

**Supporting Information for**

**Nutrient distribution and nitrogen and oxygen isotopic composition of nitrate in water masses of the subtropical South Indian Ocean**

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**Table S1.** Results of CTD casts from cruise MSM 59/2 (2016).

Cruise MSM 59/2 in 2016										
Station	Depth	Sigma-theta	Salinity	Temp	O <sub>2</sub>	NO <sub>3</sub> <sup>-</sup>	PO <sub>4</sub> <sup>3-</sup>	NO <sub>3</sub> <sup>-</sup> δ <sup>15</sup> N	NO <sub>3</sub> <sup>-</sup> δ <sup>18</sup> O	
	[m]	[kg/m <sup>3</sup> ]	[PSU]	[°C]	[ml/l]	[μM]	[μM]	[‰ ± 1 S.D.] <sup>a</sup>	[‰ ± 1 S.D.] <sup>b</sup>	
Station 03	Latitude: 23.01°S		Longitude: 67.07°E				Date: 30 November 2016			
	1	23.47	35.11	24.84	4.21	0.40	0.06	N/D	N/D	
	5	23.50	35.10	24.71	4.23	0.36	0.06	N/D	N/D	
	10	23.45	35.11	24.91	4.22	0.33	0.02	N/D	N/D	
	25	23.55	35.09	24.53	4.24	0.01	0.07	N/D	N/D	
	31	23.68	35.06	24.00	4.35	0.00	0.07	N/D	N/D	
	51	23.88	35.11	23.48	4.45	0.20	0.09	N/D	N/D	
	75	23.95	35.10	23.22	4.45	0.09	0.04	N/D	N/D	
	91	24.01	35.11	23.03	4.47	0.25	0.07	N/D	N/D	
	100	24.13	35.17	22.80	4.47	0.23	0.06	N/D	N/D	
	150	24.83	35.51	21.23	4.18	0.62	0.11	N/D	N/D	
	200	25.36	35.64	19.62	3.92	3.02	0.27	5.4 ± 0.0	1.5 ± 0.2	
	300	26.15	35.59	16.25	4.20	3.64	0.36	6.6 ± 0.2	2.5 ± 0.4	
	400	26.53	35.29	13.48	4.47	7.76	0.62	7.5 ± 0.0	4.4 ± 0.5	
	499	26.66	35.07	11.95	4.58	7.32	0.54	7.7 ± 0.1	5.2 ± 1.1	
	600	26.74	34.89	10.78	4.60	12.29	0.89	7.3 ± 0.0	4.8 ± 0.2	
	799	26.92	34.59	8.27	4.11	19.88	1.40	6.6 ± 0.0	3.4 ± 0.4	
	1000	27.19	34.45	5.49	3.36	25.06	1.87	6.0 ± 0.0	1.5 ± 0.1	
	1199	27.41	34.58	4.55	2.43	25.22	2.02	6.0 ± 0.1	1.6 ± 0.3	
	1599	27.62	34.66	2.99	2.86	35.40	2.46	5.5 ± 0.1	1.1 ± 0.3	
	2001	27.74	34.71	2.15	3.21	33.86	2.33	5.2 ± 0.0	1.1 ± 0.3	
	2502	27.78	34.72	1.77	3.31	34.13	2.34	5.2 ± 0.1	1.1 ± 0.0	
	3000	27.79	34.72	1.70	3.32	27.26	1.83	5.2 ± 0.1	1.4 ± 0.1	
	3670	27.80	34.72	1.62	3.33	22.82	1.90	5.1 ± 0.1	1.2 ± 0.1	
Station 14	Latitude: 23.87°S		Longitude: 69.50°E				Date: 2 December 2016			
	3	23.79	35.43	24.60	4.75	0.54	0.11	N/D	N/D	
	10	23.98	35.42	23.95	4.80	0.54	0.09	N/D	N/D	
	25	24.09	35.44	23.60	4.81	0.56	0.07	N/D	N/D	
	35	24.24	35.43	23.06	4.93	0.47	0.05	N/D	N/D	
	48	24.54	35.46	22.11	5.02	0.54	0.08	N/D	N/D	
	70	24.95	35.57	20.91	4.94	0.54	0.12	N/D	N/D	
	90	25.17	35.64	20.29	4.83	0.53	0.12	N/D	N/D	
	100	25.26	35.66	20.03	4.79	0.72	0.13	N/D	N/D	
	150	25.71	35.69	18.37	4.57	2.47	0.27	4.5 ± 0.1	1.7 ± 0.3	
	201	25.97	35.66	17.26	4.62	3.20	0.37	5.8 ± 0.2	2.2 ± 0.1	
	301	26.49	35.34	13.85	4.88	6.53	0.53	7.6 ± 0.0	4.0 ± 0.4	
	398	26.64	35.12	12.25	5.05	9.71	0.78	7.8 ± 0.0	4.5 ± 0.1	
	503	26.73	34.92	10.96	5.15	10.46	0.90	7.3 ± 0.0	4.9 ± 0.1	
	602	26.79	34.79	10.08	5.12	10.80	0.93	7.0 ± 0.0	4.8 ± 0.0	
	797	26.94	34.55	7.98	4.63	23.37	1.56	6.4 ± 0.4	1.9 ± 0.2	
	1001	27.27	34.47	4.93	3.55	34.17	2.31	5.9 ± 0.3	1.6 ± 0.0	
	1300	27.49	34.60	3.89	2.98	39.46	2.73	5.8 ± 0.1	1.4 ± 0.2	
	1999	27.74	34.72	2.15	3.83	40.22	2.79	5.1 ± 0.1	1.3 ± 0.1	
	2496	27.78	34.72	1.78	3.92	30.55	2.24	5.1 ± 0.1	0.6 ± 0.2	
	3501	27.79	34.73	1.76	3.93	33.69	2.34	5.0 ± 0.1	0.9 ± 0.5	

