Supplementary information

Occurrence, spatiotemporal distribution, mass balance and ecological risks of antibiotics in the subtropical shallow Lake Taihu, China

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Reagents and Materials.

Methanol and acetonitrile of HPLC grade were purchased from Merck (Darmstadt, Germany), formic acid from Tedia Company (Fairfield, OH, USA). Other chemicals disodium ethylenediamine tetraacetate (Na_2EDTA), citric acid and sodium citrate were of analytical grade and obtained from Yaohua Chemical Reagent Factory (Tianjin, China). Strong anion exchange (SAX) cartridges (6 mL, 500 mg) were provided by Varian (Lake Forest, CA, USA) while Oasis HLB cartridges (6 mL, 200 mg or 6 mL, 500 mg) were supplied by Waters (Milford, MA, USA). Glass fiber filters (GF/F, pore size 0.7 μm) were purchased from Whatman (Maidstone, England) and pyrolyzed at 450 ^{o}C for 4 h prior to use.

About 10 mg of individual standard (corrected by purity and salt form) was accurately weighed. Fluoroquinolones (including carbadox) were dissolved in 50 mL of methanol with 25 μL formic acid. Other agents were dissolved in 50 mL of methanol and stock solutions were stored at -20^{o}C. From these stock solutions, working solutions were prepared by gradient dilution.

Sample extraction.

Water. Lake water samples were filtered through glass fiber filters (0.7 μm) to remove particles and the internal standards (100 ng) were added. To improve recovery of tetracycline antibiotics, 0.2 g Na_2EDTA was added into each water sample. The SPE cartridges were preconditioned with 10 mL methanol and 10 mL MilliQ water and then water samples were introduced to the cartridges at a flow rate of 5-10 mL / min.

After loading of the water samples, the cartridges were rinsed with 10 mL of MilliQ water and allowed to dry for 2 hours to remove excess water under vacuum. The antibiotics retained on the cartridges were eluted with 12 mL methanol and then the eluates were evaporated to near dryness under a gentle stream of nitrogen and re-dissolved in 1 mL of methanol. After filtration through a 0.22 μm membrane to remove particles, the final extract was transferred to a 2 mL amber vial and stored at -18 ^{o}C until RRLC-MS/MS analysis. Just prior to the RRLC-MS/MS analysis, 100 μL aliquot of each sample extract was evaporated and reconstituted in a mixed solvent.

Sediment. Two grams of each freeze-dried sediment sample were weighted into a 30 mL glass tube, followed by addition of 100 μL of the work solutions of the internal standards (1.0 mg/L each). Then the samples were mixed and placed in a refrigerator at 4 ^{o}C overnight. Ten mL acetonitrile and 10 mL citric acid buffer (pH 3) were added into each glass tube followed by mixing on a vortex mixer for 1min. All glass tubes were then ultrasonicated for 15 min and centrifuged at 3024 *g* for 10 min. The supernatant from each tube was piped into a 200 mL round-bottom flask. The extraction process was repeated twice and the supernatants from the three extractions were combined. The extract in the round-bottom flask from each solid sample was evaporated at 50 ^{o}C to remove the organic solvent, and diluted to 200 mL with Milli-Q water to make sure that the organic solvent in the solution was less than 5%. Solid extracts were very dirty with particulate matter and organic matter, which may cause the cartridges to block or result in serious matrix effect. Strong anion exchange (SAX) cartridges (6mL, 500mg) and HLB cartridges (6mL, 200mg) were set up in tandem for cleaning up and enriching the aqueous sediment extracts. The SAX cartridge was placed on top of the HLB cartridge for removing negatively charged humic and fulvic acids of natural organic matter (NOM) in the solid sample. Prior to the SPE cleanup, 0.2 g of Na_2EDTA was added into each aqueous extract in order to chelate with metal cations. Each tandem cartridge was pre-conditioned with 10 mL methanol and 10 mL Milli-Q water and the diluted extract was passed through the cartridge at a flow rate of 5 mL/min. Then the SAX cartridge was removed and the HLB cartridge was rinsed with 10 mL Milli-Q water to remove weakly bound impurities and Na_2EDTA. The elution and reconstitution conditions were the same as those described in the water samples section.

LC-MS/MS conditions.

The target antibiotic compounds in the extracts were analyzed by rapid resolution liquid chromatography–tandem mass spectrometry (RRLC–MS/MS) (Water Acquity UPLC coupled to AB SCIEX Qtrap 5500) in multiple-reaction monitoring (MRM) mode. The analyses were performed in the negative mode for two target antibiotic compounds (CAP and FF) and in the positive mode for the other antibiotic compounds. Nitrogen gas was used as the drying and collision gas. Mass spectrometric conditions were optimized using Optimizer (Agilent, Palo Alto, USA) for collision energy (CE), fragmentor voltage, and multiple reaction monitoring mode (MRM) transitions for each compound (Table S6). All the target compounds were separated by BEH-C18 (50 mm × 2.1 mm, 1.7 μm) column with BEH C18 VanGuard pre-column (5 mm × 2.1 mm, 1.7 μm). The column temperature was set at 40 °C. The injection volume for each sample was 5 μL.

The mobile phases for the positive mode were Milli-Q water with 0.2% formic acid and 2 mM ammonium acetate (A) and acetonitrile (B) at a flow rate of 0.35 mL/min. The mobile phase gradient for the positive mode was ramped from 5% to 10% B in 5 min, 10-20% B in 1 min, 20-40% B in 3 min, 40-50% B in 2 min and then ramped to 95% B in 1min and kept for 12 min. The MS operating conditions in the positive mode were set as follows: curtain gas (CUR), 30; collision gas (CAD), medium; ionSpray voltage (IS), 5500; temperature, 550 ^{o}C; ion source gas 1, 50; ion source gas 2, 50.

The mobile phases for the negative mode were MilliQ water (A) and acetonitrile (B) at a flow rate of 0.4 mL/min. The mobile phase gradient for the negative mode was ramped from 20% to 40% B in 3.2 min, and then ramped to 90% B in 0.5 min and kept for 2 min. The MS operating conditions in the negative mode were set as follows: curtain gas (CUR), 30; collision gas (CAD), medium; ionSpray voltage (IS), -4500; temperature, 600 ^{o}C; ion source gas 1, 60; ion source gas 2, 50.

Method quality.

Concentrations of the target compounds in the samples were performed using internal standard method. All data generated from the analysis were subject to strict quality control procedures. With each set of samples to be analyzed, a solvent blank, a procedure blank and an independent check standard (100 μg/L standard solution) were run in sequence to check for carryover, background contamination, and system performance. Appropriate field quality assurance and quality control (QA/QC) procedures were followed. The reported quantitative values of each target compound in the samples were required to have the same retention time as its calibration standard (within ± 5%) and the same ion ratios (within ± 20%). Independent check standard was injected approximately every twenty injections, and the concentration computed was required to be within 20% of the expected value.

Method detection limits (MDL) and quantification limits (MQL) were determined as the minimum detectable amount of an analyte from the two environmental matrix spiked extract in MRM mode with a signal-to-noise of 3 and 10, respectively. [1] The S/N ratios were obtained from the data of the recovery test with the lowest spiked concentration for each compound. Recovery experiments were performed by spiking the standard solutions to surface water and sediment samples.

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Table 1 Basin information of Lake Taihu.[a]

Area	Main inflow/outflow rivers [b]	Annual runoff (10^8 m^3) [b]	Catchment size (km^2) [c]	Population density (Person/km^2) [c]	Aquatic products (kg) [c,d]	Livestock		Land use for agriculture [c]	
						Density (Number/km^2) [c,e]	Proportion (Pig/cattle/sheep /chicken) [c,e]	agricultural area (km^2)	Area of aquatic farming (km^2)
Northern area			6.36×10^3	1.06×10^3	1.75×10^8	5.47×10^2	1/0.07/0.02/0.55	2.55×10^2	2.88×10^3
Meiliang Bay									
Gong Bay	Wangyu River	8.30/-9.49							
Zhushan Bay	Yincungang River	5.56/-0.09							
Western area	Chendonggang River	9.98/-0.23	4.51×10^3	5.32×10^2	1.92×10^8	5.24×10^2	1/0.01/0.05/0.84	4.36×10^2	2.44×10^3
South area	Xitiaoxi River	7.05/-1.38	1.02×10^4	3.01×10^2	3.58×10^8	5.84×10^2	1/0.02/0.08/0.55	3.22×10^2	1.78×10^3
	Dongtiaoxi River	7.29/-9.68							
Eastern coast area	Xijiang River	0.05/-5.79	3.92×10^3	8.84×10^2	1.80×10^8	4.23×10^3	1/0.00/0.03/0.10	1.18×10^2	3.40×10^3
East Lake	Taipu River	0.19/-36.85	4.23×10^3	1.85×10^3	2.22×10^8	4.91×10^2	1/0.08/0.03/0.53	6.15×10^2	1.29×10^3
	Xinyun River	0.43/-9.05							
The pelagic zone									

[a] Revised based on our previous paper. [2] [b] Inflow is defined as positive and outflow is defined negative, and the data are cited from Qin et al. (2007).[3] [c] Calculated based on data from Wuxi Statistical Yearbook 2014, Suzhou Statistical Yearbook 2014, Hangzhou Statistical Yearbook 2014, Changzhou Statistical Yearbook 2014, Jiaxing Statistical Yearbook 2014, Huzhou Statistical Yearbook 2014. [4-9] [d] Aquatic products refer to seafood products such as fish and shrimp. [e] Livestock includes cattle, pigs, sheep, and poultry; and the number of animals other than the pig was converted into the number of pigs according to the volume of waste generated by each animal.

Table S2 Basic information for each sampling site in the Taihu Lake

Site	Geographic location (N, E)		Weighted water area [a]	Depth (m)		Conductivity (μs/cm)		Water pH		Turbidity (NTU)		Chl-a (μg/L)		Phycocyanobilin (cell/mL)		Do (mg/L)	
				May	Nov.	May	Nov.	May	Nov.	May	Nov.	May	Nov.	May	Nov.	May	Nov.
S1	120°13′10"	31°32′23"	1/8Average area	3.6	2.7	618	462	8.6	8.63	8.2	23.9	6.2	8.3	282	7810	9.66	12.0
S2	120°11′26"	31°30′47"	1/4Average area	2	2.2	571	470	8.41	8.33	4.7	13.6	1.4	11.6	274	5080	9.01	11.2
S3	120°11′40"	31°28′35"	1/4Average area	2.4	2.7	548	462	8.54	8.63	14.9	23.9	20.4	8.3	1840	7810	12.0	12.0
S4	120°11′17"	31°26′10"	1/4Average area	2.5	2.8	552	463	8.48	8.52	14.2	15.3	5.1	4.5	300	3152	9.02	11.7
S5	120°11′14"	31°24′40"	1/4Average area	2.7	2.7	542	460	8.95	8.43	10.5	21	3.9	6.4	127	6360	9.15	11.0
S6	120°7′52"	31°30′14"	Average area	1.6	1.7	645	468	8.14	8.32	18.8	14.3	36.4	4.9	4200	3160	12.4	11.8
S7	120°10′49"	31°20′18"	1.2Average area	2.9	1.8	696	439	6.98	8.48	50	18.2	7	3.9	6170	3140	8.96	11.2
S8	120°10′14"	31°14′53"	2Average area	2.8	3	597	440	8.23	8.15	35.7	26.3	5	2.4	2510	3650	8.55	11.1
S9	120°15′11"	31°30′47"	1/8Average area	2.3	2.7	31	385	8.32	8.36	8.8	24.6	15.5	15.1	3030	1350	11.2	9.48
S10	119°56′42"	31°18′52"	2Average area	1.8	1.9	616	572	8.82	8.27	59	43.3	16.4	9.4	NA[b]	1460	6.02	5.69
S11	120°7′7"	30°57′49"	1.5Average area	1.7	2.2	546	315	8.77	8.22	33.4	58.6	8.8	4	NA	1470	9.53	11.0
S12	120°27′14"	31°1′18"	1Average area	1.1	1.6	486	445	8.72	8.07	11.8	4.7	4.8	3.3	NA	457	9.31	10.7
S13	120°17′44"	31°23′11"	1.2Average area	1.8	2.2	649	407	8.58	8.44	51.8	30	8.6	8.7	NA	4040	8.8	10.9
S14	120°22′37"	31°26′6"	1.2Average area	1.8	2.5	489	427	8.67	8.37	39.2	18.4	6.2	13	NA	2290	8.66	11.1
S15	120°14′10"	31°31′23"	1/10Average area	2.3	2.3	476	387	8.1	8.34	11	18.8	17.8	22.7	3500	1640	10.6	10.0
S16	120°1′41"	31°27′	Average area	1.8	2.2	669	552	8.52	7.99	11.6	3.5	16.3	2.7	NA	200	6.75	8.63
S17	120°1′55"	31°23′51"	Average area	2.1	2.4	658	476	8.5	8.16	17.8	2.6	5.3	7.5	NA	943	7.99	10.2
S18	120°3′22"	31°18′29"	1.6Average area	2.9	2.6	629	463	7.26	8.48	47.6	29.7	6	2.6	1930	2310	8.53	11.1
S19	120°1′24"	31°11′26"	1.6Average area	2.8	3.24	534	457	7.41	8.6	72.3	44.8	8.3	3.4	3012	9090	8.38	10.8
S20	119°58′2"	31°6′28"	1.7Average area	2.1	2.4	553	458	8.76	8.24	67.6	41.5	6.4	4.4	NA	5490	8.83	10.8

