

**Table S1.** Supplementary information of two wetland systems.

Unit	Month	Depth (m)	Flow velocity (m/s)		Flow (m <sup>3</sup> /day)		HRT(day)	HLR (m <sup>3</sup> *m <sup>2</sup> /day)		PLR (g/m <sup>2</sup> /d)	T (°C)	
			Inlet	Outlet	Inflow	Outflow		in	out		Inlet	Outlet
CW1	January	0.28	0.017	0.018	138.36	139.19	43	0.0066	0.0066	0.16	8.90	7.41
	February	0.29	0.018	0.016	146.50	123.72	42	0.0070	0.0059	0.22	18.18	14.00
	March	0.37	0.018	0.015	146.50	115.99	53	0.0070	0.0055	0.19	13.52	13.04
	April	0.26	0.014	0.022	113.94	170.12	48	0.0054	0.0081	0.12	19.75	18.81
	May	0.31	0.017	0.015	138.36	115.99	47	0.0066	0.0055	0.13	27.87	28.12
	June	0.43	0.027	0.032	219.75	247.45	41	0.0104	0.0118	0.33	35.80	31.41
	July	0.32	0.025	0.024	203.47	185.59	33	0.0097	0.0088	0.19	29.16	29.45
	August	0.29	0.016	0.014	130.22	108.26	47	0.0062	0.0051	0.26	30.92	28.79
	September	0.31	0.025	0.026	203.47	201.05	32	0.0097	0.0096	0.31	26.65	25.98
	October	0.31	0.018	0.019	146.50	146.92	45	0.0070	0.0070	0.19	22.88	21.22
	November	0.26	0.018	0.017	146.50	131.46	37	0.0070	0.0063	0.14	24.02	20.59
	December	0.21	0.016	0.016	130.22	123.72	34	0.0062	0.0059	0.27	11.93	10.63
	<b>average</b>	0.30	0.019	0.020	155.32	150.79	42	0.0074	0.0072	0.21	22.47	20.79
CW2	January	0.27	0.015	0.021	122.08	162.39	47	0.0057	0.0076	0.19	9.35	8.60
	February	0.30	0.018	0.020	146.50	154.66	44	0.0068	0.0072	0.16	18.48	17.27
	March	0.35	0.018	0.022	146.50	170.12	51	0.0068	0.0079	0.16	13.39	12.47
	April	0.28	0.037	0.014	301.14	108.26	20	0.0141	0.0051	0.40	18.70	18.40
	May	0.30	0.034	0.029	276.72	224.25	23	0.0129	0.0105	0.40	27.77	28.12
	June	0.41	0.020	0.016	162.78	123.72	54	0.0076	0.0058	0.22	33.06	34.60
	July	0.29	0.038	0.016	309.28	123.72	20	0.0145	0.0058	0.38	28.33	28.24
	August	0.29	0.032	0.022	260.44	170.12	24	0.0122	0.0079	0.31	31.49	29.63
	September	0.30	0.024	0.028	195.33	216.52	33	0.0091	0.0101	0.26	25.14	24.59

October	0.33	0.016	0.012	130.22	92.79	54	0.0061	0.0043	0.15	23.80	22.43
November	0.26	0.015	0.014	122.08	108.26	46	0.0057	0.0051	0.16	23.63	22.52
December	0.22	0.026	0.024	211.61	185.59	22	0.0099	0.0087	0.26	9.67	9.45
<b>average</b>	0.30	0.024	0.020	198.72	153.37	37	0.0093	0.0072	0.25	21.90	21.36

Note: CW1: constructed wetland system with *Zizania latifolia* as the dominant species; CW2: constructed wetland system with *Phragmites communis* as the dominant species. HRT: annual average hydraulic retention time (day); HLR: annual average hydraulic loading rate based on surface area ( $\text{m}^3/\text{m}^2/\text{d}$ ); PLR: annual average COD loading rate based on surface area ( $\text{g}/\text{m}^2/\text{d}$ ); T: temperature.

