

Supplementary Material

Table S1

Population density of the hydrographic sub-basins in the Upper Paraná River, Mato Grosso do Sul, Brazil.

Hydrographic Sub-basin	Municipalities included	Estimated total population	Approximate total area (km ²)	Population Density (inhab./km ²)
Ivinhema River	Angélica, Antônio João, Nova Andradina, Jateí, Maracaju, Novo Horizonte do Sul, Douradina, Dourados, Itaporã, Juti, Ivinhema, Naviraí, Fátima do Sul, Caarapó, Deodápolis, Ponta Porã, Batayporã, Laguna Carapã, Taquarussu, Vicentina, Rio Brilhante, Sidrolândia, Glória de Dourados, Nova Alvorada do Sul	~781,396	~42,961	~18.18
Amambai River	Aral Moreira, Coronel Sapucaia, Itaquiraí, Juti, Naviraí, Caarapó, Laguna Carapã, Ponta Porã, Amambai, Iguatemi, Vicentina	~290,543	~10,291	~2.76
Iguatemi River	Eldorado, Mundo Novo, Japorã, Coronel Sapucaia, Sete Quedas, Paranhos, Tacuru, Amambai, Iguatemi	~140,872	~8,512	~1.95
Maracaí River	Eldorado, Mundo Novo, Naviraí, Itaquiraí, Amambai, Iguatemi	~153,592	~3,374	~4.26

Table S2

Characteristics of landscape formation, land use, occupation, urbanization, and sewage treatment in the study area
(MapBiomass 2022)

Sampling point	Latitude	Longitude	Forest	Forest Plantation	Savannah	Wetland	Pasture	Sugar cane culture	Agricultural mosaic	Urbanized area	Rivers	Monoculture	Sewage treatment (%)
1	-23.082107	-53.786727	0.30	0.000	0.000	0.22	0.20	0.00	0.18	0.000	0.000	0.10	25.10
2	-23.051331	-53.784883	0.37	0.000	0.000	0.21	0.13	0.00	0.12	0.000	0.000	0.16	25.10
3	-23.01542	-53.772446	0.27	0.000	0.000	0.32	0.14	0.00	0.06	0.000	0.004	0.21	25.10
4	-23.337543	-54.217084	0.11	0.000	0.000	0.02	0.15	0.04	0.17	0.000	0.000	0.50	1.80
5	-23.416213	-54.208105	0.14	0.000	0.000	0.06	0.51	0.01	0.19	0.000	0.000	0.10	1.80
6	-23.599709	-54.219437	0.11	0.000	0.000	0.06	0.30	0.27	0.19	0.000	0.005	0.05	10.10
7	-23.469199	-54.126035	0.08	0.000	0.000	0.02	0.44	0.00	0.22	0.000	0.000	0.23	1.80
8	-23.46079	-54.048635	0.04	0.000	0.000	0.01	0.31	0.00	0.18	0.000	0.000	0.46	1.80
9	-23.459987	-54.994865	0.07	0.000	0.011	0.02	0.79	0.00	0.10	0.000	0.000	0.00	23.70
10	-23.641367	-54.071681	0.08	0.000	0.000	0.09	0.45	0.00	0.16	0.000	0.086	0.14	10.10
11	-23.7258	-54.102259	0.18	0.000	0.000	0.10	0.31	0.00	0.10	0.000	0.067	0.23	10.10
12	-23.391617	-54.210796	0.12	0.000	0.000	0.05	0.43	0.10	0.22	0.000	0.000	0.08	1.80
13	-23.443236	-54.202353	0.03	0.000	0.000	0.01	0.55	0.00	0.17	0.031	0.000	0.20	1.80
14	-22.723128	-54.931703	0.10	0.000	0.000	0.03	0.03	0.02	0.10	0.000	0.000	0.73	21.40
15	-22.758331	-54.96179	0.14	0.000	0.000	0.01	0.00	0.08	0.11	0.000	0.000	0.67	21.40
16	-23.261979	-55.421,744	0.08	0.028	0.000	0.00	0.44	0.00	0.30	0.000	0.000	0.15	32.20
17	-22.944093	-55.222732	0.08	0.000	0.000	0.01	0.03	0.00	0.23	0.000	0.006	0.59	23.70
18	-23.510370	-55.007518	0.07	0.000	0.005	0.05	0.75	0.00	0.13	0.000	0.000	0.00	8.10
19	-23.505710	-54.836543	0.10	0.000	0.000	0.02	0.59	0.00	0.18	0.000	0.000	0.09	23.70
20	-23.654080	-54.671727	0.05	0.015	0.000	0.06	0.38	0.00	0.24	0.000	0.005	0.22	8.10
21	-23.73167	-54.57721	0.09	0.000	0.000	0.09	0.30	0.00	0.49	0.005	0.005	0.01	3.80
22	-23.58383	-54.202628	0.13	0.000	0.000	0.04	0.33	0.20	0.25	0.000	0.000	0.06	10.10
23	-23.664965	-54.261292	0.09	0.000	0.000	0.05	0.33	0.17	0.19	0.000	0.000	0.18	10.10
24	-23.761562	-54.107656	0.25	0.000	0.000	0.04	0.27	0.00	0.04	0.000	0.095	0.31	10.10
25	-23.81458	-54.105155	0.30	0.000	0.000	0.20	0.07	0.00	0.03	0.000	0.192	0.21	10.10
26	-23.814932	-54.231784	0.09	0.000	0.000	0.01	0.37	0.00	0.24	0.000	0.000	0.29	10.10
27	-23.713562	-54.270954	0.16	0.000	0.000	0.02	0.25	0.02	0.24	0.000	0.000	0.31	10.10
28	-23.836854	-54.335174	0.04	0.000	0.000	0.14	0.25	0.00	0.25	0.000	0.030	0.29	10.10
29	-24.014721	-54.275361	0.30	0.000	0.000	0.28	0.10	0.00	0.13	0.005	0.040	0.14	1.10

30	-23.963571	-54.355227	0.17	0.000	0.000	0.01	0.30	0.00	0.19	0.000	0.006	0.33	1.10
31	-23.964934	-54.378272	0.30	0.000	0.000	0.02	0.20	0.00	0.19	0.000	0.000	0.29	1.10
32	-23.698,273	-54.344,206	0.42	0.000	0.000	0.02	0.17	0.00	0.11	0.000	0.000	0.29	1.10
33	-23.698279	-54.344168	0.10	0.000	0.000	0.07	0.38	0.00	0.22	0.000	0.000	0.23	10.10
34	-23.133925	-54.197081	0.08	0.000	0.000	0.22	0.05	0.13	0.24	0.000	0.027	0.23	25.10
35	-23.3183	-53.842416	0.07	0.000	0.000	0.61	0.14	0.00	0.11	0.000	0.048	0.02	1.80
36	-22.661848	-53.925838	0.08	0.000	0.000	0.09	0.37	0.11	0.30	0.000	0.000	0.05	6.00
37	-22.38209	-53.532504	0.13	0.000	0.000	0.27	0.29	0.05	0.18	0.000	0.036	0.03	9.70
38	-22.069407	-54.229513	0.08	0.000	0.000	0.11	0.19	0.00	0.24	0.005	0.005	0.36	0.80
39	-22.087011	-54.083984	0.06	0.000	0.000	0.01	0.54	0.18	0.16	0.000	0.000	0.04	0.80
40	-21.797323	-53.986432	0.16	0.006	0.000	0.19	0.04	0.23	0.13	0.000	0.006	0.23	22.80
41	-21.89867	-54.02976	0.12	0.000	0.000	0.11	0.05	0.37	0.21	0.000	0.017	0.12	2.50
42	-21.932783	-54.045328	0.09	0.000	0.000	0.26	0.02	0.39	0.17	0.000	0.018	0.06	2.50
43	-21.91083	-54.534059	0.17	0.000	0.000	0.05	0.16	0.02	0.18	0.000	0.022	0.40	22.80
44	-21.642748	-54.423893	0.19	0.000	0.000	0.03	0.06	0.06	0.17	0.016	0.005	0.45	22.80
45	-21.624503	-54.987857	0.18	0.000	0.000	0.01	0.07	0.00	0.19	0.000	0.000	0.53	34.70
46	-21.810834	-54.939857	0.16	0.000	0.000	0.03	0.15	0.00	0.27	0.000	0.000	0.39	34.70
47	-21.394248	-55.34311	0.09	0.000	0.000	0.01	0.01	0.04	0.12	0.000	0.000	0.70	34.70
48	-21.020866	-54.935771	0.07	0.016	0.000	0.05	0.12	0.00	0.14	0.000	0.000	0.58	19.00
49	-21.219384	-55.005229	0.03	0.022	0.000	0.05	0.12	0.00	0.15	0.000	0.005	0.59	19.00
50	-21.987395	-53.844772	0.12	0.000	0.000	0.05	0.07	0.50	0.25	0.000	0.000	0.02	2.50
51	-22.003232	-54.003592	0.00	0.000	0.000	0.00	0.31	0.31	0.27	0.000	0.000	0.10	2.50
52	-21.970173	-55.37221	0.08	0.010	0.000	0.01	0.11	0.00	0.22	0.000	0.000	0.54	50.70
53	-22.112842	-55.511173	0.08	0.037	0.000	0.00	0.01	0.00	0.19	0.000	0.000	0.66	22.40
54	-22.359233	-54.981509	0.10	0.000	0.000	0.02	0.01	0.12	0.31	0.000	0.023	0.40	50.70
55	-23.893135	-54.998206	0.12	0.000	0.000	0.02	0.28	0.00	0.22	0.000	0.017	0.34	1.90
56	-23.516629	-54.507178	0.07	0.000	0.000	0.00	0.25	0.00	0.42	0.000	0.016	0.24	13.60
57	-23.281108	-54.482588	0.11	0.000	0.000	0.06	0.38	0.00	0.22	0.000	0.000	0.24	13.60
58	-22.970831	-54.564334	0.10	0.000	0.000	0.05	0.29	0.01	0.25	0.000	0.011	0.29	11.20
59	-22.371109	-54.524171	0.04	0.000	0.000	0.03	0.20	0.03	0.22	0.051	0.011	0.41	12.50
60	-22.523947	-55.466666	0.06	0.027	0.000	0.01	0.04	0.00	0.18	0.000	0.000	0.69	22.40
61	-22.559462	-55.490452	0.11	0.010	0.000	0.01	0.02	0.00	0.10	0.000	0.000	0.73	22.40
62	-23.138802	-53.80578	0.08	0.000	0.000	0.34	0.17	0.00	0.25	0.000	0.000	0.15	25.10
63	-23.20817	-53.74233	0.06	0.010	0.000	0.53	0.21	0.00	0.12	0.000	0.069	0.00	25.10
64	-22.113025	-55.511118	0.11	0.016	0.000	0.01	0.01	0.00	0.21	0.000	0.001	0.62	22.40
65	-22.503856	-55.69855	0.11	0.000	0.000	0.01	0.09	0.00	0.18	0.209	0.000	0.40	22.40
66	-22.948692	-54.579561	0.08	0.012	0.000	0.03	0.30	0.03	0.28	0.000	0.015	0.26	11.20
67	-23.061384	-54.731145	0.12	0.000	0.005	0.02	0.45	0.00	0.25	0.000	0.000	0.16	23.70