S21	120°8′38"	31°6′59"	2Average area	2.7	2.7	378	441	7.65	8.19	59.7	46.6	8.2	4.2	3260	9090	8.67	10.8
S22	120°11′23"	30°59′28"	Average area	1.9	2.6	546	422	8.75	8.17	90.7	38.6	6.4	3.1	NA	3700	8.87	11.0
S23	120°13′58"	31°0′45"	Average area	2.1	2.7	573	428	8.7	8.19	95.2	26.6	7.4	2.8	NA	3630	8.92	11.1
S24	120°22′45"	30°58′51"	1.2Average area	1.5	2.1	573	338	8.68	8.23	13.5	7.1	5.2	4	NA	256	9.5	9.56
S25	120°30′48"	31°5′22"	Average area	1.1	1.7	416	463	8.89	8.06	2.3	6.7	5.6	13.2	NA	3410	11.2	8.91
S26	120°20′8"	31°5′57"	Average area	1.6	2	5	477	8.75	8.01	15.8	10.9	6.7	2.3	NA	576	8.48	9.97
S27	120°24′21"	31°10′37"	Average area	1.4	2	554	450	8.17	8.16	50.6	2	8.4	1.1	3860	NA	8.94	11.6
S28	120°27′53"	31°12′20"	Average area	1.6	1.9	483	443	8.62	8.26	5.5	4.56	3	6.4	465	894	12.2	10.4
S29	120°20′1"	31°10′16"	1.2Average area	2.4	2.2	574	341	7.95	8.21	36.4	23.6	8	2.9	3670	3340	8.9	10.7
S30	120°19′53"	31°14′41"	Average area	1.9	2.4	549	432	8.67	8.16	32.9	18.5	6.9	4.2	NA	2580	8.83	11.0
S31	120°14′30"	31°21′12"	Average area	1.6	2.6	603	438	8.61	8.54	37	33.4	5.1	4.6	NA	3520	8.56	11.0
S32	120°8′45"	31°24′24"	1/2Average area	2.4	2.2	665	464	9.38	8.49	64.8	19	7.3	7.7	NA	3100	9.13	10.5

[a] The weighted water areas used for mass balance calculation equal to weighting coefficient × Average water area, based on real occupied areas. The average area value 73,062,500 m^2 at each sampling site was obtained by the whole areas of Lake Taihu (2,338 km^2) divided by 32 sites. [b] NA: Not available.

Table S3 Chemical parameters of water (mg/L) collected from Lake Taihu

Location	Summer					Winter				
	BOD_5	COD	TP	TN	NH_4-N	BOD_5	COD	TP	TN	NH_4-N
S1	1.82	4.11	0.081	1.90	0.46	4.02	4.22	0.097	1.76	0.53
S2	1.86	4.27	0.065	2.67	0.42	1.92	4.00	0.082	1.44	0.49
S3	2.42	5.53	0.142	4.46	0.61	2.14	6.29	0.147	2.24	0.42
S4	1.65	4.89	0.104	4.29	0.46	1.27	4.33	0.090	1.63	0.39
S5	1.36	3.86	0.079	3.45	0.50	1.59	4.30	0.101	1.50	0.42
S6	1.80	4.77	0.140	4.75	0.88	1.68	4.55	0.102	1.82	0.40
S7	2.09	4.50	0.090	3.97	0.48	1.78	4.98	0.109	1.44	0.43
S8	1.24	3.41	0.064	2.72	0.60	0.81	3.93	0.073	1.05	0.50
S9	3.16	3.63	0.057	1.14	0.60	2.78	4.04	0.092	1.10	0.34
S10	6.51	5.92	0.265	4.92	1.11	3.25	5.95	0.258	4.51	1.86
S11	1.47	3.35	0.057	2.52	0.39	1.72	4.64	0.115	3.24	0.36
S12	1.24	3.64	0.043	1.15	0.38	0.75	3.34	0.027	0.77	0.40
S13	1.16	3.19	0.077	3.27	0.32	1.39	3.48	0.073	1.03	0.42
S14	1.43	2.86	0.075	1.96	0.57	1.35	3.88	0.074	0.91	0.39
S15	4.24	3.84	0.068	1.23	0.39	3.98	4.20	0.092	0.99	0.27
S16	4.26	5.71	0.161	5.04	1.69	1.55	4.91	0.133	3.42	1.35
S17	1.82	5.55	0.158	5.39	1.02	2.06	4.49	0.093	3.21	0.74
S18	1.51	3.30	0.077	3.18	0.30	1.43	4.27	0.098	1.35	0.41
S19	1.28	3.97	0.133	3.62	0.48	1.80	4.74	0.120	1.54	0.29
S20	1.45	3.30	0.086	2.85	0.37	1.78	4.48	0.117	1.75	0.36
S21	1.20	3.19	0.063	2.74	0.19	1.17	3.75	0.089	1.37	0.33
S22	1.03	3.69	0.075	2.89	0.28	1.49	4.33	0.087	1.57	0.46

S23	1.30	3.52	0.076	2.73	0.19	1.31	3.51	0.059	1.26	0.40
S24	2.42	4.12	0.031	1.98	0.16	0.83	2.88	0.028	2.41	0.45
S25	2.05	4.81	0.036	0.76	0.30	2.26	4.63	0.057	1.02	0.43
S26	4.69	5.70	0.038	1.75	0.26	0.73	2.89	0.026	0.70	0.33
S27	1.16	3.17	0.049	1.90	0.29	0.69	2.81	0.021	0.55	0.21
S28	0.72	3.03	0.021	1.04	0.18	0.73	2.99	0.017	0.48	0.24
S29	1.20	3.11	0.050	2.30	0.25	1.39	4.03	0.047	1.41	0.22
S30	1.61	3.19	0.046	2.07	0.22	1.17	3.41	0.038	0.84	0.30
S31	1.07	3.25	0.065	2.68	0.52	1.63	4.63	0.112	1.46	0.47
S32	2.19	4.73	0.112	4.08	0.32	2.30	3.91	0.089	1.45	0.42

Table S4 The particle sizes and TOC of sediment samples of the Lake Taihu

Sites	>0.064 mm (sand)		0.016-0.064 mm (coarse silt)		0.004-0.016 mm (fine silt)		<0.004 mm (clay)		TOC (%)	
	May	November	May	November	May	November	May	November	May	November
S1	ND	2.95	41.09	45.57	48.39	41.51	10.52	9.98	1.2671	1.3706
S2	1.73	7.81	40.58	43.10	50.41	42.08	7.28	7.02	0.8542	0.7542
S3	1.36	2.96	37.21	38.73	50.88	47.95	10.55	10.36	0.8071	0.8472
S4	ND	0.13	33.52	31.38	55.75	59.99	10.73	8.51	0.7878	0.7963
S5	0.74	0.85	38.54	34.83	51.60	54.16	9.12	10.17	0.7422	0.7968
S6	2.21	3.87	55.22	64.18	33.77	24.97	8.81	6.98	0.6063	0.4570
S7	3.15	2.89	37.94	36.29	52.08	53.31	6.84	7.51	0.6552	0.5970
S8	6.98	1.03	49.58	37.43	31.33	49.33	12.11	12.21	0.4357	0.5078
S9	4.90	0	43.55	29.63	39.37	57.38	12.19	12.99	1.2062	1.1516
S10	0.12	0.51	61.30	63.47	34.66	32.44	3.92	3.58	0.5892	0.6297
S11	2.59	0	40.46	37.23	44.38	54.75	12.58	8.02	0.5469	0.4683
S12	0.31	0	46.76	45.57	43.37	43.62	9.56	10.81	1.2447	1.0917
S13	0.13	0	33.64	33.18	54.84	57.59	11.39	9.23	0.8067	0.7778
S14	0.45	0	42.39	36.33	45.25	47.64	11.91	16.03	0.7229	0.3594
S15	4.68	2.72	44.49	58.19	37.75	32.53	13.09	6.57	1.1264	0.7790
S16	3.35	0	46.02	37.64	40.90	51.81	9.73	10.55	1.2403	1.1231
S17	0.56	1.97	42.83	43.68	45.42	43.96	11.19	10.39	1.0943	1.0288
S18	0.95	0.01	33.68	33.36	55.86	58.84	9.52	7.79	0.7321	0.6629
S19	2.28	4.51	42.78	48.76	46.97	38.71	7.97	8.03	0.5563	0.4610
S20	6.05	0.86	41.15	41.45	44.54	51.80	8.26	5.90	0.5683	0.5318
S21	0.87	0	36.64	35.25	53.34	55.67	9.16	9.09	0.5838	0.6537
S22	ND	0.13	32.97	34.75	56.22	53.16	10.81	11.96	0.6406	0.5992

S23	0.27	0	37.12	33.28	52.11	55.19	10.50	11.53	0.6068	0.6331
S24	4.50	1	43.26	47.25	41.92	44.05	10.32	7.69	1.0852	1.0552
S25	3.17	3.69	66.38	61.11	26.36	29.87	4.10	5.32	1.3125	1.0843
S26	0.99	3.67	40.85	33.71	49.29	49.84	8.88	12.78	1.0568	1.3062
S27	6.66	0.09	41.06	47.21	41.23	42.73	11.06	9.96	0.5879	0.9489
S28	NA[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA
S29	2.01	NA	40.15	NA	47.11	NA	10.73	NA	0.6701	NA
S30	8.65	6.91	52.97	55.27	31.73	30.49	6.65	7.33	0.6383	0.6042
S31	4.75	1.48	43.89	45.05	43.34	46.89	8.03	6.58	0.6526	0.5965
S32	1.41	0	29.90	32.05	59.22	61.97	9.48	5.98	0.7845	0.7233

[a] NA: Not available

Table S5 Physicochemical properties of the antibiotics in this study.

