

Distribution and Source Identification of Pu in River Basins in Southern China

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Table S1. Information about the sampling locations and analytical results of $^{239+240}\text{Pu}$ activities, $^{240}\text{Pu}/^{239}\text{Pu}$ atom ratios, grain sizes and components of surface sediments.

Site	Longitude	Latitude	Region	River	$^{240}\text{Pu}/^{239}\text{Pu}$		TOC	Grain size (μm)	Sand (%) ^b	silt (%) ^b	clay (%) ^b
				Pearl River Basin	$^{239+240}\text{Pu}$ (mBq/g) ^a	u ratio ^a					
E02	113.273	23.998	Beijiang	Pearl River	0.341 ± 0.012	0.199 ± 0.032	3.81%	2.53	87.27	10.95	1.78
				Pearl River	0.305 ± 0.021	0.198 ± 0.021					
E05	113.425	24.183	Beijiang	Pearl River	0.283 ± 0.035	0.191 ± 0.015	6.37%	5.58	24.4	63.32	12.28
				Pearl River	0.336 ± 0.015	0.186 ± 0.021					
E08	114.269	23.161	Dongjiang	Pearl River	0.391 ± 0.035	0.176 ± 0.022	0.91%	-	-	-	-
				Pearl River	0.321 ± 0.042	0.178 ± 0.016					
E11	115.259	24.154	Dongjiang	Pearl River	0.690 ± 0.053	0.179 ± 0.026	5.81%	5.16	30.6	59.99	9.41
				Pearl River	1.792 ± 0.134	0.169 ± 0.015					
E13	115.779	23.963	Hanjiang	Pearl River	0.483 ± 0.243	0.175 ± 0.012	4.34%	6.43	7.61	75.3	17.09
				Pearl River	0.788 ± 0.059	0.175 ± 0.022					
E14	116.101	24.241	Hanjiang	Pearl River	0.259 ± 0.042	0.191 ± 0.016	4.88%	6.33	4.65	80.85	14.5
				Pearl River	0.630 ± 0.053	0.176 ± 0.026					
E15	116.141	24.646	Hanjiang	Pearl River	0.690 ± 0.067	0.179 ± 0.020	2.19%	4.93	39.17	50.23	10.6
				Pearl River	1.792 ± 0.134	0.169 ± 0.015					
E26	116.653	23.683	Hanjiang	Pearl River	0.483 ± 0.243	0.175 ± 0.012	2.08%	6.71	4.13	73.16	22.71
				Pearl River	0.788 ± 0.059	0.175 ± 0.022					
E27	116.464	23.461	Hanjiang	Pearl River	0.483 ± 0.243	0.175 ± 0.012	16.62%	4.61	39.44	51.33	9.23
				Pearl River	0.788 ± 0.059	0.175 ± 0.022					
E28	115.619	22.955	Hanjiang	Pearl River	0.483 ± 0.243	0.175 ± 0.012	4.87%	6.05	11.57	74.2	14.23
				Pearl River	0.788 ± 0.059	0.175 ± 0.022					
E30	114.462	23.04	Dongjiang	Pearl River	0.341 ± 0.012	0.199 ± 0.032	3.81%	2.53	87.27	10.95	1.78