upper Paraná river basin

68	-23.263801	-54.80138	0.02	0.000	0.015	0.03	0.76	0.00	0.18	0.000	0.000	0.00	23.70
69	-23.320877	-54.756456	0.03	0.000	0.000	0.01	0.78	0.00	0.17	0.000	0.000	0.00	13.60
70	-23.379344	-54.672275	0.05	0.000	0.000	0.01	0.60	0.00	0.33	0.000	0.000	0.00	13.60
71	-24.014676	-54.275412	0.27	0.000	0.000	0.28	0.12	0.00	0.09	0.000	0.089	0.14	1.10
72	-23.836897	-54.335193	0.04	0.000	0.000	0.09	0.22	0.00	0.28	0.000	0.017	0.35	10.10
73	-23.830344	-54.188786	0.13	0.000	0.000	0.05	0.31	0.00	0.26	0.000	0.000	0.23	10.10
74	-23.288094	-54.104398	0.10	0.000	0.000	0.06	0.12	0.02	0.24	0.000	0.000	0.46	1.80
75	-22.101244	-54.933825	0.07	0.011	0.000	0.00	0.09	0.00	0.15	0.000	0.000	0.68	22.60
76	-22.058618	-54.923467	0.17	0.005	0.000	0.04	0.05	0.00	0.11	0.000	0.000	0.64	22.60
77	-21.979835	-54.945756	0.10	0.000	0.000	0.03	0.02	0.00	0.14	0.000	0.005	0.71	22.60
78	-22.080632	-54.809985	0.03	0.000	0.000	0.00	0.10	0.00	0.21	0.054	0.000	0.60	22.60
79	-21.850202	-55.47781	0.08	0.006	0.000	0.02	0.07	0.00	0.18	0.000	0.000	0.63	34.70
80	-22.054523	-55.329578	0.09	0.006	0.011	0.03	0.13	0.00	0.28	0.033	0.006	0.39	50.70
81	-22.371458	-54.524269	0.03	0.005	0.000	0.03	0.19	0.03	0.16	0.132	0.032	0.39	12.50
82	-22.488653	-54.264267	0.02	0.021	0.000	0.01	0.61	0.16	0.15	0.005	0.000	0.03	26.50
83	-22.538883	-54.286935	0.01	0.000	0.000	0.01	0.54	0.26	0.15	0.006	0.000	0.03	26.50
84	-22.180579	-54.125922	0.04	0.006	0.000	0.02	0.64	0.01	0.19	0.000	0.012	0.08	0.80
85	-22.066937	-54.189714	0.02	0.000	0.000	0.05	0.14	0.03	0.35	0.016	0.011	0.39	0.80
86	-22.069284	-54.229917	0.07	0.000	0.000	0.08	0.23	0.00	0.30	0.011	0.011	0.30	0.80
87	-22.029519	-54.085376	0.02	0.000	0.000	0.04	0.22	0.43	0.19	0.000	0.000	0.11	0.80
88	-22.085662	-54.083484	0.04	0.000	0.000	0.03	0.59	0.17	0.13	0.005	0.000	0.02	0.80
89	-22.272655	-54.238395	0.05	0.000	0.000	0.04	0.23	0.00	0.22	0.024	0.005	0.42	0.80
90	-22.260103	-54.161394	0.02	0.000	0.000	0.02	0.48	0.00	0.17	0.040	0.000	0.27	0.80
91	-21.898671	-54.029923	0.12	0.000	0.000	0.14	0.04	0.37	0.20	0.000	0.024	0.10	2.50
92	-21.797315	-53.986405	0.15	0.002	0.000	0.22	0.04	0.25	0.13	0.000	0.009	0.20	22.80
93	-21.640865	-53.956744	0.03	0.000	0.006	0.05	0.30	0.37	0.19	0.000	0.002	0.04	4.80
94	-21.683049	-54.825857	0.06	0.000	0.000	0.01	0.15	0.43	0.19	0.000	0.002	0.11	22.80
95	-21.848153	-54.062093	0.14	0.000	0.000	0.03	0.04	0.51	0.12	0.000	0.000	0.15	22.80
96	-22.323275	-54.344123	0.02	0.001	0.000	0.03	0.18	0.00	0.15	0.008	0.000	0.60	12.50
97	-22.382126	-53.532522	0.11	0.000	0.000	0.25	0.32	0.06	0.19	0.000	0.032	0.03	9.70
98	-22.233562	-53.784377	0.03	0.020	0.000	0.03	0.45	0.01	0.29	0.059	0.000	0.11	9.70
99	-22.258584	-53.811369	0.07	0.020	0.000	0.05	0.43	0.05	0.24	0.044	0.000	0.08	9.70
100	-22.351543	-53.847824	0.10	0.003	0.000	0.05	0.39	0.12	0.26	0.010	0.000	0.07	9.70
101	-22.523034	-53.816112	0.31	0.000	0.000	0.03	0.28	0.23	0.13	0.000	0.000	0.01	9.70
102	-22.43517	-53.919367	0.08	0.001	0.000	0.03	0.32	0.27	0.20	0.000	0.000	0.09	9.70
103	-22.283917	-55.045615	0.11	0.002	0.000	0.03	0.01	0.21	0.23	0.000	0.015	0.37	50.70
104	-22.322883	-55.116292	0.04	0.000	0.000	0.02	0.00	0.52	0.18	0.000	0.005	0.19	22.40
105	-22.415455	-55.214879	0.10	0.005	0.001	0.01	0.03	0.01	0.10	0.000	0.001	0.73	22.40

upper Paraná river basin

106	-22.488901	-55.54953	0.11	0.021	0.000	0.00	0.01	0.00	0.10	0.000	0.000	0.76	22.40
107	-22.559466	-55.490457	0.07	0.009	0.003	0.01	0.04	0.00	0.14	0.000	0.001	0.72	22.40
108	-22.564607	-55.14286	0.05	0.002	0.000	0.00	0.01	0.00	0.10	0.020	0.000	0.81	8.60
109	-22.359086	-54.98195	0.12	0.002	0.000	0.02	0.00	0.12	0.30	0.000	0.028	0.37	50.70
110	-22.259924	-54.877995	0.06	0.006	0.000	0.01	0.03	0.10	0.19	0.066	0.004	0.53	50.70
111	-22.100196	-54.649929	0.03	0.001	0.000	0.01	0.03	0.00	0.17	0.003	0.005	0.75	50.70
112	-21.948236	-54.501392	0.10	0.000	0.000	0.05	0.20	0.01	0.27	0.000	0.000	0.36	1.60
113	-21.910904	-54.533999	0.11	0.000	0.000	0.05	0.14	0.01	0.21	0.000	0.035	0.43	22.80
114	-21.824415	-54.530787	0.07	0.000	0.000	0.00	0.11	0.08	0.15	0.084	0.000	0.50	22.80
115	-21.642666	-54.423785	0.19	0.000	0.000	0.02	0.03	0.07	0.18	0.011	0.006	0.49	22.80
116	-21.566077	-54.485939	0.16	0.000	0.000	0.01	0.04	0.09	0.22	0.000	0.000	0.47	4.80
117	-21.526681	-54.512459	0.05	0.005	0.000	0.02	0.03	0.11	0.25	0.000	0.000	0.53	22.80
118	-21.491935	-54.590019	0.06	0.000	0.000	0.03	0.12	0.22	0.24	0.000	0.000	0.31	4.80
119	-21.274015	-54.786394	0.17	0.010	0.010	0.04	0.19	0.10	0.36	0.000	0.005	0.08	19.00
120	-21.231966	-54.893078	0.06	0.025	0.000	0.00	0.31	0.00	0.47	0.000	0.000	0.10	19.00
121	-21.020911	-54.935818	0.07	0.000	0.000	0.05	0.15	0.00	0.14	0.000	0.000	0.55	19.00
122	-21.055063	-54.93674	0.12	0.000	0.005	0.04	0.07	0.00	0.21	0.000	0.000	0.56	19.00
123	-21.219474	-55.005416	0.06	0.020	0.000	0.03	0.11	0.00	0.18	0.000	0.000	0.59	19.00
124	-21.21944	-54.999669	0.04	0.016	0.000	0.03	0.11	0.00	0.17	0.000	0.000	0.60	19.00
125	-21.313763	-55.006403	0.09	0.000	0.000	0.01	0.05	0.00	0.12	0.000	0.000	0.71	19.00
126	-21.531572	-55.242792	0.11	0.006	0.000	0.01	0.00	0.00	0.06	0.000	0.000	0.81	34.70
127	-21.394292	-55.343035	0.08	0.000	0.000	0.00	0.02	0.02	0.13	0.000	0.000	0.74	34.70
128	-21.642918	-55.123522	0.07	0.000	0.000	0.00	0.03	0.00	0.16	0.077	0.000	0.64	34.70
129	-21.623917	-54.988458	0.12	0.000	0.000	0.03	0.10	0.00	0.19	0.000	0.000	0.55	34.70
130	-21.963612	-54.797977	0.03	0.000	0.000	0.03	0.09	0.00	0.26	0.000	0.040	0.55	22.60
131	-21.922309	-54.867587	0.09	0.000	0.000	0.05	0.05	0.00	0.12	0.000	0.000	0.68	22.60
132	-21.811161	-54.939252	0.11	0.000	0.000	0.07	0.11	0.00	0.19	0.000	0.000	0.51	34.70
133	-21.730924	-55.027306	0.13	0.000	0.000	0.06	0.02	0.00	0.09	0.000	0.005	0.70	34.70
134	-21.968035	-55.172383	0.04	0.201	0.006	0.02	0.08	0.00	0.16	0.000	0.000	0.47	50.70
135	-21.981073	-55.246027	0.04	0.028	0.002	0.02	0.17	0.00	0.22	0.000	0.000	0.50	50.70
136	-21.97013	-55.37222	0.08	0.011	0.000	0.01	0.13	0.00	0.19	0.000	0.000	0.54	50.70
137	-23.318299	-53.842471	0.11	0.000	0.000	0.51	0.18	0.00	0.08	0.000	0.070	0.05	1.80
138	-23.38635	-54.100228	0.22	0.000	0.000	0.09	0.16	0.00	0.23	0.000	0.001	0.29	1.80
139	-23.529154	-54.074477	0.03	0.001	0.000	0.04	0.54	0.00	0.22	0.000	0.000	0.16	1.80
140	-23.459038	-53.995688	0.30	0.000	0.000	0.03	0.22	0.00	0.10	0.000	0.109	0.25	1.80
141	-23.533611	-54.0479	0.10	0.001	0.000	0.06	0.43	0.00	0.21	0.000	0.079	0.13	1.80
142	-23.641356	-54.071399	0.13	0.000	0.000	0.09	0.44	0.00	0.13	0.000	0.098	0.13	10.10
143	-23.680639	-54.101386	0.12	0.002	0.000	0.07	0.31	0.01	0.18	0.000	0.034	0.27	10.10

upper Paraná river basin

144	-23.797952	-54.151858	0.17	0.000	0.000	0.10	0.13	0.00	0.16	0.002	0.001	0.44	10.10
145	-23.725588	-54.102251	0.19	0.000	0.000	0.06	0.29	0.00	0.10	0.000	0.098	0.25	10.10
146	-23.385089	-54.587513	0.12	0.007	0.017	0.04	0.45	0.00	0.31	0.000	0.002	0.05	13.60
147	-23.386736	-54.616959	0.08	0.008	0.020	0.04	0.50	0.00	0.31	0.000	0.003	0.03	13.60
148	-23.821189	-54.106421	0.32	0.000	0.000	0.24	0.07	0.00	0.04	0.004	0.174	0.15	10.10
149	-23.815915	-54.232485	0.11	0.000	0.000	0.01	0.36	0.00	0.20	0.000	0.000	0.32	10.10
150	-23.7131	-54.270452	0.11	0.001	0.000	0.02	0.31	0.02	0.26	0.000	0.000	0.26	10.10
151	-23.664871	-54.261025	0.08	0.000	0.000	0.03	0.33	0.20	0.23	0.000	0.001	0.13	10.10
152	-23.583244	-54.201304	0.14	0.000	0.000	0.04	0.30	0.17	0.29	0.000	0.003	0.06	1.80
153	-23.391622	-54.211031	0.16	0.000	0.000	0.07	0.42	0.06	0.20	0.000	0.001	0.08	1.80
154	-23.338144	-54.217286	0.11	0.000	0.000	0.03	0.15	0.04	0.17	0.000	0.000	0.49	1.80
155	-23.133942	-54.197283	0.10	0.004	0.000	0.20	0.08	0.11	0.22	0.002	0.019	0.26	25.10
156	-22.231854	-54.632991	0.06	0.002	0.000	0.01	0.07	0.01	0.15	0.008	0.004	0.69	50.70
157	-21.987578	-53.844714	0.10	0.000	0.000	0.04	0.09	0.50	0.24	0.000	0.004	0.02	2.50
158	-21.996638	-53.932828	0.01	0.000	0.000	0.03	0.17	0.33	0.23	0.000	0.000	0.23	2.50
159	-22.003277	-54.003895	0.00	0.000	0.000	0.02	0.33	0.30	0.26	0.000	0.000	0.08	2.50
160	-21.933174	-54.044828	0.13	0.000	0.000	0.19	0.02	0.40	0.17	0.000	0.022	0.07	2.50
161	-21.81316	-53.433522	0.01	0.000	0.119	0.05	0.72	0.03	0.08	0.000	0.000	0.00	12.70
162	-21.879248	-53.480413	0.00	0.037	0.068	0.02	0.61	0.11	0.13	0.000	0.000	0.01	12.70
163	-22.007098	-53.552519	0.10	0.001	0.064	0.03	0.58	0.07	0.16	0.000	0.000	0.00	12.70
164	-22.519155	-54.035975	0.08	0.006	0.000	0.05	0.20	0.28	0.31	0.000	0.003	0.07	9.70
165	-22.690597	-53.859032	0.12	0.002	0.000	0.10	0.41	0.00	0.18	0.014	0.001	0.18	6.00
166	-22.775262	-54.052525	0.08	0.000	0.000	0.04	0.18	0.11	0.32	0.000	0.000	0.27	25.10
167	-22.872751	-54.076602	0.01	0.000	0.000	0.03	0.04	0.00	0.06	0.000	0.000	0.86	25.10
168	-22.946334	-54.11176	0.03	0.000	0.000	0.05	0.26	0.03	0.26	0.000	0.001	0.38	25.10
169	-22.723121	-54.931853	0.10	0.000	0.000	0.03	0.03	0.02	0.10	0.000	0.001	0.72	21.40
170	-22.758289	-54.961565	0.17	0.001	0.000	0.01	0.02	0.06	0.10	0.000	0.001	0.64	21.40
171	-22.92168	-55.044881	0.22	0.008	0.000	0.04	0.01	0.00	0.06	0.000	0.011	0.65	23.70
172	-22.944197	-55.222839	0.08	0.000	0.002	0.03	0.03	0.00	0.17	0.000	0.004	0.65	23.70
173	-22.936467	-55.601035	0.11	0.005	0.000	0.00	0.05	0.00	0.16	0.022	0.000	0.65	2.80
174	-23.025192	-55.413357	0.21	0.000	0.000	0.00	0.01	0.00	0.07	0.000	0.005	0.71	2.80
175	-23.029907	-55.411865	0.16	0.000	0.000	0.00	0.04	0.00	0.09	0.000	0.003	0.71	2.80
176	-22.912363	-55.397722	0.19	0.006	0.000	0.00	0.04	0.00	0.12	0.000	0.000	0.64	2.80
177	-23.130858	-55.221102	0.05	0.005	0.004	0.02	0.30	0.00	0.25	0.121	0.000	0.24	23.70
178	-23.261996	-55.421692	0.10	0.026	0.000	0.00	0.36	0.00	0.28	0.000	0.000	0.23	32.20
179	-23.227676	-55.335493	0.07	0.000	0.000	0.00	0.11	0.00	0.21	0.000	0.000	0.61	23.70
180	-23.520972	-55.124785	0.08	0.043	0.006	0.02	0.65	0.00	0.12	0.000	0.000	0.07	8.10
181	-23.58114	-55.16717	0.09	0.001	0.000	0.02	0.67	0.00	0.13	0.000	0.002	0.09	8.10

