Why sampling time was confirmed during August, 2016

Firstly, Honghu Lake is an important storage lake in Jianghan Plain. It is a semi−closed lake, and the inflows are mainly from the north through the Four−lake Main Canal. Outflow of Honghu Lake discharges into the Yangtze River through the only water gate in southeast, and the water gate is open only in flood period (generally in some days during June−August). Secondly, the rainfall in Honghu Basin is mainly concentrated in summer. The surface runoff in the area flows into Honghu Lake through the Four−lake Main Canal. Upstream water will also bring a large amount of pollutants into Honghu Lake, so the water pollution in flood period is more complicated than other seasons. Finally, during the flood period, Honghu Lake irregularly releases water as water levels rise. August is the end of the flood season, with relatively small fluctuations in water quality. Furthermore, the high water level in Honghu Lake during the flood season will bring inconvenience and danger to the sampling work. So at the preparation stage, we had a close communication with the local guide, environmental protection department and water conservancy department to keep abreast of the latest situation in Honghu Lake. We confirmed the sampling time at the end of the August when was about two weeks from the last water releasing time. Therefore, in our sampling date, the lake came into a relatively stable state. Based on the above, sampling time in this study was determined at the end of the August.

Table S1. Hazard quotient (HQ) and Hazard index (HI) of trace elements in surface water from Honghu Lake through ingestion.

