

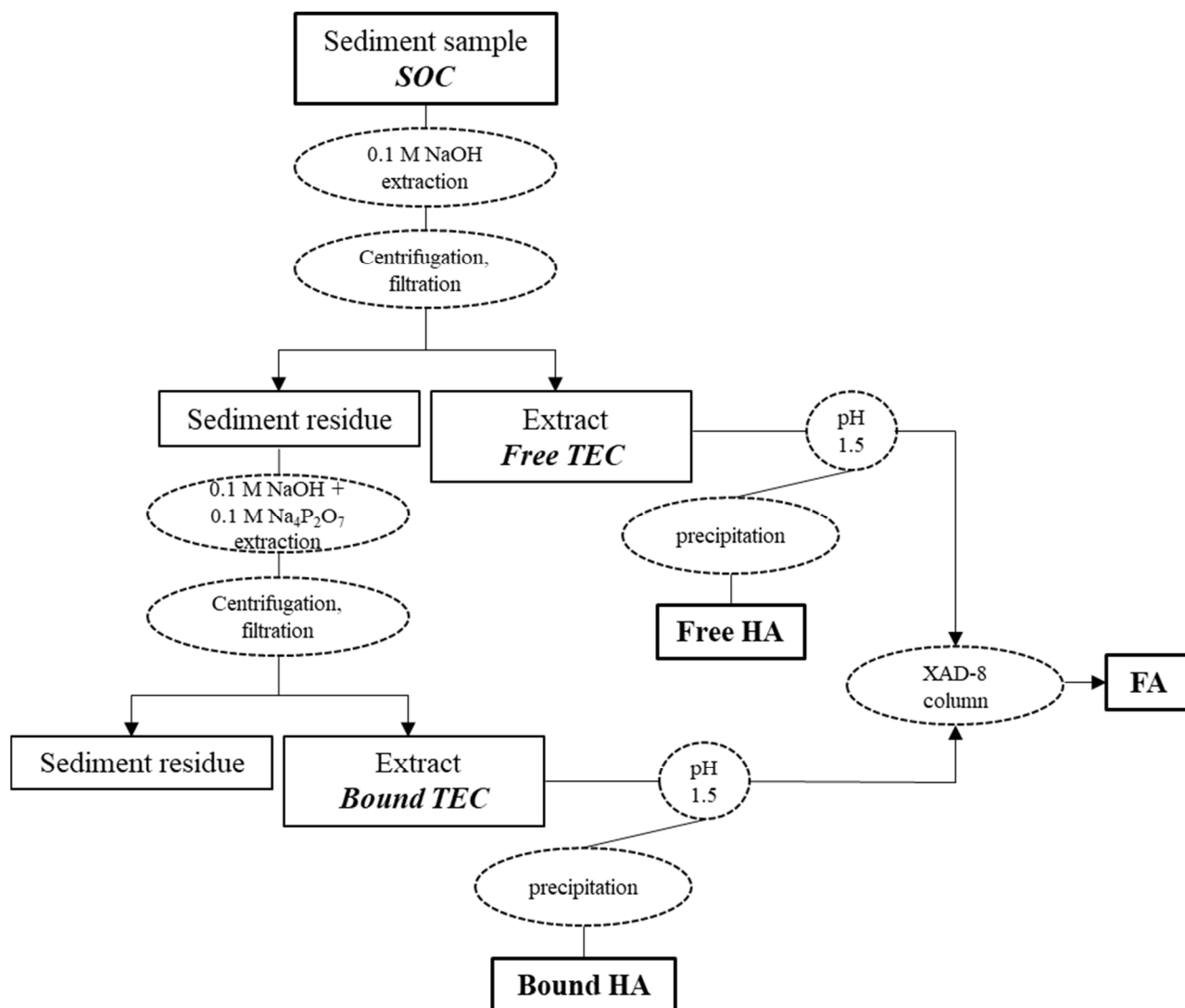
## Supplementary Material

**Table S1.** Coordinates of sampling locations and geochemical parameters measured (n.d. = not determined).

Station #	Lat (°)	Long (°)	Depth (m)	CaCO <sub>3</sub> (%)	TOC (%)	TN (%)	$\delta^{13}\text{C}_{\text{SOM}}$ (‰) (V-PDB)	Sand (%)	Silt (%)	Clay (%)	$\delta^{13}\text{C}_{\text{FHA}}$ (‰) (V-PDB)	FHA TOC/TN	$\delta^{13}\text{C}_{\text{BHA}}$ (‰) (V-PDB)	BHA TOC/TN	$\delta^{13}\text{C}_{\text{FA}}$ (‰) (V-PDB)	FA TOC/TN	[FHA] (mg g <sup>-1</sup> )	[BHA] (mg g <sup>-1</sup> )	[FA] (mg g <sup>-1</sup> )	[HS] (mg g <sup>-1</sup> )
1	-25.2498	-48.0502	0.2	6.4	3.04	0.22	-24.0	33.8	62.2	3.9	-21.6	10.20	-22.0	14.93	-23.81	23.70	1.85	5.73	3.40	10.98
2	-25.1938	-47.9993	6.6	3.4	0.67	0.03	-27.0	67.4	30.4	2.2	-23.3	5.83	-24.6	11.30	-25.98	22.72	0.26	0.73	0.69	1.68
3	-25.1749	-48.0265	5.7	8.0	0.60	0.05	-26.7	60.4	36.9	2.7	n.d.	n.d.	-24.5	18.62	-25.71	32.68	0.10	0.92	0.74	1.76
4	-25.0738	-47.9811	10.7	0.0	1.94	0.17	-25.9	43.0	54.0	3.0	-22.6	6.55	-23.8	11.13	-25.26	18.96	1.15	4.30	3.41	8.86
5	-25.0466	-47.9164	13.8	11.5	3.73	0.31	-26.3	40.2	56.2	3.6	-23.3	8.01	-24.4	11.96	-25.87	20.05	2.72	3.37	3.90	9.98
6	-25.0318	-47.9150	9.8	6.8	1.24	0.07	-26.5	47.8	48.5	3.8	-23.3	10.73	-23.6	15.18	-25.20	21.80	0.34	0.71	0.44	1.49
