Supplementary material

Table S1. Absorption coefficients of CDOM at typical wavelengths and the spectral slope coefficient between 300 nm and 500 nm. S and B denote surface and bottom, respectively.

Station	Absorption coefficients (m^{-1})							$S_{300\sim500}$ (nm^{-1})
	a_{254}	a_{325}	a_{330}	a_{350}	a_{355}	a_{412}	a_{450}	
				August 2015				
M01-S	12.86	4.70	4.35	3.18	2.95	1.09	0.63	0.0162
M01-B	12.32	4.60	4.27	3.21	3.00	1.16	0.72	0.0153
M02-S	10.04	3.40	3.09	2.19	2.03	0.70	0.38	0.0179
M02-B	9.39	3.23	2.96	2.12	1.95	0.69	0.38	0.0176
M03-S	8.60	2.83	2.56	1.80	1.64	0.55	0.29	0.0187
M03-B	5.35	1.81	1.65	1.18	1.10	0.38	0.19	0.0174
M04-S	9.17	3.02	2.74	1.89	1.73	0.58	0.31	0.0189
M04-B	8.71	2.89	2.61	1.82	1.67	0.57	0.31	0.0187
M05-S	6.04	1.95	1.78	1.22	1.11	0.36	0.18	0.0193
M05-B	6.60	2.18	1.99	1.38	1.27	0.41	0.22	0.0188
M06-S	5.78	1.82	1.66	1.16	1.05	0.34	0.17	0.0192
M06-B	4.07	1.29	1.19	0.84	0.77	0.27	0.14	0.0181
M07-S	6.81	2.10	1.91	1.33	1.22	0.42	0.21	0.0189
M07-B	4.17	1.26	1.15	0.81	0.74	0.26	0.13	0.0185
M08-S	5.86	1.80	1.63	1.13	1.03	0.36	0.19	0.0191
M08-B	5.12	1.58	1.44	1.00	0.91	0.32	0.17	0.0188
M09-S	4.52	1.45	1.33	0.96	0.89	0.38	0.23	0.0161
M09-B	3.18	0.92	0.85	0.59	0.53	0.20	0.10	0.0181
M10-S	4.41	1.25	1.12	0.76	0.69	0.24	0.12	0.0200
M10-B	2.29	0.61	0.56	0.38	0.34	0.14	0.06	0.0188
W01-S	5.36	1.70	1.56	1.08	0.98	0.34	0.17	0.0191
W01-B	5.93	1.91	1.73	1.20	1.10	0.37	0.19	0.0191
W02-S	6.22	1.93	1.76	1.21	1.11	0.37	0.19	0.0192
W02-B	4.67	1.47	1.34	0.93	0.85	0.28	0.15	0.0190
W03-S	4.89	1.50	1.35	0.95	0.86	0.31	0.16	0.0186
W03-B	4.29	1.29	1.17	0.82	0.74	0.25	0.12	0.0192
W04-S	4.02	1.17	1.07	0.73	0.66	0.23	0.11	0.0200
W04-B	3.88	1.15	1.04	0.71	0.64	0.23	0.11	0.0196
E01-S	6.16	2.19	2.02	1.50	1.39	0.60	0.43	0.0152
E01-B	7.12	2.29	2.09	1.48	1.34	0.45	0.23	0.0187
E02-S	5.15	1.60	1.45	1.02	0.93	0.33	0.17	0.0186
E02-B	4.47	1.36	1.24	0.86	0.79	0.27	0.14	0.0189
E03-S	6.01	2.20	2.04	1.59	1.49	0.87	0.69	0.0120
E03-B	2.50	0.70	0.63	0.45	0.41	0.16	0.08	0.0178

E04-S	3.98	1.18	1.08	0.74	0.66	0.24	0.12	0.0191
E04-B	3.23	1.02	0.94	0.69	0.64	0.29	0.18	0.0153
				November 2015				
M01-S	8.00	2.93	2.68	1.96	1.82	0.73	0.43	0.0159
M01-B	NA	NA	NA	NA	NA	NA	NA	NA
M02-S	10.08	3.65	3.35	2.45	2.28	0.87	0.51	0.0164
M02-B	10.61	3.72	3.40	2.45	2.25	0.81	0.45	0.0174
M03-S	8.01	2.76	2.51	1.77	1.63	0.59	0.34	0.0179
M03-B	7.44	2.54	2.30	1.62	1.50	0.55	0.32	0.0178
M04-S	5.70	1.86	1.67	1.17	1.08	0.37	0.20	0.0187
M04-B	5.21	1.68	1.52	1.06	0.98	0.34	0.19	0.0188
M05-S	6.24	2.06	1.86	1.31	1.19	0.37	0.16	0.0195
M05-B	6.27	2.15	1.93	1.38	1.26	0.44	0.24	0.0179
M06-S	4.48	1.54	1.40	1.00	0.93	0.33	0.18	0.0177
M06-B	4.37	1.34	1.20	0.87	0.79	0.24	0.12	0.0192
M07-S	4.25	1.29	1.17	0.85	0.77	0.26	0.13	0.0187
M07-B	4.23	1.26	1.13	0.83	0.77	0.26	0.14	0.0180
M08-S	4.24	1.40	1.26	0.90	0.82	0.30	0.16	0.0180
M08-B	3.63	1.14	1.03	0.76	0.69	0.25	0.14	0.0176
M09-S	3.86	1.21	1.09	0.78	0.72	0.24	0.12	0.0188
M09-B	3.12	0.93	0.83	0.60	0.56	0.18	0.09	0.0186
M10-S	2.59	0.60	0.54	0.37	0.34	0.08	0.004	0.0233
M10-B	1.90	0.47	0.43	0.31	0.30	0.11	0.06	0.0165
W01-S	4.07	1.32	1.18	0.84	0.77	0.26	0.14	0.0187
W01-B	3.58	1.15	1.04	0.74	0.67	0.23	0.12	0.0188
W02-S	3.97	1.26	1.13	0.81	0.74	0.26	0.14	0.0186
W02-B	4.17	1.33	1.22	0.88	0.80	0.29	0.16	0.0178
W03-S	4.52	1.39	1.26	0.90	0.82	0.28	0.15	0.0188
W03-B	4.11	1.26	1.13	0.82	0.74	0.25	0.13	0.0189
W04-S	3.56	1.03	0.92	0.67	0.61	0.20	0.10	0.0191
W04-B	3.59	1.03	0.93	0.66	0.61	0.20	0.09	0.0190
E01-S	5.65	1.83	1.65	1.16	1.05	0.35	0.18	0.0192
E01-B	5.30	1.70	1.53	1.09	1.00	0.32	0.17	0.0190
E02-S	4.58	1.37	1.24	0.89	0.80	0.28	0.15	0.0188
E02-B	3.33	0.97	0.87	0.64	0.58	0.18	0.08	0.0192
E03-S	3.44	1.09	0.99	0.72	0.67	0.21	0.10	0.0185
E03-B	2.50	0.68	0.63	0.46	0.42	0.12	0.05	0.0192
E04-S	3.36	0.98	0.88	0.63	0.58	0.18	0.08	0.0192
E04-B	2.16	0.55	0.49	0.36	0.34	0.11	0.04	0.0186
				January 2016				
M01-S	12.61	4.34	3.98	2.86	2.64	1.00	0.57	0.0170
M01-B	13.13	4.49	4.11	2.96	2.72	1.02	0.59	0.0171