Sites	HQ_{ing}						HI_{ing}
	Zn	Cu	Cd	Cr	As	Pb	
S1	[6.82E−04,8.25E−04]	[4.46E−03,5.45E−03]	[4.52E−03,5.43E−03]	[1.59E−02,2.00E−02]	[6.62E−02,8.69E−02]	[2.68E−02,3.34E−02]	[1.19E−01,1.52E−01]
S2	[2.54E−03,3.10E−03]	[4.62E−03,5.66E−03]	[4.95E−03,6.27E−03]	[2.69E−02,3.23E−02]	[7.63E−02,9.22E−02]	[3.45E−02,4.14E−02]	[1.50E−01,1.81E−01]
S3	[2.07E−03,2.52E−03]	[3.54E−03,4.43E−03]	[6.47E−03,7.87E−03]	[1.80E−02,2.16E−02]	[6.65E−02,8.06E−02]	[4.05E−02,4.89E−02]	[1.37E−01,1.66E−01]
S4	[6.30E−03,7.59E−03]	[1.94E−03,2.38E−03]	[2.81E−03,3.46E−03]	[1.23E−02,1.48E−02]	[1.44E−01,1.73E−01]	[1.99E−02,2.41E−02]	[1.87E−01,2.25E−01]
S5	[3.97E−04,4.81E−04]	[1.84E−03,2.29E−03]	[5.16E−03,6.19E−03]	[1.03E−02,1.24E−02]	[1.32E−01,1.62E−01]	[4.45E−02,5.50E−02]	[1.94E−01,2.38E−01]
S6	[1.43E−03,1.75E−03]	[2.36E−03,2.83E−03]	[5.60E−03,6.73E−03]	[3.04E−02,3.68E−02]	[9.81E−02,1.18E−01]	[2.69E−02,3.31E−02]	[1.65E−01,1.99E−01]
S7	[8.97E−04,1.08E−03]	[2.42E−03,3.00E−03]	[2.68E−03,3.25E−03]	[8.69E−03,1.05E−02]	[8.82E−02,1.06E−01]	[3.94E−02,4.75E−02]	[1.42E−01,1.72E−01]
S8	[7.66E−04,9.53E−04]	[2.02E−03,2.44E−03]	[2.07E−03,2.57E−03]	[1.91E−02,2.29E−02]	[9.08E−02,1.10E−01]	[1.85E−02,2.25E−02]	[1.33E−01,1.61E−01]
S9	[6.16E−04,7.61E−04]	[2.33E−03,2.80E−03]	[2.32E−03,2.78E−03]	[7.86E−03,9.44E−03]	[7.29E−02,8.85E−02]	[1.53E−02,1.85E−02]	[1.01E−01,1.23E−01]
S10	[1.63E−03,1.98E−03]	[2.29E−03,2.77E−03]	[3.27E−03,3.98E−03]	[1.20E−02,1.46E−02]	[8.36E−02,1.04E−01]	[2.06E−02,2.50E−02]	[1.23E−01,1.52E−01]
S11	[1.88E−03,2.30E−03]	[1.18E−03,1.49E−03]	[2.09E−03,2.51E−03]	[6.04E−03,7.30E−03]	[1.09E−01,1.32E−02]	[1.52E−02,1.85E−02]	[1.36E−01,1.64E−01]
S12	[6.61E−04,7.98E−04]	[1.21E−03,1.48E−03]	[3.92E−03,4.73E−03]	[1.29E−02,1.57E−02]	[8.19E−02,9.93E−02]	[2.98E−02,3.63E−02]	[1.30E−01,1.58E−01]
S13	[3.87E−03,4.72E−03]	[1.07E−03,1.35E−03]	[3.27E−03,4.04E−03]	[7.39E−03,8.95E−03]	[1.12E−01,1.36E−01]	[1.64E−02,1.99E−02]	[1.44E−01,1.75E−01]
S14	[3.99E−04,4.94E−04]	[1.61E−03,2.02E−03]	[3.09E−03,3.75E−03]	[9.68E−03,1.16E−02]	[8.24E−02,9.97E−02]	[1.94E−02,2.36E−02]	[1.17E−01,1.41E−01]
S15	[3.78E−03,4.56E−03]	[1.84E−03,2.24E−03]	[6.93E−03,8.34E−03]	[9.15E−03,1.10E−02]	[9.01E−02,1.08E−01]	[2.80E−02,3.37E−02]	[1.40E−01,1.68E−01]
S16	[2.48E−03,3.03E−03]	[1.45E−03,1.74E−03]	[3.28E−03,4.09E−03]	[4.26E−02,5.12E−02]	[8.79E−02,1.08E−01]	[4.16E−02,5.07E−02]	[1.79E−01,2.19E−01]
S17	[1.17E−03,1.43E−03]	[1.69E−03,2.07E−03]	[1.61E−03,1.93E−03]	[1.34E−02,1.61E−02]	[7.18E−02,8.66E−02]	[2.36E−02,2.89E−02]	[1.13E−01,1.37E−01]
S18	[2.97E−03,3.63E−03]	[1.45E−03,1.80E−03]	[3.21E−03,3.95E−03]	[1.00E−02,1.21E−02]	[1.13E−01,1.36E−01]	[2.23E−02,2.69E−02]	[1.53E−01,1.85E−01]
S19	[1.17E−03,1.43E−03]	[1.07E−03,1.31E−03]	[4.84E−03,5.82E−03]	[1.94E−02,2.33E−02]	[1.24E−01,1.50E−01]	[2.90E−02,2.66E−02]	[1.79E−01,2.18E−01]
S20	[2.30E−03,2.77E−03]	[2.42E−03,2.94E−03]	[3.69E−03,4.48E−03]	[1.23E−02,1.48E−02]	[5.83E−02,7.08E−02]	[3.11E−02,3.79E−02]	[1.10E−01,1.34E−01]

Table S2. Hazard quotient (HQ) and Hazard index (HI) of trace elements in surface water from Honghu Lake through dermal contact.

