Appendix:

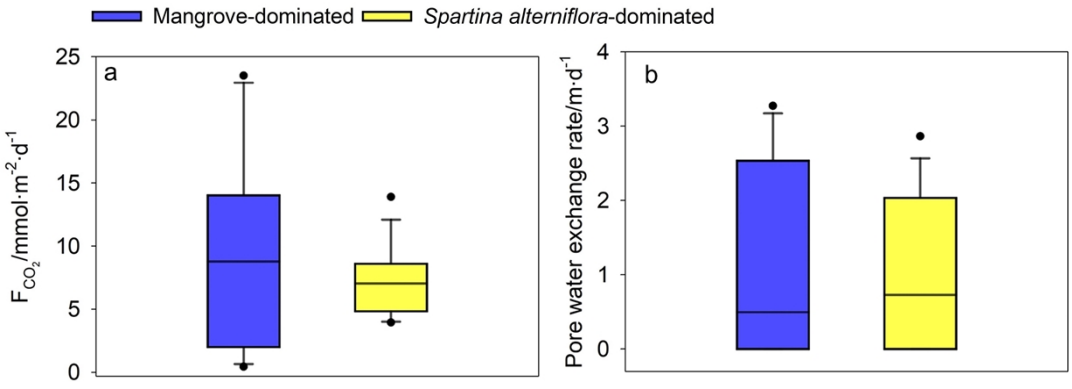

Fig. S1. Pore water exchange rates and CO_2 emission in mangrove-dominated and *Spartina alterniflora*-dominated creeks in the dry season in the ecozone.

Text S1 Error calculation

For a function, $F = f(x_1, x_2, .., x_n)$, the error in F caused by errors in x_i (i = 1, 2, …, n) can be estimated using error propagation (Taylor, 1997),

$$\delta_F = \sqrt{\sum_{i=1}^{n} \left(\frac{\partial F}{\partial x_i} \cdot \delta_{x_i}\right)^2}. \quad \text{(S1)}$$

where δ_F is the error for F and δx_i is the error for x_i.

Table S1. Sampling information and parameters at Stations TS1 and TS2

Season	ID	Time	Temperature/℃)	Salinity	Depth/m	Wind speed/m	^{222}Rn/Bq·m^{-3}	^{226}Ra/ dpm·100L^{-1}	^{228}Ra/ dpm·100L^{-1}	DIC/μmol·L^{-1}	TA/μmol·L^{-1}	DOC/μmol·L^{-1}	pCO_2/μatm
	TS1-1	2018.9.3 11:30	31.2	3.0	0.2	0.3	333	41	170	1808	1634	413	6075
	TS1-2	2018.9.3 13:30	33.8	3.1	0.7	1.3	267	54	285	1782	1615	468	4137
	TS1-3	2018.9.3 15:30	35.3	3.3	1.3	0.9	267	29	98	2044	2004	407	2854
	TS1-4	2018.9.3 17:30	31.2	3.4	2.4	2.1	233	32	109	948	902	247	1822
	TS1-5	2018.9.3 19:30	29.2	3.9	2.7	1.4	187	29	108	923	882	268	2024
	TS1-6	2018.9.3 21:30	31.0	3.4	1.8	0	233	33	112	1123	1113	273	2039
Wet Season	TS1-7	2018.9.3 23:30	31.8	4.5	1.0	1.0	233	46	193	1563	1508	346	2452
	TS1-8	2018.9.4 01:30	25.2	8.2	0.9	0.8	233	51	236	1661	1507	318	5003
	TS1-9	2018.9.4 03:30	28.9	2.0	1.5	1.3	300	42	175	1013	939	304	3020
	TS1-10	2018.9.4	28.6	4.5	2.6	1.1	267	38	120	991	948	230	1845

		05:30											
	TS1-11	2018.9.4	29.1	4.8	2.6	1.7		31	91	1029	984	265	1951
		07:30					167						
	TS1-12	2018.9.4	30.0	4.1	1.7	1.9		38	153	1183	1114	267	2348
		09:30					267						
	TS1-1	2019.3.9	16.0	6.7	0.2	0.9	603	-	-	1500	1316	629	3531
		8:00											
	TS1-2	2019.3.9	16.0	5.2	0.4	1.2	667	-	-	1315	1146	590	4114
		10:00											
	TS1-3	2019.3.9	16.5	7.3	1.6	1.8	730	-	-	1463	1346	544	3341
		12:00											
	TS1-4	2019.3.9	17.0	11.2	2.6	2.1	320	-	-	1539	1486	319	2009
		14:00											
	TS1-5	2019.3.9	17.2	11.1	2.4	1.3	160	-	-	1529	1486	276	1878
Dry		16:00											
Season	TS1-6	2019.3.9	16.5	8.6	1.2	0.5	763	-	-	1470	1367	405	2813
		18:00											
	TS1-7	2019.3.9	17.0	1.9	0.5	0.9	990	-	-	1099	895	698	4940
		20:00											
	TS1-8	2019.3.9	17.1	2.7	0.3	1.5	827	-	-	1227	1027	648	4886

