

Supplemental Information

Table S1. Transformation used to improve normality. We were unable to find a way to improve normality for live moss (L) bulk density.

Transformation	Where used
Log	Bulk density: D, F, M, amorphous N: fibrous C:N D, M, fibrous, amorphous
Square root	Bulk density: H N: D, amorphous C:N: L, F, mineral
Box cox	Bulk density: mineral, fibrous C: all horizons N: L, F, M, H, mineral C:N: H

Table S2. Average bulk density values by drainage and age class. Standard deviations are presented in parenthesis. Significant differences for a horizon code among drainage or age class are noted with superscripts.

Horizon Type	Drainage Class					Age class		
	Well	Moderately well	Somewhat Poorly	Poorly	Very poorly	New	Young	Mature
L: live moss	0.027 ^{ab} (0.023) n=6	0.020 ^{ab} (0.020) n=12	0.023 ^a (0.021) n=71	0.025 ^a (0.014) n=18	0.015 ^b (0.010) n=33	0.020 (---) n=1	0.022 (0.024) n=48	0.021 (0.015) n=92
D: dead moss	0.049 ^{ab*} (0.025) n=10	0.054 ^{ab} (0.044) n=45	0.036 ^{b*} (0.020) n=142	0.038 ^{b*} (0.028) n=30	0.038 ^b (0.024) n=313	0.055 ^a (0.037) n=19	0.036 ^b (0.017) n=253	0.041 ^b (0.031) n=268
F: fibric	0.153 ^a (0.096) n=12	0.075 ^b (0.032) n=39	0.072 ^b (0.041) n=188	0.065 ^{bc} (0.043) n=79	0.053 ^c (0.031) n=234	0.083 (0.056) n=83	0.056 (0.035) n=207	0.066 (0.039) n=262
M: mesic	0.186 ^a (0.061) n=5	0.164 ^a (0.072) n=35	0.172 ^a (0.078) n=264	0.149 ^a (0.077) n=89	0.121 ^b (0.067) n=241	0.173 (0.088) n=62	0.122 (0.060) n=197	0.159 (0.079) n=375
H: humic	--- (---) n=0	0.270 ^{ab} (0.176) n=11	0.251 ^a (0.076) n=62	0.214 ^a (0.099) n=17	0.174 ^b (0.078) n=70	0.201 (0.097) n=17	0.199 (0.107) n=58	0.228 (0.087) n=85
Min: mineral	0.799 (0.349) n=63	0.810 (0.455) n=49	0.722 (0.382) n=375	0.663 (0.339) n=67	0.722 (0.353) n=31	0.859 ^a (0.367) n=163	0.787 ^{b*} (0.418) n=89	0.654 ^b (0.356) n=333
Fibrous (D&F)	0.105 ^a (0.089) n=22	0.064 ^b (0.040) n=84	0.057 ^{bc*} (0.038) n=330	0.057 ^{bc} (0.041) n=109	0.047 ^{c*} (0.028) n=574	0.078 ^a (0.054) n=102	0.045 ^{b*} (0.028) n=460	0.053 ^{b*} (0.038) n=530
Amorphous (M&H)	0.186 ^{ab*} (0.061) n=5	0.189 ^a (0.113) n=46	0.187 ^a (0.084) n=326	0.159 ^a (0.084) n=106	0.133 ^{b*} (0.073) n=311	0.179 (0.090) n=79	0.140 (0.080) n=255	0.172 (0.085) n=460

*p-value very close to 0.05 (D = 0.06, Min = 0.06, fibrous = 0.06, amorphous = 0.04). These values are so close to our threshold of 0.05 we would like to recognize that there is a chance that the bulk density values are [not] significantly different from each other.

Table S3. Average carbon (%) values by drainage and age class. Standard deviations are presented in parenthesis. Significant differences for a horizon code among drainage or age classes are noted with superscripts.

