

Supplementary materials

Site	Upstream					Midstream					Downstream				
Season	Nov	Apr	May	Aug	Sep	Nov	Apr	May	Aug	Sep	Nov	Apr	May	Aug	Sep
Maximum depth (m)	6	6	7	6	6	10	10	10	12	12	6	6	6	6	6
Water temperature (°C)	12.7 ± 0.1	12.5 ± 0	22.3 ± 0.9	31.4 ± 1.2	23 ± 0	16.6 ± 0.1	15 ± 0	21.8 ± 0.4	32.3 ± 0.6	23.1 ± 0.1	13.9 ± 0.3	11.9 ± 0.4	20.3 ± 0.6	29.8 ± 0.4	22.6 ± 0.1
NO ₃ -N (mg L ⁻¹)	1.6 ± 0.4	3.8 ± 0.1	3 ± 0.2	2.6 ± 0.1	3 ± 0	3.2 ± 0	2.7 ± 0.2	2.5 ± 0.2	2.1 ± 0.2	2.7 ± 0.1	2.7 ± 0	3.8 ± 0	3 ± 0.2	2.2 ± 0	2.7 ± 0
PO ₄ -P (µg L ⁻¹)	22.2 ± 3.9	18.5 ± 2.1	7.6 ± 3.1	39.1 ± 9.1	53.9 ± 9.1	19.5 ± 1.7	8.4 ± 2.6	12.1 ± 1.3	58.6 ± 12.7	28.8 ± 7.3	30.1 ± 0.7	8.9 ± 3.5	10.7 ± 4.7	25.2 ± 5	30.1 ± 0.7
SiO ₂ (mg L ⁻¹)	0.4 ± 0.1	1.1 ± 0.1	0.4 ± 0	4.2 ± 0.2	6.1 ± 0.1	3.8 ± 0.4	1.6 ± 0.2	0.3 ± 0.1	3.4 ± 0.2	5.8 ± 0.1	6.4 ± 0.1	1.1 ± 0.7	0.7 ± 0.1	3.5 ± 0.1	6.4 ± 0.1
Chlorophyll <i>a</i> (mg L ⁻¹)	4.6 ± 0.5	20.7 ± 4.8	6 ± 0.9	281.7 ± 174.4	10.9 ± 0.8	16 ± 0.2	26.5 ± 1.5	6.5 ± 0.7	121.5 ± 110.1	19.6 ± 2.9	10.6 ± 0.7	34 ± 2.4	4.3 ± 0.2	11 ± 2.6	8.4 ± 0
Air temperature (°C)	9.4	21.6	26.3	35.3	23.3	18.6	21	23.4	35.9	24.1	13.3	14.3	28.2	33	21.1
Wind velocity (m s ⁻¹)	1	1.4	1.9	1.7	0.9	2	1.8	2.7	2	3.7	4.6	1.8	3.2	2.5	3.1
Solar radiation (MJ m ⁻²)	2.15	2.7	3.09	3.12	2.18	1.75	1.94	1.58	1.96	1.28	1.12	0.51	1.7	2.1	0.04
Flow rate (m ³ s ⁻¹)	-14.87	32.13	412.89	33.76	386.79	48.77	728.7	286.84	61.71	247.75	520.85	1,059.69	1,041.46	755.42	802.79
Water level (m)	3.73	4.82	4.98	4.87	4.96	0.65	0.95	0.75	0.73	0.99	0.42	0.64	0.63	0.5	0.52

Table S1: Depth-averaged water characteristics and environmental factors of three sites during the study period (n = 3, mean ± S.E.).

	Seasonal				Diel			
	PC1	PC2	r ²	P-value	PC1	PC2	r ²	P-value
RWCS	0.684	-0.729	0.729	0.002	0.515	0.857	0.758	0.001
S	0.895	-0.447	0.501	0.011	-0.874	0.486	0.777	0.001
Max	0.561	-0.828	0.682	0.003	0.414	0.910	0.779	0.001
AT	0.964	-0.268	0.699	0.002	-0.144	0.990	0.921	0.001
SR	0.330	-0.944	0.743	0.002	0.242	0.970	0.864	0.001
WV	-0.102	0.995	0.285	0.141	-0.103	0.995	0.694	0.001
FR	-0.641	0.768	0.252	0.184	-0.672	-0.741	0.593	0.002
WL	0.246	-0.969	0.413	0.052	1.000	-0.014	0.970	0.001
WT0	0.997	-0.079	0.875	0.001	-0.060	0.998	0.848	0.001
WT3	1.000	0.031	0.893	0.001	-0.885	0.466	0.415	0.015
WTB	0.998	0.064	0.878	0.001	-0.998	0.057	0.734	0.001
ChI0	0.884	-0.467	0.658	0.003	0.468	0.884	0.538	0.002
ChI3	0.828	-0.561	0.361	0.066	0.686	0.728	0.646	0.001
ChIB	-0.949	-0.315	0.082	0.619	0.993	-0.122	0.471	0.005
NO0	-0.977	-0.215	0.143	0.376	0.914	-0.406	0.179	0.251
NO3	-0.993	-0.116	0.231	0.184	0.653	0.757	0.267	0.108
NOB	-0.806	0.593	0.136	0.4	-0.546	0.838	0.022	0.855
PO0	1.000	0.009	0.673	0.002	-0.547	0.837	0.254	0.109
PO3	0.902	0.432	0.552	0.007	-0.869	0.495	0.147	0.325
POB	0.864	0.503	0.629	0.004	-0.969	0.246	0.533	0.004
SI0	0.536	0.844	0.862	0.001	0.917	-0.400	0.881	0.001
SI3	0.447	0.894	0.803	0.001	0.934	-0.356	0.888	0.001
SIB	0.551	0.835	0.878	0.002	0.753	-0.658	0.744	0.001

Table S2: Pearson correlation coefficient of determination (r²) and P-values based on random permutations between the environmental variables and the PC coordinates at seasonal and diel scales (n = 15: seasonal, 18: diel). The bold values statistical significance ($P < 0.05$)