M02-S	10.83	3.64	3.33	2.40	2.20	0.81	0.46	0.0174
M02-B	12.24	4.18	3.82	2.77	2.56	0.97	0.57	0.0168
M03-S	6.66	2.17	1.95	1.40	1.30	0.42	0.23	0.0185
M03-B	6.22	1.98	1.80	1.31	1.20	0.39	0.21	0.0187
M04-S	5.59	1.77	1.61	1.15	1.07	0.36	0.20	0.0185
M04-B	4.97	1.56	1.41	1.01	0.93	0.31	0.17	0.0188
M05-S	4.40	1.38	1.25	0.88	0.81	0.29	0.17	0.0184
M05-B	4.94	1.47	1.32	0.93	0.85	0.28	0.15	0.0195
M06-S	3.65	1.26	1.15	0.89	0.83	0.40	0.29	0.0136
M06-B	3.80	1.09	0.98	0.69	0.62	0.20	0.09	0.0200
M07-S	3.24	0.84	0.77	0.51	0.46	0.11	0.02	0.0230
M07-B	3.04	0.83	0.75	0.52	0.48	0.15	0.08	0.0198
M08-S	3.07	0.85	0.77	0.52	0.48	0.12	0.05	0.0211
M08-B	3.25	0.91	0.82	0.56	0.51	0.14	0.07	0.0205
M09-S	2.19	0.54	0.47	0.32	0.29	0.05	0.01	0.0232
M09-B	2.46	0.62	0.56	0.39	0.36	0.11	0.06	0.0193
M10-S	1.63	0.32	0.29	0.19	0.18	0.05	0.01	0.0229
M10-B	1.88	0.36	0.33	0.20	0.19	0.01	0.003	0.0265
W01-S	6.52	2.21	2.03	1.45	1.33	0.55	0.36	0.0163
W01-B	4.08	1.36	1.24	0.90	0.83	0.32	0.19	0.0173
W02-S	4.18	1.28	1.16	0.82	0.74	0.26	0.14	0.0189
W02-B	4.25	1.36	1.24	0.89	0.82	0.32	0.19	0.0173
W03-S	4.54	1.34	1.20	0.83	0.75	0.26	0.14	0.0194
W03-B	4.30	1.27	1.14	0.80	0.72	0.24	0.13	0.0194
W04-S	2.73	0.75	0.68	0.47	0.42	0.09	0.03	0.0215
W04-B	2.91	0.78	0.71	0.51	0.48	0.15	0.08	0.0185
E01-S	5.29	1.59	1.43	1.02	0.94	0.30	0.17	0.0191
E01-B	6.16	1.84	1.67	1.19	1.10	0.36	0.19	0.0190
E02-S	3.28	0.81	0.74	0.52	0.46	0.17	0.09	0.0190
E02-B	2.54	0.51	0.45	0.26	0.23	0.04	0.005	0.0308
E03-S	2.16	0.49	0.47	0.29	0.25	0.03	0.01	0.0250
E03-B	2.48	0.66	0.61	0.43	0.40	0.13	0.07	0.0179
E04-S	1.69	0.35	0.31	0.22	0.20	0.05	0.02	0.0211
E04-B	1.68	0.35	0.33	0.23	0.21	0.05	0.02	0.0209

Table S2. Linear correlation coefficients of determination (R^2) among the five PARAFAC components.

	C1	C2	C3	C4	C5
C1	1.000				
C2	0.781	1.000			
C3	0.843	0.981	1.000		
C4	0.750	0.987	0.958	1.000	
C5	0.994	0.821	0.873	0.790	1.000

Table S3. Percent decrease of each quantitative DOM variable per unit of salinity increase across the saltier zone calculated from the linear regression equations listed in Table 4. To be consistent for this calculation, the salinity range for the saltier zone was assume a fixed span from 1 to 33, though the real range could vary depending on variable and season (Figures 3 and 4). N/A: not applicable.