E31	113.846	23.104	Dongjiang	Pearl River	3.322 ± 0.499	0.183 ± 0.023	6.95%	6.02	10.43	75.7	13.87
E35	112.999	22.503	Pearl River	Pearl River	1.580 ± 0.192	0.172 ± 0.031	7.23%	5.47	24.03	65.03	10.94
E36	112.689	23.175	Pearl River	Pearl River	0.043 ± 0.013	0.165 ± 0.028	2.18%	-	-	-	-
E38	112.808	23.189	Pearl River	Pearl River	0.133 ± 0.021	0.184 ± 0.026	5.93%	6.19	10.36	72.87	16.77
E39	113.176	23.235	Pearl River	Pearl River	0.011 ± 0.019	0.179 ± 0.021	3.80%	7.3	0.02	72.16	27.82
W47	110.555	21.927	WGC	WGC	0.029 ± 0.011	0.182 ± 0.016	3.80%	-	-	-	-
W48	110.658	21.578	WGC	WGC	0.056 ± 0.028	0.171 ± 0.014	2.72%	6.31	7.94	74.65	17.41
W54	110.369	20.642	WGC	WGC	0.114 ± 0.046	0.215 ± 0.021	3.38%	5.82	12.41	75.5	12.09
W55	110.408	20.581	WGC	WGC	0.339 ± 0.022	0.201 ± 0.024	5.48%	6.26	4.95	79.85	15.2
W58	110.783	21.455	WGC	WGC	0.132 ± 0.014	0.187 ± 0.021	4.51%	5.8	13.74	73.73	12.53
W64	111.412	21.597	WGC	WGC	0.094 ± 0.014	0.176 ± 0.013	1.42%	6.14	12.87	70.28	16.84
W69	111.819	21.953	WGC	WGC	0.033 ± 0.009	0.169 ± 0.014	2.45%	-	-	-	-
W70	112.399	21.891	WGC	WGC	0.066 ± 0.024	0.163 ± 0.019	10.16%	5.54	18.61	71.78	9.61
W72	112.015	21.83	WGC	WGC	0.458 ± 0.027	0.212 ± 0.012	9.53%	-	-	-	-
W73	112.015	21.791	WGC	WGC	4.676 ± 0.075	0.221 ± 0.024	4.51%	4.94	34.44	57.24	8.2
W74	111.914	21.686	WGC	WGC	0.339 ± 0.029	0.215 ± 0.021	7.43%	5.25	30.2	59.42	10.38
E18	117.449	25.278	Jinjiang	Jingjiang	0.396 ± 0.020	0.201 ± 0.017	4.66%	5.08	28.22	62.9	8.9
E19	118.33	25.3	Jinjiang	Jingjiang	0.412 ± 0.038	0.192 ± 0.026	2.20%	5.06	33	58.9	8.1
E20	118.378	25.286	Jinjiang	Jingjiang	0.403 ± 0.065	0.184 ± 0.016	1.96%	5.44	23.82	65.28	10.9
E21	118.591	24.877	Jinjiang	Jingjiang	0.091 ± 0.051	0.168 ± 0.027	4.42%	-	-	-	-
E22	117.781	24.508	Jinjiang	Jingjiang	0.561 ± 0.036	0.221 ± 0.015	2.74%	6.34	6.27	77.45	16.28
E23	117.755	24.488	Jinjiang	Jingjiang	0.586 ± 0.053	0.207 ± 0.013	1.42%	5.43	23.58	65.64	10.78
E24	117.697	24.044	Jinjiang	Jingjiang	0.218 ± 0.028	0.183 ± 0.011	1.80%	6.33	5.43	79.96	14.61

E25	117.334	23.973	Jinjiang	Jingjiang	0.430 ± 0.128	0.167 ± 0.014	3.30%	7.05	1.07	75.4	23.53
E40	119.123	26.145	Minjiang	Minjiang	0.289 ± 0.055	0.222 ± 0.011	0.73%	6.11	10.19	74.44	15.37
W08	111.504	23.383	Hongshui	Pearl River	0.012 ± 0.017	0.171 ± 0.026	2.72%	6.63	2.29	79.6	18.11
W11	110.532	24.775	Hongshui	Pearl River	0.014 ± 0.034	0.169 ± 0.024	2.06%	6.6	4.15	76.97	18.88
W12	110.534	24.784	Hongshui	Pearl River	0.065 ± 0.020	0.221 ± 0.021	5.32%	7.84	0	57.05	42.95
W15	108.559	24.531	Hongshui	Pearl River	0.083 ± 0.042	0.174 ± 0.018	1.59%	-	-	-	-
W16	108.554	24.531	Hongshui	Pearl River	0.117 ± 0.022	0.168 ± 0.016	4.54%	6.32	6.92	77.2	15.89
W17	107.989	23.732	Hongshui	Pearl River	0.109 ± 0.024	0.196 ± 0.014	4.29%	6.01	12.02	72.13	15.85
W20	105.803	24.705	Hongshui	Pearl River	0.127 ± 0.018	0.172 ± 0.024	6.91%	5.67	16.52	72.07	11.41
W22	105.787	25.381	Hongshui	Pearl River	0.253 ± 0.104	0.189 ± 0.012	5.30%	7.28	0	70.14	29.86
W23	105.483	25.206	Hongshui	Pearl River	0.269 ± 0.051	0.190 ± 0.021	8.41%	5.54	2.67	78.79	18.54
W24	106.208	24.316	Hongshui	Pearl River	0.122 ± 0.046	0.179 ± 0.014	2.73%	5.76	18.97	67.7	13.33
W25	106.647	23.871	Hongshui	Pearl River	0.114 ± 0.040	0.199 ± 0.021	4.79%	-	-	-	-
W26	107.351	22.412	Hongshui	Pearl River	0.093 ± 0.012	0.175 ± 0.032	1.51%	2.81	90.66	7.04	2.31
W29	108.187	22.82	Hongshui	Pearl River	0.190 ± 0.047	0.212 ± 0.022	4.15%	6.26	8.73	74.9	16.37
W34	110.568	22.861	Hongshui	Pearl River	0.079 ± 0.008	0.181 ± 0.021	7.53%	-	-	-	-
HN08	110.816	19.585		Hainan rivers	0.076 ± 0.015	0.168 ± 0.025	0.65%	-	-	-	-
HN09	110.592	19.154		Hainan rivers	0.034 ± 0.011	0.172 ± 0.022	1.14%	-	-	-	-
HN12	110.035	18.522		Hainan rivers	0.057 ± 0.021	0.167 ± 0.016	0.53%	-	-	-	-

^a All given uncertainties are ± two standard deviation errors.