Spatial and seasonal variation in pollution from pharmaceuticals and personal care products and the ecological risks in the
upper Paraná river basin

182	-23.791837	-55,285,898	0.03	0.000	0.000	0.07	0.40	0.00	0.24	0.000	0.007	0.20	1.40
183	-23.66423	-55.212321	0.05	0.000	0.000	0.02	0.50	0.00	0.34	0.000	0.010	0.06	8.10
184	-23.645179	-55.201295	0.06	0.000	0.000	0.04	0.63	0.00	0.26	0.000	0.006	0.01	8.10
185	-23.644177	-55.032771	0.04	0.000	0.000	0.01	0.69	0.00	0.09	0.021	0.003	0.14	8.10
186	-23.68288	-55.044277	0.13	0.010	0.000	0.02	0.65	0.00	0.13	0.000	0.004	0.05	8.10
187	-23.893117	-54.998112	0.14	0.003	0.000	0.02	0.30	0.00	0.20	0.000	0.011	0.32	1.90
188	-23.654091	-54.671438	0.04	0.006	0.000	0.09	0.40	0.00	0.27	0.000	0.014	0.18	8.10
189	-22.435785	-54.674037	0.14	0.001	0.000	0.05	0.10	0.11	0.18	0.000	0.014	0.42	21.40
190	-22.035614	-55.794891	0.07	0.032	0.000	0.04	0.04	0.00	0.15	0.000	0.000	0.66	22.40
191	-22.211371	-55.917234	0.07	0.002	0.001	0.00	0.11	0.00	0.16	0.031	0.000	0.62	2.20
192	-22.309757	-55.756745	0.12	0.003	0.000	0.00	0.26	0.00	0.20	0.000	0.000	0.42	22.40
193	-22.827023	-55.244243	0.09	0.009	0.000	0.01	0.01	0.00	0.15	0.000	0.001	0.72	8.60
194	-23.510443	-55.007385	0.06	0.000	0.001	0.02	0.79	0.00	0.12	0.000	0.002	0.00	8.10
195	-23.412263	-54.939891	0.13	0.001	0.005	0.01	0.66	0.00	0.18	0.000	0.004	0.00	23.70
196	-23.450697	-54.888623	0.12	0.001	0.003	0.02	0.70	0.00	0.14	0.000	0.005	0.01	23.70
197	-23.505653	-54.836941	0.12	0.000	0.003	0.03	0.58	0.00	0.17	0.000	0.009	0.08	23.70
198	-23.567031	-54.741343	0.05	0.000	0.007	0.04	0.51	0.00	0.36	0.000	0.012	0.00	13.60
199	-23.592149	-54.697919	0.05	0.001	0.008	0.05	0.55	0.00	0.28	0.000	0.012	0.03	13.60
200	-23.731698	-54.577286	0.09	0.000	0.004	0.09	0.36	0.00	0.39	0.013	0.014	0.02	3.80
201	-23.731698	-54.577286	0.09	0.000	0.004	0.09	0.36	0.00	0.39	0.013	0.014	0.02	3.80
202	-23.515585	-54.507582	0.07	0.000	0.003	0.01	0.30	0.00	0.39	0.000	0.002	0.22	13.60
203	-23.45411	-54.523147	0.25	0.003	0.004	0.01	0.40	0.00	0.25	0.000	0.001	0.08	13.60
204	-23.383493	-54.52199	0.17	0.000	0.000	0.03	0.55	0.00	0.18	0.000	0.001	0.06	13.60
205	-23.281031	-54.482581	0.11	0.000	0.000	0.03	0.46	0.00	0.17	0.000	0.000	0.22	13.60
206	-23.070527	-54.488301	0.13	0.000	0.000	0.06	0.49	0.00	0.15	0.000	0.019	0.16	23.70
207	-22.970874	-54.564388	0.11	0.000	0.000	0.04	0.31	0.01	0.23	0.000	0.018	0.28	11.20
208	-22.827021	-55.794891	0.12	0.000	0.003	0.03	0.58	0.00	0.17	0.000	0.009	0.08	23.70

Table S3
Physical and chemical parameters of water samples at sampling points.

Sampling point	Date	Latitude	Longitude	Season	pH	Conductivity (µS/cm)	Temperature (°C)	Turbidity (NTU)	Dissolved oxygen (mg/L)
1	01/06/23	-23.082107	-53.786727	dry	4.8	28	20.51	1	6.03
2	01/06/23	-23.051331	-53.784883	dry	2.97	13	21.45	0.04	4.99

3	01/06/23	-23.01542	-53.772446	dry	2.42	17	22.1	1	1.86
4	02/06/23	-23.337543	-54.217084	dry	2.29	12	21.05	9.6	7.19
5	02/06/23	-23.416213	-54.208105	dry	2.14	9	21.38	1	4.69
6	02/06/23	-23.599709	-54.219437	dry	2.2	7.0	22.42	1.2	6.02
7	02/06/23	-23.469199	-54.126035	dry	2.35	9	21.74	0.9	3.4
8	02/06/23	-23.46079	-54.048635	dry	2.8	8	23.33	1	6.47
9	14/06/23	-23.459987	-54.994865	dry	0	13	17.9	0	6.96
10	14/06/23	-23.641367	-54.071681	dry	3.67	12	15.76	0.9	6.36
11	15/06/23	-23.7258	-54.102259	dry	2.09	13	17.37	19.8	7.18
12	15/06/23	-23.391617	-54.210796	dry	2.82	11	14.82	0	6.29
13	15/06/23	-23.443236	-54.202353	dry	1.06	8	16.84	1	4.49
14	04/07/23	-22.723128	-54.931703	dry	6.23	55	18.12	0	8.2
15	04/07/23	-22.758331	-54.96179	dry	6.78	45	16.76	1.3	9
16	04/07/23	-23.261979	-55.421,744	dry	6.94	71	19.56	0	6.5
17	04/07/23	-22.944093	-55.222732	dry	6.4	31	18.31	0	8
18	05/07/23	-23.510370	-55.007518	dry	7.19	22	21.27	0	9.4
19	06/07/23	-23.505710	-54.836543	dry	N.A.	N.A.	N.A.	N.A.	N.A.
20	06/07/23	-23.654080	-54.671727	dry	N.A.	N.A.	N.A.	N.A.	N.A.
21	06/07/23	-23.73167	-54.57721	dry	6.7	16	20	0	8.2
22	18/07/23	-23.58383	-54.202628	dry	5.81	14	20.12	0.8	6.6
23	18/07/23	-23.664965	-54.261292	dry	6.68	8	20.19	0	7.21
24	18/07/23	-23.761562	-54.107656	dry	5.34	16	19.42	0.1	6.29
25	18/07/23	-23.81458	-54.105155	dry	6.28	15	17.6	5.6	5.67
26	19/07/23	-23.814932	-54.231784	dry	5.59	15	19.62	0.2	4.08
27	19/07/23	-23.713562	-54.270954	dry	7.98	18	20.65	5	7.55
28	19/07/23	-23.836854	-54.335174	dry	5.7	22	19.03	34	7.96
29	19/07/23	-24.014721	-54.275361	dry	4.03	29	18.19	2	6.23
30	20/07/23	-23.963571	-54.355227	dry	5.61	21	19.43	5.5	5.6
31	20/07/23	-23.964934	-54.378272	dry	4.8	16	19.78	8.1	7.79
32	20/07/23	-23.698,273	-54,344,206	dry	4.55	17	20.54	12.1	5.61
33	20/07/23	-23.698279	-54.344168	dry	6.41	11	22.19	0.5	6.09
34	25/07/23	-23.133925	-54.197081	dry	5.51	33	22.16	13.4	7.58
35	25/07/23	-23.3183	-53.842416	dry	6.22	33	22.21	11.3	7.18
36	26/07/23	-22.661848	-53.925838	dry	7.4	20	22.24	33.3	7.56
37	26/07/23	-22.38209	-53.532504	dry	5.99	48	22.95	10	7.16
38	27/07/23	-22.069407	-54.229513	dry	7.17	48	21.74	14.9	6.07
39	27/07/23	-22.087011	-54.083984	dry	5.88	15	23.38	5.1	6.95
40	27/07/23	-21.797323	-53.986432	dry	5.46	65	22.72	19	5.65

41	27/07/23	-21.89867	-54.02976	dry	5.51	50	22.81	32.4	6.46
42	27/07/23	-21.932783	-54.045328	dry	6.24	36	21.8	10	7.12
43	02/08/23	-21.91083	-54.534059	dry	8.22	47	8.28	15.3	7.56
44	02/08/23	-21.642748	-54.423893	dry	7.21	67	21.03	10	8.58
45	02/08/23	-21.624503	-54.987857	dry	7.33	51	20.5	22.9	8.21
46	02/08/23	-21.810834	-54.939857	dry	5.49	36	22.02	15	6.96
47	03/08/23	-21.394248	-55.34311	dry	6.6	52	18.44	17	9.83
48	03/08/23	-21.020866	-54.935771	dry	4.87	205	21.24	32.2	4.08
49	03/08/23	-21.219384	-55.005229	dry	4.95	61	20.55	10	9.29
50	04/08/23	-21.987395	-53.844772	dry	4.09	25	19.15	10	6.96
51	04/08/23	-22.003232	-54.003592	dry	5.81	22	21.59	10.1	7.51
52	09/08/23	-21.970173	-55.37221	dry	5.74	42	19.88	15.5	8.16
53	09/08/23	-22.112842	-55.511173	dry	4.88	35	20.7	10.1	8.07
54	09/08/23	-22.359233	-54.981509	dry	6.38	42	22.37	10	8.04
55	10/08/23	-23.893135	-54.998206	dry	6.54	29	21.31	44.9	7.54
56	10/08/23	-23.516629	-54.507178	dry	6.4	17	22.76	10.2	7.58
57	10/08/23	-23.281108	-54.482588	dry	5.94	9	23.66	5.3	6.95
58	10/08/23	-22.970831	-54.564334	dry	5.6	33	22.99	20.5	7.9
59	11/08/23	-22.371109	-54.524171	dry	5.95	4.7	21.71	12.9	8.93
60	16/08/23	-22.523947	-55.466666	dry	7.5	25	19.82	0.01	8.44
61	16/08/23	-22.559462	-55.490452	dry	N.A.	N.A.	N.A.	N.A.	N.A.
62	30/10/23	-23.138802	-53.80578	rainy	6.95	31	26.08	27.3	8.03
63	30/10/23	-23.20817	-53.74233	rainy	6.4	41.4	27.2	30.3	6.1
64	10/11/23	-22.113025	-55.511118	rainy	6.36	38	27.4	5.6	8.19
65	10/11/23	-22.503856	-55.69855	rainy	9.16	279	28.97	11.9	5.35
66	16/11/23	-22.948692	-54.579561	rainy	N.A.	N.A.	N.A.	N.A.	N.A.
67	16/11/23	-23.061384	-54.731145	rainy	N.A.	N.A.	N.A.	N.A.	N.A.
68	16/11/23	-23.263801	-54.80138	rainy	7.83	14	27.5	9.8	4.35
69	16/11/23	-23.320877	-54.756456	rainy	6.3	11	24.9	10.4	5.4
70	16/11/23	-23.379344	-54.672275	rainy	6.04	9	26.01	11	5.94
71	17/11/23	-24.014676	-54.275412	rainy	N.A.	N.A.	N.A.	N.A.	N.A.
72	17/11/23	-23.836897	-54.335193	rainy	N.A.	N.A.	N.A.	N.A.	N.A.
73	17/11/23	-23.830344	-54.188786	rainy	6.39	17	26.8	6.9	5.28
74	17/11/23	-23.288094	-54.104398	rainy	6.2	14	25.1	2	6.17
75	04/12/23	-22.101244	-54.933825	rainy	8.32	143	26	7.2	5.34
76	04/12/23	-22.058618	-54.923467	rainy	8.54	126		22.8	4.53
77	04/12/23	-21.979835	-54.945756	rainy	8.17	89	26.2	31.1	5
78	04/12/23	-22.080632	-54.809985	rainy	5.53	136	27.22	6.4	4.49