Class	Compound	CAS	MW	Formula	Solubility (in water, mg L^{-1})	$LogK_{ow}$[a]	pK_a[b]	Solid–water distribution		
								Matrices	Kd (L/kg)	Koc (L/kg)
Sulfonamides	Sulfacetamide	144-80-9	214.2	$C_8H_{10}N_2O_3S$	12500 [c]	-0.96 [c]	5.4 [d]			
	Sulfachlorpyridazine	80-32-0	284.7	$C_{10}H_9ClN_4O_2S$			1.87, 5.45 [e]	Clay loamy, sandy loam	0.9-1.8 [f]	
	Sulfadiazine	68-35-9	250.3	$C_{10}H_{10}N_4O_2S$	77 [f]	-0.09 [f]	1.6 6.4 [f]	Whole soil, clay, sand fraction	1.4-2.8 [f]	37-125
	Sulfadoxine	2447-57-6	310.3	$C_{12}H_{14}N_4O_4S$	2700 [c]	0.7 [c]	3.15 6.16 [g]			
	Sulfadimethoxine	122-11-2	310.3	$C_{12}H_{14}N_4O_4S$	343 [c]	1.63 [c] 1.4 [h]	6.3 [d] 2.13, 6.08 [e]	Whole soil, clay, sand fraction	2.3-4.6 [f]	89-144
	Sulfamethazine	57-68-1	278.3	$C_{12}H_{14}N_4O_2S$	1500 [f]	0.80 [f]	2.07 7.49 [e] 2.65 [d]	Sand, loamy sand, sandy loam	0.6-3.2 [f]	82-208
	Sulfamethoxazole	723-46-6	253.3	$C_{10}H_{11}N_3O_3S$	610 [c]	0.89 [c]	1.85 5.6 [c] 5.9 [d]			
	Sulfamonomethoxine	1220-83-3	280.3	$C_{11}H_{12}N_4O_3S$	4030 [c]	0.7 [c]				
	Sulfapyridine	144-83-2	249.3	$C_{11}H_{11}N_3O_2S$	270 [f]	0.35 [f]	2.58 8.43 [f] 8.4 [d]	Silty loam	1.6-7.4 [f]	101-308
								Whole soil, clay, sand fraction	3.1-3.5 [f]	80-218
	Sulfaquinoxaline	59-40-5	300.4	$C_{14}H_{12}N_4O_2S$	7.5 [c]	1.68 [c]				
	Sulfisoxazole	127-69-5	267.3	$C_{11}H_{13}N_3O_3S$	300 [c]	1.01 [c]		Clay loam	1.5 [i]	48
	Sulfathiazole	72-14-0	255.3	$C_9H_9N_3O_2S_2$	373 [c]	0.05 [c]	2.0 [d] 2.01, 7.11 [e]	Loamy sand	4.9 [j]	200
Diaminopyrimidines	Trimethoprim	738-70-5	290.3	$C_{14}H_{18}N_4O_3$	400 [c]	0.91 [c]	3.23 6.76 [c]	Sewage sludge	76 [i]	205
Tetracyclines	Chlortetracycline	57-62-5	478	$C_{22}H_{23}ClN_2O_8$	630 [c]	-0.62 [c]	3.33 7.55 9.33 [e]	Clay loam, sandy loam	1280-2386 [f]	

	Doxycycline	564-25-0	444.4	$C_{22}H_{24}N_2O_8$	630 [c]	-0.02 [c]	3.02 7.97 9.15 [e]			
	Oxytetracycline	79-57-2	460.4	$C_{22}H_{24}N_2O_8$	1000 [j]	-1.22 [j]	3.22 7.46 8.94 [e]	Loamy sand, sand	417-1026 [f]	42506-9337
	Tetracycline	60-54-8	444.4	$C_{22}H_{24}N_2O_8$	1700 [j]	-1.19 [j]	3.32 7.78 9.58 [e]	Clay loam, sandy loam	1147-2370 [f]	
								Aldrich humic acid	1430-2060 [j]	
Fluoroquinolones	Ciprofloxacin	85721-33-1	331.3	$C_{17}H_{18}FN_3O_3$	30000 [j]	0.4 [j]	3.01 6.14 8.70 10.58 [e]	Loamy sand	427 [f]	61000
								Sewage sludge	417 [f]	1127
	Danofloxacin	112398-08-0	357.4	$C_{19}H_{20}FN_3O_3$		1.85 [f]	2.73 9.13 [f]	Humic acid from a soil	630 [j]	
	Difloxacin	98106-17-3	399.4	$C_{21}H_{19}F_2N_3O_3$	1330 [c]	0.89 [c]				
	Enrofloxacin	93106-60-6	359.4	$C_{19}H_{22}FN_3O_3$	130000 [c]	1.1 [j]	3.85 6.19 7.59 9.86 [e]	Clay, loam, loamy sand	260-5612 [f]	16510-99980
								Humic acid from a soil	110 [j]	
	Fleroxacin	79660-72-3	369.34	$C_{17}H_{18}F_3N_3O_3$	7320 [c]	0.24 [c]				
	Lomefloxacin	98079-51-7	351.3	$C_{17}H_{19}F_2N_3O_3$	27200 [c]	-0.3 [c]				
	Marbofloxacin	115550-35-1	362.4	$C_{17}H_{19}FN_4O_4$						
	Norfloxacin	70458-96-7	319.3	$C_{16}H_{18}FN_3O_3$	17800 [c]	-1.03 [c]	3.11 6.10 8.6 10.56 [e]			
	Ofloxacin	82419-36-1	361.3	$C_{18}H_{20}FN_3O_4$	2830 [c]	0.36 [i]	5.97 8.28 [k]	Humic acid from a soil	100 [j]	
								Loamy sand	309 [i]	44140
	Pefloxacin	70458-92-3	333.4	$C_{17}H_{20}FN_3O_3$	1140 [c]	0.27 [c]				
	Sarafloxacin	98105-99-8	385.4	$C_{20}H_{17}F_2N_3O_3$	100 [j]	1.07 [c]	6.0 8.6 [j]	Aldrich humic acid	18700-52700 [j]	55000-155000
	Carbadox	6804-7-5	262.2	$C_{11}H_{10}N_4O_4$	15000 [c]	-1.37 [c]				

Macrolides	Azithromycin	83905-01-5	749	C38H72N2O12						
	Clarithromycin	81103-11-9	748.0	$C_{38}H_{69}NO_{13}$	0.342 [c]	3.16 [c]	8.99 [c]			
	Erythromycin	114-07-8	733.9	$C_{37}H_{67}NO_{13}$	2000 [l]	3.06 [c]	8.9 [e]			
	Erythromycin-H_2O	23893-13-2	715.9	$C_{37}H_{65}NO_{12}$						
	Leucomycin	1392-21-8	771	$C_{39}H_{65}NO_{14}$						
	Oleandomycin	3922-90-5	687.9	$C_{35}H_{61}NO_{12}$	15.5 [c]	1.69 [c]	3.31 7.50 [e] 8.84 [c]			
	Roxithromycin	80214-83-1	837.0	$C_{41}H_{76}N_2O_{15}$		2.75 [c]	9.17 [e]			
	Tylosin	1401-69-0	916.1	$C_{46}H_{77}NO_{17}$	5 [c]	1.63 [c]	7.73 [c]		Loamy sand, sand	8.3-128	553-7990
Ionophores	Salinomycin	53003-10-4	751	$C_{42}H_{70}O_{11}$	17-905 [m]	8.53 [c] 5.15 [m]	4.5,6.4 [m]			
	Monensin	17090-79-8	670.9	$C_{36}H_{62}O_{11}$	63 [n] 5-63 [m]	2.75 [n] 2.8-4.1 [m]	6.65 [n] 6.7 [m]			
	Narasin	55134-13-9	765.0	$C_{43}H_{72}O_{11}$	102-681 [m]	4.9-6.2 [m]	7.9 [m]			
Aminocoumarins	Novobiocin	303-81-1	612.6	$C_{31}H_{36}N_2O_{11}$		2.45 [c]	4.3 [c]			
Lincosamides	Lincomycin	154-21-2	406.5	$C_{18}H_{34}N_2O_6S$	927 [c]	0.56 [c]				
Chloramphenicol derivatives	Florfenicol	73231-34-2	358.2	$C_{12}H_{14}Cl_2FNO_4S$		-0.04 [o]	-			
	Chloramphenicol	154-75-2	323.1	$C_{11}H_{12}Cl_2FN_2O_5$	2500 [c]	1.14 [c]			Fresh water sediment	0.4 [j]	

[a] K_{ow}: the octanol-water partition coefficient; [b] pK_a: acidity constant; [c] U.S. National Library of Medicine ChemIDPlus Advanced. (http://chem.sis.nlm.nih.gov/chemidplus/), accessed on 10 September, 2011; [d] [10]; [e] [11]; [f] [12]; [g] [13]; [h] [14]; [i] [15]; [j] [16]; [k] [17]; [l] [18]; [m] [19]; [n] [20]; [o] [21].

Table S6 Details of antibiotics and their MRM parameters in RRLC-MS/MS

Analyte	Abbr. [a]	Supplier	M.W.	CAS	R.T. [b] (min)	MRM-transitions [c]	Fragmentor (V)	CE[d] (eV)
ESI+								
Sulfonamides	SAs							
Sulfacetamide	SCT	Dr.Ehrenstorfer	214.2	144-80-9	0.79	215→91.8	40	28
						215→155.9	40	14
Sulfachloryridazine	SCP	Dr.Ehrenstorfer	284.7	80-32-0	2.79	284.8→155.8	40	19
						284.8→107.9	40	32
Sulfadiazine	SDZ	Dr.Ehrenstorfer	250.3	68-35-9	0.91	250.9→155.7	40	20
						250.9→92	40	32
Sulfadoxine	SDO	Dr.Ehrenstorfer	310.3	2447-57-6	3.51	310.9→155.9	60	26
						310.9→107.9	60	33
Sulfadimethoxine	SDM	Dr.Ehrenstorfer	310.3	122-11-2	5.86	310.8→155.9	100	27
						310.8→107.9	100	33
Sulfamethazine	SMZ	Dr.Ehrenstorfer	278.3	57-68-1	1.83	279→185.9	75	23
						279→155.9	75	25
Sulfathiazole	STZ	Dr.Ehrenstorfer	255.3	72-14-0	1.06	256→155.8	90	18
						256→91.8	90	30
Sulfamethoxazole	SMX	Dr.Ehrenstorfer	253.3	723-46-6	3.42	253.9→155.9	90	22
						253.9→107.9	90	30
Sulfamethoxazole-D_4 (IS) [e]	SMX-D_4	Dr.Ehrenstorfer	257.3	1020719-86-1	3.36	258.1→159.9	90	20
						258.1→111.9	90	32
Sulfamerazine	SMR	Dr.Ehrenstorfer	264.3	127-79-7	1.31	264.8→92.1	70	34
						264.8→108.2	70	33
Sulfamerazine-D_4	SMR-D_4	TRC	268.3		1.28	269→159.9	70	21
						269→109.8	70	27
Sulfamonomethoxine	SMM	Dr.Ehrenstorfer	280.3	1220-83-3	2.70	281.2→155.8	110	24
						281.2→107.8	110	31
Sulfapyridine	SPD	Dr.Ehrenstorfer	249.3	144-83-2	1.45	249.9→155.9	60	21
						249.9→92.1	60	33
Sulfaquinoxaline	SQX	Dr.Ehrenstorfer	300.4	59-40-5	6.11	300.9→91.8	90	31
						301.3→107.9	90	32

Sulfisoxazole	SX	Dr.Ehrenstorfer	267.3	127-69-5	4.15	268→156.0	90	17
						268→112.9	90	21
Tetracyclines	TCs							
Chlortetracycline	CTC	Dr.Ehrenstorfer	478	57-62-5	5.08	479→444	90	27
						479→462.1	90	23
Doxycycline	DC	Dr.Ehrenstorfer	444.4	564-25-0	6.50	445→428.1	155	22
						445→410	155	32
Thiabendazole-D_4 (IS)	TBD- D_4	TRC		71535-97-2	1.09	205.9→134.9	180	45
						205.9→178.9	180	35
Oxytetracycline	OTC	Dr.Ehrenstorfer	460.4	79-57-2	1.94	461.1→426.1	80	25
						461.1→443.1	80	17
Tetracycline	TC	Dr.Ehrenstorfer	444.4	60-54-8	2.47	445.1→410.0	80	26
						445.1→426.8	80	17
Tetracycline- D_6 (IS)	TC-D_6	TRC	450.5		2.46	451.3→416	65	26
						451.3→114	65	16
Fluoroquinolones	FQs							
Ciprofloxacin	CFX	Dr.Ehrenstorfer	331.3	85721-33-1	2.14	331.9→314	95	26
						331.9→288.1	95	24
Ciprofloxacin-D_8 (IS)	CFX-D_8	Dr.Ehrenstorfer			2.12	340.1→322	95	30
						340.1→296.1	95	26
Danofloxacin	DAN	Dr.Ehrenstorfer	357.4	112398-08-0	2.64	358→340.1	90	31
						358→314	90	25
Difloxacin	DIF	Dr.Ehrenstorfer	399.4	98106-17-3	3.96	400.2→356	90	24
						400.2→381.9	90	27
Enrofloxacin	EFX	Dr.Ehrenstorfer	359.4	93106-60-6	2.90	360→316.2	100	27
						360→342	100	28
Enrofloxacin-D_5(IS)	EFX- D_5	Dr.Ehrenstorfer	364.4		2.87	365.1→321.1	70	36
						365.1→347.1	70	30
Fleroxacin	FL	Dr.Ehrenstorfer	369.34	79660-72-3	1.91	370.1→326	115	25
						370.1→268.9	115	36
Norfloxacin	NFX	Dr.Ehrenstorfer	319.3	70458-96-7	1.93	320→301.8	120	26
						320→276	120	23
Lomefloxacin	LFX	Dr.Ehrenstorfer	351.3	98079-51-7	2.52	351.8→265	90	30
						351.8→308	90	22