^b Diameter ranges: clay particles, 0.02µm to 64µm; silt particles, 64µm to 128µm; sand particles, 128µm to 2000µm.

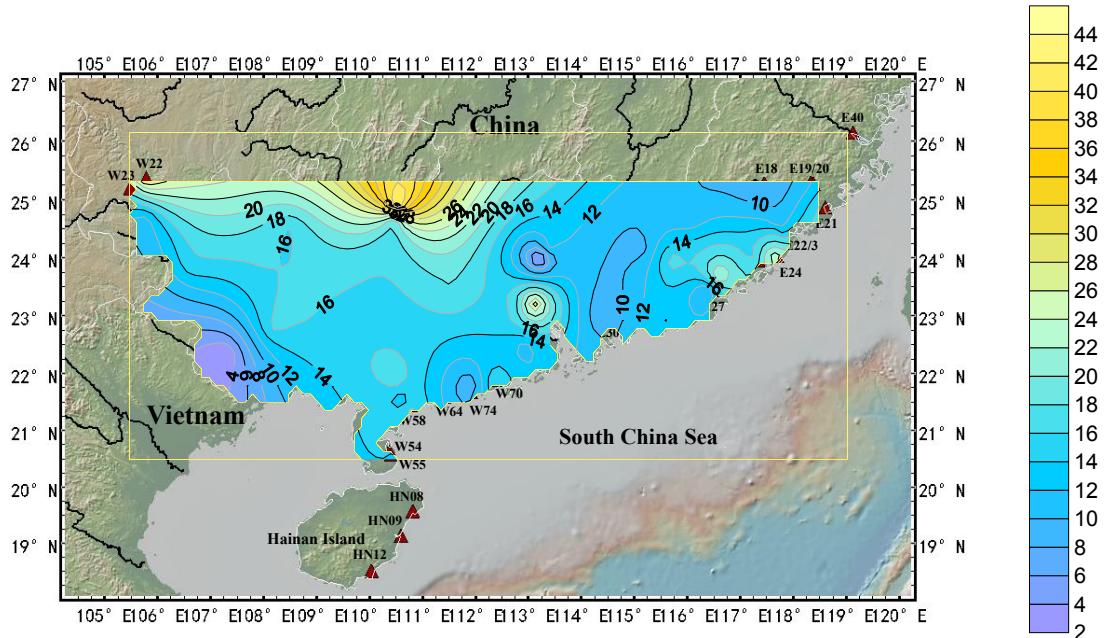


Figure S1. The content of clay in surface sediments of river basins in southern China.