	Percent decrease per unit of salinity increase				
Month	DOC	a_{330}	C3	C1+C5	C2+C4
Aug.	1.1	2.2	2.3	2.5	2.7
Nov.	N/A	2.0	2.6	2.5	2.7
Jan.	0.9	2.6	2.5	2.7	2.8

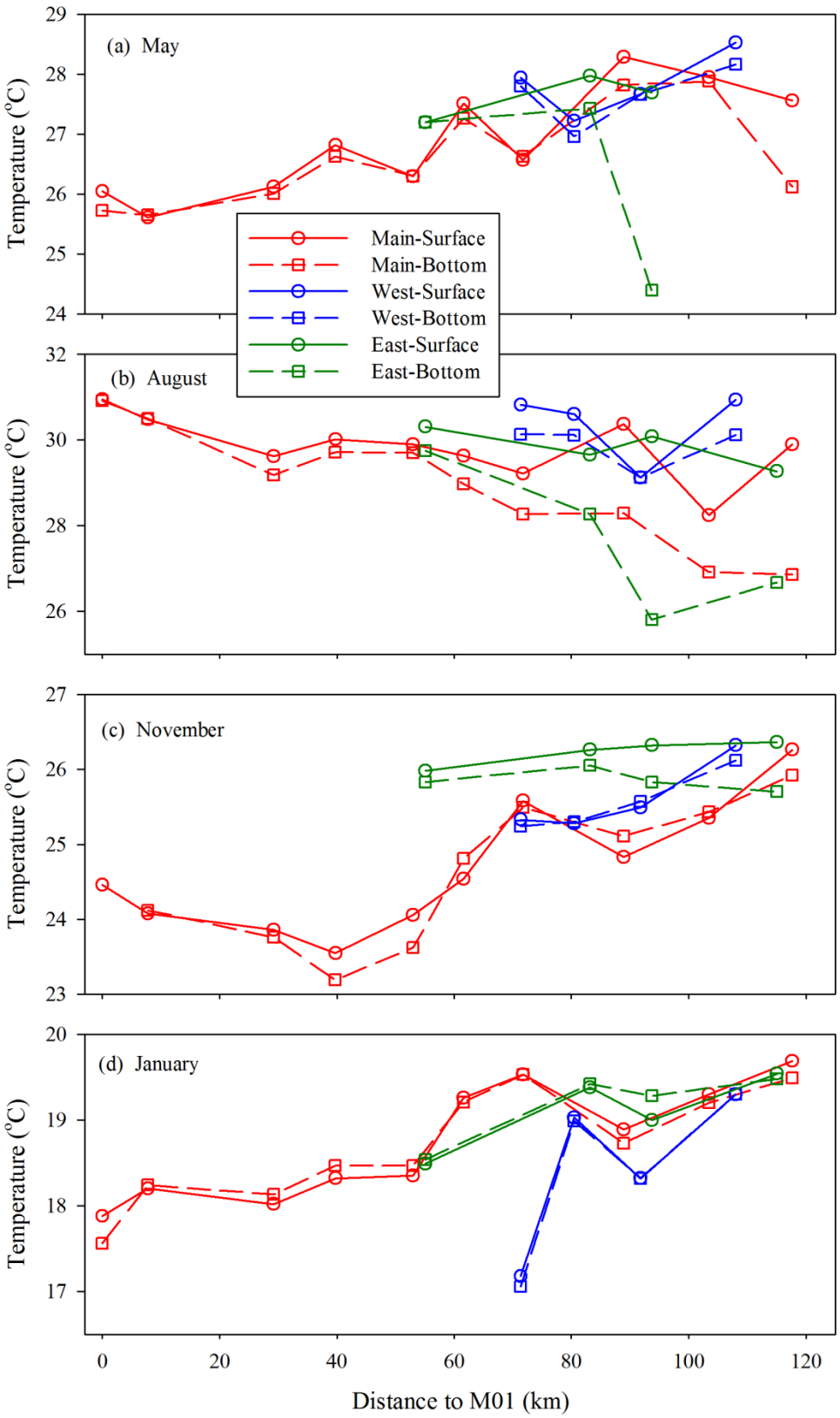

Figure S1. Water temperature versus distance to Sta. M01 along the main, west, and east transects in both surface and bottom waters.