Horizon Type	Drainage Class					Age class		
	Well	Moderately well	Somewhat Poorly	Poorly	Very poorly	New	Young	Mature
L: live moss	44.3 ^a (5.1) n=6	42.6 ^b (1.5) n=11	41.0 ^b (4.7) n=75	42.9 ^b (1.9) n=18	42.0 ^b (2.3) n=34	40.7 (6.1) n=2	41.3 (3.3) n=48	42.0 (4.1) n=95
D: dead moss	42.9 ^{ab} (3.3) n=10	44.0 ^a (2.3) n=43	41.1 ^b (5.9) n=145	43.0 ^a (2.0) n=30	43.1 ^a (2.4) n=310	41.2 (5.2) n=19	42.5 (2.5) n=242	42.8 (4.6) n=277
F: fibric	34.0 ^a (7.6) n=12	43.2 ^{bd} (6.3) n=39	39.6 ^c (7.3) n=194	42.4 ^{bc} (3.9) n=84	41.6 ^d (3.1) n=237	39.7 ^a (6.9) n=85	40.5 ^b (4.0) n=210	41.8 ^a (6.0) n=271
M: mesic	30.0 ^a (6.3) n=5	41.3 ^{bd} (7.2) n=33	37.3 ^{bc} (7.5) n=268	37.3 ^c (6.5) n=89	39.1 ^d (5.6) n=255	35.4 ^a (8.0) n=63	36.9 ^b (6.6) n=204	39.3 ^c (6.4) n=383
H: humic	--- (---) n=0	36.1 ^a (6.7) n=12	27.7 ^b (5.6) n=63	32.9 ^a (6.0) n=17	35.0 ^a (5.3) n=72	31.3 (6.4) n=18	34.6 (5.8) n=60	30.5 (6.7) n=86
Min: mineral	4.3 ^a (7.0) n=73	5.0 ^a (5.9) n=57	6.5 ^b (6.1) n=436	7.3 ^b (5.5) n=73	11.1 ^c (5.5) n=35	4.3 ^a (5.0) n=197	7.2 ^b (6.5) n=107	7.4 ^b (6.5) n=370
Fibrous (D&F)	38.1 ^a (7.4) n=22	43.6 ^{bd} (4.6) n=82	40.2 ^c (6.8) n=339	42.6 ^b (3.5) n=114	42.4 ^d (2.8) n=547	40.0 ^{ac} (6.6) n=104	41.6 ^b (3.4) n=452	42.3 ^c (5.4) n=548
Amorphous (M&H)	30.0 ^{a*} (6.3) n=5	39.9 ^{b*} (7.4) n=45	35.5 ^{bc} (8.1) n=331	36.6 ^{ac*} (6.6) n=106	38.2 ^{d*} (5.8) n=327	34.5 ^a (7.8) n=81	36.3 ^a (6.5) n=264	37.7 ^b (7.3) n=469

*p-value very close to 0.05 (moderately well vs poorly = 0.046, moderately well vs very poorly = 0.046, poorly vs well = 0.064). These values are so close to our threshold of 0.05 we would like to recognize that there is a chance that the carbon values are [not] significantly different from each other.

Table S4. Average nitrogen (%) values by drainage and age class. Standard deviations are presented in parenthesis. Significant differences for a horizon code among drainage or age classes are noted with superscripts.

Horizon Type	Drainage Class					Age class		
	Well	Moderately well	Somewhat Poorly	Poorly	Very poorly	New	Young	Mature
L: live moss	0.92 ^a (0.16) n=6	0.78 ^a (0.12) n=12	0.90 ^a (0.31) n=75	0.81 ^a (0.15) n=18	0.72 ^b (0.15) n=34	1.26 ^a (0.56) n=2	0.93 ^a (0.29) n=48	0.78 ^b (0.21) n=95
D: dead moss	1.10 ^a (0.26) n=10	0.86 ^b (0.29) n=43	0.71 ^{c*} (0.27) n=144	0.75 ^{bc} (0.18) n=30	0.78 ^{c*} (0.26) n=310	0.84 ^a (0.27) n=19	0.78 ^b (0.26) n=241	0.75 ^{ab} (0.28) n=277
F: fibric	0.92 ^{ab} (0.16) n=12	0.93 ^{ab} (0.30) n=39	0.89 ^a (0.25) n=193	1.17 ^{b*} (0.61) n=83	0.99 ^{ab*} (0.45) n=237	0.97 ^{ab} (0.35) n=84	0.97 ^b (0.33) n=209	0.99 ^b (0.49) n=271
M: mesic	0.90 ^a (0.20) n=5	1.08 ^{ab} (0.30) n=33	1.23 ^b (0.43) n=267	1.66 ^c (0.51) n=91	1.60 ^c (0.57) n=255	1.25 (0.38) n=63	1.30 (0.36) n=203	1.52 (0.61) n=385
H: humic	--- (---) n=0	1.11 ^a (0.19) n=12	1.26 ^a (0.29) n=63	2.02 ^b (0.44) n=17	1.72 ^c (0.36) n=72	1.46 ^a (0.55) n=18	1.71 ^{ab} (0.39) n=60	1.42 ^b (0.41) n=86
Min: mineral	0.18 ^{a*} (0.21) n=73	0.29 ^{b*} (0.32) n=57	0.33 ^c (0.29) n=437	0.48 ^d (0.39) n=73	0.63 ^d (0.34) n=33	0.22 ^a (0.22) n=198	0.36 ^b (0.31) n=105	0.40 ^b (0.34) n=370
Fibrous (D&F)	1.00 ^{acd*} (0.22) n=22	0.89 ^{abd} (0.30) n=82	0.81 ^{bd*} (0.27) n=337	1.05 ^c (0.56) n=113	0.87 ^d (0.37) n=547	0.94 ^a (0.34) n=103	0.87 ^{ab} (0.31) n=450	0.87 ^b (0.41) n=548
Amorphous (M&H)	0.90 ^a (0.20) n=5	1.09 ^a (0.28) n=45	1.23 ^a (0.41) n=330	1.72 ^{bc} (0.52) n=108	1.62 ^c (0.53) n=327	1.30 ^{ab} (0.43) n=81	1.39 ^a (0.40) n=263	1.50 ^b (0.58) n=471