Sites	HQ_{derm}						HI_{derm}
	Zn	Cu	Cd	Cr	As	Pb	
S1	[1.11E−05,1.18E−05]	[8.11E−05,8.69E−05]	[2.46E−03,2.59E−03]	[8.66E−03,9.58E−03]	[8.80E−04,1.01E−03]	[9.73E−05,1.06E−04]	[1.22E−02,1.34E−02]
S2	[4.16E−05,4.45E−05]	[8.40E−05,9.02E−05]	[2.70E−03,3.00E−03]	[1.46E−02,1.55E−02]	[1.01E−03,1.07E−03]	[1.25E−04,1.32E−04]	[1.86E−02,1.98E−02]
S3	[3.39E−05,3.62E−05]	[6.43E−05,7.06E−05]	[3.52E−03,3.76E−03]	[9.79E−03,1.03E−02]	[8.83E−04,9.40E−04]	[1.47E−04,1.56E−04]	[1.44E−02,1.53E−02]
S4	[1.03E−04,1.09E−04]	[3.53E−05,3.80E−05]	[1.53E−03,1.65E−03]	[6.69E−03,7.06E−03]	[1.91E−03,2.02E−03]	[7.24E−05,7.68E−05]	[1.03E−02,1.10E−02]
S5	[6.49E−06,6.90E−06]	[3.34E−05,3.66E−05]	[2.81E−03,2.96E−03]	[5.61E−03,5.95E−03]	[1.76E−03,1.89E−03]	[1.62E−04,1.75E−04]	[1.04E−02,1.10E−02]
S6	[2.33E−05,2.51E−05]	[4.28E−05,4.50E−05]	[3.05E−03,3.22E−03]	[1.66E−02,1.76E−02]	[1.30E−03,1.38E−03]	[9.79E−05,1.06E−04]	[2.11E−02,2.23E−02]
S7	[1.47E−05,1.55E−05]	[4.40E−05,4.79E−05]	[1.46E−03,1.55E−03]	[4.74E−03,5.03E−03]	[1.17E−03,1.24E−03]	[1.43E−04,1.51E−04]	[7.57E−03,8.04E−03]
S8	[1.25E−05,1.37E−05]	[3.67E−05,3.88E−05]	[1.13E−03,1.23E−03]	[1.04E−02,1.10E−02]	[1.21E−03,1.28E−03]	[6.73E−05,7.17E−05]	[1.28E−02,1.36E−02]
S9	[1.01E−05,1.09E−05]	[4.24E−05,4.46E−05]	[1.26E−03,1.33E−03]	[4.28E−03,4.54E−03]	[9.68E−04,1.03E−03]	[5.56E−05,5.89E−05]	[6.62E−03,6.99E−03]
S10	[2.66E−05,2.84E−05]	[4.16E−05,4.41E−05]	[1.78E−03,1.90E−03]	[6.56E−03,7.00E−02]	[1.11E−03,1.21E−03]	[7.47E−05,7.97E−05]	[9.59E−03,1.03E−02]
S11	[3.07E−05,3.30E−05]	[2.14E−05,2.38E−05]	[1.14E−03,1.20E−03]	[3.29E−03,3.49E−03]	[1.45E−03,1.54E−03]	[5.54E−05,5.89E−05]	[5.99E−03,6.34E−03]
S12	[1.08E−05,1.14E−05]	[2.19E−05,2.36E−05]	[2.14E−03,2.26E−03]	[7.04E−03,7.50E−03]	[1.09E−03,1.16E−03]	[1.08E−04,1.16E−04]	[1.04E−02,1.11E−02]
S13	[6.33E−05,6.77E−05]	[1.94E−05,2.15E−05]	[1.78E−03,1.93E−03]	[4.03E−03,4.28E−03]	[1.49E−03,1.58E−03]	[5.96E−05,6.35E−05]	[7.44E−03,7.95E−03]
S14	[6.52E−06,7.08E−06]	[2.92E−05,3.22E−05]	[1.68E−03,1.79E−03]	[5.28E−03,5.57E−03]	[1.10E−03,1.16E−03]	[7.06E−05,7.52E−05]	[8.16E−03,8.63E−03]
S15	[6.18E−05,6.53E−05]	[3.34E−05,3.57E−05]	[3.78E−03,3.98E−03]	[4.98E−03,5.26E−03]	[1.20E−03,1.26E−03]	[1.02E−04,1.07E−04]	[1.02E−02,1.07E−02]
S16	[4.06E−05,4.35E−05]	[2.64E−05,2.78E−05]	[1.79E−03,1.95E−03]	[2.32E−02,2.45E−02]	[1.17E−03,1.26E−03]	[1.51E−04,1.62E−04]	[2.64E−02,2.79E−02]
S17	[1.91E−05,2.05E−05]	[3.07E−05,3.29E−05]	[8.77E−04,9.23E−04]	[7.29E−03,7.68E−03]	[9.54E−04,1.01E−03]	[8.57E−05,9.22E−05]	[9.26E−03,9.75E−03]
S18	[4.85E−05,5.21E−05]	[2.64E−05,2.87E−05]	[1.75E−03,1.89E−03]	[5.45E−03,5.77E−03]	[1.50E−03,1.59E−03]	[8.10E−05,8.57E−05]	[8.86E−03,9.41E−03]
S19	[1.92E−05,2.05E−05]	[1.95E−05,2.10E−05]	[2.64E−03,2.78E−03]	[1.06E−02,1.11E−02]	[1.65E−03,1.75E−03]	[1.05E−04,1.16E−04]	[1.50E−02,1.58E−02]
S20	[3.76E−05,3.97E−05]	[4.39E−05,4.69E−05]	[2.01E−03,2.14E−03]	[6.71E−03,7.07E−03]	[7.75E−04,8.26E−04]	[1.13E−04,1.21E−04]	[9.69E−03,1.02E−02]

Table S3. Hazard quotient (HQ) and Hazard index (HI) of trace elements in surface water from Honghu Lake based on fuzzy assessment.

