

Supplementary information

Table S1. Concentration of Hg in peatlands in China

Location	Concentration of Hg ($\mu\text{g kg}^{-1}$)			Period	References
	min	max	ave		
Zoige	7.30	32.13	18.51	1824-2011	This study
Wuliangsuhai in Inner Mongolia*	0.55	35.94	4.35	1883-2012	(Zhang 2013)
Hongyuan	16.7	100	ND	1840-2006	(Shi et al. 2011)
Tanghongling in the Lesser Khingan Mountains	174.4	574.4	399.1 \pm 136.7	1880-1970	(Tang et al. 2012)
The Greater Khingan Mountains*	4.10	335.84	154.73	1874-2003	(Bao et al. 2016)
	9.41	313.59	77.77	1839-2007	
	7.10	163.87	146.12	1819-2005	

*Part of the data were calculated by GetData 2.20. ND: no data. Ave: average.

Table S2. Recent accumulation rate (AR) of total Hg in peatlands in China

Location	Average recent Hg AR ($\mu\text{g m}^{-2} \text{ year}^{-1}$)			Period	References
	min	max	ave		
Zoige	3.46	34.37	18.24	1824-2011	This study
Tanghongling in the Lesser Khingan Mountains	10.04	27.43	15.43	300 aB.P-	(Xu 2010)
Tanghongling in the Lesser Khingan Mountains	33.1	112.4	74.6 \pm 13.1	1880-1970	(Tang et al. 2012)
The Greater Khingan Mountains*	40.78	307.45	122.52	1874-2003	(Bao et al. 2016)
	13.62	246.3	109.29	1839-2007	
	2.39	94.81	41.38	1819-2005	

* Part of the data were calculated by GetData 2.20. ND: no data. Ave: average.

Table S3. Concentration of total As in peatlands in China

Location	Concentration of As ($\mu\text{g kg}^{-1}$)			Period	References
	min	max	ave		
Zoige	86.38	174.21	174.21	1824-2011	This study
Wuliangsuhai in Inner Mongolia*	710.04	1907.96	1219.54	1883-2012	(Zhang 2013)

*Part of the data were calculated by GetData 2.20. Ave: average.

Table S4. TN, TC, and TOC of every 1-cm soil layer along peat profile with triplicate samples.