**Cruise MSM 59/2 in 2016**

Station	Depth	Sigma-theta	Salinity	Temp	O <sub>2</sub>	NO <sub>3</sub> <sup>-</sup>	PO <sub>4</sub> <sup>3-</sup>	NO <sub>3</sub> <sup>-</sup> δ <sup>15</sup> N	NO <sub>3</sub> <sup>-</sup> δ <sup>18</sup> O
	[m]	[kg/m <sup>3</sup> ]	[PSU]	[°C]	[ml/l]	[μM]	[μM]	[‰ ± 1 S.D.] <sup>a</sup>	[‰ ± 1 S.D.] <sup>b</sup>
Station 22	Latitude: 22.89°S		Longitude: 69.16°E			Date: 5 December 2016			
	3	23.49	35.17	24.95	4.67	0.55	0.08	N/D	N/D
	11	23.49	35.17	24.95	4.69	0.60	0.09	N/D	N/D
	21	23.66	35.28	24.66	4.74	0.53	0.03	N/D	N/D
	30	23.79	35.24	24.12	4.80	0.55	0.02	N/D	N/D
	50	24.05	35.33	23.48	4.94	0.59	0.07	N/D	N/D
	74	24.42	35.35	22.23	4.87	0.58	0.09	N/D	N/D
	100	24.74	35.48	21.46	4.62	0.65	0.11	N/D	N/D
	120	25.04	35.65	20.84	4.87	0.88	0.11	N/D	N/D
	149	25.38	35.67	19.63	4.66	1.79	0.18	4.5 ± 0.2	1.4 ± 0.4
	201	25.74	35.71	18.33	4.57	2.74	0.26	5.7 ± 0.4	2.6 ± 0.5
	300	26.38	35.43	14.68	4.78	6.24	0.55	7.1 ± 0.1	3.8 ± 0.1
	400	26.59	35.20	12.84	4.99	9.47	0.73	7.6 ± 0.2	4.7 ± 0.1
	500	26.71	34.96	11.27	5.12	12.78	0.91	7.0 ± 0.1	5.3 ± 0.5
	600	26.78	34.81	10.21	5.07	15.94	1.09	7.3 ± 0.0	4.3 ± 0.2
	799	26.96	34.54	7.74	4.54	22.98	1.54	6.4 ± 0.4	1.6 ± 0.2
	999	27.24	34.45	5.08	3.71	34.41	2.28	6.1 ± 0.3	1.1 ± 0.1
	1250	27.47	34.62	4.29	2.72	32.65	2.35	5.4 ± 0.2	0.8 ± 0.4
	2000	27.75	34.72	2.03	3.81	35.31	2.32	5.3 ± 0.3	0.6 ± 0.5
	2501	27.78	34.72	1.78	3.86	35.12	2.43	5.3 ± 0.3	0.6 ± 0.2
	3149	27.79	34.72	1.71	3.86	35.70	2.45	5.3 ± 0.2	0.7 ± 0.4
	3693	27.79	34.72	1.74	3.84	35.53	2.44	5.2 ± 0.3	0.6 ± 0.2
Station 32	Latitude: 21.78°S		Longitude: 69.02°E			Date: 8 December 2016			
	5	23.14	34.96	25.57	4.61	0.26	0.09	N/D	N/D
	10	23.14	34.96	25.54	4.61	N/D	N/D	N/D	N/D
	20	23.57	35.07	24.43	4.75	0.20	0.02	N/D	N/D
	29	23.64	35.08	24.21	4.78	0.23	0.05	N/D	N/D
	51	23.95	35.11	23.23	4.91	0.19	0.05	N/D	N/D
	75	24.24	35.23	22.57	4.88	0.17	0.07	N/D	N/D
	101	24.49	35.33	21.96	4.75	0.26	0.07	N/D	N/D
	139	24.90	35.50	20.92	4.18	2.64	0.26	5.9 ± 0.3	2.9 ± 0.4
	199	25.53	35.71	19.19	4.24	2.88	0.27	4.9 ± 0.2	0.5 ± 0.3
	293	26.23	35.55	15.81	4.68	3.97	0.39	7.1 ± 0.2	3.2 ± 0.3
	400	26.60	35.19	12.77	4.99	6.74	0.60	7.8 ± 0.2	4.4 ± 0.8
	500	26.71	34.97	11.31	5.14	10.03	0.77	7.2 ± 0.2	5.0 ± 0.5
	601	26.79	34.78	10.03	5.12	15.44	1.07	7.1 ± 0.0	4.5 ± 0.0
	799	26.98	34.54	7.65	4.33	25.15	1.71	6.4 ± 0.4	2.7 ± 0.4
	889	27.11	34.45	6.19	4.08	29.75	2.00	6.2 ± 0.0	1.3 ± 0.1
	1005	27.28	34.47	4.91	3.55	33.97	2.35	6.1 ± 0.0	1.0 ± 0.3
	1256	27.49	34.62	4.02	2.84	0.83	0.09	N/D	N/D
	2008	27.75	34.72	2.04	3.83	26.63	1.78	5.3 ± 0.0	0.9 ± 0.2
	2509	27.78	34.72	1.76	3.89	31.23	2.19	5.2 ± 0.0	0.4 ± 0.1
	2731	27.78	34.72	1.76	3.89	34.20	2.37	5.3 ± 0.0	0.5 ± 0.1
	3412	27.79	34.73	1.75	3.91	33.84	2.33	5.1 ± 0.1	1.4 ± 0.1