Sites	HQ						HI
	Zn	Cu	Cd	Cr	As	Pb	
S1	[6.93E−04,8.37E−04]	[4.55E−03,5.54E−03]	[6.98E−03,8.02E−03]	[2.45E−02,2.96E−02]	[6.71E−02,8.79E−02]	[2.69E−02,3.35E−02]	[1.31E−01,1.65E−01]
S2	[2.59E−03,3.15E−03]	[4.71E−03,5.75E−03]	[7.65E−03,9.26E−03]	[4.15E−02,4.78E−02]	[7.73E−02,9.32E−02]	[3.46E−02,4.16E−02]	[1.68E−01,2.01E−01]
S3	[2.11E−03,2.56E−03]	[3.60E−03,4.50E−03]	[9.99E−03,1.16E−02]	[2.78E−02,3.19E−02]	[6.74E−02,8.15E−02]	[4.07E−02,4.91E−02]	[1.52E−01,1.81E−01]
S4	[6.41E−03,7.70E−03]	[1.98E−03,2.42E−03]	[4.35E−03,5.11E−03]	[1.90E−02,2.18E−02]	[1.46E−01,1.75E−01]	[2.00E−02,2.42E−02]	[1.98E−01,2.36E−01]
S5	[4.03E−04,4.88E−04]	[1.87E−03,2.33E−03]	[7.97E−03,9.15E−03]	[1.59E−02,1.84E−02]	[1.34E−01,1.64E−01]	[4.47E−02,5.52E−02]	[2.05E−01,2.49E−01]
S6	[1.45E−03,1.77E−03]	[2.40E−03,2.87E−03]	[8.65E−03,9.95E−03]	[4.70E−02,5.43E−02]	[9.94E−02,1.19E−01]	[2.70E−02,3.33E−02]	[1.86E−01,2.21E−01]
S7	[9.11E−04,1.10E−03]	[2.47E−03,3.05E−03]	[4.14E−03,4.80E−03]	[1.34E−02,1.56E−02]	[8.94E−02,1.08E−01]	[3.96E−02,4.77E−02]	[1.50E−01,1.80E−01]
S8	[7.79E−04,9.67E−04]	[2.06E−03,2.47E−03]	[3.19E−03,3.79E−03]	[2.95E−02,3.39E−02]	[9.20E−02,1.11E−01]	[1.86E−02.2.26E−02]	[1.45E−01,1.75E−01]
S9	[6.26E−04,7.71E−04]	[2.37E−03,2.84E−03]	[3.58E−03,4.11E−03]	[1.21E−02,1.39E−02]	[7.38E−02,8.95E−02]	[1.54E−02,1.85E−02]	[1.08E−01,1.30E−01]
S10	[1.65E−03,2.01E−03]	[2.33E−03,2.81E−03]	[5.06E−03,5.88E−03]	[1.86E−02,2.16E−02]	[8.47E−02,1.05E−01]	[2.06E−02,2.51E−02]	[1.31E−01,1.62E−01]
S11	[1.91E−03,2.34E−03]	[1.20E−03,1.52E−03]	[3.23E−03,3.71E−03]	[9.33E−03,1.08E−02]	[1.11E−01,1.33E−01]	[1.53E−02,1.86E−02]	[1.42E−01,1.70E−01]
S12	[6.72E−04,8.10E−04]	[1.23E−03,1.51E−03]	[6.05E−03,6.99E−03]	[2.00E−02,2.32E−02]	[8.30E−02,1.00E−01]	[3.00E−02,3.65E−02]	[1.41E−01,1.69E−01]
S13	[3.93E−03,4.79E−03]	[1.09E−03,1.37E−03]	[5.05E−03,5.98E−03]	[1.14E−02,1.32E−02]	[1.14E−01,1.38E−01]	[1.65E−02,2.00E−02]	[1.52E−01,1.83E−01]
S14	[4.05E−04,5.01E−04]	[1.64E−03,2.05E−03]	[4.78E−03,5.54E−03]	[1.50E−02,1.72E−02]	[8.35E−02,1.01E−01]	[1.95E−02,2.37E−02]	[1.25E−01,1.50E−01]
S15	[3.84E−03,4.62E−03]	[1.87E−03,2.27E−03]	[1.07E−02,1.23E−02]	[1.41E−02,1.62E−02]	[9.13E−02,1.09E−01]	[2.81E−02,3.38E−02]	[1.50E−01,1.79E−01]
S16	[2.52E−03,3.07E−03]	[1.48E−03,1.77E−03]	[5.07E−03,6.04E−03]	[6.58E−02,7.57E−02]	[8.91E−02,1.09E−01]	[4.17E−02,5.09E−02]	[2.06E−01,2.46E−01]
S17	[1.19E−03,1.45E−03]	[1.72E−03,2.10E−03]	[2.49E−03,2.86E−03]	[2.07E−02,2.37E−02]	[7.28E−02,8.76E−02]	[2.37E−02,2.90E−02]	[1.23E−01,1.47E−01]
S18	[3.02E−03,3.69E−03]	[1.48E−03,1.83E−03]	[4.96E−03,5.83E−03]	[1.55E−02,1.78E−02]	[1.15E−01,1.38E−01]	[2.24E−02,2.70E−02]	[1.62E−01,1.94E−01]
S19	[1.19E−03,1.45E−03]	[1.09E−03,1.34E−03]	[7.47E−03,8.60E−03]	[2.99E−02,3.44E−02]	[1.26E−01,1.52E−01]	[2.91E−02,3.67E−02]	[1.94E−01,2.34E−01]
S20	[2.34E−03,2.81E−03]	[2.46E−03,2.99E−03]	[5.70E−03,6.62E−03]	[1.90E−02,2.19E−02]	[5.91E−02,7.16E−02]	[3.13E−02,3.80E−02]	[1.20E−01,1.44E−01]

