Supplementary Material

Spatial Distribution and Pollution Assessment of Potentially Toxic Elements (PTEs) in Surface Sediments at the Drinking Water Source Channel of Taipu River in China

Table S1. Pollution grades of the geoaccumulation index (I_{geo}).

Grade	Value	Degree of Pollution
0	$I_{geo} \leq 0$	unpolluted
1	$0 < I_{geo} \leq 1$	unpolluted to moderately polluted
2	$1 < I_{geo} \leq 2$	moderately polluted
3	$2 < I_{geo} \leq 3$	moderately to severely polluted
4	$3 < I_{geo} \leq 4$	severely polluted
5	$4 < I_{geo} \leq 5$	extremely severely polluted
6	$5 < I_{geo}$	and extremely polluted

Table S2. (EF) of different levels.

EF	Levels
0-1.0	No enrichment
1.0-3.0	Minor enrichment
3.0-5.0	Moderate enrichment
5.0-10	Moderately severe enrichment
10-25	Severe enrichment
25-50	Very severe enrichment;
>50	Extremely severe enrichment

Table S3. The categories of potential ecological risk represented by E_r^i and RI.

E_r^i	Individual ecological risk	RI	Potential ecological risk to the environment
$E_r^i < 30$	Low risk	$RI < 80$	Low risk
$30 \leq E_r^i < 60$	Moderate risk	$80 \leq RI < 160$	Moderate risk
$60 \leq E_r^i < 120$	Considerable risk	$160 \leq RI < 320$	Considerable risk
$120 \leq E_r^i < 240$	High risk	$RI \geq 320$	High risk
$E_r^i \geq 240$	Extremely high risk		

Table S4. Heavy metal content in surface sediments of Taipu river (mg / kg).

	Cr	Ni	Cu	Zn	Mo	Cd	Tl	Pb	V	Co	As	Sb
TP1	42.7	16.26	13.52	44.0	0.306	0.106	0.350	16.02	57.5	8.51	5.96	42.7
TP2	60.6	27.1	18.4	71.2	0.721	0.086	0.422	17.4	77.3	11.54	6.74	60.6
TP3	62.0	29.7	31.0	121.9	0.661	0.162	0.499	25.3	85.2	13.89	11.38	62.0
TP4	56.4	27.9	19.2	62.4	0.255	0.072	0.434	16.06	77.2	12.74	9.46	56.4
TP5	57.4	28.1	29.7	121.0	0.963	0.246	0.508	27.5	78.1	12.58	10.56	57.4
TP6	37.5	12.15	9.26	32.3	0.224	0.029	0.306	12.59	46.6	5.87	2.70	37.5
TP7	51.5	24. 8	24.7	76.8	0.385	0.123	0.401	19.6	68.5	11.24	8.33	51.4
TP8	66.1	33.3	35.9	143.1	0.802	0.455	0.527	27.4	88.2	14.45	10.46	66.1
TP9	73.9	36.5	50.8	104.5	0.651	0.138	0.524	24.8	96.0	14.69	9.29	73.9
TP10	35.6	10.88	8.53	33.8	0.302	0.021	0.291	12.03	45.8	6.38	3.40	35.6
TP11	44.9	33.4	130.2	48.6	0.457	0.088	0.336	15.53	55.9	14.24	5.14	44.9
TP12	39.0	13.71	12.16	26.8	0.222	0.043	0.301	12.62	53.5	5.48	3.50	39.0
TP13	85.4	46.7	39.4	98.8	0.519	0.184	0.617	26.9	116.5	18.9	22.48	85.3
TP14	50.9	21.7	24.0	59.0	0.307	0.069	0.402	16.25	65.8	9.89	4.93	50.9
TP15	62.0	29.2	24.3	67.1	0.433	0.077	0.431	18.7	76.5	12.46	9.37	62.0
TP16	57.9	27.4	20.6	61.8	0.285	0.081	0.423	16.67	77.1	11.91	7.02	57.9
TP17	66.5	33.1	25.0	64.8	0.502	0.067	0.519	21.1	91.8	13.33	13.54	66.5
TP18	71.0	37.6	26.6	82.6	0.312	0.070	0.563	21.1	100.0	14.11	10.91	71.0
TP19	66.5	32.3	21.4	69.2	0.374	0.065	0.508	19.8	88.9	13.85	7.68	66.5
TP20	65.7	33.1	23.3	57.3	0.465	0.072	0.528	18.4	92.7	13.00	11.30	65.7
TP21	55.0	23.1	16.05	57.4	0.391	0.048	0.387	17.3	71.4	9.15	6.59	55.0
TP22	54.3	24.9	27.4	91.2	0.671	0.128	0.361	20.1	68.8	11.91	7.89	54.3
TP23	54.3	21.2	11.52	46.8	0.235	0.035	0.329	14.78	66.9	8.49	3.02	54.3
TP24	70.9	33.5	22.1	68.8	0.471	0.084	0.489	20.3	94.5	13.24	8.87	70.9
TP25	66.3	31.1	21.2	75.3	0.522	0.118	0.421	18.4	86.6	12.66	9.20	66.3
Xiashu Loess background value in Taihu Lake Basin [1]	79.3	15.7	18.9	59.15	/	/	/	19.5	/	15.6	9.4	/

