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4 **Introduction**

5 The supplementary information contains Tables S1-S2 and Figures S1-S2. Table S1 presents
6 the parameters for models in load estimator for simulating carbon fluxes in the Shaliu River.
7 Table S2 shows the river water properties in the Shaliu River. Figure S1 provides the
8 concentrations of different forms of carbon and the relationship between dissolved inorganic
9 carbon and cation concentration. Figure S2 shows the spatial-temporal variations of riverine
10 carbon along the Shaliu River.

11 **Table S1.** Coefficients (\pm SD) and R^2 values for model 1 and model 9 in load estimator (LOADEST) for simulating carbon fluxes in the Shaliu
 12 River.

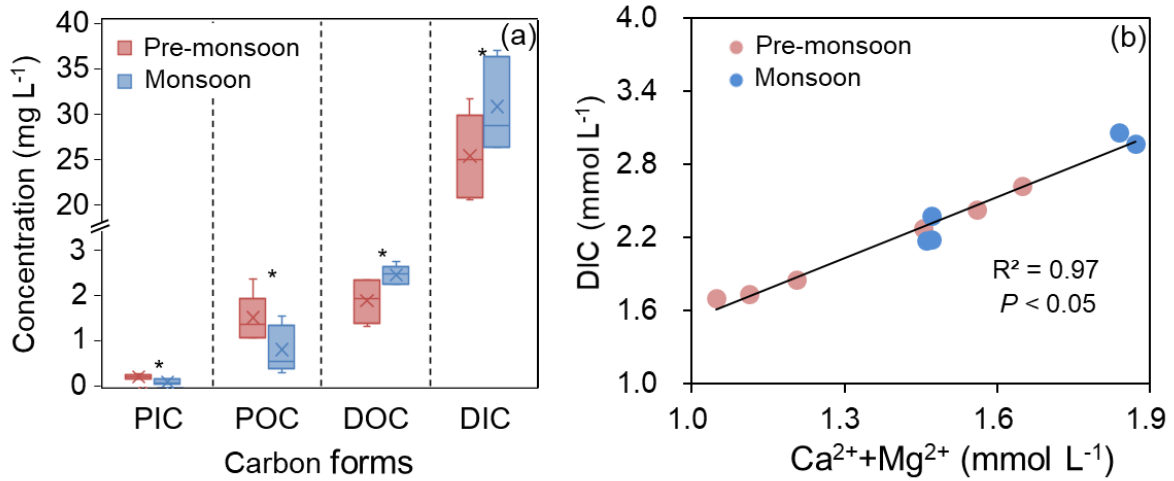
	R^2	a_0	a_1	a_2	a_3	a_4	a_5	a_6
DOC	0.9894	6.4648 ± 0.0318	0.9595 ± 0.0212					
DIC	0.9955	8.6819 ± 0.1734	0.8616 ± 0.0509	0.0066 ± 0.0169	-0.1742 ± 0.1156	0.6415 ± 0.1805	0.1773 ± 0.1263	5.1433 ± 1.7183

13 Note: model 1, $\ln(\text{DOC flux}) = a_0 + a_1 \ln Q$; model 9, $\ln(\text{DIC flux}) = a_0 + a_1 \ln Q + a_2 \ln Q^2 + a_3 \sin(2\pi \text{dtime}) + a_4 \cos(2\pi \text{dtime}) + a_5 \text{dtime} + a_6$
 14 dtime^2 ; flux in kg day^{-1} , Q in $\text{ft}^3 \text{s}^{-1}$, $\ln Q = \ln(\text{streamflow}) - \text{center of } \ln(\text{streamflow})$, $\text{dtime} = \text{decimal} - \text{center of decimal time}$.

15 **Table S2.** River water properties along the Shaliu River.