Table S4. Carcinogenic risk (CR) of trace elements in surface water from Honghu Lake based on fuzzy assessment.

Sites	Cd		Cr	As		Pb	CR
	CR_{ing}	CR_{derm}	CR_{ing}	CR_{ing}	CR_{derm}	CR_{ing}	
S1	[6.98E−07,2.06E−06]	[6.11E−08,1.58E−07]	[9.69E−06,3.01E−05]	[1.21E−05,3.91E−05]	[1.61E−07,4.56E−07]	[3.24E−07,9.94E−07]	[2.31E−05,7.29E−05]
S2	[7.65E−07,2.38E−06]	[6.69E−08,1.83E−07]	[1.64E−05,4.85E−05]	[1.40E−05,4.15E−05]	[1.86E−07,4.84E−07]	[4.17E−07,1.23E−06]	[3.18E−05,9.42E−05]
S3	[1.00E−06,2.99E−06]	[8.75E−08,2.30E−07]	[1.10E−05,3.24E−05]	[1.22E−05,3.63E−05]	[1.62E−07,1.45E−06]	[4.91E−07,1.45E−06]	[2.49E−05,7.37E−05]
S4	[4.35E−07,1.31E−06]	[3.81E−08,1.01E−07]	[7.49E−06,2.22E−05]	[2.63E−05,7.79E−05]	[3.50E−07,9.08E−07]	[2.41E−07,7.17E−07]	[3.49E−05,1.03E−04]
S5	[7.97E−07,2.35E−06]	[6.97E−08,1.81E−07]	[6.28E−06,1.87E−05]	[2.42E−05,7.29E−05]	[3.22E−07,8.50E−07]	[5.38E−07,1.64E−06]	[3.22E−05,9.66E−05]
S6	[8.66E−07,2.56E−06]	[7.57E−08,1.96E−07]	[1.85E−05,5.51E−05]	[1.80E−05,5.31E−05]	[2.39E−07,6.19E−07]	[3.26E−07,9.86E−07]	[3.80E−05,1.13E−04]
S7	[4.14E−07,1.23E−06]	[3.62E−08,9.47E−08]	[5.30E−06,1.58E−05]	[1.80E−05,4.79E−05]	[2.15E−07,5.59E−07]	[4.77E−07,1.41E−06]	[2.26E−05,6.70E−05]
S8	[3.19E−07,9.75E−07]	[2.79E−08,7.48E−08]	[1.16E−05,3.44E−05]	[1.66E−05,4.94E−05]	[2.21E−07,5.76E−07]	[2.24E−07,6.69E−07]	[2.91E−05,8.61E−05]
S9	[3.58E−07,1.06E−06]	[3.13E−08,8.11E−08]	[4.80E−06,1.42E−05]	[1.33E−05,3.98E−05]	[1.77E−07,4.64E−07]	[1.85E−07,5.49E−07]	[1.89E−05,5.61E−05]
S10	[5.06E−07,1.51E−06]	[4.43E−08,1.16E−07]	[7.34E−06,2.20E−05]	[1.53E−05,4.67E−05]	[2.03E−07,5.44E−07]	[2.49E−07,7.44E−07]	[2.36E−05,7.15E−05]
