Supplementary Material for

Iron-Bound Organic Carbon in Forest Soils: Quantification and Characterization

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Table S1 The major data collected in this study for the 14 forest soils

Forest	TC (%)	TOC (%)	$f_{Fe\text{-}OC}$ (%)	Reactive Fe (mg g^{-1})	$\delta^{13}C_{TOC}$	$\delta^{13}C_{non\text{-}Fe\text{-}OC}$	$\delta^{13}C_{Fe\text{-}OC}$	$\delta^{13}C_{Labile}$
				Average Value				
AL	3.34	3.55	5.57	4.87	-27.32	-27.71	-23.42	-30.29
BL	3.15	2.83	12.07	4.13	-26.76	-27.17	-26.50	-26.64
MS	3.99	3.01	13.04	19.31	-27.42	-27.96	-25.18	-23.43
TSI	5.58	4.30	18.16	6.20	-26.09	-26.43	-24.60	-29.04
GS	1.94	1.20	0.00	0.08	-26.93	-26.80	-27.01	-26.85
HT	4.83	3.00	36.67	2.69	-27.28	-27.33	-27.24	-28.53
HL	4.76	3.34	57.75	5.24	-25.87	-26.57	-25.40	-26.69
LV	1.55	1.07	11.96	0.99	-24.93	-25.40	-23.51	-24.27
LVF	1.86	1.36	11.02	2.11	-24.71	-25.59	-23.93	-24.53
NR	3.45	2.83	12.06	1.27	-26.31	-26.48	-26.03	-28.15
OR	2.44	2.31	0.00	1.60	-27.07	-27.66	-24.22	-27.51
TSII	8.30	6.05	7.41	6.87	-25.77	-26.00	-25.13	-26.67
TKF	3.41	2.76	19.99	1.85	-24.54	-25.11	-23.34	-24.08
TK	5.33	5.40	12.62	2.28	-25.29	-25.64	-24.50	-23.58
				Standard Deviation				
AL	0.23	0.30	11.03	1.64	0.30	0.03	1.51	5.28
BL	0.09	0.62	10.66	0.83	0.71	0.32	0.96	1.02
MS	0.56	0.14	3.08	5.56	0.13	0.08	0.14	2.15
TSI	0.58	0.69	0.07	0.60	0.37	0.39	0.39	6.71
GS	0.79	0.38	5.79	0.02	0.09	0.17	0.20	0.05
HT	0.04	0.30	36.87	0.84	0.02	0.04	0.00	1.26
HL	0.57	0.30	23.08	2.65	0.54	0.21	0.68	0.57
LV	0.07	0.00	13.82	0.08	0.23	0.31	0.08	0.37
LVF	0.14	0.15	3.45	1.23	0.03	0.10	0.17	0.16
NR	0.04	0.27	32.26	0.01	0.15	0.04	0.43	1.92
OR	0.02	0.10	6.56	0.03	0.04	0.13	0.16	0.84
TSII	1.49	1.87	14.22	0.79	0.09	0.12	0.17	0.70
TKF	0.67	0.52	10.32	0.51	0.02	0.03	0.05	0.77
TK	0.29	1.51	14.54	0.11	0.29	0.24	0.34	1.71

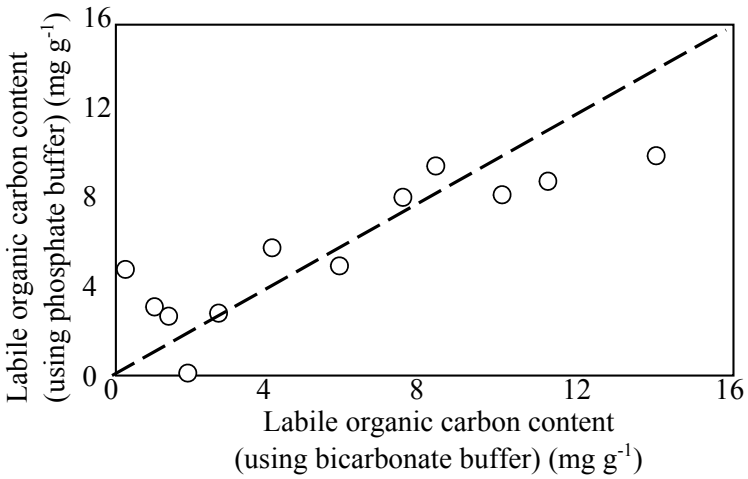

Figure S1. Labile OC under heating extraction was measured by different buffers, bicarbonate buffer and phosphate buffer, with the same ionic strength. Dashed line represented the 1:1 ratio.