7	-25.0115	-47.9241	4.8	1.3	0.73	0.04	n.d.	97.5	2.5	0.0	-25.1	13.21	-25.4	17.68	-26.27	31.68	0.17	0.37	0.52	1.06
8	-24.9986	-47.8973	11.6	4.0	0.94	0.08	-26.2	45.3	51.1	3.6	-23.5	10.58	-24.0	15.45	-25.14	23.27	0.46	1.00	0.93	2.39
9	-24.9592	-47.8934	12.2	3.9	0.73	0.08	-26.6	48.3	48.6	3.1	-24.3	9.18	-25.0	13.82	-26.49	22.49	1.58	1.64	1.52	4.74
10	-24.9642	-47.8642	10.7	2.9	0.79	0.04	-25.3	57.3	39.0	3.7	-23.2	12.02	-24.1	18.20	-25.27	25.92	0.60	0.75	0.73	2.08
11	-25.0335	-48.0138	3.7	0.5	0.06	0.01	n.d.	97.2	2.8	0.0	-28.0	8.43	-27.2	10.17	-26.90	24.61	0.06	0.04	0.13	0.23
12	-25.0202	-47.9825	9.0	n.d.	1.07	0.08	n.d.	62.8	32.7	4.5	-26.0	10.34	-26.1	13.97	-26.96	23.22	1.22	0.73	0.71	2.66
13	-25.0202	-47.9825	6.2	4.9	1.10	0.10	-25.6	45.2	51.5	3.3	-22.9	7.05	-24.3	12.51	-25.61	21.28	0.47	1.15	1.10	2.72
14	-24.9493	-47.9111	0.2	n.d.	4.76	0.33	-25.2	39.3	58.1	2.6	-23.7	7.29	-24.6	12.22	-25.85	22.86	3.76	7.83	3.62	15.20
15	-24.9167	-47.8765	2.8	5.1	1.10	0.10	-26.8	54.3	42.9	2.9	-23.3	6.40	-24.4	11.18	-25.78	19.60	0.45	0.72	1.20	2.37
16	-24.8161	-47.6958	3.4	4.5	2.59	0.24	-27.5	7.8	85.7	6.6	-26.0	10.47	-26.1	12.29	-26.81	22.02	9.23	2.56	3.09	14.88
17	-24.7937	-47.6725	3.1	5.2	2.65	0.21	-28.3	16.3	77.2	6.5	-26.2	10.44	-26.3	12.60	-27.04	22.08	6.56	2.74	2.48	11.78
18	-24.7686	-47.6429	2.8	5.2	2.41	0.18	-28.0	17.1	76.7	6.2	-25.9	11.64	-25.9	14.28	-26.65	21.41	5.90	1.82	2.24	9.96

