

Table S1: Properties of the sediment

Texture (%)		Wet bulk density (g cm ⁻³)	Organic matter per 100 g dry sediment (g)
sand	61.6	1.46	4.89
silt	26.3		
clay	12.1		

Table S2: Identification of the selected pharmaceuticals in SIM mode by LC-MS.

	NAP	CAR	SUL	FUR	FEN
m/z ions	231	237	254	331	361
Time (min)	11.3	9.3	6.8	9.2	17.2

Table S3: Limit of detection and quantification of the compounds in water and sediments.

	NAP	CAR	SUL	FUR	FEN
LOD ($\mu\text{g L}^{-1}$)	0.9318	0.0884	0.3597	3.6035	0.0691
LOQ ($\mu\text{g L}^{-1}$)	2.8237	0.2679	1.0900	10.9196	0.2093
LOD (ng g^{-1})	9.2261	0.8823	3.6116	35.6777	0.6894
LOQ (ng g^{-1})	30.4462	2.91156	11.9183	117.7366	2.27484

Table S4: Freundlich model fitting result and sediment-water distribution coefficient. K_f ($\mu\text{g}^{1-1/n} \text{L}^{1/n} \text{g}^{-1}$), K_d (L kg^{-1})

	pH=5				pH=6				pH=7				pH=8			
	K_f	n	R ²	log K_d	K_f	n	R ²	log K_d	K_f	n	R ²	log K_d	K_f	n	R ²	log K_d
NAP	0.557	1.68	0.971	2.837	0.329	1.86	0.974	2.641	0.188	1.72	0.888	2.372	0.069	1.40	0.991	1.878
CAR	0.240	1.19	0.980	2.393	0.663	1.73	0.986	2.921	0.142	1.12	0.998	2.158	0.166	1.29	0.994	2.246
SUL	0.008	0.78	0.998	0.928	0.004	0.58	0.934	0.569	0.009	1.11	0.822	0.949	0.005	0.88	0.996	0.740
FUR	0.660	1.72	0.956	2.917	0.342	1.53	0.995	2.598	0.283	1.67	0.990	2.541	0.104	1.42	0.963	2.061
FEN	24.320	1.18	0.987	4.397	22.799	1.01	0.999	4.358	26.729	1.31	0.982	4.454	26.137	1.35	0.909	4.451

Table S5: The fitting results of first-order decay model

	Aerobic microcosm (AE)				Anaerobic microcosm (ANAE)				Undisturbed microcosm (RE)			
	k (d ⁻¹)	t _{1/2} (d)	P-value	R ²	k (d ⁻¹)	t _{1/2} (d)	P-value	R ²	k (d ⁻¹)	t _{1/2} (d)	P-value	R ²
NAP	0.0908	7.6	<0.0001	0.938	0.0846	8.2	0.0002	0.926	0.0969	7.2	0.0003	0.919
CAR	0.0194	35.8	<0.0001	0.959	0.0186	37.4	<0.0001	0.872	0.0193	36.2	0.0002	0.598
SUL	0.1027	6.9	<0.0001	0.948	0.1601	4.3	0.0006	0.897	0.1510	4.6	0.0006	0.900
FUR	0.0314	22	<0.0001	0.896	0.0144	48.5	<0.0001	0.951	0.0102	70.3	<0.0001	0.815
FEN	0.5165	2.4	0.003	0.835	0.2099	3.3	0.0032	0.821	0.2420	2.9	0.0087	0.748

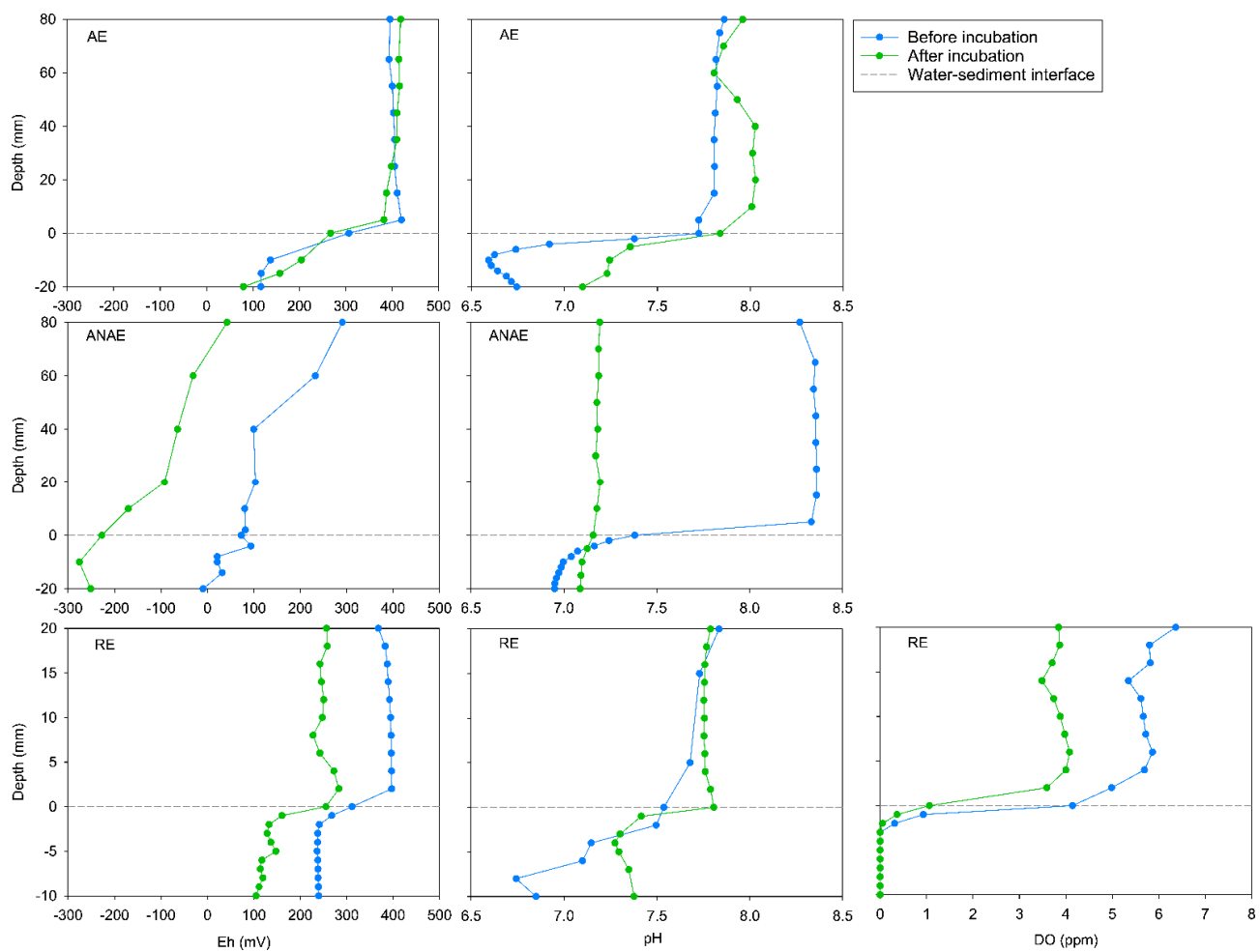


Fig. S1. Vertical profiles of aerobic (AE), anaerobic (ANAE) and undisturbed (RE) microcosms before and after incubation in terms of redox potential (left), pH (middle) and dissolved oxygen concentration (right).