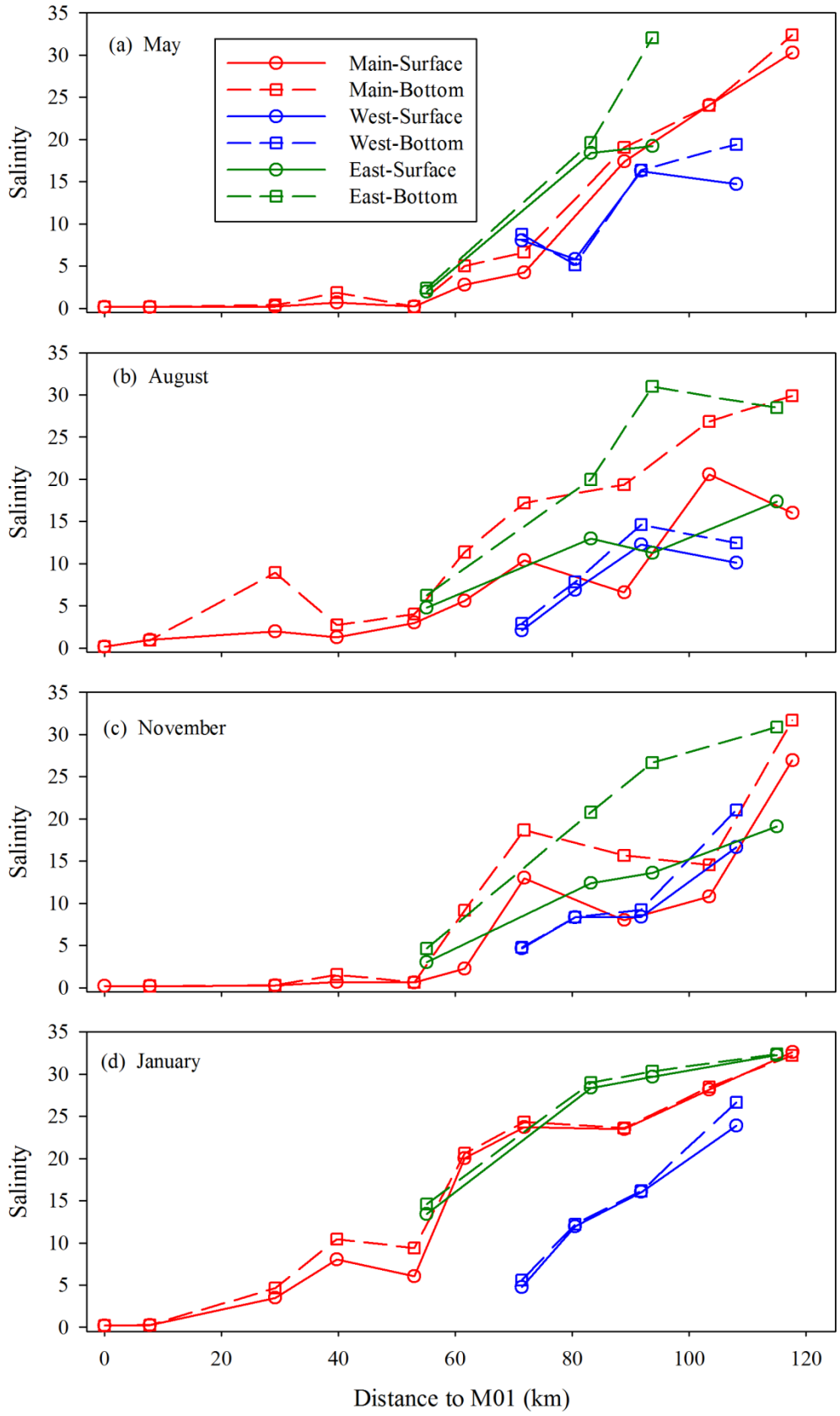

Figure S2. Salinity versus distance to Sta. M01 along the main, west, and east transects in both surface and bottom waters.