**Table S2.** Monthly water quality index of two wetland systems.

COD(mg/L)					
Unit	Season	Month	Inlet	Outlet	R (%)
CW1	spring	March	27.17	15.50	42.95
		April	22.35	14.45	35.33
		May	19.29	10.74	44.32
	summer	June	31.25	18.98	39.26
		July	19.69	9.48	51.85
		August	41.65	17.10	58.95
	autumn	September	32.09	19.80	38.30
		October	26.87	16.51	38.57
		November	20.18	15.65	22.45
	winter	December	44.22	39.88	9.83
		January	24.58	19.26	21.64
		February	31.94	23.17	27.46
CW2	spring	March	22.80	17.54	23.07
		April	28.54	19.11	33.04
		May	30.56	18.98	37.89
	summer	June	29.01	16.30	43.81
		July	26.19	15.55	40.63
		August	25.23	15.48	38.64
	autumn	September	28.60	19.48	31.89
		October	24.80	19.81	20.12
		November	27.63	19.88	28.05
	winter	December	26.27	21.59	17.81
		January	32.53	28.23	13.22
		February	23.59	22.76	3.52
TN (mg/L)					
CW1	spring	March	1.44	0.94	34.72
		April	1.35	0.82	39.26
		May	1.11	0.67	39.64
	summer	June	1.21	0.57	52.89
		July	1.22	0.63	47.90
		August	1.05	0.65	38.10
	autumn	September	1.74	0.98	43.68
		October	1.36	0.95	29.91
		November	1.75	0.98	43.97
	winter	December	1.07	0.93	13.08
		January	1.46	1.19	18.49
		February	2.32	1.83	21.12
CW2	spring	March	1.34	0.90	32.84
		April	1.31	0.88	32.82
		May	1.49	0.91	38.93
	summer	June	1.23	0.67	45.53

	autumn	July	1.13	0.71	37.17
		August	1.15	0.66	42.61
		September	1.23	0.88	28.46
		October	1.23	0.90	26.83
	winter	November	1.35	0.92	31.85
		December	1.30	1.18	9.23
		January	1.46	1.28	12.33
		February	1.34	1.21	9.70
TP (mg/L)					
CW1	spring	March	0.25	0.17	32.00
		April	0.21	0.15	28.57
		May	0.20	0.13	35.00
	summer	June	0.23	0.12	49.18
		July	0.22	0.14	36.36
		August	0.35	0.17	52.76
	autumn	September	0.26	0.16	38.46
		October	0.20	0.12	39.92
		November	0.26	0.18	31.48
	winter	December	0.23	0.19	17.39
		January	0.24	0.21	12.50
		February	0.21	0.20	4.76
CW2	spring	March	0.22	0.18	18.18
		April	0.27	0.19	29.63
		May	0.23	0.17	26.09
	summer	June	0.27	0.18	33.33
		July	0.30	0.19	36.67
		August	0.22	0.16	27.27
	autumn	September	0.23	0.17	26.09
		October	0.25	0.18	28.00
		November	0.24	0.17	29.17
	winter	December	0.21	0.20	4.76
		January	0.23	0.22	4.35
		February	0.24	0.21	12.50
NH <sub>4</sub> <sup>+</sup> -N (mg/L)					
CW1	spring	March	0.50	0.29	42.00
		April	0.45	0.31	31.11
		May	0.56	0.37	33.93
	summer	June	0.57	0.30	47.37
		July	0.39	0.20	48.72
		August	0.44	0.21	52.27
	autumn	September	0.58	0.35	39.66
		October	0.53	0.29	45.28
		November	0.55	0.27	50.91
	winter	December	0.44	0.42	4.55