79	05/12/23	-21.850202	-55.47781	rainy	9.54	36	24.3	163	4.5
80	05/12/23	-22.054523	-55.329578	rainy	4.25	54	24.82	32.1	5.34
81	05/12/23	-22.371458	-54.524269	rainy	6.54	50	27.4	50.2	5.85
82	05/12/23	-22.488653	-54.264267	rainy	5.31	66	25.69	22.1	6.27
83	07/12/23	-22.538883	-54.286935	rainy	5.54	18	25.91	3.4	6.39
84	07/12/23	-22.180579	-54.125922	rainy	N.A.	N.A.	N.A.	N.A.	N.A.
85	07/12/23	-22.066937	-54.189714	rainy	4.83	39	27.6	15.4	5.71
86	07/12/23	-22.069284	-54.229917	rainy	5.49	51	28.9	63.6	5.81
87	08/12/23	-22.029519	-54.085376	rainy	5.12	21	26.32	7.6	6.37
88	08/12/23	-22.085662	-54.083484	rainy	N.A.	N.A.	N.A.	N.A.	N.A.
89	08/12/23	-22.272655	-54.238395	rainy	N.A.	N.A.	N.A.	N.A.	N.A.
90	08/12/23	-22.260103	-54.161394	rainy	3.96	18	24.3	2.3	7.56
91	12/12/23	-21.898671	-54.029923	rainy	4.15	52	27.5	6.7	5.69
92	12/12/23	-21.797315	-53.986405	rainy	5.04	53	26.26	61.6	4.72
93	12/12/23	-21.640865	-53.956744	rainy	4.79	16	26.41	36.1	6.48
94	12/12/23	-21.683049	-54.825857	rainy	4.76	27	25.86	0.01	5.83
95	12/12/23	-21.848153	-54.062093	rainy	4.68	159	25.04	15.1	4.78
96	12/12/23	-22.323275	-54.344123	rainy	6.26	57	26.77	43.6	5.23
97	13/12/23	-22.382126	-53.532522	rainy	5.95	49	28.15	15.1	5.28
98	13/12/23	-22.233562	-53.784377	rainy	5.74	20	26.93	5.9	5.67
99	13/12/23	-22.258584	-53.811369	rainy	5.23	28	30.32	162	5.82
100	13/12/23	-22.351543	-53.847824	rainy	5.36	19	27.83	20.1	5.94
101	13/12/23	-22.523034	-53.816112	rainy	5.46	16	28.14	23.3	5.47
102	13/12/23	-22.43517	-53.919367	rainy	5.06	16	27.98	11.2	5.92
103	14/12/23	-22.283917	-55.045615	rainy	5.68	45	26.08	13.1	5.92
104	14/12/23	-22.322883	-55.116292	rainy	5.86	35	25.21	6.4	4.08
105	14/12/23	-22.415455	-55.214879	rainy	6.64	33	25.12	8	6.69
106	14/12/23	-22.488901	-55.54953	rainy	6.09	73	27.28	25.6	5.22
107	14/12/23	-22.559466	-55.490457	rainy	5.87	47	29.9	5	6.04
108	14/12/23	-22.564607	-55.14286	rainy	5.94	32	25.36	16.7	5.85
109	14/12/23	-22.359086	-54.98195	rainy	6.31	42	28.96	36.3	5.55
110	14/12/23	-22.259924	-54.877995	rainy	6.51	60	26.8	41.8	6.07
111	16/01/24	-22.100196	-54.649929	rainy	6.89	143	25.98	47.8	5.28
112	16/01/24	-21.948236	-54.501392	rainy	7.27	93	26.49	68.3	5.57
113	16/01/24	-21.910904	-54.533999	rainy	7.2	49	28.92	54.9	5.48
114	16/01/24	-21.824415	-54.530787	rainy	5.96	82	27.25	45.3	4.8
115	16/01/24	-21.642666	-54.423785	rainy	6.8	55	27.83	51.5	6.22
116	16/01/24	-21.566077	-54.485939	rainy	6.01	31	26.52	20.8	6.49

117	16/01/24	-21.526681	-54.512459	rainy	6.65	82	28.6	51.6	5.92
118	16/01/24	-21.491935	-54.590019	rainy	6.32	57	26.46	73.3	5.22
119	16/01/24	-21.274015	-54.786394	rainy	5.6	29	26.27	5.6	5.31
120	16/01/24	-21.231966	-54.893078	rainy	4.78	19	26.17	15.8	5.98
121	17/01/24	-21.020911	-54.935818	rainy	5.65	223	25.93	37.7	3.99
122	17/01/24	-21.055063	-54.93674	rainy	5.17	26	25.88	50.7	4.78
123	17/01/24	-21.219474	-55.005416	rainy	5.47	53	25.79	21	4.8
124	17/01/24	-21.21944	-54.999669	rainy	5.09	19	26.08	12.5	5.64
125	17/01/24	-21.313763	-55.006403	rainy	N.A.	N.A.	N.A.	N.A.	N.A.
126	17/01/24	-21.531572	-55.242792	rainy	N.A.	N.A.	N.A.	N.A.	N.A.
127	17/01/24	-21.394292	-55.343035	rainy	6.3	57	27.31	8.3	5.48
128	17/01/24	-21.642918	-55.123522	rainy	5.66	51	27.51	14.2	4.74
129	17/01/24	-21.623917	-54.988458	rainy	5.96	54	28.93	60	4.97
130	18/01/24	-21.963612	-54.797977	rainy	6.13	84	27.22	149	4.91
131	18/01/24	-21.922309	-54.867587	rainy	6.52	69	26.38	25.8	5.15
132	18/01/24	-21.811161	-54.939252	rainy	6.48	40	27.91	36.4	4.34
133	18/01/24	-21.730924	-55.027306	rainy	6.14	46	26.95	108	5.68
134	18/01/24	-21.968035	-55.172383	rainy	6.07	28	26.32	24.3	5.24
135	18/01/24	-21.981073	-55.246027	rainy	6.06	35	25.54	15.1	5.38
136	18/01/24	-21.97013	-55.37222	rainy	6.68	45	25.89	3.2	5.37
137	22/01/24	-23.318299	-53.842471	rainy	7.76	28	27.59	95.6	5.21
138	23/01/24	-23.38635	-54.100228	rainy	6.01	14	25.32	36	4.89
139	23/01/24	-23.529154	-54.074477	rainy	5.72	42	24.01	15.5	5.89
140	23/01/24	-23.459038	-53.995688	rainy	7.84	12	24.13	7.1	5.74
141	23/01/24	-23.533611	-54.0479	rainy	5.58	7	24.5	0	3.62
142	23/01/24	-23.641356	-54.071399	rainy	6.5	16	24.5	14.5	4.84
143	23/01/24	-23.680639	-54.101386	rainy	6.56	12	23.96	6.7	5.14
144	23/01/24	-23.797952	-54.151858	rainy	6.14	15	23.97	13.3	3.06
145	24/01/24	-23.725588	-54.102251	rainy	N.A.	N.A.	N.A.	N.A.	N.A.
146	24/01/24	-23.385089	-54.587513	rainy	5.24	7	25.63	0.001	4.87
147	24/01/24	-23.386736	-54.616959	rainy	5.57	12	25.6	17.5	5.71
148	24/01/24	-23.821189	-54.106421	rainy	5.24	14	25.98	6.4	2.62
149	24/01/24	-23.815915	-54.232485	rainy	N.A.	N.A.	N.A.	N.A.	N.A.
150	25/01/24	-23.7131	-54.270452	rainy	N.A.	N.A.	N.A.	N.A.	N.A.
151	25/01/24	-23.664871	-54.261025	rainy	N.A.	N.A.	N.A.	N.A.	N.A.
152	25/01/24	-23.583244	-54.201304	rainy	N.A.	N.A.	N.A.	N.A.	N.A.
153	25/01/24	-23.391622	-54.211031	rainy	6.92	13	24.69	28.2	5.25
154	25/01/24	-23.338144	-54.217286	rainy	N.A.	N.A.	N.A.	N.A.	N.A.

155	25/01/24	-23.133942	-54.197283	rainy	7.10	32	25.09	91.9	4.83
156	25/01/24	-22.231854	-54.632991	rainy	7.91	110	23.16	16	5.34
157	29/01/24	-21.987578	-53.844714	rainy	7.11	23	24.04	19.1	5.8
158	29/01/24	-21.996638	-53.932828	rainy	6.51	19	23.85	11	5.38
159	29/01/24	-22.003277	-54.003895	rainy	6.46	21	25.46	16	4.95
160	29/01/24	-21.933174	-54.044828	rainy	6.19	34	25.73	9.3	4.42
161	29/01/24	-21.81316	-53.433522	rainy	6.53	34	26.15	12	5.15
162	29/01/24	-21.879248	-53.480413	rainy	6.03	26	26.8	11.6	5.17
163	29/01/24	-22.007098	-53.552519	rainy	6.34	27	26.8	32.9	4.95
164	29/01/24	-22.519155	-54.035975	rainy	6.39	23	25.93	21.3	5.58
165	30/01/24	-22.690597	-53.859032	rainy	6.13	22.2	25.48	16.5	5.01
166	30/01/24	-22.775262	-54.052525	rainy	6.47	13	24.7	13.3	5.44
167	30/01/24	-22.872751	-54.076602	rainy	5.91	12	25.52	15.4	4.5
168	30/01/24	-22.946334	-54.11176	rainy	6.13	NA	26.61	12.5	4.29
169	06/02/24	-22.723121	-54.931853	rainy	8.15	56	26.9	9.4	6.47
170	06/02/24	-22.758289	-54.961565	rainy	7.97	50	28.02	15.1	5.54
171	06/02/24	-22.92168	-55.044881	rainy	7.64	38	29.15	32.2	6.33
172	06/02/24	-22.944197	-55.222839	rainy	6.98	33	29.05	10.1	5.31
173	07/02/24	-22.936467	-55.601035	rainy	7.2	44	22.9	1.3	5.85
174	07/02/24	-23.025192	-55.413357	rainy	7.36	33	25.27	1.5	5.43
175	07/02/24	-23.029907	-55.411865	rainy	7.36	35	26.88	3	5.83
176	07/02/24	-22.912363	-55.397722	rainy	N.A.	N.A.	N.A.	N.A.	N.A.
177	07/02/24	-23.130858	-55.221102	rainy	7.13	NA	28.7	154	5.8
178	07/02/24	-23.261996	-55.421692	rainy	7.42	67	25.68	7	5.79
179	07/02/24	-23.227676	-55.335493	rainy	6.84	31	24.17	36.8	5.19
180	07/02/24	-23.520972	-55.124785	rainy	6.82	16	27.63	7.5	5.27
181	07/02/24	-23.58114	-55.16717	rainy	6.62	10	26.1	2.5	5.57
182	08/02/24	-23.791837	-55.285,898	rainy	6.53	19	26.5	12.3	5.29
183	08/02/24	-23.66423	-55.212321	rainy	6.08	8	25.46	43	5.68
184	08/02/24	-23.645179	-55.201295	rainy	NA	NA	NA	NA	NA
185	08/02/24	-23.644177	-55.032771	rainy	NA	NA	NA	NA	NA
186	08/02/24	-23.68288	-55.044277	rainy	6.35	17	27.17	10.9	5.32
187	08/02/24	-23.893117	-54.998112	rainy	6.53	22	28.01	31.7	5.79
188	08/02/24	-23.654091	-54.671438	rainy	5.74	17	28.73	14.9	3.81
189	14/02/24	-22.435785	-54.674037	rainy	5.8	75	25.82	7.8	4.67
190	14/02/24	-22.035614	-55.794891	rainy	6.83	26	24.3	7.2	5.34
191	14/02/24	-22.211371	-55.917234	rainy	6.42	47	24.3	0.9	4.24
192	14/02/24	-22.309757	-55.756745	rainy	7.05	31	23.8	0.8	5.39

Spatial and seasonal variation in pollution from pharmaceuticals and personal care products and the ecological risks in the upper Paraná river basin

193	14/02/24	-22.827023	-55.244243	rainy	7.21	48	27.51	10.7	5.11
194	14/02/24	-23.510443	-55.007385	rainy	6.35	22	29.04	5.8	5.07
195	14/02/24	-23.412263	-54.939891	rainy	6.01	13	25.58	6.1	5.46
196	14/02/24	-23.450697	-54.888623	rainy	5.79	17	25.64	11	5.43
197	14/02/24	-23.505653	-54.836941	rainy	6.26	14	28.48	2.5	4.78
198	14/02/24	-23.567031	-54.741343	rainy	6.16	18	27.04	8.4	5.94
199	14/02/24	-23.592149	-54.697919	rainy	5.97	16	27.29	7.5	5.23
200	15/02/24	-23.731698	-54.577286	rainy	6.16	18	27.04	8.4	5.94
201	15/02/24	-23.731698	-54.577286	rainy	5.97	16	27.29	7.5	5.23
202	15/02/24	-23.515585	-54.507582	rainy	6.87	19	28.12	20.1	4.98
203	15/02/24	-23.45411	-54.523147	rainy	6.87	19	28.12	20.1	4.98
204	15/02/24	-23.383493	-54.52199	rainy	5.94	15	23.97	28.8	5.61
205	15/02/24	-23.281031	-54.482581	rainy	6.08	19	24.84	24.5	5.26
206	15/02/24	-23.070527	-54.488301	rainy	6.32	12	25.68	13.3	4.77
207	15/02/24	-22.970874	-54.564388	rainy	5.84	14	26.25	48	5.58
208	15/02/24	-23.070527	-54.488301	rainy	6.73	34	28.18	22.2	5.4

N.A. = Sample does not analyze

Table S4

Basic information and physicochemical properties for target pharmaceutical compounds.

Compounds	Molecular formula	Molecular weight	CAS	pK _a	Water solubility at 25 °C (mg L ⁻¹)	logK _{ow}	Purity	Supplier
Caffeine	C ₈ H ₁₀ N ₄ O ₂	194.19	58-08-2	14.0 ^a ; 10.0 ^a ; 0.7 ^a	21,600 ^a	- 0.07	98%	Sigma-Aldrich
Naproxen	C ₁₄ H ₁₄ O ₃	230.263	22204-53-1	4.15 ^a	15.9 ^a	3.18 ^a	97%	Sigma-Aldrich

Diclofenac	C ₁₄ H ₁₁ Cl ₂ NO ₂	296.147	15307-86-5	4.15 ^a	2.37 ^a	4.51 ^a	97%	Sigma-Aldrich
Ibuprofen	C ₁₃ H ₁₈ O ₂	206.285	15687-27-1	4.91 ^a	21 ^a	3.97 ^a	97%	Sigma-Aldrich
Piroxicam	C₁₅H₁₃N₃O₄S	331.3	36322-90-4	6.3 ^a	23 ^a	2.58 ^b	97%	Sigma-Aldrich

^aData from PubChem (<https://pubchem.ncbi.nlm.nih.gov/>); ^bData from Chemspider (<http://www.chemspider.com/>).