S11	[3.23E−07,9.55E−07]	[2.83E−08,7.33E−08]	[3.69E−06,1.09E−05]	[2.00E−05,5.93E−05]	[2.66E−07,6.91E−07]	[1.84E−07,5.50E−07]	[2.45E−05,7.25E−05]
S12	[6.06E−07,1.80E−06]	[5.30E−08,1.38E−07]	[7.89E−06,2.35E−05]	[1.50E−05,4.47E−05]	[1.99E−07,5.21E−07]	[3.61E−07,1.08E−06]	[2.41E−05,7.18E−05]
S13	[5.05E−07,1.54E−06]	[4.42E−08,1.18E−07]	[4.51E−06,1.34E−05]	[2.05E−05,6.12E−05]	[2.73E−07,7.13E−07]	[1.99E−07,5.93E−07]	[2.61E−05,7.75E−05]
S14	[4.78E−07,1.42E−06]	[4.18E−08,1.09E−07]	[5.91E−06,1.75E−05]	[1.51E−05,4.49E−05]	[2.01E−07,5.23E−07]	[2.35E−07,7.02E−07]	[2.20E−05,6.51E−05]
S15	[1.07E−06,3.17E−06]	[9.37E−08,2.43E−07]	[5.58E−06,1.65E−05]	[1.65E−05,4.87E−05]	[2.19E−07,5.68E−07]	[3.39E−07,1.00E−06]	[2.38E−05,7.02E−05]
S16	[5.08E−07,1.55E−06]	[4.44E−08,1.19E−07]	[2.60E−05,7.68E−05]	[1.61E−05,4.85E−05]	[2.14E−07,5.66E−07]	[5.03E−07,1.51E−06]	[4.34E−05,1.29E−04]
S17	[2.49E−07,7.34E−07]	[2.18E−08,5.63E−08]	[8.16E−06,2.41E−05]	[1.31E−05,3.90E−05]	[1.75E−07,4.54E−07]	[2.85E−07,8.61E−07]	[2.20E−05,6.51E−05]
S18	[4.97E−07,1.50E−06]	[4.34E−08,1.15E−07]	[6.10E−06,1.81E−05]	[2.07E−05,6.13E−05]	[1.75E−07,7.15E−07]	[2.70E−07,8.00E−07]	[2.79E−05,8.26E−05]
S19	[7.48E−07,2.21E−06]	[6.54E−08,1.70E−07]	[1.18E−05,3.49E−05]	[2.27E−05,6.75E−05]	[3.02E−07,7.88E−07]	[3.51E−07,1.09E−06]	[3.60E−05,1.07E−04]
S20	[5.70E−07,1.70E−06]	[4.99E−08,1.31E−07]	[7.51E−06,2.22E−05]	[1.07E−05,3.19E−05]	[1.42E−07,3.72E−07]	[3.77E−07,1.13E−06]	[1.93E−05,5.74E−05]

Table S5. Carcinogenic risk of trace elements in surface water from Honghu Lake based on certainty assessment.