Soil layer (cm)	Sample number	TN (mg g ⁻¹)	TC (mg g ⁻¹)	TOC (mg g ⁻¹)	Soil layer (cm)	Sample number	TN (mg g ⁻¹)	TC (mg g ⁻¹)	TOC (mg g ⁻¹)
1	1-1	11.646	167.635	70.243	14	14-2	11.284	166.674	79.851
1	1-2	11.018	164.085	77.607	14	14-3	11.201	165.861	94.719
1	1-3	11.625	160.498	72.505	15	15-1	11.473	165.695	98.244
2	2-1	11.797	161.192	82.598	15	15-2	11.620	165.217	100.370
2	2-2	10.717	145.827	76.163	15	15-3	11.282	168.009	85.223
2	2-3	11.686	161.141	73.274	16	16-1	11.568	167.357	89.592
3	3-1	11.437	160.040	78.537	16	16-2	11.457	166.985	90.296
3	3-2	11.984	161.180	95.899	16	16-3	11.838	170.296	58.569
3	3-3	12.126	163.578	90.328	17	17-1	12.476	170.915	95.239
4	4-1	12.034	162.304	104.209	17	17-2	11.607	170.719	90.880
4	4-2	12.057	162.517	86.860	17	17-3	11.348	168.344	90.223
4	4-3	12.762	170.357	107.263	18	18-1	11.239	167.819	86.111
5	5-1	12.813	170.822	83.102	18	18-2	11.313	167.806	88.721
5	5-2	12.223	170.529	93.665	18	18-3	11.776	168.414	84.108
5	5-3	11.898	166.616	104.835	19	19-1	11.132	166.450	124.102
6	6-1	11.788	166.217	87.149	19	19-2	11.681	166.800	114.913
6	6-2	12.101	165.908	47.394	19	19-3	12.985	207.593	116.084
6	6-3	12.075	163.721	89.569	20	20-1	13.416	209.443	81.508
7	7-1	12.271	163.698	96.219	20	20-2	12.640	204.824	80.835
7	7-2	12.305	163.837	95.796	20	20-3	11.362	162.995	79.069
7	7-3	11.842	168.133	93.994	21	21-1	10.985	162.547	75.604
8	8-1	12.071	168.006	100.491	21	21-2	11.106	161.797	73.942
8	8-2	12.255	168.339	92.530	21	21-3	9.337	144.502	79.703
8	8-3	12.156	169.293	89.159	22	22-1	9.502	143.534	62.026
9	9-1	11.826	169.328	99.689	22	22-2	9.659	144.039	68.381
9	9-2	12.482	168.060	72.714	22	22-3	8.324	127.495	107.246
9	9-3	12.038	163.774	104.308	23	23-1	8.371	127.397	57.247
10	10-1	11.362	163.486	87.610	23	23-2	8.345	127.625	49.565
10	10-2	11.673	163.505	85.847	23	23-3	7.571	121.518	56.510
10	10-3	12.133	168.434	87.070	24	24-1	7.710	121.165	55.299
11	11-1	11.744	168.853	99.230	24	24-2	7.770	120.941	60.598
11	11-2	12.499	169.362	103.718	24	24-3	7.728	122.720	58.846
11	11-3	12.454	172.086	101.382	25	25-1	8.271	123.114	66.321
12	12-1	12.218	171.311	138.459	25	25-2	7.813	123.110	68.592
12	12-2	12.045	172.074	152.097	25	25-3	7.638	121.310	62.939
12	12-3	12.647	178.890	137.771	26	26-1	7.716	121.462	69.797
13	13-1	12.282	177.738	82.354	26	26-2	7.732	121.473	43.204
13	13-2	12.772	178.192	86.022	26	26-3	7.761	121.800	72.598
13	13-3	11.455	168.431	75.930	27	27-1	7.560	122.360	61.557
14	14-1	11.454	167.247	92.329	27	27-2	7.504	121.522	68.144

Continued Table S4

27	27-3	7.621	119.362	62.451
28	28-1	7.580	117.985	70.166
28	28-2	7.488	119.229	63.954
28	28-3	7.615	121.025	67.721
29	29-1	8.103	121.376	61.088
29	29-2	7.783	121.461	61.778
29	29-3	8.154	124.803	58.369
30	30-1	8.077	125.014	60.027
30	30-2	8.158	124.975	65.831
30	30-3	8.014	127.571	64.060

Note: TN, TC, and TOC are the abbreviations of total nitrogen content, total carbon content, and total organic carbon content, respectively.

Table S5 ^{210}Pb radioactivity specific activity degree along depth and mass depth. Chronology and sedimentation flux were determined by CRS model.

Depth (cm)	Mass depth (g cm ⁻²)	Age (a)	Sedimentation flux (g cm ⁻² yr ⁻¹)	Depth (cm)	Mass depth (g cm ⁻²)	Age (a)	Sedimentation flux (g cm ⁻² yr ⁻¹)
1	0.247	2011	0.093	16	4.154	1975	0.105
2	0.489	2009	0.090	17	4.447	1971	0.103
3	0.732	2007	0.106	18	4.737	1969	0.104
4	0.977	2004	0.102	19	5.031	1965	0.102
5	1.219	2002	0.099	20	5.323	1960	0.098
6	1.468	2000	0.105	21	5.618	1956	0.096
7	1.720	1997	0.102	22	5.918	1953	0.097
8	1.967	1996	0.107	23	6.219	1949	0.095
9	2.229	1994	0.112	24	6.522	1943	0.092
10	2.495	1990	0.105	25	6.823	1927	0.078
11	2.762	1989	0.109	26	7.126	1921	0.077
12	3.034	1986	0.109	27	7.428	1912	0.073
13	3.308	1984	0.112	28	7.733	1889	0.062
14	3.585	1982	0.112	29	8.042	1865	0.054
15	3.867	1976	0.102	30	8.352	1824	0.044