**Table S2.** Metal concentrations ( $\mu\text{g g}^{-1}$ ) in FHA, BHA, and FA (n.d. = not determined).

Station	FHA	FHA	FHA	FHA	FHA	FHA	FHA	FHA	BHA	BHA	BHA	BHA	BHA	BHA	BHA	BHA	FA	FA	FA	FA	FA	FA	FA	FA
#	Pb	V	Cr	Mn	Ni	Cu	Zn	As	Pb	V	Cr	Mn	Ni	Cu	Zn	As	Pb	V	Cr	Mn	Ni	Cu	Zn	As
1	2.30	13.9	58.9	10.7	29.2	61.5	19.8	7.32	2.86	6.01	103	2.98	39.0	72.7	15.4	7.22	0.66	3.30	33.3	3.32	2.71	12.3	13.5	5.52
2	3.36	8.13	22.1	11.9	17.4	95.6	104	6.00	2.88	11.2	62.5	12.6	24.7	72.6	40.8	5.83	1.11	2.12	45.7	10.4	6.83	24.8	19.4	8.88
3	5.08	9.17	36.5	6.98	38.0	153	54.1	12.4	12.2	23.1	88.9	18.1	42.5	99.4	38.9	7.56	28.3	6.52	41.8	11.3	5.20	25.2	27.1	10.9
4	3.44	14.7	19.1	16.8	24.4	433	17.1	205	3.04	7.92	53.8	13.4	36.8	162	19.7	9.16	2.92	1.78	20.5	4.30	9.50	11.5	16.9	7.28
5	1.86	21.9	31.1	25.7	27.0	128	21.4	24.2	4.72	28.8	69.4	31.2	34.8	97.8	28.0	8.83	1.24	10.2	33.2	6.56	6.72	34.8	16.5	13.3
6	4.01	15.6	40.3	21.9	32.0	118	37.4	8.29	9.46	27.5	83.5	24.3	42.3	91.3	29.5	6.51	3.12	6.04	35.9	18.4	9.07	39.1	26.6	11.9
7	3.79	21.9	81.2	16.9	19.0	82.0	36.7	6.57	3.80	19.3	130	15.2	20.1	93.1	31.3	4.36	2.86	5.45	104	10.0	9.73	48.4	52.4	8.37
8	4.96	15.1	50.5	7.98	32.2	138	23.1	15.9	12.0	21.7	100	12.9	43.1	117	33.1	7.75	1.98	4.67	46.7	6.85	7.19	34.9	19.1	12.5
9	2.89	28.6	34.8	13.6	24.8	227	20.2	79.5	3.01	8.35	55.4	6.68	28.0	138	27.2	8.17	1.59	7.99	37.6	3.68	4.50	44.7	13.6	55.9
10	3.57	25.6	56.0	22.0	34.2	144	26.0	13.7	8.85	15.6	99.5	10.7	45.5	116	34.2	6.26	9.82	5.58	51.0	8.90	7.62	43.3	27.5	17.1
11	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
12	2.08	17.4	65.8	29.1	9.65	78.5	27.3	11.8	3.44	31.8	132	36.2	14.8	95.3	31.5	4.22	2.03	4.02	47.0	14.9	2.81	28.3	20.3	2.11
13	2.17	14.0	31.9	14.2	25.6	191	21.7	20.5	4.41	16.9	80.0	13.0	33.8	87.6	38.5	7.61	2.09	4.33	49.5	6.35	5.27	80.1	63.7	17.2
14	1.30	19.4	28.6	8.47	17.0	57.4	16.8	43.8	1.85	6.07	53.1	4.49	22.1	65.0	19.4	12.4	2.65	1.16	22.0	3.66	2.26	10.6	23.9	12.7
15	18.7	12.4	25.8	7.60	21.4	580	63.0	62.1	7.33	16.2	77.1	12.1	33.0	169	43.4	8.24	1.58	6.32	53.0	6.83	10.6	64.1	17.8	29.7
16	4.14	69.8	73.3	50.0	12.9	222	27.0	37.4	3.74	37.2	88.2	32.6	16.7	171	30.5	8.51	0.77	7.13	32.2	5.12	2.57	51.3	11.2	21.4
17	3.61	40.8	76.7	44.7	12.3	108	33.3	23.1	11.6	71.9	93.6	88.1	21.8	130	59.7	8.54	1.32	7.41	42.3	7.47	4.05	43.6	18.2	7.60
18	2.39	46.8	72.6	25.6	14.1	184	19.0	30.9	2.86	26.7	97.3	20.8	19.1	171	32.5	6.82	0.99	8.54	50.6	6.29	4.99	46.5	19.8	8.66



**Figure S1.** Flow chart of the method to extract Free Humic Acids (FHA), Bound Humic Acids (BHA), and Fulvic Acids (FA) from the sediment samples. SOC = Soil Organic Carbon; TEC = Total Extractable Carbon.