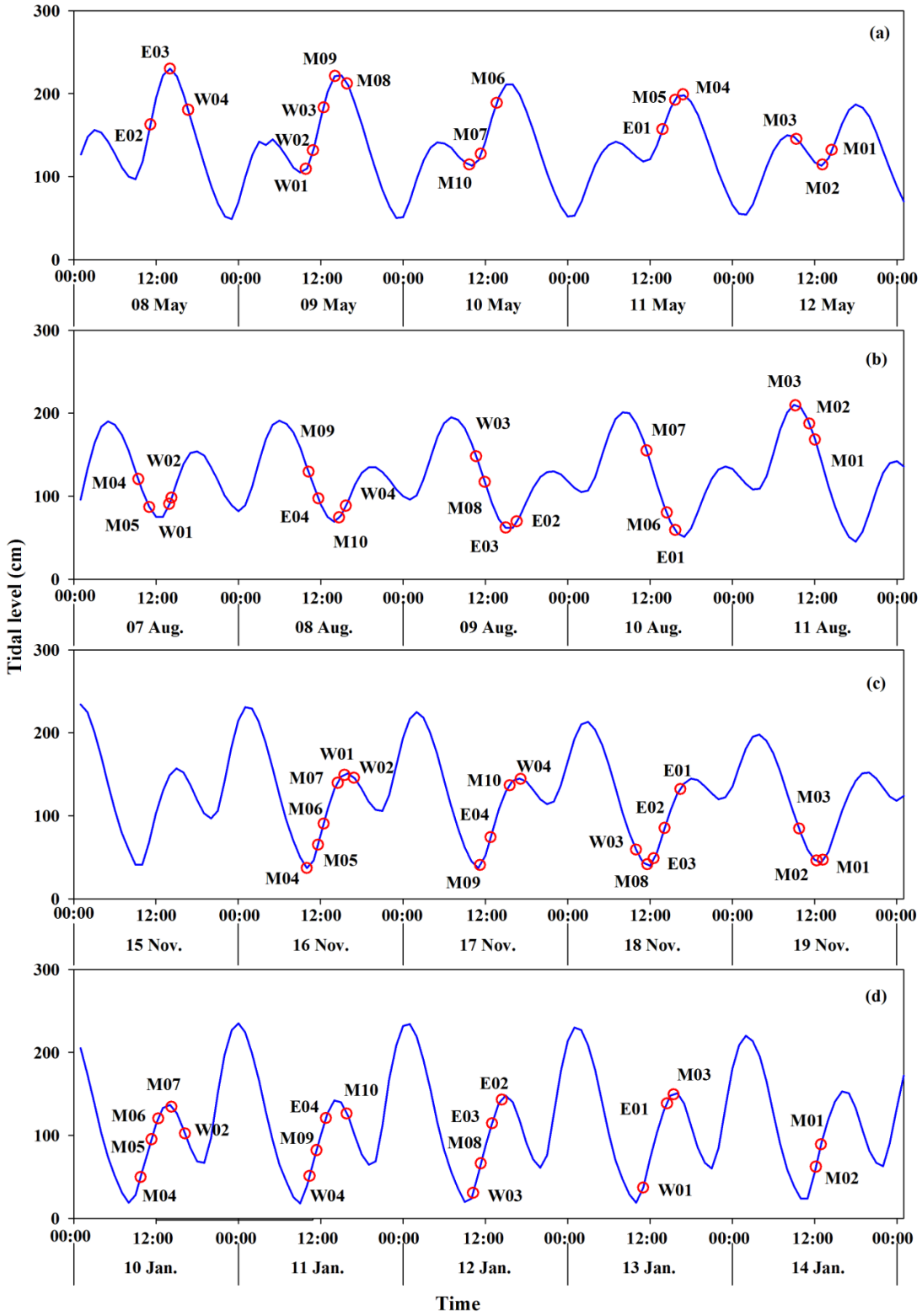

Figure S3. Tide charts overlaid with sampling stations for cruises in May (a), August (b), November (c), and January (d). Tides were recorded at Hengmen (22°633N, 113°517E; Fig. 1) and provided by the National Marine Data and Information Service of China (http://www.nmdis.org.cn/nmdisenglish/). Tide heights at the sampling stations were approximate due to spatial variations of the tidal level.

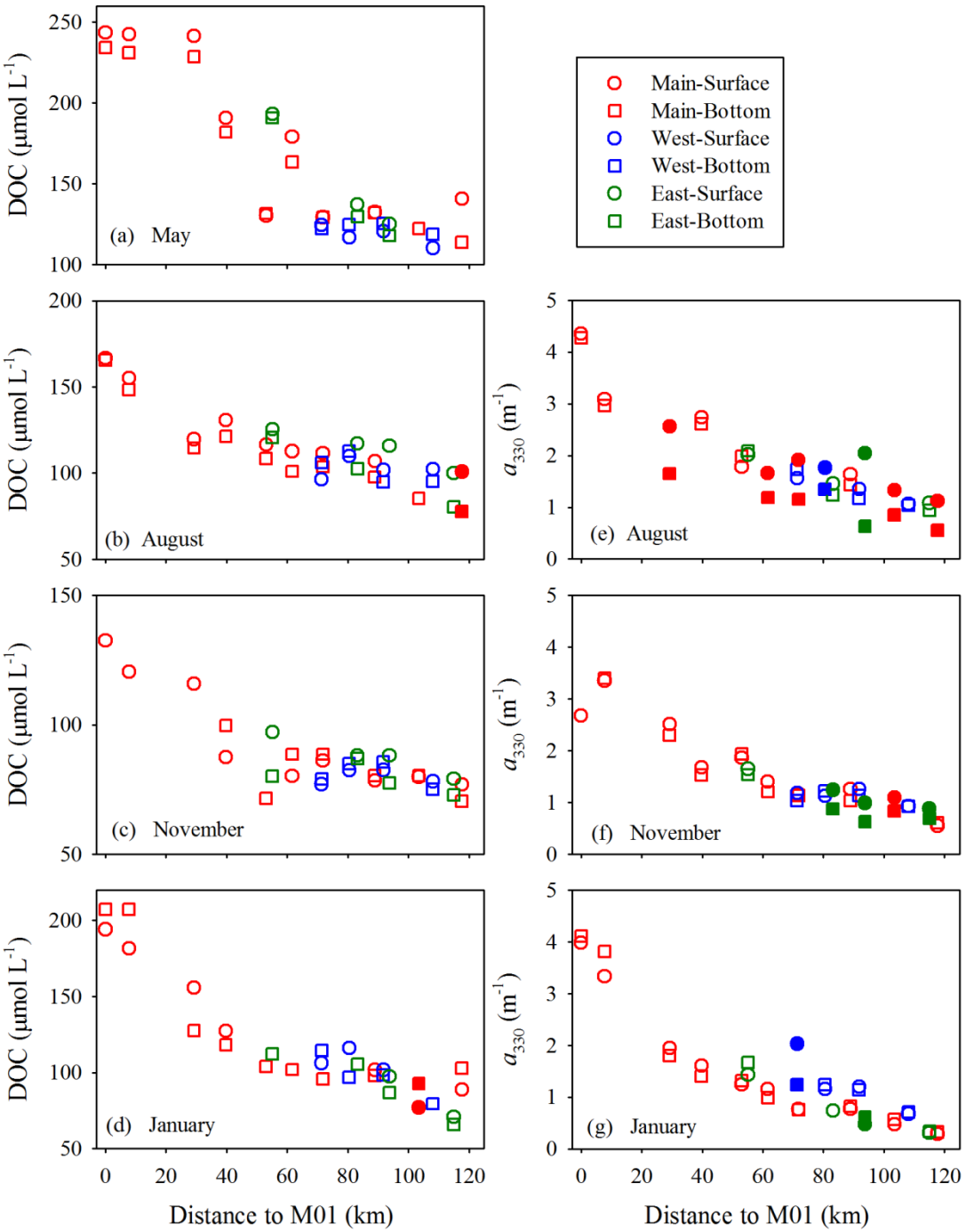

Figure S4. DOC concentration (a–d) and CDOM absorption coefficient at 330 nm (e–g) versus distance to station M01. Filled symbols denote stations with differences between bottom and surface >20% (DOC: M10 in August and M09 in January; CDOM: M03, M06, M07, M 09, M10, W02, and E03 in August, M09, E02, E03, and E04 in November, and W01, E02, and E03 in January). Legend: Main stands for main transect, West for west transect, and East for east transect.

