03	0.17	16	0.06
.10-.20	2.15	0.40	19	0.13 (6)	88-184	2.17	0.36	16	0.12
.20-.30	1.86	0.36	19	0.12 (6)	184-286	1.71	0.42	24	0.14
.30-.40	0.82	0.56	68	0.18 (23)	286-386	0.89	0.50	56	0.16
.40-.50	0.50	0.32	64	0.10 (21)					
.50-.60	0.40	0.20	50	0.07 (16)					
<i>Gebesee, Germany, cropland, 51°06'N, 10°55'E, 470mm, Haplic Phaeozem</i>									
0-05	1.28	0.16	12	0.05 (4)	0-54	1.29	0.09	7	0.03
.05-.10	1.47	0.13	9	0.04 (3)	54-124	1.50	0.07	4	0.02
.10-.20	3.02	0.21	7	0.07 (2)	124-264	2.96	0.18	6	0.06
.20-.30	2.88	0.21	7	0.07 (2)	264-404	2.94	0.19	7	0.06
.30-.40	2.15	0.42	19	0.14 (6)	404-544	2.19	0.46	21	0.15
.40-.50	1.44	0.47	33	0.15 (11)					
.50-.60	0.86	0.42	49	0.14 (16)					
<i>Grignon, France, cropland, 48°51'N, 1°58'E, 700 mm, Eutric Cambisol</i>									
0-05	1.36	0.26	18	0.08 (6)	0-64	1.35	0.15	11	0.05
.05-.10	1.43	0.19	13	0.06 (4)	64-137	1.41	0.21	15	0.07
.10-.20	2.81	0.39	14	0.13 (5)	137-286	2.82	0.36	13	0.12
.20-.30	2.64	0.39	15	0.13 (5)	286-440	2.66	0.41	15	0.13
.30-.40	1.46	0.49	34	0.16 (11)	440-597	1.43	0.49	34	0.16
.40-.50	0.78	0.33	41	0.11 (13)					

.50-.60 0.64 0.21 34 0.07 (11)

Table A2 Average (Av), standard deviation with (Stdwe) and without (Stdse) application of error propagation, mean error (ME) and root mean square error (RMSE) of OC stocks calculated using the site specific and the more general PTF.

Soil depth	OC-Stocks Site-specific PTF						OC-Stocks General PTF					
	Av.	Stdse	Stdwe	ME	ME%	RMSE	Av.	Stdse	Stdwe	ME	ME%	RMSE
	Kg C m ⁻²						Kg C m ⁻²					
Hainich												
0-5	2.22	0.13	0.36	-0.11	-5	0.35	2.93	0.22	0.53	0.59	25	0.68
5-10	1.83	0.25	0.49	0.03	1	0.20	2.29	0.38	0.70	0.49	27	0.52
10-20	2.81	0.44	0.56	0.01	0	0.22	3.33	0.62	0.79	0.54	19	0.60
20-30	1.97	0.47	0.49	0.04	2	0.10	2.25	0.58	0.62	0.32	17	0.35
30-40	1.36	0.54	0.55	0.03	2	0.10	1.52	0.63	0.65	0.19	14	0.24
40-50	0.93	0.55	0.55	0.01	1	0.07	1.03	0.64	0.63	0.10	11	0.15
50-60	0.76	0.55	0.53	0.00	-0	0.20	0.84	0.63	0.61	0.07	9	0.23
Hesse												
0-5	1.11	0.13	0.22	-0.05	-4	0.22	1.60	0.32	0.43	0.44	38	0.48
5-10	0.93	0.12	0.19	-0.01	-1	0.09	1.17	0.23	0.31	0.23	25	0.26
10-20	1.60	0.27	0.37	0.02	1	0.14	1.92	0.44	0.54	0.33	21	0.40
20-30	1.25	0.29	0.34	0.03	3	0.09	1.41	0.40	0.45	0.20	16	0.24
30-40	0.86	0.25	0.32	0.01	1	0.06	0.93	0.33	0.38	0.08	10	0.11
40-50	0.57	0.24	0.33	0.00	-0	0.05	0.61	0.30	0.37	0.03	6	0.09
50-60	0.39	0.18	0.19	-0.01	-3	0.03	0.41	0.20	0.21	0.00	0	0.03
Soroe												
0-5	1.98	0.18	0.59	0.06	3	0.43	2.18	0.31	0.62	0.26	14	0.40
5-10	1.68	0.34	0.57	-0.06	-4	0.40	1.73	0.45	0.62	-0.01	0	0.32
10-20	2.50	0.81	1.15	-0.08	-3	0.50	2.47	0.98	1.21	-0.11	-4	0.35
20-30	1.50	0.62	1.14	-0.07	-4	0.27	1.40	0.68	1.07	-0.17	-11	0.26
30-40	0.95	0.47	0.56	0.00	0	0.12	0.86	0.46	0.51	-0.10	-10	0.15
40-50	0.60	0.27	0.28	0.02	3	0.24	0.53	0.25	0.26	-0.05	-9	0.24
50-60	0.49	0.25	0.26	0.01	1	0.09	0.43	0.23	0.24	-0.05	-11	0.10
Le Bray												
0-5	1.97	0.28	0.48	0.26	15	0.42	2.11	0.37	0.57	0.40	23	0.51
5-10	1.70	0.38	0.55	0.05	3	0.25	1.78	0.46	0.62	0.13	8	0.26
10-20	3.54	0.70	0.97	-0.10	-3	0.57	3.72	0.85	1.12	0.08	2	0.50
20-30	2.84	0.76	0.95	-0.14	-5	0.38	2.91	0.85	1.04	-0.07	-2	0.32
30-40	2.20	0.85	1.41	-0.12	-5	0.40	2.24	0.95	1.46	-0.09	-4	0.35
40-50	1.73	1.04	1.12	-0.17	-9	0.40	1.74	1.09	1.17	-0.16	-9	0.35
50-60	1.44	1.12	1.19	-0.17	-10	0.37	1.44	1.17	1.23	-0.16	-10	0.32
Laqueuille												
0-5	3.47	0.37	1.00	0.44	3	0.61	2.38	0.26	1.16	-0.65	-6	0.77
5-10	3.18	0.26	0.74	-0.27	-3	0.37	2.57	0.14	0.85	-0.87	-16	0.94
10-20	4.84	0.63	1.08	-0.33	-6	0.48	4.57	0.50	1.17	-0.60	-12	0.77
20-30	4.19	0.76	1.02	0.09	2	0.34	4.23	0.68	1.07	0.12	3	0.40
30-40	3.43	0.93	1.04	0.28	9	0.46	3.64	0.88	1.04	0.48	15	0.63
40-50	2.55	1.03	1.09	0.22	9	0.43	2.83	1.04	1.11	0.50	21	0.63
50-60	1.91	1.17	1.21	0.03	2	0.36	2.16	1.17	1.27	0.28	15	0.50
Bugac												
0-5	3.07	0.30	0.47	0.20	7	0.38	2.65	0.19	0.66	-0.22	-8	0.43
5-10	2.26	0.53	0.49	-0.13	-5	0.35	2.06	0.45	0.51	-0.33	-14	0.46