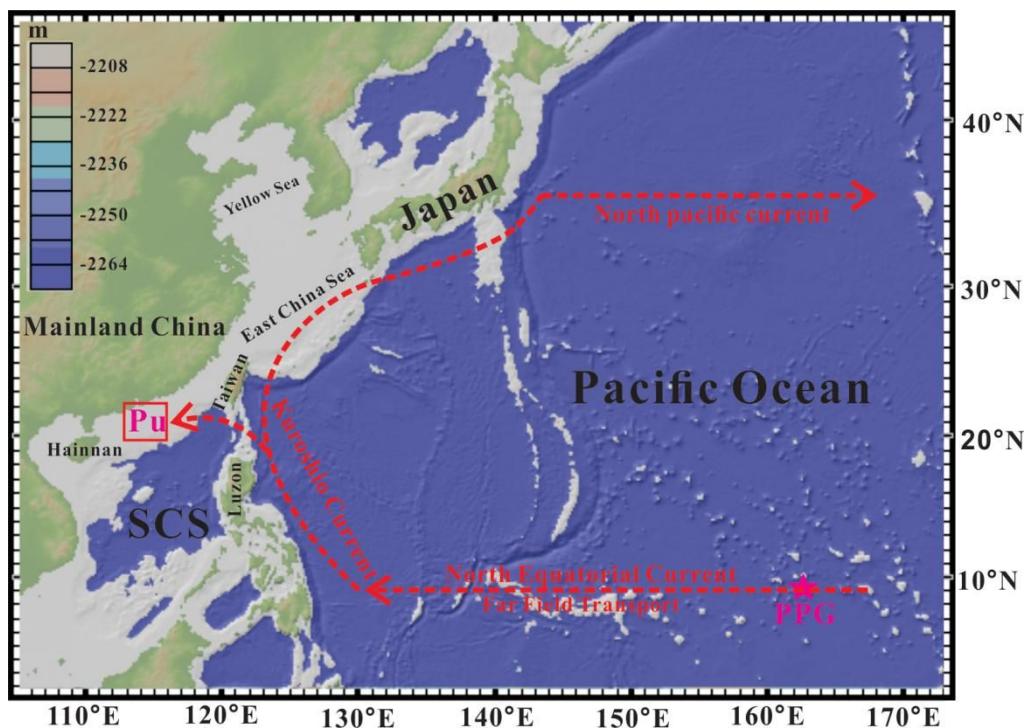


Figure S2. The schematic map of the North Equatorial Current-Kuroshio current system and the location of the Pacific Proving Ground (PPG).¹⁻²

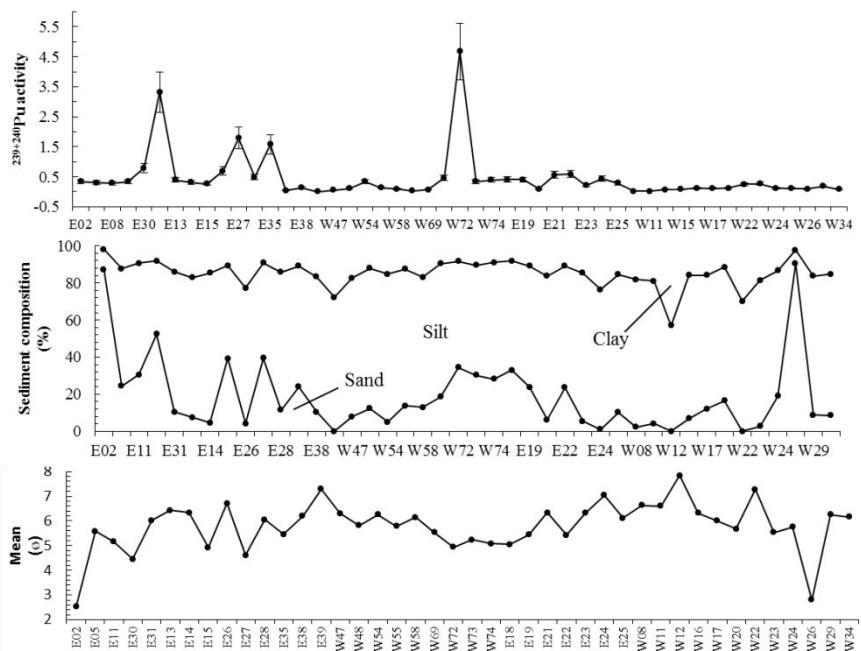


Figure S3. Grain sizes, sediment components and $^{239+240}\text{Pu}$ activities in surface sediments of river basins in southern China.