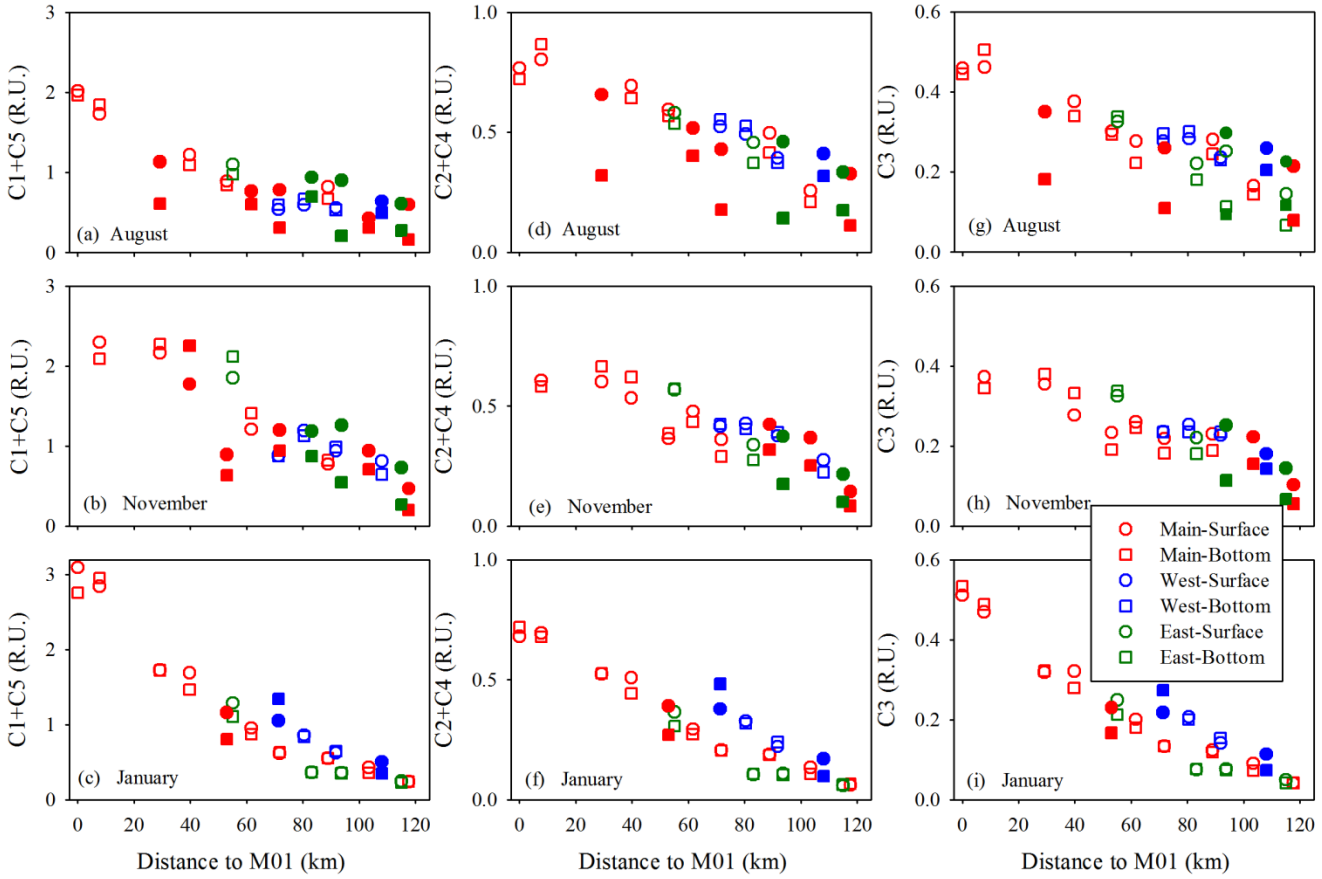

Figure S5. FDOM components, C1+C5 (a-c), C2+C4 (d-f) and C3 (g-i) versus distance to station M01. Filled symbols denote stations with differences between bottom and surface >20% (C1+C5: M03, M06, M07, M09, M10, W04, E02, E03, and E04 in August, M04, M05, M07, M09, M10, W04, E02, E03, and E04 in November, and M05, W01, and W04 in January; C2+C4: M03, M06, M07, M10, W04, E03, and E04 in August, M08, M09, M10, E03, and E04 in November, and M05, W01, and W04 in November; C3: M03, M07, M10, W04, E03, and E04 in August, M09, M10, W04, E03, and E04 in November, and M05, W01, and W04 in January).