Marbofloxacin	MAR	Dr.Ehrenstorfer	362.4	115550-35-1	1.64	363→72	95	26
						363→319.9	95	21
Ofloxacin	OFX	Dr.Ehrenstorfer	361.3	82419-36-1	1.97	362→261	124	35
						362→318.1	124	26
Pefloxacin	PEF	Dr.Ehrenstorfer	333.4	70458-92-3	2.59	334→290	120	26
						334→316	120	26
Sarafloxacin	SAR	Dr.Ehrenstorfer	385.4	98105-99-8	3.79	386.1→368	140	27
						386.1→342.1	140	26
Carbadox	CAR	Dr.Ehrenstorfer	262.2	6804-7-5	1.51	263.3→129.0	68	27
						263.3→231.1	68	17
Macrolides	MLs							
Azithromycin	ATM	Dr.Ehrenstorfer	749.0	830905-01-5	7.59	749.5→158.2	64	40
						749.5→591.5	64	30
Clarithromycin	CTM	Dr.Ehrenstorfer	748.0	81103-11-9	7.59	748.9→158.2	95	37
						748.9→590.6	95	29
Erythromycin-H_2O	ETM-H_2O	TRC	715.9	23893-13-2	7.44	716.6→158.3	85	42
						716.6→558.5	85	21
Erythromycin-^{13}C–D_3 (IS)	ETM-^{13}C-D_3	TRC			7.44	720.7→162.4	97	42
						720.7→562.5	97	22
Leucomycin	LCM	Dr.Ehrenstorfer	771	1392-21-8	7.46	772.7→109.1	132	63
						772.7→174.2	132	44
Oleandomycin	ODM	Dr.Ehrenstorfer	687.9	3922-90-5	7.67	689→158.1	100	42
						689→544	100	28
Roxithromycin	RTM	Dr.Ehrenstorfer	837.0	80214-83-1	7.63	837.8→158.1	102	47
						837.8→679.8	102	29
Tylosin	TYL	Dr.Ehrenstorfer	916.1	1401-69-0	7.26	916.7→174.3	141	55
						916.7→772.4	141	41
Ionophores	IPs							
Salinomycin	SAL	Dr.Ehrenstorfer	751	53003-10-4	9.99	773.6→431.4	160	68
						773.6→265.2	160	70
Narasin	NAR	TRC	765.0	55134-13-9	10.2	787.7→431.6	175	69
						787.7→531.5	175	62
Monensin	MON	Dr.Ehrenstorfer	670.9	17090-79-8	10.0	693.5→675.7	170	52
						693.5→479.4	170	70

Others								
Trimethoprim	TMP	Dr.Ehrenstorfer	290.3	738-70-5	1.71	291.1→122.9	150	31
						291.2→230.1	150	31
Trimethoprim-D_3 (IS)	TMP- D_3	TRC			1.66	294.4→123.1	150	30
						294.4→230.0	150	47
Lincomycin	LIN	Dr.Ehrenstorfer	406.5	154-21-2	1.23	407.5→126.1	80	32
						407.5→359.1	80	26
Lincomycin-d_3	LIN-D_3	TRC			1.23	410.6→129.1	80	30
						410.6→362.2	90	25
ESI-								
Florfenicol	FF	Dr.Ehrenstorfer	358.2	73231-34-2	2.92	355.7→335.8	60	12
						355.7→184.5	60	25
Chloramphenicol	CAP	Dr.Ehrenstorfer	323.1	154-75-2	3.63	320.8→152	40	21
						320.8→256.8	40	15
Chloramphenicol-d_5	CAP-D_5	Dr.Ehrenstorfer	328.1		3.61	325.7→156.8	55	23
						325.7→261.8	55	16

[a] Abbreviation. [b] Retention time. [c] The selected ions for the antibiotic compounds were $[M+H]^+$, except ionophore compounds ($[M+Na]^+$), florfenicol and chlormphenicol ($[M-H]^-$). The underlined MRM transitions were used for quantification. [d] Collision energy. [e]Internal standard.

Table S7 Recoveries (n = 3), method detection limits (MDLs), and method quantitation limits (MQLs) of the antibiotics from surface water and sediment.

Analyte	IS [a]	Surface water					Sediment					
		10 ng/L	100 ng/L	Matrix%	MDLs (ng/L)	MQLs (ng/L)	10 ng/g	50 ng/g	100 ng/g	Matrix%	MDLs (ng/L)	MQLs (ng/L)
SCT	SMX-D$_4$	102±8.56 [b]	87±11.6	101±3.54 [c]	0.21	0.70	**46.8±10.8**[d]	**30.8±5.52**	**30.1±4.51**	119±3.93	0.28	0.93
SCP	SMX-D$_4$	108±5.16	114±3.39	140±2.82	0.30	1.00	110±14.1	123±9	133±11.9	125±4.54	0.24	0.80
SDZ	SMR-D$_4$	106±4.78	93.1±6.21	112±1.98	0.07	0.24	101±2.36	95.4±20.1	78.5±16.1	89.5±9.32	0.12	0.41
SDO	SMX-D$_4$	103±5.88	105±4.09	110±4.81	0.14	0.48	115±7.3	101±5.4	97±4.3	93.0±1.4	0.09	0.30
SDM	SMX-D$_4$	114±5.83	123±5.11	126±5.66	0.12	0.41	125±10.8	112±4.73	105±3	92.4±1.6	0.07	0.23
SMR	SMR-D$_4$	90.1±3.21	85.7±7.75	95.1±1.56	0.16	0.55	86.7±11.5	84.0±6.15	66.7±1.89	70.2±5.05	0.12	0.40
SMZ	SMR-D$_4$	139±2.87	122±8.26	149±0.42	0.12	0.39	117±15.1	135±17.5	120±4.19	123±8.66	0.16	0.53
SMX	SMX-D$_4$	149±12.7	133±10.2	99.6±1.7	0.17	0.57	78.8±3.79	77.5±2.46	75.2±2.02	83.5±4.09	0.27	0.91
SMM	SMX-D$_4$	100±5.14	101±3.12	120±3.68	0.26	0.87	102±13.1	102±6.82	104±9.54	108±1.01	0.29	0.97
SPD	SMR-D$_4$	80.1±8.06	83±5.18	102±2.12	0.13	0.43	95.7±7.78	61.1±10.9	66.8±8.81	77.8±6.22	0.11	0.35
SQX	SMX-D$_4$	117±6.94	118±11.8	87±4.24	0.14	0.45	69.7±3.69	70.1±3.25	67.8±4.54	74.3±1.51	0.05	0.18
SX	SMX-D$_4$	120±5.07	110±11.8	101±5.66	0.23	0.76	109±8.74	105±1.15	101±0.76	94.9±1.7	0.14	0.46
STZ	SMR-D$_4$	102±3.17	92.4±6.83	124±0.28	0.20	0.66	97.3±14.2	119±10.7	94.8±15.3	86.1±5.33	0.11	0.36
TMP	TMP-D$_3$	102±6.9	91.6±7.38	104±1.56	0.04	0.15	94.3±4.48	104±14.9	90.5±3.97	70.6±8.05	0.13	0.43
CTC	TC-D$_6$	95.9±5.48	88.3±9.01	87.3±1.84	0.82	2.74	106±14.	122±27.5	96.0±11.5	73.1±3.53	0.91	3.04
DC	TC-D$_6$	96.6±9.84	89.9±15.5	86.9±2.12	0.29	0.95	103±12.8	119±18.5	88.7±14.5	58.3±4	0.07	0.25
OTC	TC-D$_6$	135±14.4	118±10.8	91.5±8.06	0.30	1.00	101±12.4	91.2±11.2	93.0±9.73	108±10.3	0.80	2.65
TC	TC-D$_6$	105±7.51	106±13.9	99.4±0.28	0.68	2.28	89.5±15.9	82.9±3.44	89.7±4.48	101±1.94	1.00	3.34
CFX	CFX-D$_8$	112±11.4	87.8±7.74	116±5.8	1.00	3.33	145±19.2	96.7±4.33	102±9.19	99.3±3.24	0.78	2.59
DAN	EFX- D$_5$	81.9±21	66.4±5.07	74.8±6.11	0.32	1.07	113±17.8	113±14.3	112±10.6	65.2±3.2	1.56	5.21
DIF	EFX- D$_5$	119±7.59	94.2±4.16	125±4.62	0.95	3.17	154±13.9	149±21.8	137±7.11	107±6.73	0.76	2.54
EFX	EFX- D$_5$	101±9.07	85.6±3.26	110±1.76	0.66	2.19	**222±27.6**	111±2.91	103±9.11	91.5±2.13	0.50	1.65
FL	EFX- D$_5$	85.8±13.1	79.8±7.09	120±5.08	0.62	2.06	147±14.6	155±19.6	147±13.7	171±5.26	0.81	2.70
LFX	EFX- D$_5$	79.2±13.0	76.9±10.1	119±2.72	0.71	2.38	**249±7.6**	**158±23.3**	**188±11.4**	108±11.8	0.35	1.18
MAR	EFX- D$_5$	70.6±13.1	68.3±5.89	101±2.44	0.50	1.66	94.1±14.3	75.4±10.4	80.3±19.2	140±4.49	0.68	2.27
NFX	CFX-D$_8$	111±7.15	72.7±4.1	98.4±3.34	0.94	3.13	113±26.7	96.2±9.12	84.6±11.5	110±3.08	0.77	2.56
OFX	EFX- D$_5$	77.3±16.6	75.4±3.47	91.7±2.97	0.47	1.56	**212±19.8**	130±5.55	116±21.8	117±1.22	0.33	1.09

PEF	EFX- D_5	104±14.2	86.4±3.59	106±5.29	0.80	2.68	103±6.67	94.4±22.3	77.0±4.34	79.7±2.78	0.87	2.92
SAR	CFX-D_8	121±8.61	79.7±3.45	125±0.21	0.86	2.86	96.3±3.18	91.3±0.25	78.4±5.15	93.2±8.63	0.73	2.43
CAR	TBD-D_4	75.7±5.5	68±9.25	67±4.92	1.22	4.29	124±6	102±7.02	92.1±19.1	64.5±3.3	0.85	2.84
ATM	ETM-^{13}C-D_3	89.4±10.1	76.8±8.56	132±0.73	0.52	1.73	**43.2±6.93**	111±19.4	108±16.7	63±5.8	0.29	0.97
CTM	ETM-^{13}C-D_3	54.1±3.74	87.7±8.29	117±4.30	0.30	1.00	87.8±11.2	81.5±18.2	104±21.3	79.3±7.1	0.54	1.79
ETM-H_2O	ETM-^{13}C-D_3	56.4±2.31	53.1±3.42	141±3.64	0.36	1.19	85.1±13.5	65.3±11.2	99.0±11.0	83.9±4.77	0.72	2.41
LCM	ETM-^{13}C-D_3	63.7±9.47	71.4±7.10	110±8.90	0.48	1.59	61.1±10.1	65.8±11.2	86.0±3.2	79.9±4.14	0.50	1.65
ODM	ETM-^{13}C-D_3	60.2±5.17	54.6±8.95	135±8.27	0.08	0.26	60.8±11.3	119±9.33	105±12.7	67.2±10.5	0.23	0.77
RTM	ETM-^{13}C-D_3	82.7±3.87	84.8±5.11	98.4±2.38	0.19	0.62	57.6±11.5	86.5±12.5	96.1±12.9	101±4.32	0.74	2.47
TYL	ETM-^{13}C-D_3	57.3±6.69	95.8±7.59	140±8.90	0.42	1.40	96.7±6.75	91.7±19.5	117±21	60.2±0.88	1.40	4.65
SAL	TBD-D_4	**45.7±6.53**	78.8±16.8	79.3±3.76	1.13	3.77	**44.0±7.72**	141±16.3	**190±47.3**	112±1.16	1.94	6.45
NAR	TBD-D_4	58.6±5.28	85.1±19.6	102±13.1	0.60	2.00	80 ±17	81.5±6.17	84.6±20.5	80±1.32	0.54	1.81
MON	TBD-D_4	64.9±5.17	71.4±7.10	85.7±5.18	0.41	1.36	**36.8±6.51**	76.7±8.73	135±28.8	75.8±6.35	0.76	2.54
LIN	LIN-D_3	123±2.21	110±7.32	126±6.36	0.56	1.86	127±20.9	81.8±9.45	102±24.6	98.2±1.93	1.26	4.20
FF	CAP-D_5	79.7±4.79	71.4±3.6	88.3±3.12	0.08	0.26	100±3.5	88.5±3.02	94.5±1.13	95.4±3.24	0.10	0.34
CAP	CAP-D_5	103±10.5	97.3±10.9	96.4±2.31	0.28	0.94	96.8±3.55	88.7±3.06	95.2±1.14	102±2.99	0.05	0.18

[a] Internal standards. [b] Mean(%)±standard deviation (%). [c]>100% means matrix enhancement effect, <100% means matrix suppression effect. [d] Bold letters in the table represent those recoveries or matrix effect outside the range of 50-150%.