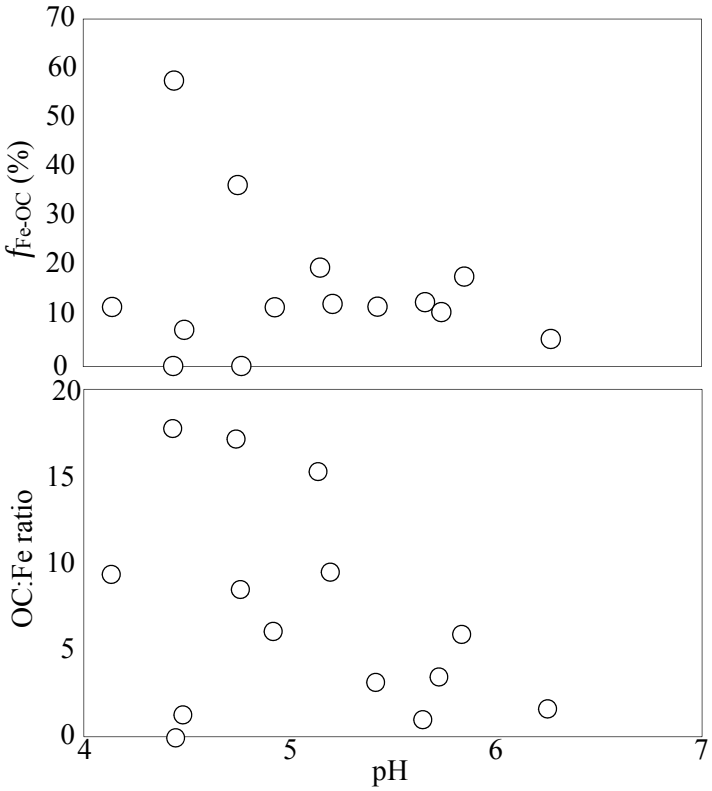

Figure S2. Variation of $f_{Fe\text{-}OC}$ and OC:Fe molar ratio vs. soil pH for forest soils.

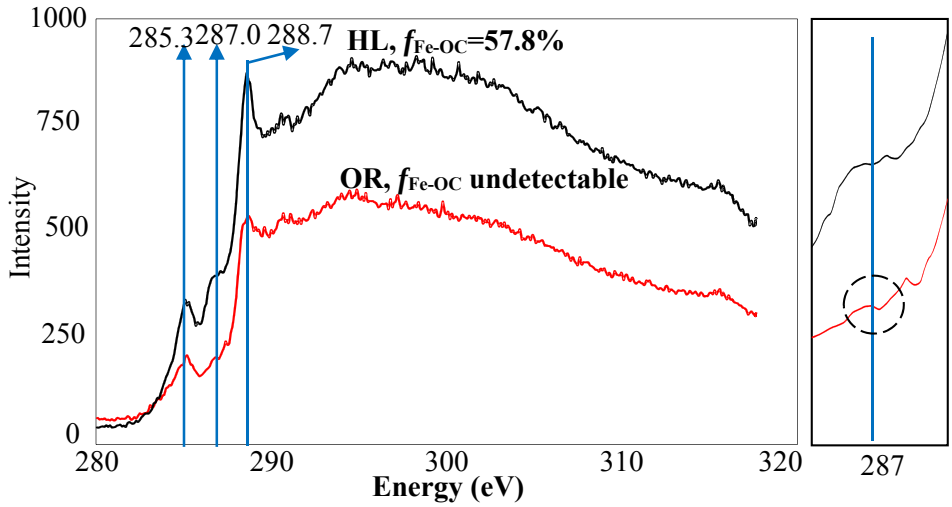

Figure S3. C 1s Near-edge X-ray absorption fine structure analysis (NEXAFS) for OR (Tennessee) soil (non-detectable $f_{Fe\text{-}OC}$) and HL (Maine) soil ($f_{Fe\text{-}OC}$ = 57.8%).

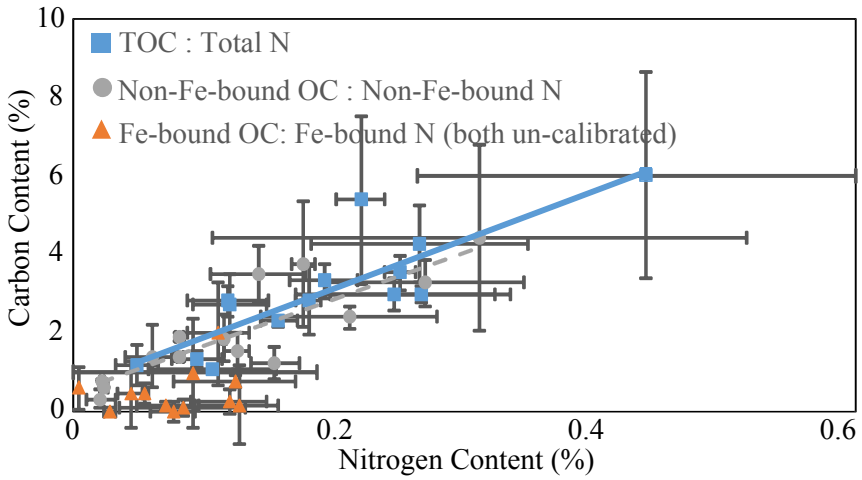

Figure S4. Variation of OC concentration vs. N concentration for bulk soils, Fe-bound OC, and non-Fe-bound OC.