	22:00											
TS1-9	2019.3.10 00:00	17.6	2.5	1.4	0.4	860	-	-	1351	1221	288	3624
TS1-10	2019.3.10 02:00	18.0	4.0	2.3	0.3	607	-	-	1354	1239	295	3189
TS1-11	2019.3.10 04:00	17.7	6.7	2.5	1.5	317	-	-	1395	1311	256	2468
TS1-12	2019.3.10 06:00	17.5	4.3	1.7	0.8	573	-	-	1387	1260	355	3580
TS2-1	2019.3.10 15:40	17.2	7.8	3.3	1.2	287	31	109	1446	1400	244	1558
TS2-2	2019.3.10 17:40	17.5	6.0	2.4	1.2	510	28	106	1418	1365	273	1637
TS2-3	2019.3.10 19:40	17.4	6.0	1.5	1.2	503	32	124	1490	1396	284	2551
TS2-4	2019.3.10 21:40	17.7	4.5	0.7	1.2	760	39	154	1853	1687	490	4251
TS2-5	2019.3.10 23:40	17.2	1.3	1.2	1.2	413	29	66	1067	962	268	2585

Dry Season	TS2-6	2019.3.11 01:40	17.3	4.4	2.1	1.2	493	31	107	1339	1273	247	1848
	TS2-7	2019.3.11 03:40	17.1	9.3	3.4	1.2	317	29	85	1462	1419	230	1517
	TS2-8	2019.3.11 05:40	17.2	4.5	2.6	1.2	383	25	75	1328	1245	263	2192
	TS2-9	2019.3.11 07:40	17.2	4.1	1.6	1.2	507	29	96	1401	1304	298	2524
	TS2-10	2019.3.11 09:40	17.4	6.4	0.9	1.2	347	41	160	1700	1590	375	2964
	TS2-11	2019.3.11 11:40	17.8	5.5	1.3	1.2	693	37	138	1114	1041	295	1972
	TS2-12	2019.3.11 13:40	18.3	6.2	2.3	1.2	440	33	116	1405	1357	245	1584
	TS2-13	2019.3.11 15:40	18.1	9.2	3.4	1.2	227	31	102	1459	1425	229	1393

Table S2. Errors calculated with error propagation for the pore water exchange rate, taking the maximum rate in each model as an example

Pore water exchange rate/cm·d^{-1}	^{222}Rn model	δ-$^{222}Rn_{PW}$	δ-$^{228}Ra_{PW}$	δ-S_{PW}	δ-$^{228}Ra_{R}$	δ-S_{R}	δ-$^{222}Rn_{SW}$	δ-$^{228}Ra_{SW}$	δ-S_{SW}	δ-$^{222}Rn_{Creek\ av}$	δ-$^{222}Rn_{Creek}$	δ-total
	TS1-9-^{222}Rn (wet)	3.21	0.40	0.11	0.03	0.08	3.22	0.03	0.04	1.32	27.0	27.5
	TS1-9-^{222}Rn (dry)	10.4	2.01	0.38	0.06	0.22	4.20	0.04	0.06	2.72	47.7	49.2
	TS2-10-^{222}Rn (dry)	8.29	3.62	1.61	0.51	0.93	4.92	0.10	0.53	3.61	50.1	51.4
	^{228}Ra model	δ-$^{228}Ra_{PW}$	δ-S_{PW}	δ-$^{228}Ra_{R}$	δ-S_{R}	δ-$^{228}Ra_{SW}$	δ-S_{SW}	δ-$^{228}Ra_{Creek\ av}$	δ-$^{228}Ra_{Creek}$	δ-total	-	-
	TS1-12-^{228}Ra (wet)	20.7	0.22	0.01	0.08	2.08	0.01	0.42	0.04	20.8	-	-

Note: "Wet" and "dry" represents the wet season and the dry season respectively. δ-x represents the uncertainty resulting from the uncertainty in x. C is the concentration of carbon. The subscript "$_R$" represents river endmember, "$_{SW}$"— sea water endmember, "$_{PW}$"— pore water endmember, "$_{creek}$"— creek water, and "$_{av}$"— daily average concentration.

Table S3. Errors calculated with error propagation for the pore water exchange-derived carbon fluxes

Pore water exchange-derived carbon/mol·m^{-2}·d^{-1}	Carbon species	δ-*Rate*	δ-C_{PW}	δ-C_{Creek}	δ-total
	TS1-DIC (wet)	0.82	0.31	0.01	0.99
	TS1-DIC (dry)	1.14	0.59	0.24	1.31
	TS2-DIC (dry)	1.04	0.55	0.40	1.22
	TS1-DOC (wet)	0.82	0.66	0.17	1.07
	TS1-DOC (dry)	1.14	1.05	0.99	1.82
	TS2-DOC (dry)	1.04	1.22	0.69	1.75

Note: "Wet" and "dry" represents the wet season and the dry season respectively. δ-*Rate,* δ-C_{PW} and δ-C_{Creek} are the standard deviations of pore water exchange rate, concentration of carbon in the pore water and concentration of carbon in the tidal creek water, respectively.

References

Taylor JR (1997) An Introduction to Error Analysis. University Science Books, Sausalito.