Table S5

Regression equation, correlation coefficient, limit of detection (LOD), limit of quantification (LOQ) and recoveries for the target compounds.

Compounds	Regression equation ^a	r ²	LOD (µg/L)	LOQ (µg/L)	Recoveries (%)
Caffeine	y= 67514x + 0.0375	0.997	0.003	0.005	90
Naproxen	y= 90458x + 0.0018	0.989	0.004	0.008	90
Diclofenac	y= 170474x + 0.0157	0.994	0.003	0.005	85
Ibuprofen	y= 11667x + 0.0019	0.995	0.003	0.007	70
Piroxicam	y= 153559x + 0.0177	0.998	0.004	0.008	75

^a The linear range was from 0.001 to 5.0 µg/L for all target compound

Table S6

Different trophic levels, evaluated effects, toxicological values, assessment factors and predicted no effect concentrations (PNEC) for the studied pharmaceuticals

Compound	Trophic level	Test species	Toxicity endpoint (Type)	Effect concentration (NOEC/LOEC/EC50) (µg/L)	Assessment factor (AF)	Estimated PNEC (µg/L)	Reference
Caffeine	Microcrustaceans	<i>Daphnia magna</i>	NOEC (chronic)	1200	100	12	Dafouz (2018)
	Fish	<i>Salmo salar</i>	NOEC (chronic)	300	100	3.0	Lower (2008)
	Algae	<i>Pseudokirchneriella subcapitata</i>	NOEC (chronic)	520	100	5.2	Komori et al (2013)
Naproxen	Microcrustaceans	<i>Moina macrocopa</i>	NOEC (chronic)	300	100	3	Kwak et al. (2018)
	Fish	<i>Oryzias latipes</i>	NOEC (chronic)	500	100	5	Kwak et al. (2018)
	Algae	<i>Scenedesmus subspicatus</i>	EC50 (acute)	72,000	1000	72	Cleuvers (2004)
Diclofenac	Microcrustaceans	<i>Daphnia magna</i>	EC50 (acute)	22,430	1000	22	Ferrari et al. (2004)
	Fish	<i>Oncorhynchus mykiss</i>	NOEC (chronic)	50	100	0.5	Fent et al. (2006)
	Algae	<i>Desmodesmus subspicatus</i>	EC50 (acute)	100,000	1000	100	Sanderson et al. (2003)
Ibuprofen	Microcrustaceans	<i>Daphnia magna</i>	NOEC (chronic)	1,230	100	12.3	Han et al. (2010)
	Fish	<i>Oryzias latipes</i>	NOEC (chronic)	100	100	1.0	Han et al. (2010)
	Algae	<i>Skeletonema costatum</i>	EC50 (acute)	7,1000	1000	7.1	Webb (2001)

Table S7

Measurement of environmental concentration (MEC) of pharmaceutical compounds at collection points and calculation of risk quotient (RQ) values at three trophic levels (microcrustaceans, fish, and algae).

Sampling point	Season	MEC	RQ Caffeine		
			Fish (PNEC = 3 µg/L)	Microcrustaceans (PNEC = 12 µg/L)	Algae (PNEC = 5.2 µg/L)
1	dry	< LOD	-	-	-
2	dry	27.557	9.186	2.296	5.299
3	dry	37.071	12.357	3.089	7.129
4	dry	1.939	0.646	0.162	0.373
5	dry	N;A.	-	-	-
6	dry	< LOD	-	-	-
7	dry	< LOD	-	0.000	-
8	dry	19.488	6.496	1.624	3.748
9	dry	< LOD	-	-	-
10	dry	7.245	2.415	0.604	1.393
11	dry	20.338	6.779	1.695	3.911
12	dry	21.307	7.102	1.776	4.098
13	dry	< LOD	-	-	-
14	dry	< LOD	-	-	-
15	dry	< LOD	-	-	-
16	dry	29.400	9.800	2.450	5.654
17	dry	28.900	9.633	2.408	5.558
18	dry	25.200	8.400	2.100	4.846
19	dry	< LOD	-	-	-
20	dry	< LOD	-	-	-
21	dry	26.800	8.933	2.233	5.154
22	dry	< LOD	-	-	-
23	dry	5.766	1.922	0.480	1.109
24	dry	< LOD	-	-	-
25	dry	N;A.	-	-	-
26	dry	N;A.	-	-	-
27	dry	N;A.	-	-	-
28	dry	N;A.	-	-	-
29	dry	N;A.	-	-	-
30	dry	N;A.	-	-	-
31	dry	N;A.	-	-	-
32	dry	N;A.	-	-	-
33	dry	N;A.	-	-	-
34	dry	30.400	10.133	2.533	5.846
35	dry	< LOD	-	-	-
36	dry	33.600	11.200	2.800	6.462
37	dry	32.700	10.900	2.725	6.288
38	dry	39.400	13.133	3.283	7.577
39	dry	N.A.	-	-	-
40	dry	< LOD	-	-	-
41	dry	< LOD	-	-	-
42	dry	33.400	11.133	2.783	6.423
43	dry	33.100	11.033	2.758	6.365
44	dry	< LOD	-	-	-
45	dry	34.100	11.367	2.842	6.558
46	dry	< LOD	-	-	-

Spatial and seasonal variation in pollution from pharmaceuticals and personal care products and the ecological risks in the
upper Paraná river basin

47	dry	< LOD	-	-	-
48	dry	28.900	9.633	2.408	5.558
49	dry	33.800	11.267	2.817	6.500
50	dry	N.A.	-	-	-
51	dry	N.A.	-	-	-
52	dry	28.500	9.500	2.375	5.481
53	dry	< LOD	-	-	-
54	dry	< LOD	-	-	-
55	dry	< LOD	-	-	-
56	dry	N.A.	-	-	-
57	dry	N.A.	-	-	-
58	dry	< LOD	-	-	-
59	dry	< LOD	-	-	-
60	dry	N.A.	-	-	-
61	dry	N.A.	-	-	-
62	rainy	< LOD	-	-	-
63	rainy	7.302	2.434	0.608	1.404
64	rainy	5.986	1.995	0.499	1.151
65	rainy	0.002	0.001	0.000	0.000
66	rainy	N.A.	-	-	-
67	rainy	0.002	0.001	0.000	0.000
68	rainy	4.863	1.621	0.405	0.935
69	rainy	0.002	0.001	0.000	0.000
70	rainy	0.002	0.001	0.000	0.000
71	rainy	4.478	1.493	0.373	0.861
72	rainy	0.002	0.001	0.000	0.000
73	rainy	0.002	0.001	0.000	0.000
74	rainy	0.002	0.001	0.000	0.000
75	rainy	0.002	0.001	0.000	0.000
76	rainy	0.002	0.001	0.000	0.000
77	rainy	4.904	1.635	0.409	0.943
78	rainy	5.734	1.911	0.478	1.103
79	rainy	0.927	0.309	0.077	0.178
80	rainy	0.002	0.001	0.000	0.000
81	rainy	1.624	0.541	0.135	0.312
82	rainy	6.494	2.165	0.541	1.249
83	rainy	12.547	4.182	1.046	2.413
84	rainy	0.002	0.001	0.000	0.000
85	rainy	0.002	0.001	0.000	0.000
86	rainy	12.002	4.001	1.000	2.308
87	rainy	0.002	0.001	0.000	0.000
88	rainy	0.002	0.001	0.000	0.000
89	rainy	N.A.	-	-	-
90	rainy	0.002	0.001	0.000	0.000
91	rainy	9.380	3.127	0.782	1.804
92	rainy	0.002	0.001	0.000	0.000
93	rainy	0.002	0.001	0.000	0.000
94	rainy	0.002	0.001	0.000	0.000
95	rainy	9.629	3.210	0.802	1.852
96	rainy	10.665	3.555	0.889	2.051
97	rainy	0.002	0.001	0.000	0.000
98	rainy	0.002	0.001	0.000	0.000
99	rainy	N.A.	-	-	-
100	rainy	0.002	0.001	0.000	0.000
101	rainy	11.991	3.997	0.999	2.306
102	rainy	0.002	0.001	0.000	0.000

Spatial and seasonal variation in pollution from pharmaceuticals and personal care products and the ecological risks in the
upper Paraná river basin

103	rainy	0.002	0.001	0.000	0.000
104	rainy	0.002	0.001	0.000	0.000
105	rainy	0.002	0.001	0.000	0.000
106	rainy	6.827	2.276	0.569	1.313
107	rainy	3.923	1.308	0.327	0.754
108	rainy	0.002	0.001	0.000	0.000
109	rainy	0.002	0.001	0.000	0.000
110	rainy	10.130	3.377	0.844	1.948
111	rainy	11.201	3.734	0.933	2.154
112	rainy	15.990	5.330	1.333	3.075
113	rainy	14.570	4.857	1.214	2.802
114	rainy	4.645	1.548	0.387	0.893
115	rainy	0.002	0.001	0.000	0.000
116	rainy	0.002	0.001	0.000	0.000
117	rainy	2.793	0.931	0.233	0.537
118	rainy	6.880	2.293	0.573	1.323
119	rainy	0.002	0.001	0.000	0.000
120	rainy	0.002	0.001	0.000	0.000
121	rainy	6.297	2.099	0.525	1.211
122	rainy	10.038	3.346	0.837	1.930
123	rainy	17.946	5.982	1.496	3.451
124	rainy	8.212	2.737	0.684	1.579
125	rainy	< LOD	-	-	-
126	rainy	0.507	0.169	0.042	0.097
127	rainy	5.171	1.724	0.431	0.994
128	rainy	1.515	0.505	0.126	0.291
129	rainy	16.221	5.407	1.352	3.119
130	rainy	3.072	1.024	0.256	0.591
131	rainy	3.440	1.147	0.287	0.662
132	rainy	< LOD	-	-	-
133	rainy	< LOD	-	-	-
134	rainy	< LOD	-	-	-
135	rainy	< LOD	-	-	-
136	rainy	1.994	0.665	0.166	0.384
137	rainy	18.136	6.045	1.511	3.488
138	rainy	0.002	0.001	0.000	0.000
139	rainy	0.002	0.001	0.000	0.000
140	rainy	0.002	0.001	0.000	0.000
141	rainy	0.002	0.001	0.000	0.000
142	rainy	15.807	5.269	1.317	3.040
143	rainy	0.002	0.001	0.000	0.000
144	rainy	0.002	0.001	0.000	0.000
145	rainy	0.002	0.001	0.000	0.000
146	rainy	0.002	0.001	0.000	0.000
147	rainy	0.002	0.001	0.000	0.000
148	rainy	0.002	0.001	0.000	0.000
149	rainy	0.002	0.001	0.000	0.000
150	rainy	0.002	0.001	0.000	0.000
151	rainy	0.002	0.001	0.000	0.000
152	rainy	0.002	0.001	0.000	0.000
153	rainy	< LOD	-	-	-
154	rainy	0.002	0.001	0.000	0.000
155	rainy	4.719	1.573	0.393	0.907
156	rainy	< LOD	-	-	-
157	rainy	0.002	0.001	0.000	0.000
158	rainy	0.002	0.001	0.000	0.000

Spatial and seasonal variation in pollution from pharmaceuticals and personal care products and the ecological risks in the
upper Paraná river basin

159	rainy	0.002	0.001	0.000	0.000
160	rainy	< LOD	-	-	-
161	rainy	0.002	0.001	0.000	0.000
162	rainy	N.A.	-	-	-
163	rainy	0.002	0.001	0.000	0.000
164	rainy	0.002	0.001	0.000	0.000
165	rainy	< LOD	-	-	-
166	rainy	9.099	3.033	0.758	1.750
167	rainy	0.002	0.001	0.000	0.000
168	rainy	< LOD	-	-	-
169	rainy	0.002	0.001	0.000	0.000
170	rainy	0.002	0.001	0.000	0.000
171	rainy	8.858	2.953	0.738	1.704
172	rainy	< LOD	-	-	-
173	rainy	0.002	0.001	0.000	0.000
174	rainy	0.002	0.001	0.000	0.000
175	rainy	0.002	0.001	0.000	0.000
176	rainy	0.002	0.001	0.000	0.000
177	rainy	0.002	0.001	0.000	0.000
178	rainy	3.012	1.004	0.251	0.579
179	rainy	0.002	0.001	0.000	0.000
180	rainy	< LOD	-	-	-
181	rainy	0.002	0.001	0.000	0.000
182	rainy	7.694	2.565	0.641	1.480
183	rainy	< LOD	-	-	-
184	rainy	0.002	0.001	0.000	0.000
185	rainy	0.002	0.001	0.000	0.000
186	rainy	20.752	6.917	1.729	3.991
187	rainy	5.253	1.751	0.438	1.010
188	rainy	4.755	1.585	0.396	0.915
189	rainy	< LOD	-	-	-
190	rainy	< LOD	-	-	-
191	rainy	43.351	14.450	3.613	8.337
192	rainy	7.138	2.379	0.595	1.373
193	rainy	< LOD	-	-	-
194	rainy	16.028	5.343	1.336	3.082
195	rainy	0.002	0.001	0.000	0.000
196	rainy	0.002	0.001	0.000	0.000
197	rainy	< LOD	-	-	-
198	rainy	0.002	0.001	0.000	0.000
199	rainy	0.002	0.001	0.000	0.000
200	rainy	4.293	1.431	0.358	0.826
201	rainy	< LOD	-	-	-
202	rainy	0.002	0.001	0.000	0.000
203	rainy	0.002	0.001	0.000	0.000
204	rainy	0.002	0.001	0.000	0.000
205	rainy	0.002	0.001	0.000	0.000
206	rainy	0.002	0.001	0.000	0.000
207	rainy	4.733	1.578	0.394	0.910
208	rainy	N.A.	-	-	-