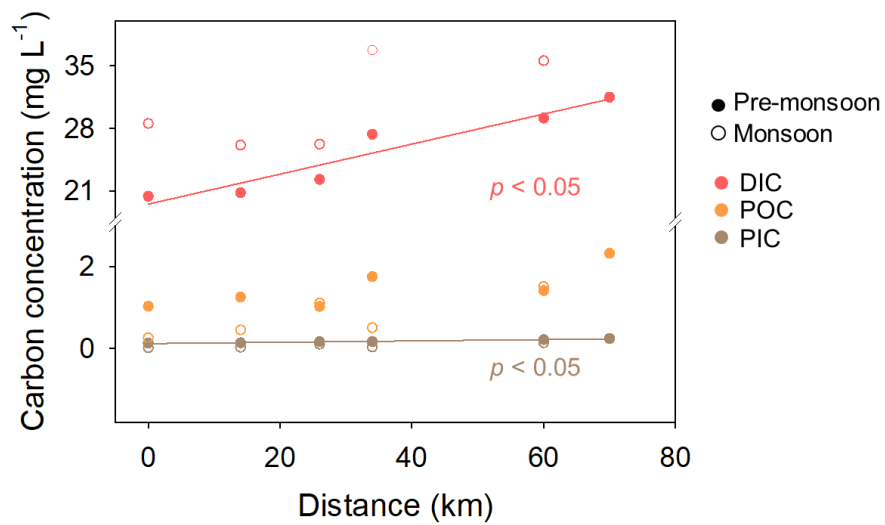
Sample	Lat.	Long.	E	T	pH	Cond.	DO	TSS	DIN	DON	Carbon content (POC)	DOC/POC	DOC/DON
	(°N)	(°E)	(m a.s.l.)	(°C)		($\mu\text{s cm}^{-1}$)		(mg L ⁻¹)			(%)		
Pre-monsoon season (May, 2015)													
SLH-0	37.73	99.78	3846	10.4	8.5	369	6.2	13.2	NA	NA	7.80	1.25	NA
SLH-1	37.66	99.89	3678	8.2	8.4	267	6.4	15.2	NA	NA	8.29	1.09	NA
SLH-2	37.60	100.00	3553	8.8	8.5	302	6.1	18.6	NA	NA	5.54	1.74	NA
SLH-3	37.55	100.06	3485	7.7	8.4	417	6.8	23.4	NA	NA	7.48	1.14	NA
SLH-4	37.33	100.12	3293	11.5	8.4	355	6.6	25.8	NA	NA	5.47	1.63	NA
SLH-5	37.25	100.19	3243	12.9	8.2	342	5.9	33.4	NA	NA	6.98	0.99	NA
Mean				9.9a	8.4a	342a	6.3a	21.6a	NA	NA	6.92a	1.31b	NA
Monsoon season (August, 2015)													
SLH-0	37.73	99.78	3846	8.8	7.6	339	5.3	5.2	0.8	0.3	5.00	9.39	10.9
SLH-1	37.66	99.89	3678	10.0	7.7	305	5.3	6.2	1.2	0.4	7.26	4.89	6.8
SLH-2	37.60	100.00	3553	9.3	7.5	313	5.8	22.4	1.5	0.4	4.96	2.43	7.3
SLH-3	37.55	100.06	3485	8.0	7.5	377	5.9	9.8	3.0	0.5	5.20	4.32	5.2
SLH-4	37.33	100.12	3293	17.9	8.4	355	4.4	26.8	1.6	0.3	5.63	1.63	10.5
Mean				10.8a	7.7b	338a	5.3b	14.1a	1.6	0.4	5.61b	4.54a	8.2

16 Different lowercase letters indicate significant differences between the pre-monsoon and monsoon seasons ($p < 0.05$). Lat., Latitude; Long.,
 17 Longitude; E, elevation; T, water temperature; Cond., conductivity; DO, dissolved oxygen; TSS, total suspended solid; DOC, dissolved
 18 organic carbon; POC, particulate organic carbon; DIN, dissolved inorganic nitrogen; DON, dissolved organic nitrogen; DOC/POC, ratio of
 19 DOC to POC; DOC/DON, the atomic ratio of DOC to DON; a.s.l., above sea level; NA, not analyzed.



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Figure S1. Concentrations of particulate inorganic carbon (PIC), particulate organic carbon (POC), dissolved organic carbon (DOC) and dissolved inorganic carbon (DIC) in the Shaliu River (a); Relationship between DIC and cation ($\text{Mg}^{2+} + \text{Ca}^{2+}$) concentrations during pre-monsoon and monsoon seasons (b). The solid bar and cross in the box mark the median and mean of each data set, respectively. The upper and lower ends of boxes denote the 0.25 and 0.75 percentiles, respectively. Asterisks indicate significant differences between the pre-monsoon and monsoon seasons (Independent sample t tests, $p < 0.05$). The black line in (b) indicate the linear regression between DIC and cation concentrations in both seasons ($p < 0.05$).



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 32 **Figure S2.** The spatial-temporal variation of dissolved inorganic carbon (DIC), particulate
 33 organic carbon (POC) and particulate inorganic carbon (PIC) in Shaliu River in pre-monsoon
 34 and monsoon seasons in 2015. The abscissa means the distance of the sampling sites from
 35 SLH-0. The red and brown lines correspond to the linear regression of data ($p < 0.05$),
 36 respectively.