**Table S5.** The content of PTEs in the surface sediments of the Taipu River and other rivers in the study (mg/kg).

Area	Cr	Ni	Cu	Zn	Cd	Pb	V	Co	As	Sb	References
Taipu River	58.2	27.6	27.5	71.7	0.107	19.1	77.1	11.80	8.40	1.01	this study
Taipu River (2016)	87.2	41.2	62.2	-	0.740	34.9	90.3	16.00	-	7.74	[37]
Huangpu River	-	34.4	40.2	139.7	2.20	68.6	-	0	11.30	2.80	[38]
Xiangjiang River	120.4	57.1	101.4	443	13.68	215	117.0	23.2	54.9	-	[39]
Zijiang River	67.5	34.7	34.2	141.9	3.00	35.7	-	-	31.5	36.6	[40]
Dadu River	158.7	65.8	77.1	137.0	2.80	48.4	-	-	23.1	-	[41]
Jialu River	60.8	42.4	39.2	107.6	2.93	29.4	-	-	6.31	-	[42]
Songhua River	121.4	12.89	13.33	92.5	0.270	18.8	-	-	10.13	-	[43]
Haihe Basin	81.9	27.8	53.3	256	0.364	20.0	--	13.40	-	-	[44]
Liaohe River	35.1	17.7	17.8	50.2	1.200	10.57	-	-	9.88	-	[31]
Biliu Reservoir	42.9	32.4	31.0	84.3	0.132	24.7	-	-	7.30	-	[45]
Bortala River	51.6	22.3	30.1	99.2	0.170	32.0	-	-	9.67	-	[46]
Chenab River	-	-	8.16	33.7	1.67	18.1	-	7.95	-	-	[47]
Vaigai River	69.0	41.5	44.7	164.2	1.010	69.3	-	-	-	-	[48]
Bangshi River	98.0	26.0	31.0	-	0.610	60.0	-	-	1.93	-	[49]
Somesu Mic River	22.6	26.6	32.6	97.7	0.160	35.5			-		[50]

Note: The missing values of Mo and Tl are due to references not mentioned.

Table S6. Correlation analysis of heavy metals and physicochemical properties in surface sediments of Taipu river （n=25）.

	Cr	Ni	Cu	Zn	Mo	Cd	Tl	Pb	V	Co	As	Sb	pH	TOC	clay	silt
Cr	1															
Ni	0.918**	1														
Cu	0.090	0.445*	1													
Zn	0.620**	0.606**	0.179	1												
Mo	0.428*	0.444*	0.259	0.830**	1											
Cd	0.361	0.395	0.208	0.846**	0.725**	1										
Tl	0.913**	0.875**	0.097	0.698**	0.484*	0.471*	1									
Pb	0.752**	0.737**	0.201	0.943**	0.783**	0.765**	0.837**	1								
V	0.987**	0.912**	0.060	0.616**	0.404*	0.363	0.950**	0.760**	1							
Co	0.867**	0.971**	0.47*	0.688**	0.519**	0.482*	0.854**	0.785**	0.860**	1						
As	0.819**	0.822**	0.128	0.602**	0.433*	0.432*	0.860**	0.769**	0.854**	0.832**	1					
Sb	0.425*	0.427*	0.195	0.776**	0.731**	0.630**	0.508**	0.747**	0.427*	0.475*	0.396*	1				
pH	0.474*	0.266	-0.360	0.038	-0.018	-0.212	0.203	0.018	0.411*	0.217	0.156	-0.137	1			
TOC	-0.383	-0.206	0.405*	-0.264	-0.105	-0.066	-0.362	-0.263	-0.373	-0.243	-0.280	-0.289	-0.512**	1		
clay	0.523*	0.440	-0.157	0.034	-0.046	-0.169	.567**	0.211	0.567**	0.381	0.400	0.139	0.230	-0.338	1	
silt	-0.464*	-.457*	-0.099	-0.066	-0.071	0.009	-0.422	-0.204	-0.438	-0.408	-0.302	-0.170	-0.176	0.135	-0.709**	1