*p-value very close to 0.05 (D = 0.053, F = 0.059, Min = 0.047, fibrous = 0.044). These values are so close to our threshold of 0.05 we would like to recognize that there is a chance that the nitrogen values of these two drainage classes are [not] significantly different from each other.

Table S5. C:N ratio values by drainage and age class. Standard deviations are presented in parenthesis. Significant differences for a horizon code among drainage or age classes are noted with superscripts.

Horizon Type	Drainage Class					Age class		
	Well	Moderately well	Somewhat Poorly	Poorly	Very poorly	New	Young	Mature
L: live moss	50 ^a (12) n=6	56 ^{a*} (9) n=12	51 ^a (18) n=75	55 ^a (10) n=18	60 ^{b*} (12) n=34	35 ^a (11) n=2	48 ^a (14) n=48	57 ^b (15) n=95
D: dead moss	41 ^a (9) n=10	59 ^b (27) n=43	67 ^b (31) n=144	60 ^{bc} (13) n=30	61 ^c (19) n=310	56 ^a (14) n=19	60 ^b (19) n=241	65 ^{ab} (26) n=277
F: fibric	38 ^a (10) n=12	50 ^{bc} (14) n=39	47 ^b (12) n=193	46 ^{ac} (23) n=83	49 ^b (18) n=237	46 ^{ab} (18) n=84	47 ^b (17) n=209	49 ^b (16) n=271
M: mesic	33 ^{ac} (4) n=5	41 ^a 13 n=33	34 ^a (14) n=267	24 ^b (8) n=89	28 ^c (12) n=255	30 (10) n=63	31 (11) n=203	31 (14) n=383
H: humic	--- (---) n=0	33 ^a (5) n=12	23 ^b (6) n=63	17 ^c (3) n=17	21 ^b (6) n=72	24 ^{a*} (7) n=18	21 ^{ab*} (6) n=60	23 ^b (7) n=86
Min: mineral	18 ^a (9) n=73	17 ^a (8) n=55	18 ^{b*} (7) n=436	17 ^a (4) n=73	17 ^{a*} (3) n=33	18 (7) n=196	19 (5) n=105	18 (8) n=370
Fibrous (D&F)	39 ^a (10) n=22	55 ^b (22) n=82	56 ^b (24) n=337	50 ^{ab} (22) n=113	56 ^c (19) n=547	47 ^a (18) n=103	54 ^b (19) n=450	57 ^c (23) n=548
Amorphous (M&H)	33 ^{ac} (4) n=5	39 ^a (12) n=45	32 ^a (13) n=330	23 ^b (7) n=108	26 ^c (11) n=327	29 (10) n=81	29 (11) n=263	29 (14) n=469

*p-values very close to 0.05 (L = 0.044, H = 0.055, Min = 0.045). These values are so close to our threshold of 0.05 we would like to recognize that there is a chance that the CN values of these two classes are [not] significantly different from each other.