Table S8 Mass balance of antibiotics in the surface water and sediment of Lake Taihu in summer and winter

Site	Summer		Winter	
	Mass in water (kg)	Mass in sediment (kg)	Mass in water (kg)	Mass in sediment (kg)
S1	3.06	117	7.44	46.8
S2	4.05	66.2	5.95	37.9
S3	4.59	35.9	6.10	26.5
S4	4.84	40.1	8.17	64.9
S5	8.25	29.9	5.89	33.5
S6	13.7	128	25.8	1,520
S7	28.7	123	31.6	666
S8	64.3	90.8	88.5	550
S9	0.20	14.9	0.17	21.3
S10	32.0	879	158	891
S11	22.3	181	18.9	305
S12	5.21	46.5	8.43	210
S13	25.7	124	37.3	1,330
S14	53.7	170	38.9	986
S15	0.25	10.3	0.12	89.3
S16	21.2	951	434	1,830
S17	19.2	329	93.0	205
S18	64.1	116	66.5	139
S19	27.6	251	27.6	432
S20	24.1	108	41.5	303
S21	54.6	98.1	46.7	2,700
S22	18.6	45.6	18.1	82.7
S23	22.5	45.7	16.8	221
S24	14.0	36.0	46.8	51.2
S25	1.59	145	2.75	40.1

S26	11.1	133	7.79	189
S27	13.3	35.7	6.93	37.4
S28	8.13	-- [c]	5.19	--
S29	27.6	10.2	19.7	--
S30	19.4	0.00	14.5	37.4
S31	21.0	1.42	26.7	120
S32	11.2	5.65	16.8	213
All of the entire lake	650	4,370	1,330	13,400

[a] Mass of antibiotics in the water around each site (kg)=total concentrations of antibiotics in the aqueous phase (ng/L)×water depth (m)×water area(m^2)/1000,000,000; and the water depth and weighted water area at each site were provided in Table S2. [b] Mass of antibiotics in the sediment around each site (kg)=total concentrations of antibiotics in the sedimentary phase (ng/g)×sediment depth (m)×water area(m^2) ×sediment density (g/cm^3)×water content of sediment (%)/1000,000; and sediment depth 0.2 m, sediment density 1.3 g/cm^3, water content of sediment 50% were used and cited from Qin, 2008. [22] [c] not available, because sediment samples at site S28 in summer were not sampled due to lush aquatic plants and thin sedimentary deposit thickness.

Table S9 Pseudo-distribution coefficient of antibiotics in Lake Taihu during two seasons

Site	SDO		SMZ		SMX	SMM		SPD	TMP		TC	DC	DNA	DIF		EFX		FL		LFX	MAR		NFX	OFX		PEF	SAR	ETM-H2O	RTM	FF
	May	Nov.	May	Nov.	May	May	Nov.	May	May	Nov.	May	Nov.	Nov.	May	Nov.	May	Nov.	May	Nov.	May	May	Nov.	May	May	Nov.	May	May	May	May	Nov.
S1	7.77	--[a]	--[a]	--	--	--	--	--	156	--	10000	--	--	3100	31.4	5800	--	1310	44.6	--	1370	--	5440	5500	212	2990	6510	--	--	3.17
S2	5.84	--	--	--	--	--	--	--	123	--	--	--	--	--	--	--	--	--	353	--	--	--	--	--	538	--	3380	--	--	--
S3	21.2	--	--	--	--	--	--	--	86.7	--	--	--	--	--	--	--	--	--	--	--	--	--	--	699	--	--	--	--	--	--
S4	18.9	--	--	--	--	--	--	--	62.1	--	--	--	--	--	--	753	--	--	--	--	--	--	--	--	--	--	--	--	--	--
S5	4.32	--	--	--	--	--	--	--	89.2	--	--	--	--	--	--	753	--	--	--	75.6	--	--	--	--	--	--	--	--	--	--
S6	--	--	--	--	--	--	--	--	62.1	--	--	--	--	--	--	753	--	--	776	--	--	--	--	--	--	--	--	--	--	--
S7	--	--	--	--	--	--	--	--	73.4	--	--	--	--	--	729	753	--	--	2590	--	--	--	--	--	--	--	--	--	--	--
S8	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
S9	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
S10	--	--	57.6	--	--	71.9	--	--	63.0	40.6	--	--	--	--	--	--	--	--	--	63.3	--	--	--	--	--	--	--	--	--	--
S11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	152	--	--	--	--	--	--	--	--	--	--
S12	--	--	--	--	--	--	--	--	102	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
S13	7.06	2.65	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	184	--	--	--	--	--	--	--	--	--	--
S14	2.81	5.40	--	--	--	--	--	--	--	--	--	--	--	--	3200	--	1180	--	2620	--	--	--	--	--	1530	--	--	2030	--	--
S15	--	--	--	--	--	--	--	--	789	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
S16	--	--	41.6	--	--	66.6	--	195	93.4	14.6	347	18.4	--	--	3530	--	--	--	388	--	--	313	--	--	--	--	--	--	1810	0.18
S17	71.1	--	85.5	182	21.7	88.5	26.9	--	133	54.2	--	1.87	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.5
S18	2.52	--	--	--	--	--	--	--	114	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
S19	--	--	--	--	--	--	--	--	--	489	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
S20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
S21	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
S22	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
S23	--	--	--	--	--	--	--	--	236	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
S24	--	--	--	--	--	--	--	--	299	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
S25	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

S26	--	--	--	--	--	--	--	--	--	--	--	--	214	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
S27	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
S28	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
S29	2.94	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
S30	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
S31	2.38	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	574	--	--	--	--	--	--	--	--	--	--	--
S32	10.1	--	--	--	--	--	--	--	73.9	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

[a] Not available because this antibiotic was not detected in the water or sediment.

Table S10 Occurrence of antibiotics in aquatic environment in the world

Compound	Country	Location	Aqueous phase (ng/L)			Sediment (μg/kg)			Reference
			Range	Median	Mean	Range	Median	Mean	
Sulfonamides									
Sulfacetamide	China	Lake Taihu	ND-34.9	2.24		ND-<MQL			In this study
	China	Bosten Lake	11.56-48.26	15.41		<MQL-1.25	3.81		[23]
	China	Coastal environment of Dalian	ND-1.51	ND	0.33	ND-1.39	ND	0.13	[24]
	China	Liao River Basin	ND-12.25	ND	1.24	ND			[25]
Sulfachlorpyridazine	China	Lake Taihu	ND-9.52	ND		ND			In this study
	China	Lake Taihu	ND-89.4		27.1	ND-15.8		7.3	[26]
	China	Lake Chaohu	ND-4.6						[27]
	China	Inflowing rivers of Lake Chaohu	ND-1.6						[18]
	China	Huangpu River	3.2-58.3						[28]
	China	Coastal environment of Dalian	ND			ND			[15]
	China	Liao River Basin	ND-13.52	ND	0.98	ND			[16]
	USA	139 stream sites	ND						[29]
	USA	Cache La Poudre River	30		30	1.9-3.32		2.7	[30]
Sulfadiazine	China	Lake Taihu	ND-3.14	0.72		ND			In this study
	China	Lake Chaohu	ND-45.6						[18]
	China	Inflowing rivers of Lake Chaohu	ND-3.2						[18]
	China	Baiyangdian Lake	0.86-505	56.0	118	ND-2.07	ND	0.41	[31]
	China	Bosten Lake	2.88-37.77	10.54		<MQL-4.46			[14]
	China	Coastal environment of Dalian	ND-2.05	ND	0.19	ND-1.68	ND	0.50	[15]
	China	Huangpu River	1.4-40.6						[19]
	China	Huangpu River	4.9-112.5		53.6	0.07-0.71		0.4	[32]
	China	Yangze Estuary	0.3-71.8						[33]

	China	The Yangtze Estuary and nearby coastal areas				ND-0.469			[34]
	China	Pearl River	ND-336						[35]
	China	Pearl River	ND-26.9						[36]
	China	lower reach of the Pearl River	Up to 18.0			ND			[37]
	China	Victoria Harbour	ND						[26]
	China	Pearl River				ND-83.9	3.16		[38]
	China	Streams in Jianghan Plain	ND-37.4						[39]
	China	Hai River	3.1-52	38.8	32.7	ND			[40]
	China	Laizhou Bay	ND-0.43	ND	0.02				[41]
	China	Jiulongjiang River	<0.26-316.2	24.2	51.38				[42]
	China	Yellow River				ND-22	ND		[43]
	China	Hai River				ND-1.18	ND		[34]
	China	Liao River				ND-11	ND		[34]
	China	Streams with livestock farms	4.57-214			ND			[44]
Sulfadoxine	China	Lake Taihu	ND-210	7.99		ND-0.59			In this study
	China	Coastal environment of Dalian	ND-1.88	ND	0.33	ND			[15]
Sulfadimethoxine	China	Lake Taihu	ND			ND			In this study
	China	Lake Taihu	ND-43.3		11.9	ND-15.7		6.9	[17]
	China	Lake Chaohu	ND-8.8						[18]
	China	Inflowing rivers of Lake Chaohu	<MQL						[18]
	China	Baiyangdian Lake	ND			ND-0.20	ND	0.04	[22]
	China	Jiulongjiang River	<0.22-1.90	0.80	0.89				[33]
	China	Coastal environment of Dalian	ND-2.00	ND	0.13	ND			[15]
	China	Liao River Basin	ND-5.90	0.62	0.94	ND-0.97	ND	0.06	[16]
	Japan	Nationwide survey	ND-6.4	ND	0.45				[45]

	Japan	Tamagawa River	ND						[46]
	Vietnam	Urban drainage	ND						[37]
	Vietnam	Mekong River	ND						[37]
	USA	139 stream sites	Up to 60						[20]
	USA	Cache La Poudre River	10-40		20	1.7-6.8		3.8	[21]
Sulfamerazine	China	Baiyangdian Lake	ND			ND-2.47	ND	0.05	[22]
	China	The Yangtze Estuary and nearby coastal areas				ND-<MQL			[25]
	China	Huangpu River	<MQL			0.03-0.8		0.2	[23]
	China	Coastal environment of Dalian	ND			ND-3.67	2.55	1.73	[15]
	China	Liao River Basin	ND			ND			[16]
	China	Streams in Jianghan Plain	ND-11.0						[30]
	Japan	Nationwide survey	ND-0.03	ND	ND2				[36]
	Japan	Tamagawa River	ND						[37]
	USA	139 stream sites	ND						[20]
	USA	Cache La Poudre River	10-60		20	2.3-6.8		4.8	[21]
Sulfamethazine	China	Lake Taihu	ND-6.69	0.47		ND-0.27	ND		In this study
	China	Lake Taihu	ND-654.0		252.7	ND-99.8		39.8	[17]
	China	Lake Chaohu	ND-9.9						[18]
	China	Inflowing rivers of Lake Chaohu	<MQL-14.9						[18]
	China	Baiyangdian Lake	ND-16.1	2.68	5.25	ND-6.92	1.08	1.47	[22]
	China	Huangpu River	2.0-623.3						[19]
	China	Huangpu River	19.9-389.4		188.9	0.2-2.7		1.2	[23]
	China	Yangze Estuary	0.50-89.1						[24]
	China	The Yangtze Estuary and nearby coastal areas				<MQL-4.84			[25]