		January	0.72	0.70	2.78
		February	0.38	0.35	7.89
CW2	spring	March	0.45	0.28	37.78
		April	0.33	0.20	39.39
		May	0.43	0.28	34.88
	summer	June	0.44	0.34	22.73
		July	0.47	0.30	36.17
		August	0.30	0.24	20.00
	autumn	September	0.41	0.36	12.20
		October	0.45	0.38	15.56
		November	0.54	0.40	25.93
	winter	December	0.45	0.42	6.67
		January	0.51	0.52	-1.96
		February	0.62	0.58	6.45
pH					
CW1	spring	March	8.02	7.77	-
		April	7.89	7.58	-
		May	7.85	7.63	-
	summer	June	7.74	7.54	-
		July	7.88	7.50	-
		August	7.65	7.36	-
	autumn	September	7.92	7.54	-
		October	7.98	7.38	-
		November	8.12	7.45	-
	winter	December	8.25	8.06	-
		January	8.45	8.00	-
		February	8.30	8.18	-
CW2	spring	March	8.04	7.65	-
		April	8.01	7.45	-
		May	7.77	7.52	-
	summer	June	7.89	7.56	-
		July	7.92	7.44	-
		August	7.28	7.26	-
	autumn	September	7.85	7.77	-
		October	7.65	7.68	-
		November	8.02	7.90	-
	winter	December	8.34	8.08	-
		January	8.48	8.03	-
		February	8.56	8.06	-

Note: Treatment units CW1 and CW2 refer to the constructed wetlands defined in Table S1. COD: chemical oxygen demand; TN: total nitrogen; TP: total phosphorus;  $\text{NH}_4^+\text{-N}$ : ammonia nitrogen; R: removal rates.

**Table S3.** Plant richness, diversity and evenness indexes for each season.

Index	Season	Unit	
		CW1	CW2
Margalef (richness)	Spring	5.06	5.37
	Summer	5.47	5.54
	Autumn	4.65	4.14
	Winter	2.78	3.19
Simpson (diversity)	Spring	0.80	0.82
	Summer	0.89	0.81
	Autumn	0.76	0.75
	Winter	0.62	0.66
Shannon-Wiener (diversity)	Spring	2.54	2.80
	Summer	2.85	2.24
	Autumn	1.74	1.58
	Winter	1.24	1.17
Pielou (evenness)	Spring	0.80	0.77
	Summer	0.86	0.80
	Autumn	0.67	0.53
	Winter	0.38	0.40

Note: Treatment units CW1 and CW2 refer to the constructed wetlands defined in Table S1.

**Table S4.** Pollutant concentration of the water samples collected at the sites where the sediment samples were taken.

Unit	Sample site	COD (mg/L)	TN (mg/L)	TP (mg/L)	NH <sub>4</sub> <sup>+</sup> -N(mg/L)
CW1 <sub>in</sub>	1	39.03	1.59	0.18	0.28
	2	42.15	1.49	0.20	0.31
	3	34.28	1.82	0.21	0.30
	4	31.35	1.52	0.19	0.29
	5	32.96	1.70	0.21	0.32
	6	32.47	1.86	0.19	0.33
CW1 <sub>out</sub>	1	23.78	0.76	0.14	0.19
	2	29.03	0.66	0.13	0.18
	3	29.68	0.58	0.14	0.20
	4	23.29	0.66	0.14	0.18
	5	20.50	0.70	0.17	0.22
	6	21.98	0.56	0.16	0.16
CW2 <sub>in</sub>	1	47.23	1.29	0.29	0.42
	2	37.06	1.49	0.30	0.40
	3	35.26	1.13	0.26	0.40
	4	43.62	1.10	0.24	0.45
	5	47.89	1.20	0.24	0.38
	6	45.59	1.26	0.21	0.38
CW2 <sub>out</sub>	1	16.24	0.95	0.19	0.33
	2	18.37	0.86	0.13	0.18
	3	19.02	0.93	0.20	0.26
	4	22.14	0.78	0.23	0.30
	5	20.17	0.72	0.21	0.20
	6	25.91	0.86	0.22	0.24

Note: Treatment units CW1 and CW2 refer to the constructed wetlands defined in Table S1. COD, TN, TP and NH<sub>4</sub><sup>+</sup>-N refer to the constructed wetlands defined in Table S1.