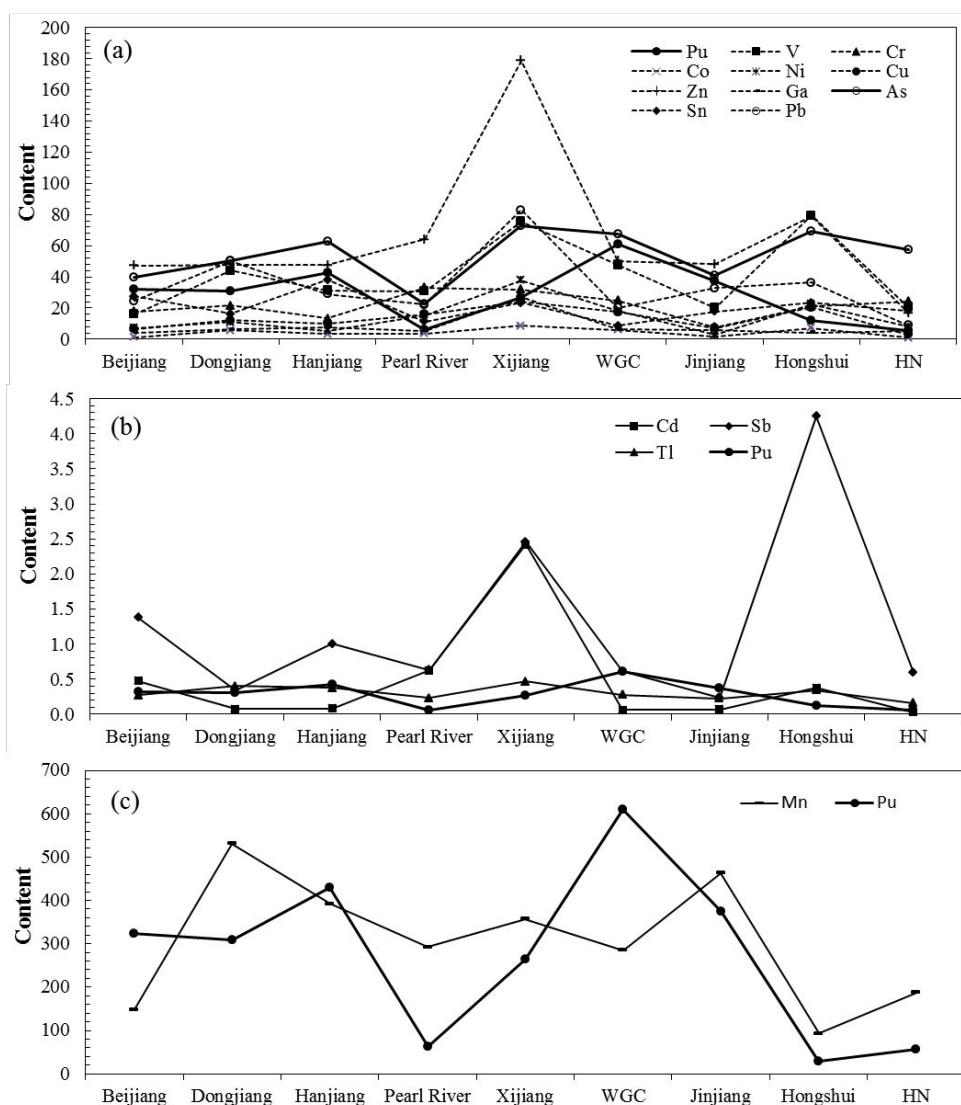


Figure S4. Content of $^{239+240}\text{Pu}$ activity (mBq/g) and heavy metals (mg/kg) in surface sediments of river basins in southern China. The activities of $^{239+240}\text{Pu}$ in (a) are on a scale of 100 times, the activities of $^{239+240}\text{Pu}$ in (b) are the test results, and the activities of $^{239+240}\text{Pu}$ in (c) are on a scale of 1000 times.

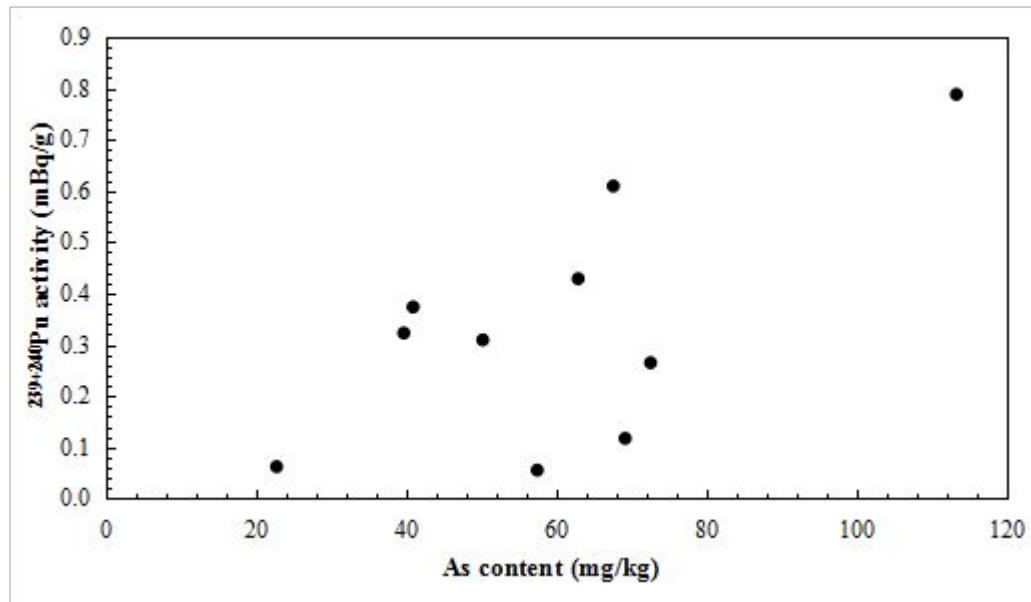


Figure S5. Relationship between $^{239+240}\text{Pu}$ activity (mBq/g) and content of As (mg/kg) found in surface sediments of river basins in southern China.

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