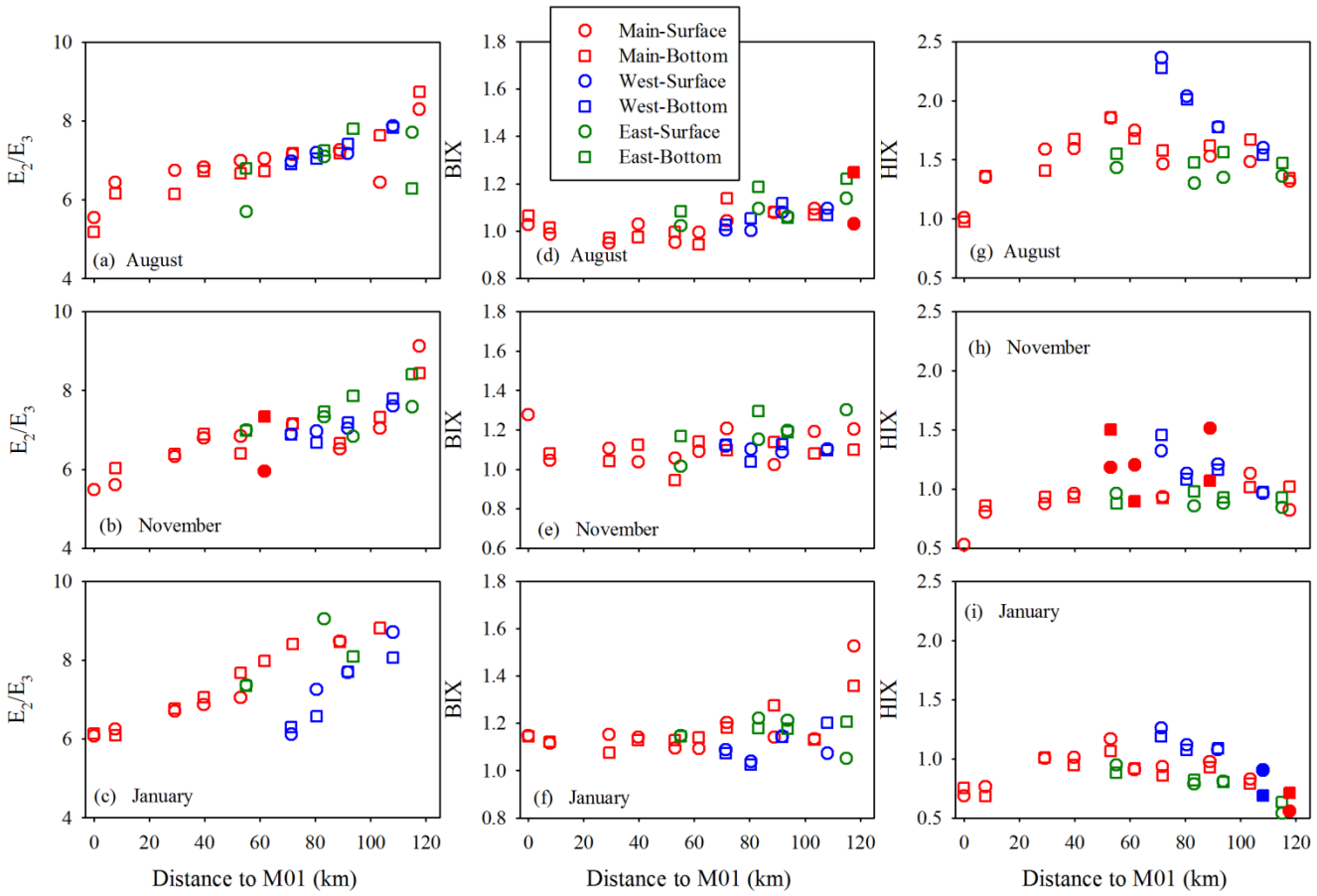

Figure S6. E_2/E_3 (a-c), BIX (d-f) and HIX (g-i) versus distance to station M01. Filled symbols denote stations with differences between bottom and surface >20% (E_2/E_3: M06 in November; BIX: M10 in August; HIX: M05, M06, M08, and M10 in November and M10, W04 in January).