(continues)

Sampling point	Season	MEC	RQ Naproxen		
			Fish (PNEC = 5 µg/L)	Microcrustaceans (PNEC = 3 µg/L)	Algae (PNEC = 72 µg/L)
1	dry	< LOD	-	-	-

Spatial and seasonal variation in pollution from pharmaceuticals and personal care products and the ecological risks in the
upper Paraná river basin

2	dry	5.000	1.000	1.667	0.069
3	dry	0.330	0.066	0.110	0.005
4	dry	1.190	0.238	0.397	0.017
5	dry	N.A.	-	-	-
6	dry	4.900	0.980	1.633	0.068
7	dry	< LOD	-	-	-
8	dry	< LOD	-	-	-
9	dry	6.304	1.261	2.101	0.088
10	dry	< LOD	-	-	-
11	dry	4.380	0.876	1.460	0.061
12	dry	< LOD	-	0.000	0.000
13	dry	30.043	6.009	10.014	0.417
14	dry	< LOD	-	-	-
15	dry	35.295	7.059	11.765	0.490
16	dry	100.845	20.169	33.615	1.401
17	dry	< LOD	-	-	-
18	dry	< LOD	-	-	-
19	dry	< LOD	-	-	-
20	dry	126.347	25.269	42.116	1.755
21	dry	< LOD	-	-	-
22	dry	3.170	0.634	1.057	0.044
23	dry	< LOD	-	-	-
24	dry	< LOD	-	-	-
25	dry	N;A.	-	-	-
26	dry	N;A.	-	-	-
27	dry	N;A.	-	-	-
28	dry	N;A.	-	-	-
29	dry	N;A.	-	-	-
30	dry	N;A.	-	-	-
31	dry	N;A.	-	-	-
32	dry	N;A.	-	-	-
33	dry	N;A.	-	-	-
34	dry	< LOD	-	-	-
35	dry	29.872	5.974	9.957	0.415
36	dry	< LOD	-	-	-
37	dry	< LOD	-	-	-
38	dry	< LOD	-	-	-
39	dry	N.A.	-	-	-
40	dry	39.922	7.984	13.307	0.554
41	dry	7.204	1.441	2.401	0.100
42	dry	36.379	7.276	12.126	0.505
43	dry	10.322	2.064	3.441	0.143
44	dry	16.829	3.366	5.610	0.234
45	dry	16.829	3.366	5.610	0.234
46	dry	< LOD	-	-	-
47	dry	< LOD	-	-	-
48	dry	< LOD	-	-	-
49	dry	< LOD	-	-	-
50	dry	N.A.	-	-	-
51	dry	N.A.	-	-	-
52	dry	< LOD	-	-	-
53	dry	19.857	3.971	6.619	0.276
54	dry	< LOD	-	-	-
55	dry	< LOD	-	-	-
56	dry	N.A.	-	-	-
57	dry	N.A.	-	-	-

Spatial and seasonal variation in pollution from pharmaceuticals and personal care products and the ecological risks in the
upper Paraná river basin

58	dry	< LOD	-	-	-
59	dry	43.429	8.686	14.476	0.603
60	dry	N.A.	0.000	0.000	0.000
61	dry	N.A.	0.000	0.000	0.000
62	rainy	< LOD	-	-	-
63	rainy	13.600	2.720	4.533	0.189
64	rainy	3.040	0.608	1.013	0.042
65	rainy	< LOD	-	-	-
66	rainy	N.A.	-	-	-
67	rainy	< LOD	-	-	-
68	rainy	4.680	0.936	1.560	0.065
69	rainy	< LOD	-	-	-
70	rainy	< LOD	-	-	-
71	rainy	< LOD	-	-	-
72	rainy	8.550	1.710	2.850	0.119
73	rainy	< LOD	-	-	-
74	rainy	< LOD	-	-	-
75	rainy	< LOD	-	-	-
76	rainy	< LOD	-	-	-
77	rainy	< LOD	-	-	-
78	rainy	< LOD	-	-	-
79	rainy	< LOD	-	-	-
80	rainy	< LOD	-	-	-
81	rainy	< LOD	-	-	-
82	rainy	4.570	0.914	1.523	0.063
83	rainy	< LOD	-	-	-
84	rainy	< LOD	-	-	-
85	rainy	< LOD	-	-	-
86	rainy	< LOD	-	-	-
87	rainy	< LOD	-	-	-
88	rainy	< LOD	-	-	-
89	rainy	N.A.	-	-	-
90	rainy	< LOD	-	-	-
91	rainy	6.130	1.226	2.043	0.085
92	rainy	< LOD	-	-	-
93	rainy	< LOD	-	-	-
94	rainy	< LOD	-	-	-
95	rainy	< LOD	-	-	-
96	rainy	< LOD	-	-	-
97	rainy	< LOD	-	-	-
98	rainy	< LOD	-	-	-
99	rainy	N.A.	-	-	-
100	rainy	< LOD	-	-	-
101	rainy	1.300	0.260	0.433	0.018
102	rainy	< LOD	-	-	-
103	rainy	< LOD	-	-	-
104	rainy	< LOD	-	-	-
105	rainy	< LOD	-	-	-
106	rainy	< LOD	-	-	-
107	rainy	0.770	0.154	0.257	0.011
108	rainy	< LOD	-	-	-
109	rainy	< LOD	-	-	-
110	rainy	1.170	0.234	0.390	0.016
111	rainy	< LOD	-	-	-
112	rainy	< LOD	-	-	-
113	rainy	< LOD	-	-	-

114	rainy	< LOD	-	-	-
115	rainy	< LOD	-	-	-
116	rainy	< LOD	-	-	-
117	rainy	< LOD	-	-	-
118	rainy	< LOD	-	-	-
119	rainy	< LOD	-	-	-
120	rainy	< LOD	-	-	-
121	rainy	< LOD	-	-	-
122	rainy	< LOD	-	-	-
123	rainy	< LOD	-	-	-
124	rainy	< LOD	-	-	-
125	rainy	0.080	0.016	0.027	0.001
126	rainy	0.340	0.068	0.113	0.005
127	rainy	< LOD	-	-	-
128	rainy	< LOD	-	-	-
129	rainy	< LOD	-	-	-
130	rainy	< LOD	-	-	-
131	rainy	< LOD	-	-	-
132	rainy	< LOD	-	-	-
133	rainy	< LOD	-	-	-
134	rainy	< LOD	-	-	-
135	rainy	< LOD	-	-	-
136	rainy	0.490	0.098	0.163	0.007
137	rainy	0.990	0.198	0.330	0.014
138	rainy	< LOD	-	-	-
139	rainy	< LOD	-	-	-
140	rainy	< LOD	-	-	-
141	rainy	< LOD	-	-	-
142	rainy	< LOD	-	-	-
143	rainy	< LOD	-	-	-
144	rainy	< LOD	-	-	-
145	rainy	< LOD	-	-	-
146	rainy	< LOD	-	-	-
147	rainy	< LOD	-	-	-
148	rainy	< LOD	-	-	-
149	rainy	< LOD	-	-	-
150	rainy	< LOD	-	-	-
151	rainy	< LOD	-	-	-
152	rainy	< LOD	-	-	-
153	rainy	< LOD	-	-	-
154	rainy	< LOD	-	-	-
155	rainy	0.100	0.020	0.033	0.001
156	rainy	< LOD	-	-	-
157	rainy	< LOD	-	-	-
158	rainy	< LOD	-	-	-
159	rainy	< LOD	-	-	-
160	rainy	< LOD	-	-	-
161	rainy	< LOD	-	-	-
162	rainy	N.A.	-	-	-
163	rainy	< LOD	-	-	-
164	rainy	< LOD	-	-	-
165	rainy	< LOD	-	-	-
166	rainy	< LOD	-	-	-
167	rainy	< LOD	-	-	-
168	rainy	< LOD	-	-	-
169	rainy	< LOD	-	-	-

170	rainy	< LOD	-	-	-
171	rainy	< LOD	-	-	-
172	rainy	< LOD	-	-	-
173	rainy	< LOD	-	-	-
174	rainy	< LOD	-	-	-
175	rainy	< LOD	-	-	-
176	rainy	< LOD	-	-	-
177	rainy	< LOD	-	-	-
178	rainy	0.380	0.076	0.127	0.005
179	rainy	0.330	0.066	0.110	0.005
180	rainy	< LOD	-	-	-
181	rainy	< LOD	-	-	-
182	rainy	< LOD	-	-	-
183	rainy	< LOD	-	-	-
184	rainy	< LOD	-	-	-
185	rainy	< LOD	-	-	-
186	rainy	< LOD	-	-	-
187	rainy	< LOD	-	-	-
188	rainy	< LOD	-	-	-
189	rainy	0.220	0.044	0.073	0.003
190	rainy	< LOD	-	-	-
191	rainy	< LOD	-	-	-
192	rainy	< LOD	-	-	-
193	rainy	0.340	0.068	0.113	0.005
194	rainy	< LOD	-	-	-
195	rainy	< LOD	-	-	-
196	rainy	< LOD	-	-	-
197	rainy	6.160	1.232	2.053	0.086
198	rainy	< LOD	-	-	-
199	rainy	< LOD	-	-	-
200	rainy	< LOD	-	-	-
201	rainy	< LOD	-	-	-
202	rainy	< LOD	-	-	-
203	rainy	< LOD	-	-	-
204	rainy	< LOD	-	-	-
205	rainy	< LOD	-	-	-
206	rainy	< LOD	-	-	-
207	rainy	< LOD	-	-	-
208	rainy	N.A.	-	-	-

(continues)

Sampling point	Season	MEC	RQ Diclofenac		
			Fish (PNEC = 0.5 µg/L)	Microcrustaceans (PNEC = 22 µg/L)	Algae (PNEC = 100 µg/L)
1	dry	< LOD	-	-	-
2	dry	2.500	5.000	0.114	0.025
3	dry	4.080	8.160	0.185	0.041
4	dry	9.900	19.800	0.450	0.099
5	dry	N.A.	-	-	-
6	dry	8.990	17.980	0.409	0.090
7	dry	6.660	13.320	0.303	0.067
8	dry	12.650	25.300	0.575	0.127
9	dry	29.917	59.834	1.360	0.299
10	dry	< LOD	-	-	-
11	dry	3.680	7.360	0.167	0.037
12	dry		0.000	0.000	0.000

Spatial and seasonal variation in pollution from pharmaceuticals and personal care products and the ecological risks in the
upper Paraná river basin

13	dry	15.616	31.232	0.710	0.156
14	dry	< LOD	-	-	-
15	dry	13.014	26.028	0.592	0.130
16	dry	< LOD	-	-	-
17	dry	< LOD	-	-	-
18	dry	34.610	69.221	1.573	0.346
19	dry	< LOD	-	-	-
20	dry	< LOD	-	-	-
21	dry	< LOD	-	-	-
22	dry	< LOD	-	-	-
23	dry	< LOD	-	-	-
24	dry	< LOD	-	-	-
25	dry	N;A.	-	-	-
26	dry	N;A.	-	-	-
27	dry	N;A.	-	-	-
28	dry	N;A.	-	-	-
29	dry	N;A.	-	-	-
30	dry	N;A.	-	-	-
31	dry	N;A.	-	-	-
32	dry	N;A.	-	-	-
33	dry	N;A.	-	-	-
34	dry	< LOD	-	-	-
35	dry	< LOD	-	-	-
36	dry	< LOD	-	-	-
37	dry	67.748	135.495	3.079	0.677
38	dry	50.004	100.008	2.273	0.500
39	dry	N.A.	-	-	-
40	dry	165.247	330.495	7.511	1.652
41	dry	< LOD	-	-	-
42	dry	< LOD	-	-	-
43	dry	40.795	81.589	1.854	0.408
44	dry	< LOD	-	-	-
45	dry	40.031	80.061	1.820	0.400
46	dry	58.536	117.073	2.661	0.585
47	dry	< LOD	-	-	-
48	dry	< LOD	-	-	-
49	dry	< LOD	-	-	-
50	dry	N.A.	-	-	-
51	dry	N.A.	-	-	-
52	dry	101.442	202.885	4.611	1.014
53	dry	36.327	72.654	1.651	0.363
54	dry	< LOD	-	-	-
55	dry	41.324	82.647	1.878	0.413
56	dry	N.A.	-	-	-
57	dry	N.A.	-	-	-
58	dry	57.010	114.020	2.591	0.570
59	dry	59.980	119.960	2.726	0.600
60	dry	N.A.	-	-	-
61	dry	N.A.	-	-	-
62	rainy	< LOD	-	-	-
63	rainy	< LOD	-	-	-
64	rainy	0.960	1.920	0.044	0.010
65	rainy	< LOD	-	-	-
66	rainy	N.A.	-	-	-
67	rainy	< LOD	-	-	-
68	rainy	< LOD	-	-	-