Sites	Cd		Cr	As		Pb	CR	Risk Level
	CR_{ing}	CR_{derm}	CR_{ing}	CR_{ing}	CR_{derm}	CR_{ing}		
S1	1.29E−06	1.05E−07	1.79E−05	2.24E−05	2.78E−07	5.98E−07	4.26E−05	III
S2	1.41E−06	1.15E−07	3.03E−05	1.40E−05	1.86E−07	7.70E−07	4.67E−05	III
S3	1.85E−06	1.51E−07	2.03E−05	1.22E−05	1.62E−07	9.06E−07	3.55E−05	III
S4	8.03E−07	6.57E−08	1.38E−05	2.63E−05	3.50E−07	4.45E−07	4.18E−05	III
S5	1.47E−06	1.20E−07	1.16E−05	2.42E−05	3.22E−07	9.94E−07	3.87E−05	III
S6	1.60E−06	1.31E−07	3.43E−05	1.80E−05	2.39E−07	6.02E−07	5.48E−05	IV
S7	7.65E−07	6.25E−08	9.79E−06	1.61E−05	2.15E−07	8.81E−07	2.79E−05	III
S8	5.90E−07	4.82E−08	2.15E−05	1.66E−05	2.21E−07	4.14E−07	3.94E−05	III
S9	6.62E−07	5.41E−08	8.86E−06	1.33E−05	1.77E−07	3.42E−07	2.34E−05	III
S10	9.35E−07	7.64E−08	1.36E−05	1.53E−05	2.03E−07	4.59E−07	3.05E−05	III
S11	5.97E−07	4.88E−08	6.81E−06	2.00E−05	2.66E−07	3.41E−07	2.81E−05	III
S12	1.12E−06	9.14E−08	1.46E−05	1.50E−05	1.99E−07	6.67E−07	3.16E−05	III
S13	9.33E−07	7.63E−08	8.33E−06	2.05E−05	2.73E−07	3.67E−07	3.05E−05	III
S14	8.83E−07	7.21E−08	1.09E−05	1.51E−05	2.01E−07	4.34E−07	2.76E−05	III
S15	1.98E−06	1.62E−07	1.03E−05	1.65E−05	2.19E−07	6.25E−07	2.98E−05	III
S16	9.38E−07	7.66E−08	4.80E−05	1.61E−05	2.14E−07	9.30E−07	6.63E−05	IV
S17	4.59E−07	3.75E−08	1.51E−05	1.31E−05	1.75E−07	5.27E−07	2.94E−05	III
S18	9.17E−07	7.50E−08	1.13E−05	2.07E−05	2.75E−07	4.99E−07	3.37E−05	III
S19	1.38E−06	1.13E−07	2.18E−05	2.27E−05	3.02E−07	6.48E−07	4.70E−05	III
S20	1.05E−06	8.61E−08	1.39E−05	1.07E−05	1.42E−07	6.96E−07	2.65E−05	III

Table S6. Reliability degrees of carcinogenic risk caused by trace element in different risk levels.

Lake	Trace Element	Grade I	Grade II	Grade III	Grade IV
Dongting Lake	Cd	0.84	0.16		
	Cr			1	
	As			0.26	0.74
	Pb	1			
Pear River Estuary	Cd	0.37	0.63		
	Cr			1.00	
	Pb	0.42	0.58		

Table S7. Differences of carcinogenic risk level in each sampling sites between fuzzy and certainty assessment.

Lake	Sampling Sites	Reliability Degree Based on Fuzzy Assessment						Certainty Assessment
		Reliability Degree					Risk Level	Risk Level
		I	II	III	IV	V		
Dongting Lake	Yugong Temple				0.28	0.72	V	V
	Lujiao				0.29	0.71	V	V
	Nanzui			0.19	0.77	0.04	IV	IV
	Xiaohezui			0.19	0.77	0.04	IV	IV
	Hengling Lake			0.03	0.61	0.36	IV	IV
	Wanzi Lake			0.07	0.65	0.29	IV	IV
	Jiangjiazui			0.15	0.73	0.11	IV	IV
	East Dongting Lake				0.35	0.65	V	V
	Bian Mountain				0.38	0.62	V	V
	Yueyang Tower				0.42	0.58	V	V
	Outlet of Dongting Lake				0.40	0.60	V	V
Pear River Estuary	Jiaomen			0.68	0.32		III	III
	Hongqimen			1.00			III	III
	Humen1			1.00			III	III
	Humen2			1.00			III	III
	Modaomen		0.14	0.86			III	III
	Yamen			1.00			III	III
	Jitimen		0.35	0.65			III	III