**. $p<0.01$, *. $p<0.05$
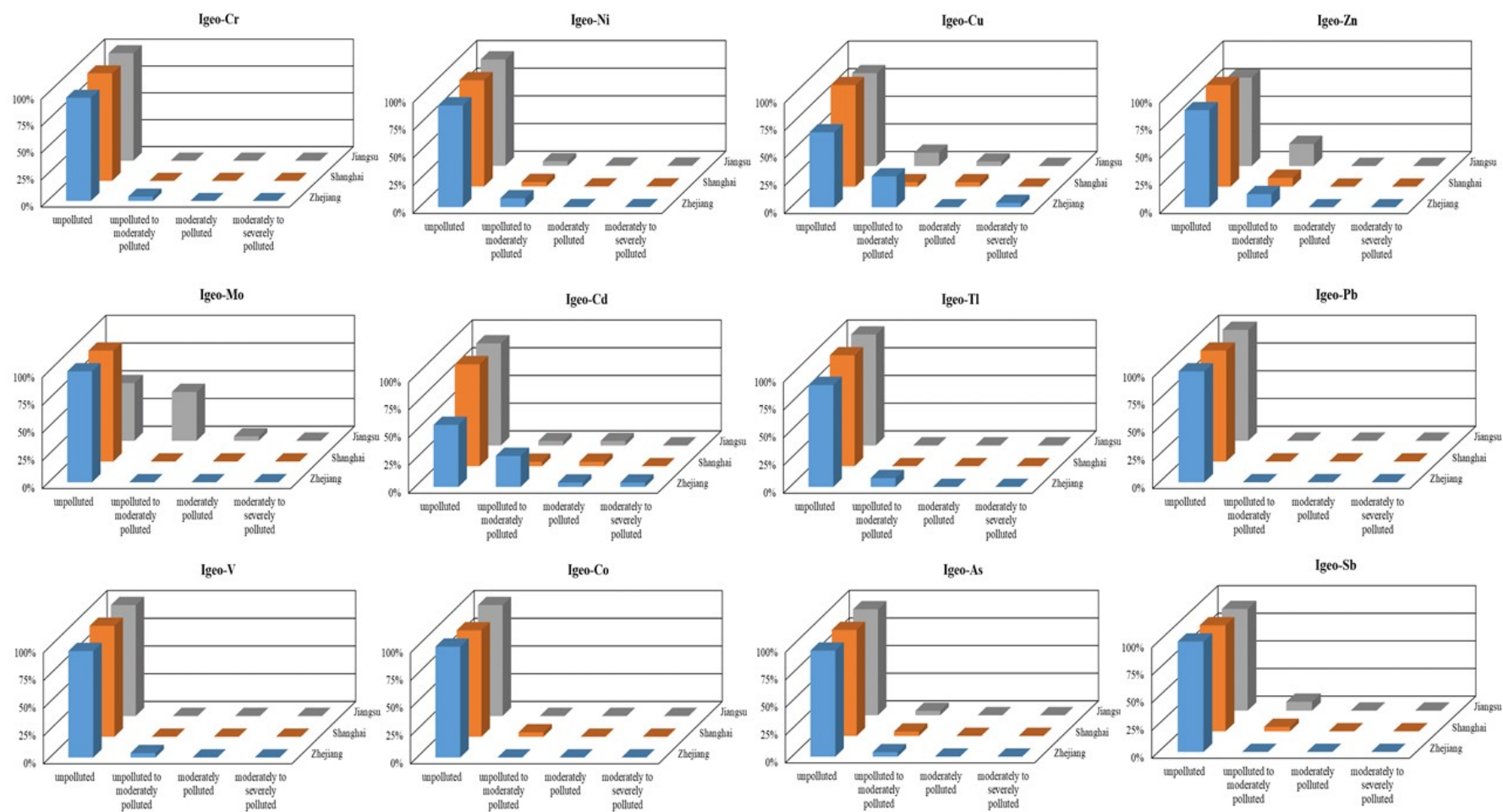
Figure S1. Percentage of different pollution grades of PTEs in the geoaccumulation index (I_{geo}) of 25 surface sediments in three provinces (Zhejiang, Shanghai and Jiangsu Province) background values.

Figure S2. Percentage of different pollution grades of PTEs in the Enrichment factor (EF) of 25 surface sediments in three provinces (Zhejiang, Shanghai and Jiangsu Province) background values.