10-20	2.50	0.73	0.80	-0.13	-5	0.20	2.37	0.66	0.78	-0.26	-10	0.32
20-30	1.31	0.40	0.42	0.00	0	0.06	1.26	0.38	0.42	-0.04	-3	0.08
30-40	1.01	0.34	0.36	0.02	2	0.07	0.98	0.33	0.35	-0.01	-1	0.07
40-50	1.00	0.37	0.38	0.00	0	0.06	0.97	0.36	0.38	-0.03	-3	0.07
50-60	1.04	0.39	0.39	-0.02	-2	0.12	1.01	0.37	0.39	-0.05	-5	0.14
Easter Bush												
0-5	2.29	0.15	0.28	0.26	13	0.33	2.23	0.18	0.43	0.21	10	0.28
5-10	1.62	0.17	0.20	-0.07	-4	0.16	1.53	0.17	0.27	-0.16	-9	0.21
10-20	2.84	0.31	0.39	-0.14	-5	0.19	2.66	0.30	0.48	-0.32	-11	0.34
20-30	2.47	0.41	0.37	-0.16	-6	0.39	2.30	0.39	0.44	-0.33	-13	0.47
30-40	1.34	0.39	0.42	0.02	1	0.08	1.23	0.37	0.41	-0.10	-7	0.13
40-50	0.90	0.30	0.29	0.02	2	0.06	0.82	0.27	0.28	-0.06	-7	0.08
50-60	0.86	0.31	0.31	0.10	12	0.27	0.78	0.29	0.30	0.02	2	0.25
Gebesee												
0-5	1.56	0.11	0.20	0.28	19	0.32	1.55	0.08	0.24	0.27	19	0.31
5-10	1.40	0.06	0.16	-0.08	-5	0.15	1.42	0.05	0.20	-0.05	-3	0.13
10-20	2.77	0.16	0.34	-0.25	-8	0.30	2.83	0.13	0.41	-0.19	-6	0.26
20-30	2.72	0.17	0.34	-0.17	-6	0.23	2.78	0.14	0.41	-0.10	-3	0.19
30-40	2.08	0.39	0.45	-0.07	-3	0.12	2.22	0.37	0.46	0.07	3	0.12
40-50	1.48	0.49	0.51	0.04	3	0.07	1.63	0.49	0.52	0.19	13	0.20
50-60	0.91	0.46	0.47	0.04	5	0.07	1.04	0.47	0.52	0.17	20	0.19
Carlow												
0-5	1.05	0.23	0.26	0.08	9	0.16	0.97	0.21	0.25	0.00	0	0.14
5-10	1.05	0.22	0.26	0.03	3	0.11	0.96	0.20	0.25	-0.05	-5	0.11
10-20	2.15	0.35	0.48	-0.03	-1	0.17	1.98	0.31	0.46	-0.20	-10	0.26
20-30	1.77	0.39	0.44	-0.09	-5	0.18	1.65	0.36	0.42	-0.21	-13	0.26
30-40	0.77	0.36	0.61	-0.01	-1	0.08	0.74	0.34	0.58	-0.05	-6	0.09
40-50	0.54	0.34	0.38	0.02	4	0.07	0.51	0.33	0.36	0.00	-1	0.06
50-60	0.42	0.22	0.23	0.02	4	0.05	0.40	0.21	0.22	0.00	0	0.04
Grignon												
0-5	1.51	0.17	0.22	0.15	11	0.25	1.39	0.13	0.23	0.02	2	0.20
5-10	1.41	0.15	0.20	-0.02	-2	0.10	1.30	0.12	0.21	-0.13	-10	0.16
10-20	2.74	0.34	0.42	-0.08	-3	0.17	2.55	0.27	0.44	-0.27	-10	0.32
20-30	2.50	0.36	0.42	-0.14	-5	0.18	2.35	0.29	0.43	-0.28	-12	0.31
30-40	1.40	0.47	0.48	-0.06	-4	0.10	1.39	0.43	0.47	-0.07	-5	0.12
40-50	0.79	0.30	0.32	0.01	1	0.05	0.82	0.28	0.32	0.03	4	0.07
50-60	0.66	0.21	0.23	0.02	3	0.07	0.68	0.20	0.23	0.05	7	0.08