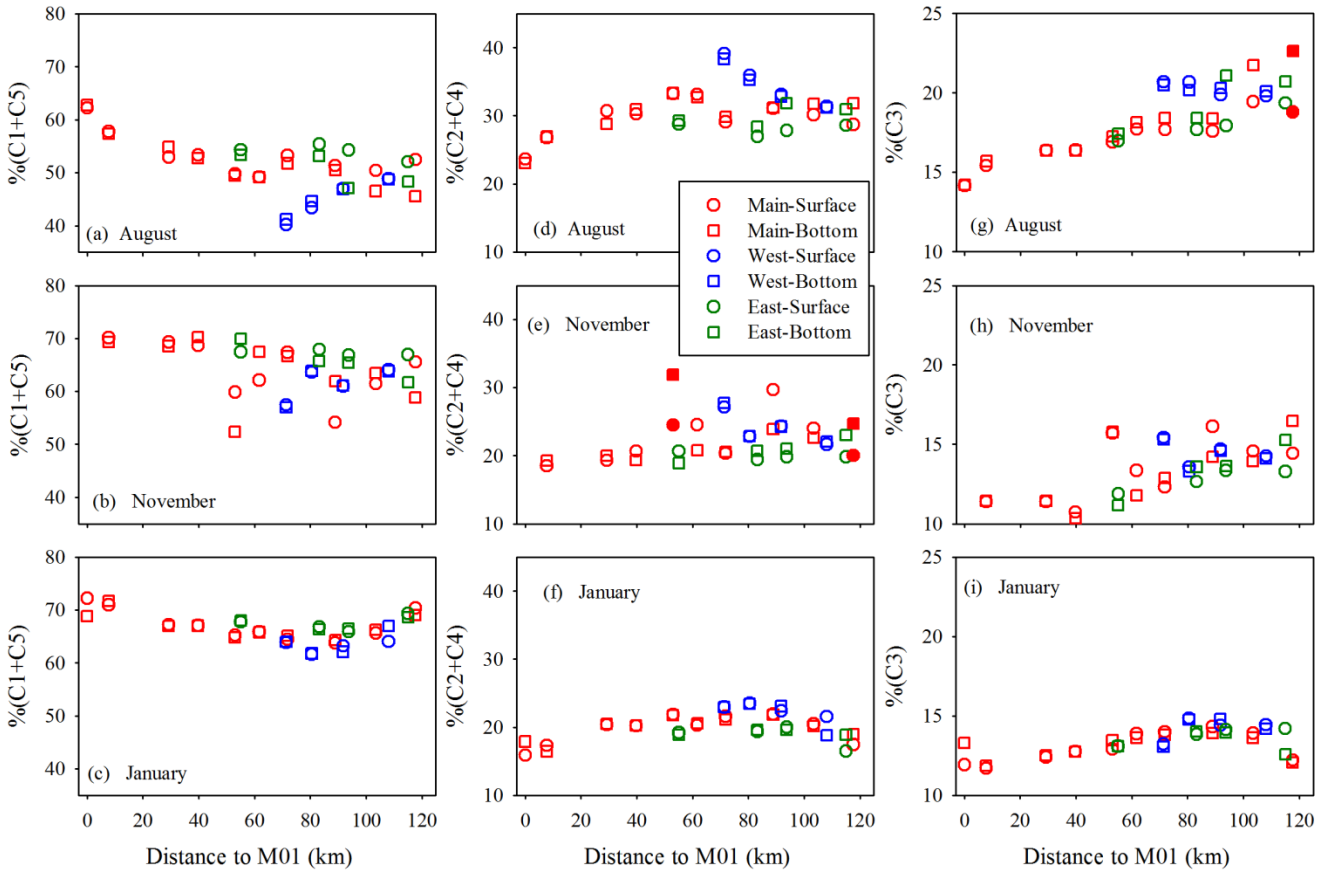

Figure S7. % (C1+C5) (a-c), % (C2+C4) (d-f), and %C3 (g-i) versus distance to Sta. M01 for each cruise. Filled symbols denote stations with differences between bottom and surface >20% (%(C2+C4): M05 and M10 in November; %C3: M10 in August).

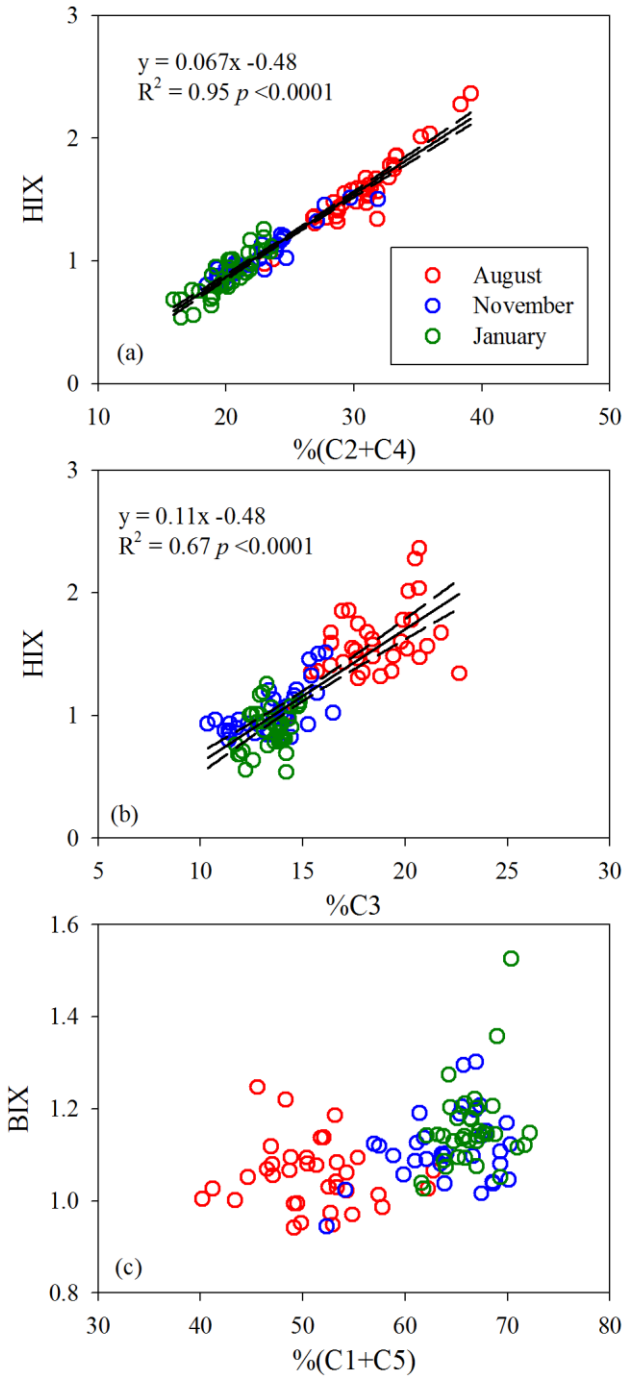

Figure S8. HIX vs. %(C2+C4)(a), HIX vs. %C3 (b), and BIX vs. %(C1+C5)(c). Solid lines in panels a and b denote linear fits of data for three cruises combined; dashed lines denote the 95% confidence intervals.

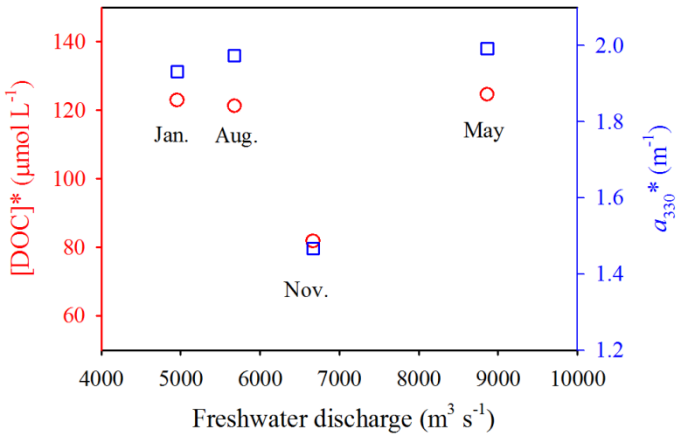

Figure S9. The effective [DOC] and a_{330} versus freshwater discharge rate in the Pearl River estuary.