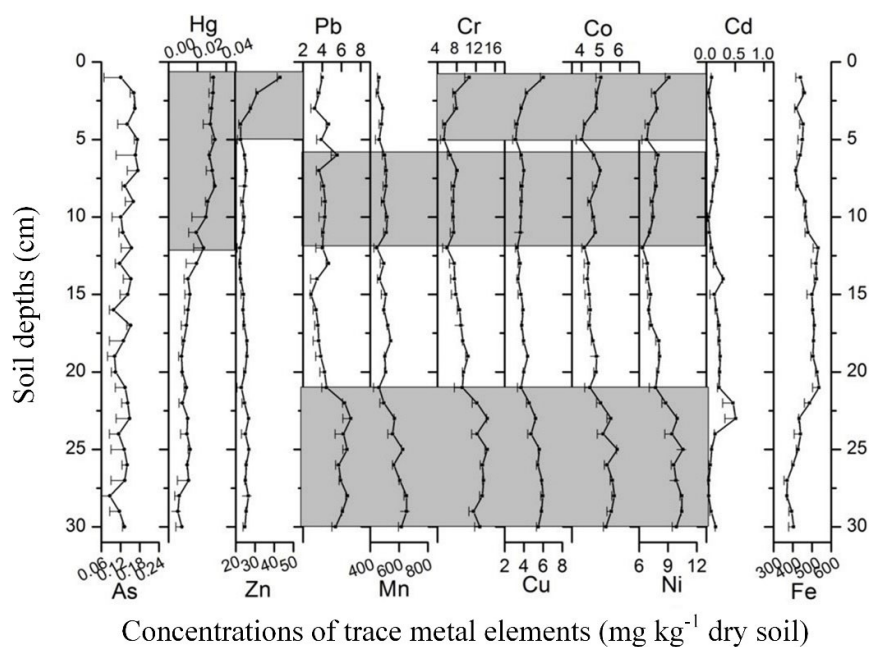


Figure S1. Main trace metal elements concentrations along peat profile. Note different scales of x-axis of different elements. All elements were determined by model Z-2000 flame graphite furnace atomic absorption spectrometer AAS, Hitachi LTD, Japan. The pretreatment of samples was similar to that in Pb and As determination. The recoveries of standard samples for these elements were all within 90%–110%.

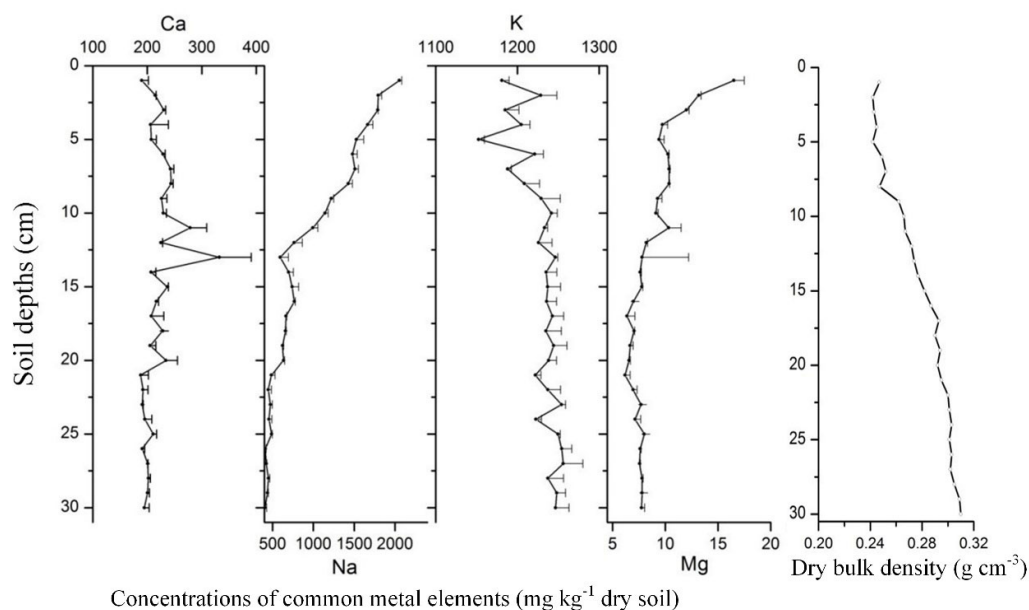


Figure S2. Main trace metal elements concentrations and dry bulk density along peat profile. Note different scales of x-axis of different elements.