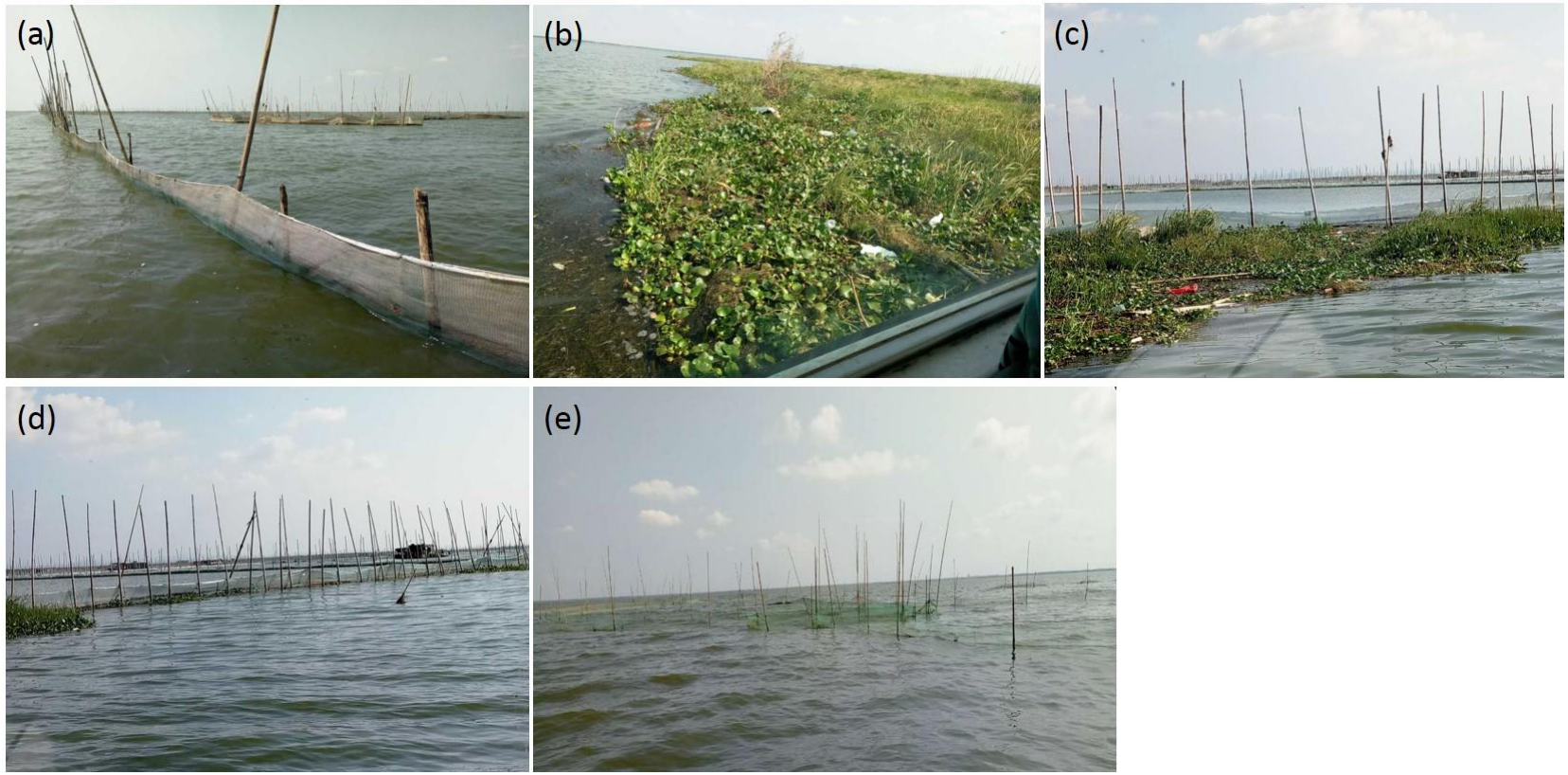

Figure S1. Pictures of surrounding conditions in sites S8 (a), S13 (b), S16 (c, d) and S18 (e).