69	rainy	< LOD	-	-	-
70	rainy	< LOD	-	-	-
71	rainy	< LOD	-	-	-
72	rainy	1.910	3.820	0.087	0.019
73	rainy	0.270	0.540	0.012	0.003
74	rainy	< LOD	-	-	-
75	rainy	< LOD	-	-	-
76	rainy	< LOD	-	-	-
77	rainy	< LOD	-	-	-
78	rainy	< LOD	-	-	-
79	rainy	< LOD	-	-	-
80	rainy	< LOD	-	-	-
81	rainy	< LOD	-	-	-
82	rainy	0.750	1.500	0.034	0.008
83	rainy	3.060	6.120	0.139	0.031
84	rainy	< LOD	-	-	-
85	rainy	< LOD	-	-	-
86	rainy	< LOD	-	-	-
87	rainy	< LOD	-	-	-
88	rainy	< LOD	-	-	-
89	rainy	N.A.	-	-	-
90	rainy	< LOD	-	-	-
91	rainy	2.750	5.500	0.125	0.028
92	rainy	< LOD	-	-	-
93	rainy	< LOD	-	-	-
94	rainy	< LOD	-	-	-
95	rainy	0.770	1.540	0.035	0.008
96	rainy	0.760	1.520	0.035	0.008
97	rainy	< LOD	-	-	-
98	rainy	< LOD	-	-	-
99	rainy	N.A.	0.000	0.000	0.000
100	rainy	< LOD	-	-	-
101	rainy	0.880	1.760	0.040	0.009
102	rainy	< LOD	-	-	-
103	rainy	< LOD	-	-	-
104	rainy	< LOD	-	-	-
105	rainy	< LOD	-	-	-
106	rainy	0.290	0.580	0.013	0.003
107	rainy	1.240	2.480	0.056	0.012
108	rainy	0.060	0.120	0.003	0.001
109	rainy	< LOD	-	-	-
110	rainy	< LOD	-	-	-
111	rainy	< LOD	-	-	-
112	rainy	0.030	0.060	0.001	0.000
113	rainy	1.610	3.220	0.073	0.016
114	rainy	< LOD	-	-	-
115	rainy	< LOD	-	-	-
116	rainy	< LOD	-	-	-
117	rainy	< LOD	-	-	-
118	rainy	< LOD	-	-	-
119	rainy	< LOD	-	-	-
120	rainy	< LOD	-	-	-
121	rainy	< LOD	-	-	-
122	rainy	< LOD	-	-	-
123	rainy	< LOD	-	-	-
124	rainy	< LOD	-	-	-

Spatial and seasonal variation in pollution from pharmaceuticals and personal care products and the ecological risks in the
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125	rainy	1.520	3.040	0.069	0.015
126	rainy	6.590	13.180	0.300	0.066
127	rainy	< LOD	-	-	-
128	rainy	< LOD	-	-	-
129	rainy	1.760	3.520	0.080	0.018
130	rainy	1.910	3.820	0.087	0.019
131	rainy	< LOD	-	-	-
132	rainy	< LOD	-	-	-
133	rainy	< LOD	-	-	-
134	rainy	< LOD	-	-	-
135	rainy	< LOD	-	-	-
136	rainy	2.090	4.180	0.095	0.021
137	rainy	< LOD	-	-	-
138	rainy	< LOD	-	-	-
139	rainy	< LOD	-	-	-
140	rainy	< LOD	-	-	-
141	rainy	< LOD	-	-	-
142	rainy	< LOD	-	-	-
143	rainy	< LOD	-	-	-
144	rainy	< LOD	-	-	-
145	rainy	< LOD	-	-	-
146	rainy	< LOD	-	-	-
147	rainy	< LOD	-	-	-
148	rainy	< LOD	-	-	-
149	rainy	< LOD	-	-	-
150	rainy	< LOD	-	-	-
151	rainy	< LOD	-	-	-
152	rainy	< LOD	-	-	-
153	rainy	2.520	5.040	0.115	0.025
154	rainy	< LOD	-	-	-
155	rainy	6.050	12.100	0.275	0.061
156	rainy	< LOD	-	-	-
157	rainy	< LOD	-	-	-
158	rainy	< LOD	-	-	-
159	rainy	< LOD	-	-	-
160	rainy	0.710	1.420	0.032	0.007
161	rainy	< LOD	-	-	-
162	rainy	N.A.	-	-	-
163	rainy	< LOD	-	-	-
164	rainy	< LOD	-	-	-
165	rainy	0.170	0.340	0.008	0.002
166	rainy	< LOD	-	-	-
167	rainy	< LOD	-	-	-
168	rainy	2.790	5.580	0.127	0.028
169	rainy	< LOD	-	-	-
170	rainy	< LOD	-	-	-
171	rainy	0.180	0.360	0.008	0.002
172	rainy	< LOD	-	-	-
173	rainy	< LOD	-	-	-
174	rainy	< LOD	-	-	-
175	rainy	< LOD	-	-	-
176	rainy	< LOD	-	-	-
177	rainy	< LOD	-	-	-
178	rainy	< LOD	-	-	-
179	rainy	< LOD	-	-	-
180	rainy	< LOD	-	-	-

181	rainy	< LOD	-	-	-
182	rainy	0.190	0.380	0.009	0.002
183	rainy	< LOD	-	-	-
184	rainy	< LOD	-	-	-
185	rainy	< LOD	-	-	-
186	rainy	1.560	3.120	0.071	0.016
187	rainy	0.300	0.600	0.014	0.003
188	rainy	0.810	1.620	0.037	0.008
189	rainy	1.380	2.760	0.063	0.014
190	rainy	0.680	1.360	0.031	0.007
191	rainy	1.390	2.780	0.063	0.014
192	rainy	< LOD	-	-	-
193	rainy	0.310	0.620	0.014	0.003
194	rainy	0.540	1.080	0.025	0.005
195	rainy	< LOD	-	-	-
196	rainy	< LOD	-	-	-
197	rainy	< LOD	-	-	-
198	rainy	< LOD	-	-	-
199	rainy	< LOD	-	-	-
200	rainy	0.340	0.680	0.015	0.003
201	rainy	< LOD	-	-	-
202	rainy	< LOD	-	-	-
203	rainy	< LOD	-	-	-
204	rainy	< LOD	-	-	-
205	rainy	< LOD	-	-	-
206	rainy	0.920	1.840	0.042	0.009
207	rainy	< LOD	-	-	-
208	rainy	N.A.	-	-	-

(continues)

Sampling point	Season	MEC	RQ Ibuprofen		
			Fish (PNEC = 1 µg/L)	Microcrustaceans (PNEC = 12.3 µg/L)	Algae (PNEC = 7.1 µg/L)
1	dry	< LOD	-	-	-
2	dry	13.930	13.930	1.161	1.962
3	dry	6.150	6.150	0.513	0.866
4	dry	< LOD	-	-	-
5	dry	N.A.	-	-	-
6	dry	23.360	23.360	1.947	3.290
7	dry	< LOD	-	-	-
8	dry	< LOD	-	-	-
9	dry	47.172	47.172	3.931	6.644
10	dry	< LOD	-	-	-
11	dry	< LOD	-	-	-
12	dry	33.280	33.280	2.773	4.687
13	dry	93.433	93.433	7.786	13.160
14	dry	50.877	50.877	4.240	7.166
15	dry	75.449	75.449	6.287	10.627
16	dry	47.217	47.217	3.935	6.650
17	dry	< LOD	-	-	-
18	dry	93.433	93.433	7.786	13.160
19	dry	71.282	71.282	5.940	10.040
20	dry	< LOD	-	-	-
21	dry	61.226	61.226	5.102	8.623
22	dry	< LOD	-	-	-
23	dry	< LOD	-	-	-

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24	dry	2.550	2.550	0.213	0.359
25	dry	N;A.	-	-	-
26	dry	N;A.	-	-	-
27	dry	N;A.	-	-	-
28	dry	N;A.	-	-	-
29	dry	N;A.	-	-	-
30	dry	N;A.	-	-	-
31	dry	N;A.	-	-	-
32	dry	N;A.	-	-	-
33	dry	N;A.	-	-	-
34	dry	182.271	182.271	15.189	25.672
35	dry	232.056	232.056	19.338	32.684
36	dry	323.923	323.923	26.994	45.623
37	dry	95.741	95.741	7.978	13.485
38	dry	148.904	148.904	12.409	20.972
39	dry	N.A.	-	-	-
40	dry	153.037	153.037	12.753	21.555
41	dry	< LOD	-	-	-
42	dry	< LOD	-	-	-
43	dry	48.028	48.028	4.002	6.765
44	dry	167.294	167.294	13.941	23.562
45	dry	108.444	108.444	9.037	15.274
46	dry	136.382	136.382	11.365	19.209
47	dry	47.420	47.420	3.952	6.679
48	dry	< LOD	-	-	-
49	dry	< LOD	-	-	-
50	dry	N.A.	-	-	-
51	dry	N.A.	-	-	-
52	dry	147.485	147.485	12.290	20.773
53	dry	63.354	63.354	5.280	8.923
54	dry	92.205	92.205	7.684	12.987
55	dry	200.919	200.919	16.743	28.298
56	dry	N.A.	-	-	-
57	dry	N.A.	-	-	-
58	dry	< LOD	-	-	-
59	dry	< LOD	-	-	-
60	dry	N.A.	-	-	-
61	dry	N.A.	-	-	-
62	rainy	0.550	0.550	0.046	0.077
63	rainy	< LOD	-	-	-
64	rainy	17.600	17.600	1.467	2.479
65	rainy	< LOD	-	-	-
66	rainy	N.A.	-	-	-
67	rainy	< LOD	-	-	-
68	rainy	< LOD	-	-	-
69	rainy	< LOD	-	-	-
70	rainy	< LOD	-	-	-
71	rainy	< LOD	-	-	-
72	rainy	12.680	12.680	1.057	1.786
73	rainy	< LOD	-	-	-
74	rainy	< LOD	-	-	-
75	rainy	< LOD	-	-	-
76	rainy	< LOD	-	-	-
77	rainy	< LOD	-	-	-
78	rainy	5.960	5.960	0.497	0.839
79	rainy	< LOD	-	-	-

Spatial and seasonal variation in pollution from pharmaceuticals and personal care products and the ecological risks in the
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80	rainy	< LOD	-	-	-
81	rainy	< LOD	-	-	-
82	rainy	< LOD	-	-	-
83	rainy	1.980	1.980	0.165	0.279
84	rainy	< LOD	-	-	-
85	rainy	< LOD	-	-	-
86	rainy	< LOD	-	-	-
87	rainy	< LOD	-	-	-
88	rainy	< LOD	-	-	-
89	rainy	N.A.	-	-	-
90	rainy	< LOD	-	-	-
91	rainy	6.940	6.940	0.578	0.977
92	rainy	< LOD	-	-	-
93	rainy	< LOD	-	-	-
94	rainy	< LOD	-	-	-
95	rainy	11.980	11.980	0.998	1.687
96	rainy	< LOD	-	-	-
97	rainy	< LOD	-	-	-
98	rainy	< LOD	-	-	-
99	rainy	N.A.	-	-	-
100	rainy	< LOD	-	-	-
101	rainy	< LOD	-	-	-
102	rainy	< LOD	-	-	-
103	rainy	< LOD	-	-	-
104	rainy	< LOD	-	-	-
105	rainy	< LOD	-	-	-
106	rainy	13.070	13.070	1.089	1.841
107	rainy	12.440	12.440	1.037	1.752
108	rainy	< LOD	-	-	-
109	rainy	< LOD	-	-	-
110	rainy	15.260	15.260	1.272	2.149
111	rainy	12.550	12.550	1.046	1.768
112	rainy	10.900	10.900	0.908	1.535
113	rainy	8.400	8.400	0.700	1.183
114	rainy	1.600	1.600	0.133	0.225
115	rainy	< LOD	-	-	-
116	rainy	< LOD	-	-	-
117	rainy	11.810	11.810	0.984	1.663
118	rainy	9.690	9.690	0.808	1.365
119	rainy	< LOD	-	-	-
120	rainy	< LOD	-	-	-
121	rainy	< LOD	-	-	-
122	rainy	8.240	8.240	0.687	1.161
123	rainy	5.550	5.550	0.463	0.782
124	rainy	1.130	1.130	0.094	0.159
125	rainy	27.810	27.810	2.318	3.917
126	rainy	< LOD	-	-	-
127	rainy	< LOD	-	-	-
128	rainy	< LOD	-	-	-
129	rainy	< LOD	-	-	-
130	rainy	< LOD	-	-	-
131	rainy	12.960	12.960	1.080	1.825
132	rainy	< LOD	-	-	-
133	rainy	< LOD	-	-	-
134	rainy	< LOD	-	-	-
135	rainy	< LOD	-	-	-

