

Supplementary information:

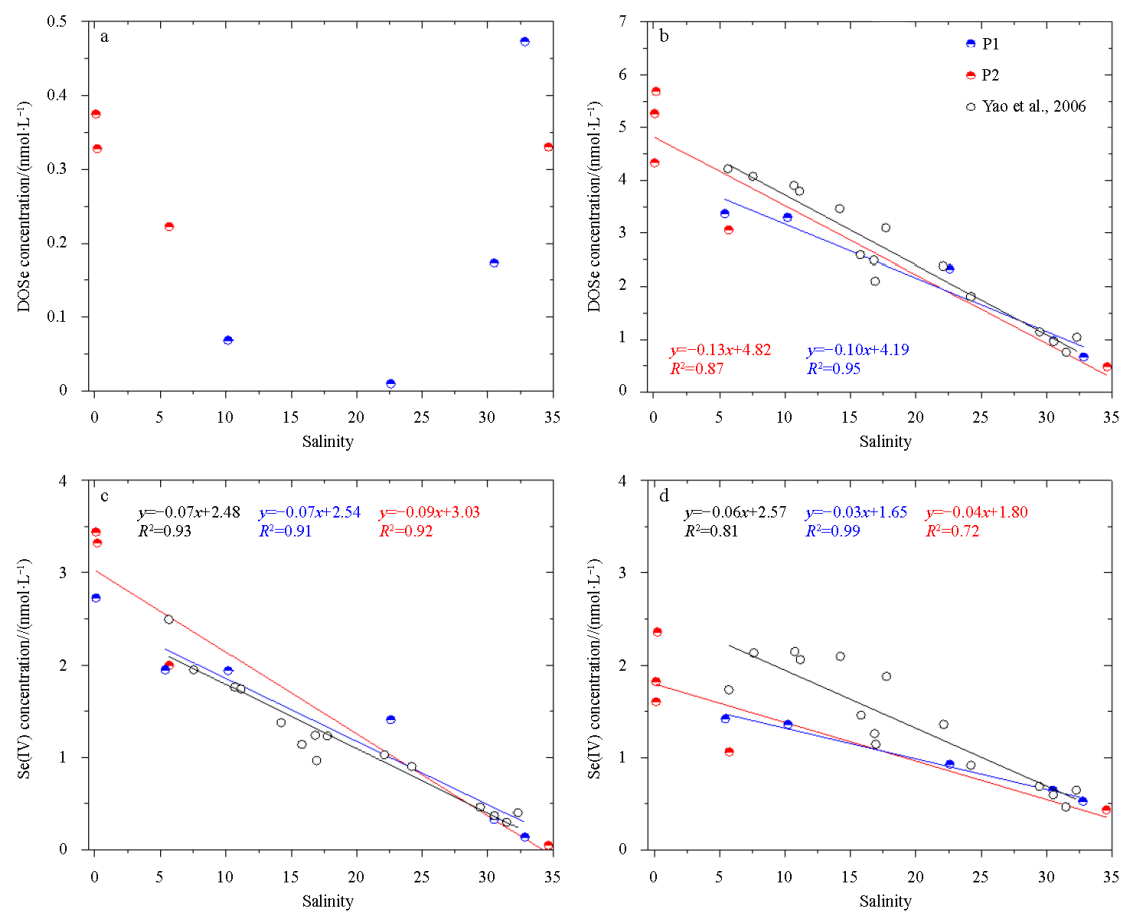


Fig. S1. Distribution of DOSe (a), DISe (b), Se(IV) (c), Se(VI) (d) concentrations along the salinity gradient in the Zhujiang River Estuary during P1 (blue dots) and P2 (red dots). The black dots represented data from Yao et al. (2006).