	China	Pearl River	ND-323						[26]
	China	Pearl River	ND-446						[27]
	China	Pearl River				ND-248	19.7		[29]
	China	lower reach of the Pearl River	Up to 218			Up to 3.24			[28]
	China	Victoria Harbour	ND						[26]
	China	Yellow River				ND			[34]
	China	Hai River				ND-5.67	ND		[34]
	China	Liao River				ND			[34]
	China	Hai River	ND-53.5	30.7	27.7	0.5-5.8	3.1	2.9	[31]
	China	Coastal environment of Dalian	ND-2.81	ND	0.34	ND-1.76	ND	0.26	[15]
	China	Liao River Basin	ND-15.91	2.37	3.55	ND-1.03	ND	ND	[16]
	China	Laizhou Bay	ND-1.5	ND	0.13				[32]
	China	Jiulongjiang River	<0.28-775.5	39.55	170.86				[33]
	China	Streams in Jianghan Plain	ND-33.8						[30]
	China	Streams with livestock farms	63.8-101			4.16-5.34			[35]
	Japan	Nationwide survey	ND-62.9	ND	2.55				[36]
	Japan	Tamagawa River	ND						[37]
	Vietnam	Urban drainage	58-328	103	119				[37]
	Vietnam	Mekong River	15-28	19	20.3				[37]
	USA	Cache La Poudre River	20		20	1-13.7		4.7	[21]
	USA	139 stream sites	Up to 220						[20]
	France	Seine River	<10						[47]
	Germany	River waters and drainages	ND	ND					[48]
Sulfamethiazole	China	Coastal environment of Dalian	ND-1.34	ND	0.38	ND			[15]
Sulfamethoxazole	China	Lake Taihu	2.29-234	25.8		ND-0.46	ND		In this study
	China	Lake Taihu	ND-114.7		48.4	ND-49.3		16.1	[17]

China	Lake Chaohu	ND-171.6						[18]
China	Inflowing rivers of Lake Chaohu	2.5-95.6						[18]
China	Baiyangdian Lake	ND-940	121	240	ND-7.86	ND	0.28	[22]
China	Bosten Lake	1.12-13.28	5.91		ND			[14]
China	Huangpu River	4.9-55.2						[19]
China	Huangpu River	2.2-764.9		259.6	0.05-0.6		0.2	[23]
China	Yangze Estuary	0.3-56.8						[24]
China	The Yangtze Estuary and nearby coastal areas				ND-1.13			[25]
China	Pearl River	ND-193						[26]
China	Pearl River	ND-616						[27]
China	Pearl River				ND-<LOQ	ND		[29]
China	lower reach of the Pearl River	Up to 37.6			ND			[28]
China	Victoria Harbour	ND						[26]
China	Yellow River	<LOQ-56						[49]
China	Hai River	22.1-201	137	113.8	ND			[31]
China	Yellow River				ND			[34]
China	Hai River				ND			[34]
China	Liao River				ND-<LOQ	ND		[34]
China	Coastal environment of Dalian	ND-2.23	1.41	1.28	ND			[15]
China	Liao River Basin	ND-1483.9	59.75	104.9	ND-2.63	ND	ND	[16]
China	Laizhou Bay	1.5-82	13	19				[32]
China	Jiulongjiang River	0.05-58.3	10.73	15.98				[33]
China	Streams in Jianghan Plain	ND-13.4						[30]
China	Streams with livestock farms	3.58-11.9			ND			[35]
Japan	Nationwide survey	ND-33.9	1.1	4.85				[36]

	Japan	Tamagawa River	4-23	18.5	7				[37]
	Vietnam	Urban drainage	37-360	153	179				[37]
	Vietnam	Mekong River	20-33	22	26.3				[37]
	USA	Cache La Poudre River	40-320		110	1.2-1.9		1.6	[21]
	USA	139 stream sites	Up to 1900						[20]
	UK	Downstream of WWTPs	<50						[50]
	France	Arc River	ND						[51]
	France	Seine River	Up to 121						[38]
	Germany	Watersides in westphalia	40-200						[52]
	Germany	River waters and drainages	ND-480	30					[39]
	Spain	Llobregat River	0.2-1500						[53]
	Spain	Llobregat River	30-11920		1110				[54]
	Sweden	Hoje River	ND-10						[55]
	Italian	River Po	1.83-2.39		2.1				[56]
	Italian	River Arno	1.79-11.4		5.3				[47]
	Australia	Six river systems	ND-2000	8					[57]
Sulfamethoxypyridazine	China	Coastal environment of Dalian	ND-1.95	ND	0.23	ND-7.67	ND	1.49	[15]
	China	Liao River Basin	ND-8.04	ND	0.56	ND			[16]
Sulfameter	China	Coastal environment of Dalian	ND-1.92	ND	0.10	ND-56.65	ND	8.82	[15]
Sulfamonomethoxine	China	Lake Taihu	ND-85.8	5.58		ND-0.49	ND		In this study
	China	Baiyangdian Lake	ND-23.1	5.40	6.92	ND-0.50	ND	0.06	[22]
	China	Hai River	2.3-19.4	8.9	10.8	ND-0.9	ND	0.1	[31]
	China	Coastal environment of Dalian	ND-2.28	ND	0.39	ND-7.00	ND	1.63	[15]
Sulfapyridine	China	Lake Taihu	ND-1.13	ND		ND-0.17	ND		In this study
	China	Baiyangdian Lake	ND-85.0	2.58	13.0	ND-1.40	ND	0.16	[22]
	China	Huangpu River	1.14-57.4						[19]

	China	Huangpu River	ND-103.1		24.1	ND-6.6		1.7	[23]
	China	The Yangtze Estuary and nearby coastal areas				<MQL-9.12			[25]
	China	Pearl River				ND-<LOQ			[29]
	China	Pearl River	ND-74.6						[27]
	China	Hai River	ND-5.5	1.3	2.2	ND-2.0	ND	0.5	[31]
	China	Yellow River				ND			[34]
	China	Hai River				ND			[34]
	China	Liao River				ND			[34]
	China	Liao River Basin	ND-0.96	ND	ND	ND-0.68	ND	ND	[16]
	Japan	Nationwide survey	ND-144	1.95	15.2				[36]
	Japan	Tamagawa River	21-132	108	41.9				[37]
	Vietnam	Urban drainage	ND						[37]
	Vietnam	Mekong River	ND						[37]
Sulfaquinoxaline	China	Lake Taihu	ND			ND-<MQL	ND		In this study
	China	Yangze Estuary	ND-23.5						[24]
	China	Huangpu River	ND-64.2		21.5	0.08-0.9		0.4	[23]
	China	The Yangtze Estuary and nearby coastal areas				<MQL-0.959			[25]
	China	Liao River Basin	ND-14.59	ND	0.91	ND			[16]
Sulfathiazole	China	Lake Taihu	ND-8.18	ND		ND			In this study
	China	Lake Taihu	ND-134.5		45.9	ND-51.7		17.8	[17]
	China	Baiyangdian Lake	ND-1.38	ND	0.08	ND-5.94	0.57	0.64	[22]
	China	Huangpu River	ND-121.1		34.1	ND-0.6		0.2	[23]
	China	Yangze Estuary	0.03-5.23						[24]
	China	The Yangtze Estuary and nearby				ND-<MQL			[25]

		coastal areas							
	China	Streams in Jianghan Plain	ND-3.7						[30]
	China	Coastal environment of Dalian	ND-1.24	ND	0.34	ND-1.89	ND	0.09	[15]
	China	Liao River Basin	ND-7.5	ND	0.8	ND			[16]
	Japan	Nationwide survey	ND-0.02	ND	ND05				[36]
	Japan	Tamagawa River	ND						[37]
	Vietnam	Urban drainage	ND						[37]
	Vietnam	Mekong River	ND						[37]
	USA	139 stream sites	Up to 130						[20]
	USA	Cache La Poudre River	10-30		10	1.3-5.4		3.3	[21]
	Australia	Six river systems	ND-40	ND					[48]
Sulfisoxazole	China	Lake Taihu	ND			ND			In this study
	China	Lake Taihu	ND-61.4		44.4	ND-22.6		11.0	[17]
	China	Bosten Lake	3.34-10.36	5.39		ND-<MQL	<MQL		[14]
	China	Coastal environment of Dalian	ND-2.01	ND	0.23	ND			[15]
Diaminopyrimidines									
Trimethoprim	China	Lake Taihu	ND-18.3	1.28		ND-1.09	ND		In this study
	China	Lake Taihu	ND-40.8		12.0	ND-39.3		9.3	[17]
	China	Pearl River	ND-605						[27]
	China	Yellow River				ND-<LOQ	ND		[34]
	China	Hai River				ND-5.63	ND		[34]
	China	Liao River				ND-9.84	0.93		[34]
	China	Laizhou Bay	1.3-330	18	53				[32]
	China	Streams in Jianghan Plain	ND-19.0						[30]
	China	Streams with livestock farms	6.22-19.2			ND-1.77			[35]
	Japan	Nationwide survey	ND-36	0.02	2.50				[36]

	Japan	Tamagawa River	19-54	29.5	13.7				[37]
	Vietnam	Urban drainage	15-46	28	29.9				[37]
	Vietnam	Mekong River	7-19	17.5	15.3				[37]
	USA	139 stream sites	Up to 710						[20]
	Spain	Llobregat River	ND-35.6						[44]
	Spain	Llobregat River	20-470		140				[45]
	UK	Downstream of WWTPs	<10-42	<10	12				[41]
	UK	Estuaries	<4-569	<4					[58]
	France	Seine River	ND-45						[38]
	Sweden	Hoje River	<1-20						[46]
	Germany	River waters and drainages	ND-200	ND					[39]
	Germany	Watersides in westphalia	6-70 ng/L						[43]
	Australia	Six river systems	ND-150	3					[48]
Tetracyclines									
Chlortetracycline	China	Lake Taihu	ND-73.0	ND		ND-8.75	ND		In this study
	China	Lake Taihu	ND-142.5		67.9	ND-48.5		19.0	[17]
	China	Lake Chaohu	ND-4.0						[18]
	China	Inflowing rivers of Lake Chaohu	ND-4.2						[18]
	China	Bosten Lake	ND-3.11	1.03		4.62-17.28	10.41		[14]
	China	Huangpu River	ND-16.8						[19]
	China	Huangpu River	ND-46.7		3.6	ND-6.3		2.4	[23]
	China	Yangze Estuary	ND-3.5						[24]
	China	The Yangtze Estuary and nearby coastal areas				<MQL-12			[25]
	China	Jiulongjiang River	2.81-766.51	9.98	97.52				[33]
	China	Streams in Jianghan Plain	ND-122.3						[30]

	China	Yellow River				ND			[34]
	China	Hai River				ND-10.9	ND		[34]
	China	Liao River				ND-32.5	ND		[34]
	China	Coastal environment of Dalian	1.01-3.00	1.23	1.49	ND			[15]
	China	Streams with livestock farms	ND-98.2			315-1010			[35]
	USA	139 stream sites	Up to 690						[20]
	USA	Cache La Poudre River	10-210		80	1.1- 30.8		10.8	[21]
	Germany	River waters and drainages	ND	ND					[39]
	Australia	Six river systems	ND-600	3					[48]
Doxycycline	China	Lake Taihu	ND-947	ND		ND-6.09	<MQL		In this study
	China	Lake Chaohu	ND-42.3						[18]
	China	Inflowing rivers of Lake Chaohu	ND-3.5						[18]
	China	Bosten Lake	ND-4.92	2.06		<MQL-9.96	4.23		[14]
	China	Huangpu River	ND-46.9						[19]
	China	Huangpu River	ND-112.3		11.3	ND-6.3		2.4	[23]
	China	Yangze Estuary	ND-5.6						[24]
	China	The Yangtze Estuary and nearby coastal areas				<MQL-18.6			[25]
	China	Coastal environment of Dalian	ND-1.56	ND	0.26	1.10-1.54	1.44	1.33	[15]
	China	Liao River Basin	ND-25.05	ND	1.38	ND-12.26	ND	2.00	[16]
	China	Streams with livestock farms	ND-12.6			35.8-444			[35]
	China	Streams in Jianghan Plain	ND-66.5						[30]
	China	Yellow River				ND			[34]
	China	Hai River				ND-7.0	ND		[34]
	China	Liao River				ND-2.8	ND		[34]
	USA	Cache La Poudre River	10-50		30	2.2-38.9		15.7	[21]