136	rainy	15.330	15.330	1.278	2.159
137	rainy	27.190	27.190	2.266	3.830
138	rainy	< LOD	-	-	-
139	rainy	< LOD	-	-	-
140	rainy	< LOD	-	-	-
141	rainy	< LOD	-	-	-
142	rainy	10.580	10.580	0.882	1.490
143	rainy	< LOD	-	-	-
144	rainy	< LOD	-	-	-
145	rainy	< LOD	-	-	-
146	rainy	< LOD	-	-	-
147	rainy	< LOD	-	-	-
148	rainy	< LOD	-	-	-
149	rainy	< LOD	-	-	-
150	rainy	< LOD	-	-	-
151	rainy	< LOD	-	-	-
152	rainy	< LOD	-	-	-
153	rainy	4.640	4.640	0.387	0.654
154	rainy	< LOD	-	-	-
155	rainy	1.610	1.610	0.134	0.227
156	rainy	< LOD	-	-	-
157	rainy	< LOD	-	-	-
158	rainy	< LOD	-	-	-
159	rainy	< LOD	-	-	-
160	rainy	6.380	6.380	0.532	0.899
161	rainy	< LOD	-	-	-
162	rainy	N.A.	0.000	0.000	0.000
163	rainy	< LOD	-	-	-
164	rainy	< LOD	-	-	-
165	rainy	18.220	18.220	1.518	2.566
166	rainy	< LOD	-	-	-
167	rainy	< LOD	-	-	-
168	rainy	26.370	26.370	2.198	3.714
169	rainy	< LOD	-	-	-
170	rainy	< LOD	-	-	-
171	rainy	2.360	2.360	0.197	0.332
172	rainy	< LOD	-	-	-
173	rainy	< LOD	-	-	-
174	rainy	< LOD	-	-	-
175	rainy	< LOD	-	-	-
176	rainy	< LOD	-	-	-
177	rainy	< LOD	-	-	-
178	rainy	9.820	9.820	0.818	1.383
179	rainy	< LOD	-	-	-
180	rainy	11.390	11.390	0.949	1.604
181	rainy	< LOD	-	-	-
182	rainy	6.090	6.090	0.508	0.858
183	rainy	13.190	13.190	1.099	1.858
184	rainy	< LOD	-	-	-
185	rainy	< LOD	-	-	-
186	rainy	3.380	3.380	0.282	0.476
187	rainy	4.010	4.010	0.334	0.565
188	rainy	5.680	5.680	0.473	0.800
189	rainy	23.440	23.440	1.953	3.301
190	rainy	5.770	5.770	0.481	0.813
191	rainy	23.880	23.880	1.990	3.363

192	rainy	16.790	16.790	1.399	2.365
193	rainy	28.440	28.440	2.370	4.006
194	rainy	21.930	21.930	1.828	3.089
195	rainy	< LOD	-	-	-
196	rainy	< LOD	-	-	-
197	rainy	< LOD	-	-	-
198	rainy	< LOD	-	-	-
199	rainy	< LOD	-	-	-
200	rainy	3.780	3.780	0.315	0.532
201	rainy	< LOD	-	-	-
202	rainy	< LOD	-	-	-
203	rainy	< LOD	-	-	-
204	rainy	< LOD	-	-	-
205	rainy	< LOD	-	-	-
206	rainy	12.390	12.390	1.033	1.745
207	rainy	< LOD	-	-	-
208	rainy	N.A.	0.000	0.000	0.000

N.A. = Sample does not analyze.

< LOD = Below the detection limit

Table S8

Concentrations (µg/L) of pharmaceutical compounds at the collection points of the study.

Sampling point	Caffeine	Naproxen	Diclofenac	Ibuprofen
1	< LOD	< LOD	< LOD	< LOD
2	27.557	5.000	2.500	13.930
3	37.071	0.330	4.080	6.150
4	1.939	1.190	9.900	< LOD
5	N;A.	N.A.	N.A.	N.A.
6	< LOD	4.900	8.990	23.360
7	< LOD	< LOD	6.660	< LOD
8	19.488	< LOD	12.650	< LOD
9	< LOD	6.304	29.917	47.172
10	7.245	< LOD	< LOD	< LOD
11	20.338	4.380	3.680	< LOD
12	21.307	< LOD		33.280
13	< LOD	30.043	15.616	93.433
14	< LOD	< LOD	< LOD	50.877
15	< LOD	35.295	13.014	75.449
16	29.400	100.845	< LOD	47.217
17	28.900	< LOD	< LOD	< LOD
18	25.200	< LOD	34.610	93.433
19	< LOD	< LOD	< LOD	71.282
20	< LOD	126.347	< LOD	< LOD
21	26.800	< LOD	< LOD	61.226
22	< LOD	3.170	< LOD	< LOD
23	5.766	< LOD	< LOD	< LOD
24	< LOD	< LOD	< LOD	2.550
25	N;A.	N;A.	N;A.	N;A.
26	N;A.	N;A.	N;A.	N;A.
27	N;A.	N;A.	N;A.	N;A.
28	N;A.	N;A.	N;A.	N;A.

29	N;A.	N;A.	N;A.	N;A.
30	N;A.	N;A.	N;A.	N;A.
31	N;A.	N;A.	N;A.	N;A.
32	N;A.	N;A.	N;A.	N;A.
33	N;A.	N;A.	N;A.	N;A.
34	30.400	< LOD	< LOD	182.271
35	< LOD	29.872	< LOD	232.056
36	33.600	< LOD	< LOD	323.923
37	32.700	< LOD	67.748	95.741
38	39.400	< LOD	50.004	148.904
39	N.A.	N.A.	N.A.	N.A.
40	< LOD	39.922	165.247	153.037
41	< LOD	7.204	< LOD	< LOD
42	33.400	36.379	< LOD	< LOD
43	33.100	10.322	40.795	48.028
44	< LOD	16.829	< LOD	167.294
45	34.100	16.829	40.031	108.444
46	< LOD	< LOD	58.536	136.382
47	< LOD	< LOD	< LOD	47.420
48	28.900	< LOD	< LOD	< LOD
49	33.800	< LOD	< LOD	< LOD
50	N.A.	N.A.	N.A.	N.A.
51	N.A.	N.A.	N.A.	N.A.
52	28.500	< LOD	101.442	147.485
53	< LOD	19.857	36.327	63.354
54	< LOD	< LOD	< LOD	92.205
55	< LOD	< LOD	41.324	200.919
56	N.A.	N.A.	N.A.	N.A.
57	N.A.	N.A.	N.A.	N.A.
58	< LOD	< LOD	57.010	< LOD
59	< LOD	43.429	59.980	< LOD
60	N.A.	N.A.	N.A.	N.A.
61	N.A.	N.A.	N.A.	N.A.
62	< LOD	< LOD	< LOD	0.550
63	7.302	13.600	< LOD	< LOD
64	5.986	3.040	0.960	17.600
65	0.002	< LOD	< LOD	< LOD
66	N.A.	N.A.	N.A.	N.A.
67	0.002	< LOD	< LOD	< LOD
68	4.863	4.680	< LOD	< LOD
69	0.002	< LOD	< LOD	< LOD
70	0.002	< LOD	< LOD	< LOD
71	4.478	< LOD	< LOD	< LOD
72	0.002	8.550	1.910	12.680
73	0.002	< LOD	0.270	< LOD
74	0.002	< LOD	< LOD	< LOD
75	0.002	< LOD	< LOD	< LOD
76	0.002	< LOD	< LOD	< LOD
77	4.904	< LOD	< LOD	< LOD
78	5.734	< LOD	< LOD	5.960
79	0.927	< LOD	< LOD	< LOD
80	0.002	< LOD	< LOD	< LOD

81	1.624	< LOD	< LOD	< LOD
82	6.494	4.570	0.750	< LOD
83	12.547	< LOD	3.060	1.980
84	0.002	< LOD	< LOD	< LOD
85	0.002	< LOD	< LOD	< LOD
86	12.002	< LOD	< LOD	< LOD
87	0.002	< LOD	< LOD	< LOD
88	0.002	< LOD	< LOD	< LOD
89	N.A.	N.A.	N.A.	N.A.
90	0.002	< LOD	< LOD	< LOD
91	9.380	6.130	2.750	6.940
92	0.002	< LOD	< LOD	< LOD
93	0.002	< LOD	< LOD	< LOD
94	0.002	< LOD	< LOD	< LOD
95	9.629	< LOD	0.770	11.980
96	10.665	< LOD	0.760	< LOD
97	0.002	< LOD	< LOD	< LOD
98	0.002	< LOD	< LOD	< LOD
99	N.A.	N.A.	N.A.	N.A.
100	0.002	< LOD	< LOD	< LOD
101	11.991	1.300	0.880	< LOD
102	0.002	< LOD	< LOD	< LOD
103	0.002	< LOD	< LOD	< LOD
104	0.002	< LOD	< LOD	< LOD
105	0.002	< LOD	< LOD	< LOD
106	6.827	< LOD	0.290	13.070
107	3.923	0.770	1.240	12.440
108	0.002	< LOD	0.060	< LOD
109	0.002	< LOD	< LOD	< LOD
110	10.130	1.170	< LOD	15.260
111	11.201	< LOD	< LOD	12.550
112	15.990	< LOD	0.030	10.900
113	14.570	< LOD	1.610	8.400
114	4.645	< LOD	< LOD	1.600
115	0.002	< LOD	< LOD	< LOD
116	0.002	< LOD	< LOD	< LOD
117	2.793	< LOD	< LOD	11.810
118	6.880	< LOD	< LOD	9.690
119	0.002	< LOD	< LOD	< LOD
120	0.002	< LOD	< LOD	< LOD
121	6.297	< LOD	< LOD	< LOD
122	10.038	< LOD	< LOD	8.240
123	17.946	< LOD	< LOD	5.550
124	8.212	< LOD	< LOD	1.130
125	< LOD	0.080	1.520	27.810
126	0.507	0.340	6.590	< LOD
127	5.171	< LOD	< LOD	< LOD
128	1.515	< LOD	< LOD	< LOD
129	16.221	< LOD	1.760	< LOD
130	3.072	< LOD	1.910	< LOD
131	3.440	< LOD	< LOD	12.960
132	< LOD	< LOD	< LOD	< LOD

133	< LOD	< LOD	< LOD	< LOD
134	< LOD	< LOD	< LOD	< LOD
135	< LOD	< LOD	< LOD	< LOD
136	1.994	0.490	2.090	15.330
137	18.136	0.990	< LOD	27.190
138	0.002	< LOD	< LOD	< LOD
139	0.002	< LOD	< LOD	< LOD
140	0.002	< LOD	< LOD	< LOD
141	0.002	< LOD	< LOD	< LOD
142	15.807	< LOD	< LOD	10.580
143	0.002	< LOD	< LOD	< LOD
144	0.002	< LOD	< LOD	< LOD
145	0.002	< LOD	< LOD	< LOD
146	0.002	< LOD	< LOD	< LOD
147	0.002	< LOD	< LOD	< LOD
148	0.002	< LOD	< LOD	< LOD
149	0.002	< LOD	< LOD	< LOD
150	0.002	< LOD	< LOD	< LOD
151	0.002	< LOD	< LOD	< LOD
152	0.002	< LOD	< LOD	< LOD
153	< LOD	< LOD	2.520	4.640
154	0.002	< LOD	< LOD	< LOD
155	4.719	0.100	6.050	1.610
156	< LOD	< LOD	< LOD	< LOD
157	0.002	< LOD	< LOD	< LOD
158	0.002	< LOD	< LOD	< LOD
159	0.002	< LOD	< LOD	< LOD
160	< LOD	< LOD	0.710	6.380
161	0.002	< LOD	< LOD	< LOD
162	N.A.	N.A.	N.A.	N.A.
163	0.002	< LOD	< LOD	< LOD
164	0.002	< LOD	< LOD	< LOD
165	< LOD	< LOD	0.170	18.220
166	9.099	< LOD	< LOD	< LOD
167	0.002	< LOD	< LOD	< LOD
168	< LOD	< LOD	2.790	26.370
169	0.002	< LOD	< LOD	< LOD
170	0.002	< LOD	< LOD	< LOD
171	8.858	< LOD	0.180	2.360
172	< LOD	< LOD	< LOD	< LOD
173	0.002	< LOD	< LOD	< LOD
174	0.002	< LOD	< LOD	< LOD
175	0.002	< LOD	< LOD	< LOD
176	0.002	< LOD	< LOD	< LOD
177	0.002	< LOD	< LOD	< LOD
178	3.012	0.380	< LOD	9.820
179	0.002	0.330	< LOD	< LOD
180	< LOD	< LOD	< LOD	11.390
181	0.002	< LOD	< LOD	< LOD
182	7.694	< LOD	0.190	6.090
183	< LOD	< LOD	< LOD	13.190
184	0.002	< LOD	< LOD	< LOD

185	0.002	< LOD	< LOD	< LOD
186	20.752	< LOD	1.560	3.380
187	5.253	< LOD	0.300	4.010
188	4.755	< LOD	0.810	5.680
189	< LOD	0.220	1.380	23.440
190	< LOD	< LOD	0.680	5.770
191	43.351	< LOD	1.390	23.880
192	7.138	< LOD	< LOD	16.790
193	< LOD	0.340	0.310	28.440
194	16.028	< LOD	0.540	21.930
195	0.002	< LOD	< LOD	< LOD
196	0.002	< LOD	< LOD	< LOD
197	< LOD	6.160	< LOD	< LOD
198	0.002	< LOD	< LOD	< LOD
199	0.002	< LOD	< LOD	< LOD
200	4.293	< LOD	0.340	3.780
201	< LOD	< LOD	< LOD	< LOD
202	0.002	< LOD	< LOD	< LOD
203	0.002	< LOD	< LOD	< LOD
204	0.002	< LOD	< LOD	< LOD
205	0.002	< LOD	< LOD	< LOD
206	0.002	< LOD	0.920	12.390
207	4.733	< LOD	< LOD	< LOD
208	N.A.	N.A.	N.A.	N.A.

N.A. = Sample does not analyze.

< LOD = Below the detection limit

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