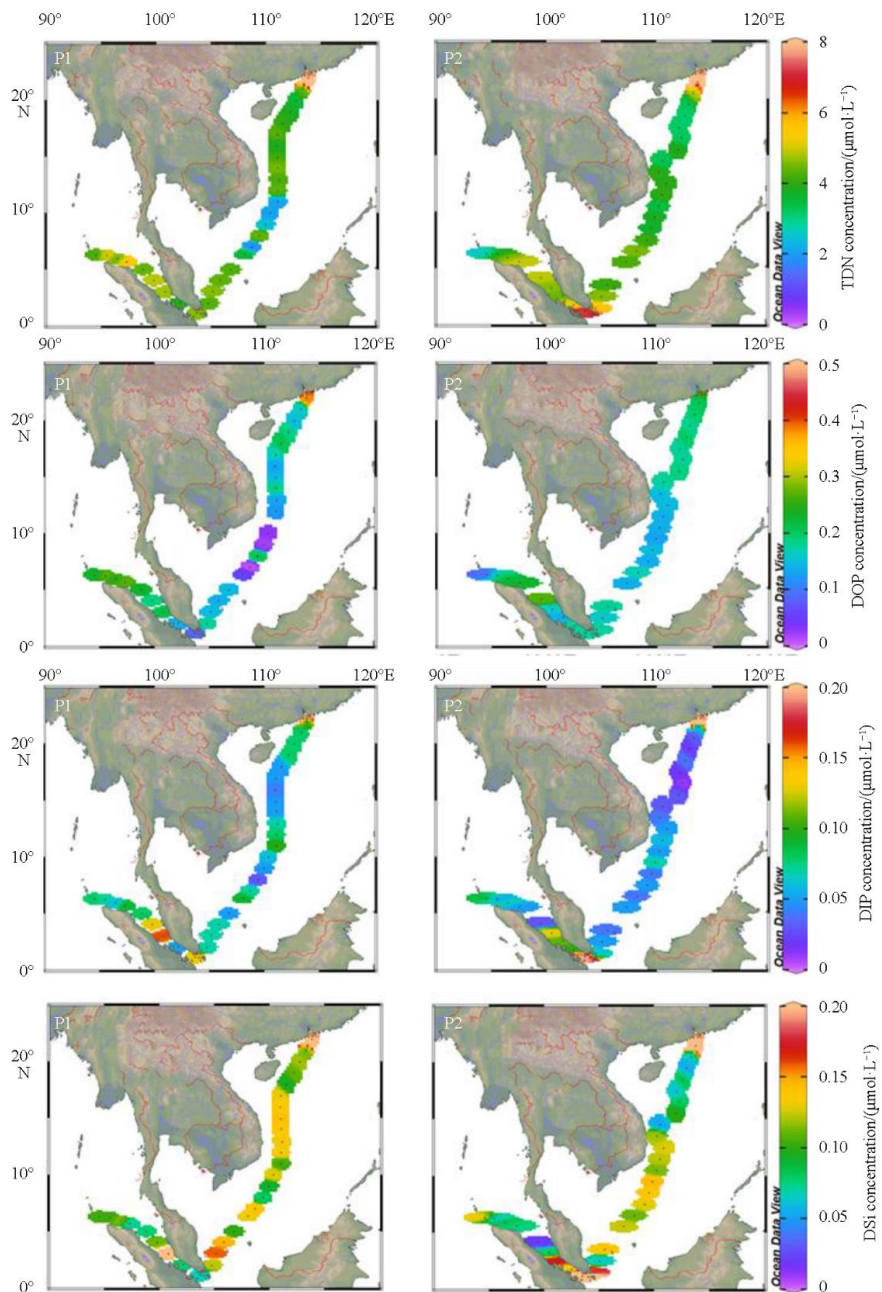


Fig. S2. Surface TDN, DOP, DIP and DSi concentrations of the Zhujiang River Estuary, South China Sea and Malacca Straits during March (P1) and May (P2) 2018.

Table S1. The correlations between Se species and nutrients in the Zhujiang River Estuary (ZRE), Malacca Straits (MS), northern South China Sea (NSCS) and southern South China Sea (SSCS)

Locations	Parameters	TDSe	DOSe	DISe	Se(IV)	Se(VI)
ZRE (n=9)	TDN	0.915**	0.168	0.910**	0.860**	0.971**
	DOP	0.414	0.106	0.397	0.306	0.564
	DIP	0.960**	0.224	0.950**	0.924**	0.962**
	DSi	0.884**	0.148	0.905**	0.904**	0.869**
MS (n=17)	TDN	0.349	0.338	-0.127	0.507*	-0.342
	DOP	0.430	0.487*	-0.388	-0.095	-0.351
	DIP	0.366	0.272	0.136	0.482*	-0.066
	DSi	0.233	0.104	0.313	0.659**	0.038
NSCS (n=20)	TDN	0.037	-0.009	0.248	-0.066	0.235
	DOP	-0.025	0.011	-0.194	-0.396	0.112
	DIP	0.087	-0.003	0.483*	-0.301	0.572**
	DSi	0.103	0.033	0.367	0.230	0.131
SSCS (n=21)	TDN	0.545*	0.527*	0.348	0.713**	-0.041
	DOP	0.680**	0.651**	0.491*	0.598**	0.164
	DIP	-0.388	-0.402	-0.142	-0.026	-0.121
	DSi	-0.146	-0.144	-0.080	-0.205	0.031

Note: *. Correlation is significant at the 0.05 level. **. Correlation is significant at the 0.01 level.

Table S2. The correlations between Se species and nutrients in the northern South China Sea (NSCS) and southern South China Sea (SSCS) during P1 (March) and P2 (May) 2018

Locations	Parameters	DOSe		Se(IV)		Se(VI)	
		P1	P2	P1	P2	P1	P2
NSCS	TDN	-0.422	0.288	0.214	-0.182	0.220	-0.061
	DOP	0.085	-0.029	-0.303	-0.648*	0.036	0.777**
	DIP	-0.297	0.306	-0.700*	-0.275	0.589	0.221
	DSi	-0.084	-0.034	0.848**	0.131	-0.476	-0.202
SSCS	TDN	0.693*	-0.399	0.739**	0.554	0.244	-0.768**
	DOP	0.823**	-0.609	0.608	0.517	0.379	-0.625
	DIP	-0.344	0.460	0.248	-0.122	-0.269	0.160
	DSi	-0.406	-0.206	-0.183	-0.449	-0.119	0.304

Note: *. Correlation is significant at the 0.05 level. **. Correlation is significant at the 0.01 level.