	USA	139 stream sites	ND						[20]
	Germany	River waters and drainages	ND	ND					[39]
	Australia	Six river systems	ND-400	ND					[48]
Oxytetracycline	China	Lake Taihu	ND-34.8	ND		ND-9.00	ND		In this study
	China	Lake Taihu	ND-72.8		44.2	ND-196.7		52.8	[17]
	China	Baiyangdian Lake	4.64-90.3		27.17	4.28-35.4		15.66	[59]
	China	Lake Chaohu	ND-2.9						[18]
	China	Inflowing rivers of Lake Chaohu	ND-16.5						[18]
	China	Bosten Lake	ND-6.6	2.99		4.61-20.67	7.79		[14]
	China	Huangpu River	11.5-84.5						[19]
	China	Huangpu River	ND-219.8		78.3	0.6-18.6		6.9	[23]
	China	Yangze Estuary	ND-22.5						[24]
	China	The Yangtze Estuary and nearby coastal areas				0.305-14			[25]
	China	Pearl River				ND- 196	7.15		[29]
	China	Yellow River				ND-184	ND		[34]
	China	Hai River				ND-422	2.52		[34]
	China	Liao River				ND- 652	2.34		[34]
	China	Jiulongjiang River	2.75-456.67	36.91	117.97				[33]
	China	Coastal environment of Dalian	1.09-6.28	2.08	2.46	ND			[15]
	China	Liao River Basin	ND-741.85	ND	22.41	ND-384.59	3.71	29.21	[16]
	China	Streams in Jianghan Plain	ND-61.8						[30]
	China	Streams with livestock farms	33-60			497-214			[35]
	Japan	Streams with livestock farms	2-6800						[60]
	USA	Cache La Poudre River	10-1210		180	2.4-56.1		14.8	[21]
	USA	139 stream sites	Up to 340						[20]

	France	Arc River	ND-650						[42]
	Germany	River waters and drainages	ND	ND					[39]
	Italian	River Po	<1.19-1.82		1.1				[47]
	Italian	River Arno	<1.19		<1.19				[47]
	Australia	Six river systems	ND-100	ND					[48]
Tetracycline	China	Lake Taihu	ND-4.18	ND		ND-27.0	ND		In this study
	China	Lake Taihu	ND-87.9		43.2	ND-112.2		47.9	[17]
	China	Baiyangdian Lake	8.07-85.19		25.95	4.78-93.36		25.71	[50]
	China	Lake Chaohu	ND-17.8						[18]
	China	Inflowing rivers of Lake Chaohu	ND-1.9						[18]
	China	Bosten Lake	ND-4.92	2.06		<MQL-9.96	4.23		[14]
	China	Huangpu River	ND-113.9						[19]
	China	Huangpu River	ND-54.3		4.2	ND-21.7		3.5	[23]
	China	Yangze Estuary	ND-2.4						[24]
	China	The Yangtze Estuary and nearby coastal areas				<MQL-6.84			[25]
	China	Pearl River				ND- 72.6	4.05		[29]
	China	lower reach of the Pearl River	Up to 13.1			Up to 7.13			[28]
	China	Yellow River				ND- 18	ND		[34]
	China	Hai River				1.06- 135	2.0		[34]
	China	Liao River				ND-4.82	ND		[34]
	China	Coastal environment of Dalian	1.01-3.00	1.23	1.49	ND			[15]
	China	Liao River Basin	ND-28.65	ND	ND	ND-7.97	ND	0.98	[16]
	China	Jiulongjiang River	3.28-49.57	10.48	13.87				[33]
	China	Streams in Jianghan Plain	ND-137.4						[30]
	China	Streams with livestock farms	ND-8.73			13.7-56.3			[35]

	USA	Cache La Poudre River	10-30		20	1.1- 102.7	17.9		[21]
	USA	139 stream sites	Up to 110						[20]
	Germany	River waters and drainages	ND	ND					[39]
	Australia	Six river systems	ND-80	ND					[48]
Fluoroquinolones									
Ciprofloxacin	China	Lake Taihu	ND			ND-46.5	3.76		In this study
	China	Lake Taihu	ND-43.6		8.8	ND-25.3		9.8	[17]
	China	Lake Chaohu	ND-23.2						[18]
	China	Inflowing rivers of Lake Chaohu	ND-21.0						[18]
	China	Baiyangdian Lake	ND-60.3	4.55	9.45	ND-46.0	ND	2.49	[22]
	China	Bosten Lake	17.33-112.3	39.22		21.18-213	76.51		[14]
	China	Huangpu River	<MQL						[19]
	China	Huangpu River	ND-34.2		2.7	ND			[23]
	China	Yangze Estuary	ND-2.3						[24]
	China	The Yangtze Estuary and nearby coastal areas				<MQL-42.9			[25]
	China	Pearl River				ND-197	21.8		[29]
	China	Hai River	ND-19.7	13.4	11.3	ND-88.3	13.8	23.2	[31]
	China	Yellow River				ND-32.8	ND		[34]
	China	Hai River				2.05- 1290	16.0		[34]
	China	Liao River				ND-28.7	ND		[34]
	China	Liao River Basin	ND-185.14	ND	11.6	ND-13.15	ND	ND	[16]
	China	Laizhou Bay	ND-66	25	31				[32]
	China	Streams in Jianghan Plain	ND-18.0						[30]
	China	Streams with livestock farms	ND-8.91			8.72-20.5			[35]
	USA	139 stream sites	Up to 30						[20]

	France	Arc River	ND-9660						[42]
	Germany	Watersides in westphalia	Up to 13						[43]
	Italian	River Po	1.32-16		8.8				[47]
	Italian	River Arno	<1.8-37.5		19				[47]
	Australia	Six river systems	ND-1300	ND					[48]
Danofloxacin	China	Lake Taihu	ND-12.2	ND		ND-34.1	ND		In this study
	China	Jiulongjiang River	<2.17-3.95	3.32	3.43				[33]
	France	Seine River	ND-19						[38]
Difloxacin	China	Lake Taihu	ND-40.4	ND		ND-79.0	1.27		In this study
	China	Lake Chaohu	ND-10.4						[18]
	China	Inflowing rivers of Lake Chaohu	<MQL-12.4						[18]
	China	Baiyangdian Lake	ND			ND			[22]
	China	Hai River	ND-3.4	ND	0.5	ND-16.9	2.3	5.0	[31]
	France	Seine River	<10						[38]
Enrofloxacin	China	Lake Taihu	ND-7.57	ND		ND-54.2	<MQL		In this study
	China	Lake Chaohu	ND-82.7						[18]
	China	Inflowing rivers of Lake Chaohu	ND-20.7						[18]
	China	Baiyangdian Lake	ND-4.42	1.31	1.26	ND-13.0	ND	0.46	[22]
	China	Bosten Lake	ND-15.22	6.03		3.42-19.96	8.6		[14]
	China	Huangpu River	<MQL						[19]
	China	Huangpu River	ND-14.6		2.8	ND-8.9		3.2	[23]
	China	Yangze Estuary	ND-4.8						[24]
	China	The Yangtze Estuary and nearby coastal areas				<MQL-4.84			[25]
	China	lower reach of the Pearl River	ND			Up to 1.43			[28]
	China	Hai River	ND-1.0	ND	0.4	ND-69.7	15.5	19.8	[31]

	China	Yellow River				ND			[34]
	China	Hai River				ND-2.34	ND		[34]
	China	Liao River				ND			[34]
	China	Liao River Basin	ND-70.36	25.13	25.72	ND-25.67	ND	2.71	[16]
	China	Laizhou Bay	ND-7.6	ND	1.8				[32]
	China	Streams in Jianghan Plain	ND-53.1						[30]
	China	Streams with livestock farms	ND-2.45			21.3-137			[35]
	France	Seine River	<10						[38]
	Australia	Six river systems	ND-300	ND					[48]
Fleroxacin	China	Lake Taihu	ND-30.3	ND		ND-13.2	ND		In this study
	China	Baiyangdian Lake	ND-6.35	2.05	2.29	ND-6.69	ND	0.15	[22]
	China	Hai River	ND-7.3	1.3	2.2	ND-24.2	ND	5.3	[31]
	China	Streams with livestock farms	ND-4.48			ND			[35]
Lomefloxacin	China	Lake Taihu	ND-16.3	ND		ND-11.1	ND		In this study
	China	Lake Chaohu	ND-5.50						[18]
	China	Inflowing rivers of Lake Chaohu	ND-24.0						[18]
	China	Baiyangdian Lake	ND			ND-29.0	ND	0.98	[22]
	China	Hai River	ND-0.9	ND	0.1	ND-16.2	3.8	4.8	[31]
	China	Yellow River				ND			[34]
	China	Hai River				ND-298	1.67		[34]
	China	Liao River				ND-5.82	ND		[34]
	China	Streams in Jianghan Plain	ND-13.1						[30]
	China	Streams with livestock farms	ND			ND-2.78			[35]
	France	Seine River	<10						[38]
	Italian	River Po	<0.31		<0.31				[47]
	Italian	River Arno	<0.31		<0.31				[47]

Marbofloxacin	China	Lake Taihu	ND-16.7	ND		ND-8.93	ND		In this study
	China	Streams with livestock farms	ND-3.46			ND			[35]
Norfloxacin	China	Lake Taihu	ND-<MQL			ND-12.2	ND		In this study
	China	Lake Taihu	ND-6.5		4.3	ND-28.4		9.9	[17]
	China	Lake Chaohu	ND-70.2						[18]
	China	Inflowing rivers of Lake Chaohu	ND-107.4						[18]
	China	Baiyangdian Lake	ND-156	19.6	28.6	49.4-1140	255	267	[22]
	China	Baiyangdian Lake	3.00-97.00		31.6	104-550		274	[50]
	China	Huangpu River	ND-0.2			ND			[23]
	China	Yangze Estuary	ND-14.2						[24]
	China	The Yangtze Estuary and nearby coastal areas				<MQL-69.3			[25]
	China	Pearl River				ND-1120	88.0		[29]
	China	Pearl River	ND-174						[27]
	China	Pearl River	ND-251						[26]
	China	lower reach of the Pearl River	Up to 136			Up to 20.5			[28]
	China	Victoria Harbour	ND-28.1						[26]
	China	Yellow River	<LOQ-300						[40]
	China	Hai River	ND-129	58.5	65.5	3.9-141	56.6	67.2	[31]
	China	Liao River Basin	ND-256.03	ND	49.03	ND-52.48	7.14	11.7	[16]
	China	Yellow River				ND-114	8.34		[34]
	China	Hai River				ND-5770	32.0		[34]
	China	Liao River				ND-176	3.32		[34]
	China	Laizhou Bay	7.5-103	38	40				[32]
	China	Streams in Jianghan Plain	ND-134.2						[30]
	China	Jiulongjiang River	<1.13-6.70	3.75	3.57				[33]

	China	Streams with livestock farms	ND-14.8			19.9-27.6			[35]
	USA	139 stream sites	Up to 120						[20]
	France	Seine River	ND-163						[38]
	Australia	Six river systems	ND-1150	30					[48]
Ofloxacin	China	Lake Taihu	ND-26.3	ND		ND-12.2	ND		In this study
	China	Lake Taihu	ND-82.8		32.2	ND-52.8		16.5	[17]
	China	Lake Chaohu	ND-182.7						[18]
	China	Inflowing rivers of Lake Chaohu	1.5-383.4						[18]
	China	Baiyangdian Lake	2.02-9.43		4.33	18.62-71.51		39.73	[50]
	China	Bosten Lake	1.3-32.24	9.29		18.39-94.1	40.99		[14]
	China	Huangpu River	<MQL						[19]
	China	Huangpu River	ND-28.5		6.5	ND-12.4		4.1	[23]
	China	Yangze Estuary	ND-12.4						[24]
	China	The Yangtze Estuary and nearby coastal areas				<MQL-458.2			[25]
	China	Pearl River	ND-108						[26]
	China	Pearl River				ND- 1560	156		[29]
	China	lower reach of the Pearl River	Up to 15.8			Up to 13.7			[28]
	China	Victoria Harbour	ND-16.4						[26]
	China	Yellow River	<LOQ-264						[40]
	China	Hai River	9.1-95.2	30.9	36.4	ND-64.6	33.4	36.8	[31]
	China	Yellow River				ND-123	3.07		[34]
	China	Hai River				ND-653	10.3		[34]
	China	Liao River				ND-50.5	3.56		[34]
	China	Liao River Basin	ND-632.52	ND	37.93	ND-51.36	ND	5.62	[16]

	China	Laizhou Bay	ND-6.5	ND	0.24				[32]
	China	Streams in Jianghan Plain	ND-135.1						[30]
	China	Streams with livestock farms	ND-14.5			17.7-235			[35]
	Spain	Llobregat River	<LOD-488.4						[44]
	Spain	Llobregat River	190-8770		2110				[45]
	Italian	River Po	0.65-18.06		10.9				[47]
	Italian	River Arno	<1.4-10.88		5				[47]
	France	Seine River	ND-55						[38]
Pefloxacin	China	Lake Taihu	ND-323	ND		ND-9.12	ND		In this study
	China	Streams with livestock farms	ND			4.45-20.5			[35]
Sarafloxacin	China	Lake Taihu	ND-1.43	ND		ND-15.6	ND		In this study
	China	Baiyangdian Lake	ND-28.2	11.0	9.30	ND			[22]
	China	Hai River	ND-11.9	ND	4.4	ND-35.9	ND	8.8	[31]
	China	Jiulongjiang River	<1.90-7.09	3.71	3.89				[33]
	USA	139 stream sites	ND						[20]
	France	Seine River	<10						[38]
Carbadox	China	Lake Taihu	ND			ND			In this study
	USA	139 stream sites	ND						[20]
Macrolides									
Azithromycin	China	Lake Taihu	ND-8.11	ND		ND-<MQL			In this study
	China	Streams in Jianghan Plain	0.3-5.6						[30]
	China	Laizhou Bay	ND-1.20	ND	0.14				[32]
	Japan	Nationwide survey	ND-44.5	ND05	1.94				[36]
	Japan	Tamagawa River	43-448	153	89.1				[37]
	Vietnam	Urban drainage	ND						[37]
	Vietnam	Mekong River	ND						[37]

	France	Arc River	ND			ND-265			[42]
	Spain	Llobregat River	<MDL						[45]
Clarithromycin	China	Lake Taihu	ND			ND			In this study
	China	Streams in Jianghan Plain	0.6-15.8						[30]
	Japan	Nationwide survey	ND-233	1	16.1				[36]
	Japan	Tamagawa River	55-254	168	71.5				[37]
	Vietnam	Urban drainage	ND						[37]
	Vietnam	Mekong River	ND						[37]
	France	Arc River	ND-1560			ND-3.82			[42]
	Germany	River waters and drainages	ND-260	ND					[39]
	Italian	River Po	0.89-2.19		1.7				[47]
	Italian	River Arno	6.7-44.76		25.4				[47]
Erythromycin	China	Baiyangdian Lake	ND-121	4.94	19.5	ND-3.04	0.42	0.59	[22]
	China	Huangpu River	0.4-6.9		3.9	1.5-24.6		10.2	[23]
	China	Yangze Estuary	0.05-45.4						[24]
	China	The Yangtze Estuary and nearby coastal areas				<MQL-51.5			[25]
	China	Hai River	3.1-10.3	5.6	6.5	ND-5.8	ND	1.5	[31]
	China	Laizhou Bay	0.9-8.5	2.4	2.6				[32]
	Japan	Nationwide survey	ND-27.8	0.01	2.55				[36]
	Spain	Llobregat River	ND-362.5						[44]
	Spain	Llobregat River	10-70		30				[45]
	Italian	River Po	0.78-4.62		2.9				[47]
	Italian	River Arno	2.88-8.12		5.4				[47]
	Australia	Six river systems	Not quantified						[48]
Erythromycin-H_2O	China	Lake Taihu	ND-4.66	ND		ND-<MQL	ND		In this study

	China	Lake Taihu	ND-624.8		109.1	ND-120.3		27.7	[17]
	China	Pearl River	ND-636						[26]
	China	Pearl River				ND-385	24.4		[29]
	China	Pearl River	ND-2070						[27]
	China	lower reach of the Pearl River	Up to 121			Up to 14.0			[28]
	China	Victoria Harbour	ND-5.2						[26]
	China	Yellow River	<LOQ-102						[40]
	China	Yellow River				ND-49.8	1.28		[34]
	China	Hai River				ND-67.7	<LOQ		[34]
	China	Liao River				ND- 40.3	3.61		[34]
	China	Liao River Basin	ND-2834.36	50.07	165.41	ND-175.38	ND	11.45	[16]
	China	Streams in Jianghan Plain	ND-381.5						[30]
	Japan	Nationwide survey	ND-128	1.1	8.13				[36]
	Japan	Tamagawa River	21-120	78	32.9				[37]
	Vietnam	Urban drainage	29-41	35.6	36.5				[37]
	Vietnam	Mekong River	9-12	10.5	10.5				[37]
	USA	139 stream sites	Up to 1700						[20]
	USA	Cache La Poudre River	20-450		120	1.3- 25.6		10	[21]
	Germany	Watersides in westphalia	Up to 200						[43]
	Germany	River waters and drainages	ND-1700	150					[39]
	Italian	River Po	1.66-5.31		3.7				[47]
	Italian	River Arno	9.68-30.52		17.9				[47]
	Australia	Six river systems	Not quantified						[48]
Leucomycin	China	Lake Taihu	ND			ND-<MQL	ND		In this study
Oleandomycin	Australia	Six river systems	ND-20	ND					[48]
Roxithromycin	China	Lake Taihu	ND-1.80	ND		ND-3.56	ND		In this study

China	Lake Taihu	ND-218.3		50.7	ND-45.2		16.9	[17]
China	Baiyangdian Lake	ND-155	2.64	27.2	ND-302	36.4	64.9	[22]
China	Huangpu River	0.13-9.93						[19]
China	Huangpu River	0.2-2.2		0.9	0.3-4.1		1.9	[23]
China	Yangze Estuary	0.05-8.20						[24]
China	The Yangtze Estuary and nearby coastal areas				<MQL-3.61			[25]
China	Pearl River				ND-133	24.7		[29]
China	Pearl River	ND-2260						[27]
China	Pearl River	ND-169						[26]
China	lower reach of the Pearl River	<MQL-1.5	<MQL	0.38	Up to 13.5			[28]
China	Victoria Harbour	ND-30.6						[26]
China	Yellow River	<LOQ-95						[40]
China	Hai River	1.5-24.3	10	10.5	ND-40.2	5.9	10.4	[31]
China	Yellow River				ND-6.8	ND		[34]
China	Hai River				ND- 11.7	2.29		[34]
China	Liao River				ND-29.6	5.51		[34]
China	Liao River Basin	ND-740.99	6.75	36.47	ND-229.31	3.10	21.31	[16]
China	Laizhou Bay	ND-0.43	ND	0.02				[32]
China	Streams in Jianghan Plain	0.6-9.8						[30]
Japan	Tamagawa River	13-43	28	11.7				[37]
Vietnam	Urban drainage	ND						[37]
Vietnam	Mekong River	ND						[37]
USA	Cache La Poudre River	ND			1.1-5.9		2.1	[21]
USA	139 stream sites	Up to 180						[20]
Germany	River waters and drainages	ND-560	ND					[39]

	Australia	Six river systems	ND-350	9					[48]
Tylosin	China	Baiyangdian Lake	ND-1.88	ND	0.10	ND			[22]
	China	Streams with livestock farms	ND-5.55			ND			[35]
	USA	139 stream sites	Up to 280						[20]
	USA	Cache La Poudre River	50			1.1-9.3		3	[21]
	Italian	River Po	<0.77		<0.77				[47]
	Italian	River Arno	<0.77		<0.77				[47]
	Germany	Watersides in westphalia	90 ng/L						[43]
	Australia	Six river systems	ND-60	1					[48]
Ionophores									
Narasin	China	Lake Taihu	ND			ND-<MQL	ND		In this study
Salinomycin	Australia	Six river systems	ND-150	ND					[48]
Monensin	Australia	Six river systems	ND-150	2					[48]
Polypeptides									
Bacitracin	Australia	Six river systems	ND						[48]
Lincosamides									
Lincomycin	China	Lake Taihu	ND-53.8	3.00		ND-<MQL	ND		In this study
	USA	139 stream sites	Up to 730						[20]
	Italian	River Po	3.72-7.47		5.7				[47]
	Italian	River Arno	5.34-10.92		8.1				[47]
	Australia	Six river systems	ND-50	1					[48]
Clindamycin	Germany	Watersides in westphalia	3-90 ng/L						[43]
	Australia	Six river systems	ND-10	1					[48]
Chloramphenicol derivatives									
Chloramphenicol	China	Yangze Estuary	ND-8.63						[24]
	China	Huangpu River	ND-28.3						[19]

	China	Huangpu River	ND-3.9		0.4	ND-0.7		0.3	[23]
	China	The Yangtze Estuary and nearby coastal areas				<MQL			[25]
	China	Pearl River	ND-266						[26]
	China	Victoria Harbour	ND						[26]
	China	Coastal environment of Dalian	ND-1.14	ND	0.33	ND-2.31	ND	1.02	[15]
	Germany	River waters and drainages	ND-60	ND					[39]
Florfenicol	China	Lake Taihu	ND-963	ND		ND-<MQL	ND		In this study
	China	Yangze Estuary	0.45-89.5						[24]
	China	Huangpu River	6.85-46.6						[19]
	China	Huangpu River	ND-241.1		116.3	ND-1.3		0.5	[23]
	China	The Yangtze Estuary and nearby coastal areas				<MQL			[25]
	China	Coastal environment of Dalian	ND-2.27	0.51	0.53	ND-1.21	ND	0.43	[15]
Thiampheniol	China	Huangpu River	ND-0.6		0.5	ND-1.3		0.4	[23]
β-Lactams									
Amoxicillin	China	Pearl River	ND						[26]
	China	Victoria Harbour	ND						[26]
	Italian	River Po	<2.08		<2.08				[47]
	Italian	River Arno	3.57-9.91		5.7				[47]
	Australia	Six river systems	ND-200	ND					[48]
Cloxacillin	Germany	River waters and drainages	ND	ND					[39]
	Australia	Six river systems	ND						[48]

Table S11 Statistical analyses on temporal variations of antibiotics in water and sediment of Lake Taihu

Class	Water (N=32) [a]	Sediment (N=30) [a]
SAs+TMP	t=0.154, df=55.096, p=0.878 [b]	**Z=-5.352, p=0.000** [c]
TCs	Z=-0.433, p=0.665 [c]	**Z=-2.968, p=0.003** [c]
FQs	Z=-1.853, p=0.064 [c]	**Z=-3.904, p=0.000** [c]
MLs	Z=-0.254, p=0.800 [c]	**Z=-5.590, p=0.000** [c]
IPs	**----** [d]	**---** [d]
LIN	**Z=-6.847, p=0.000** [c]	**---** [d]
FF	**Z=-4.639, p=0.000** [c]	**---** [d]
All of antibiotics	Z=-0.900, p=0.368 [c]	**Z=-3.386, p=0.001** [c]

[a] The concentrations of antibiotics were tested by Kolmogorov-Smirnov Test for normal. When P>0.05, the distribution of this group of data was normal. When the data were normally distributed, independent t-test was used, and test statistic values and p value were provided. When the data were not normally distributed, Mann Whitney U test was used, and test statistic values and p values were provided. For all the statistical analyses about steroids in water, degrees of freedom are 31; for all the statistical analyses about steroids in sediment, degrees of freedom are 29. When the data with the value less than MQL, a half of MQL was substituted for the value; for the data of ND (not detected, the value less than MDL), a half of MDL was used to run statistical analyses. [b] The data are normally distributed. Independent-samples t-test was used, and test statistic values (t and df) and p value were provided. [c] The data are not normally distributed. Mann Whitney U test was used, and test statistic value Z and p values were provided. [f] Bold means temporal variation is statistically significant (P<0.05). [d] This kind of class of antibiotics were not detected in surface water or sediment of Lake Taihu.

SAs, sulfonamides; TMP, trimethoprim; TCs, tetracyclines; FQs, fluoroquinolones; MLs, macrolides; IPs, polyether ionophores; LIN, lincomycin; FF, florfenicol.

Table S12 Multiple linear regression analyses for the sediment properties (TOC and texture) and concentrations of antibiotics in the sediments of Lake Taihu

Class	May [a]		November [a]	
	R^2	Significant variable (Standardized Coefficient)	**R^2**	Significant variable (Standardized Coefficient)
SAs+TMP	0.128	TOC(0.358) [b]	--- [c]	---
TCs	0.162	TOC(0.402)	---	---
FQs	0.198	TOC(0.445)	---	---
MLs	---	---	---	---
IPs	---	---	---	---
LIN	---	---	---	---
FF	---	---	---	---

[a] When the data with the value less than MQL, a half of MQL was substituted for the value; for the data of ND (not detected, the value less than MDL), a half of MDL was used to run statistical analyses. [b] TOC: total organic matter, %; Texture: sand, silt and clay, %. [c]--: multiple linear regression equation fitted was found "not significant".

SAs, sulfonamides; TMP, trimethoprim; TCs, tetracyclines; FQs, fluoroquinolones; MLs, macrolides; IPs, polyether ionophores; LIN, lincomycin; FF, florfenicol.

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