**Cruise MSM 59/2 in 2016**

Station	Depth	Sigma-theta	Salinity	Temp	O <sub>2</sub>	NO <sub>3</sub> <sup>-</sup>	PO <sub>4</sub> <sup>3-</sup>	NO <sub>3</sub> <sup>-</sup> δ <sup>15</sup> N	NO <sub>3</sub> <sup>-</sup> δ <sup>18</sup> O
	[m]	[kg/m <sup>3</sup> ]	[PSU]	[°C]	[ml/l]	[μM]	[μM]	[‰ ± 1 S.D.] <sup>a</sup>	[‰ ± 1 S.D.] <sup>b</sup>
Station 35	Latitude: 21.61°S		Longitude: 69.44°E			Date: 8 December 2016			
	0	n/D	n/D	n/D	n/D	0.05	0.12	N/D	N/D
	10	23.07	34.90	25.62	4.65	0.26	0.02	N/D	N/D
	25	23.33	35.00	25.06	4.70	0.03	0.06	N/D	N/D
	50	23.82	35.05	23.54	4.88	0.05	0.06	N/D	N/D
	75	24.15	35.18	22.72	4.90	0.01	0.01	N/D	N/D
	101	24.44	35.30	22.04	4.88	0.07	0.05	N/D	N/D
	149	24.78	35.47	21.30	4.45	0.85	0.15	N/D	N/D
	200	25.37	35.69	19.73	4.32	2.41	0.25	4.8 ± 0.1	1.7 ± 0.1
	301	26.17	35.59	16.19	4.62	3.74	0.38	6.8 ± 0.3	2.6 ± 0.3
	400	26.56	35.26	13.23	4.97	8.11	0.63	7.9 ± 0.1	4.9 ± 0.8
	501	26.69	35.01	11.55	5.11	11.63	0.84	7.3 ± 0.2	4.9 ± 0.6
	600	26.78	34.81	10.25	5.13	10.99	0.80	7.0 ± 0.2	4.6 ± 0.4
	900	27.16	34.46	5.86	3.80	31.21	2.16	5.9 ± 0.1	2.2 ± 0.2
	1400	27.55	34.69	4.00	2.58	37.65	2.70	5.9 ± 0.1	1.7 ± 0.1
	1999	27.75	34.72	2.12	3.77	34.41	2.42	5.2 ± 0.2	1.6 ± 0.7
	3053	27.79	34.73	1.70	3.93	33.51	2.39	5.1 ± 0.3	1.7 ± 0.5
Station 52	Latitude: 21.17°S		Longitude: 68.62°E			Date: 14 December 2016			
	2	23.00	34.80	25.61	4.62	0.10	0.08	N/D	N/D
	10	23.00	34.80	25.62	4.63	0.11	0.08	N/D	N/D
	21	23.01	34.80	25.61	4.62	0.10	0.08	N/D	N/D
	31	23.01	34.79	25.57	4.61	0.09	0.08	N/D	N/D
	51	23.26	34.87	24.93	4.71	0.09	0.07	N/D	N/D
	75	23.72	34.90	23.49	4.84	0.10	0.07	N/D	N/D
	101	24.12	35.16	22.79	4.82	0.16	0.08	N/D	N/D
	150	24.63	35.41	21.67	4.66	1.00	0.15	N/D	N/D
	201	25.26	35.65	20.03	4.35	1.90	0.21	4.3 ± 0.2	1.0 ± 0.8
	251	25.63	35.73	18.87	4.40	2.49	0.27	4.6 ± 0.1	0.7 ± 0.9
	299	26.07	35.64	16.77	4.54	1.51	0.14	N/D	N/D
	401	26.57	35.24	13.09	4.95	7.62	0.60	7.6 ± 0.1	4.5 ± 0.5
	503	26.69	35.02	11.61	5.11	10.51	0.82	7.1 ± 0.0	4.9 ± 0.2
	600	26.76	34.85	10.49	5.17	8.78	0.79	7.3 ± 0.1	4.4 ± 0.1
	899	27.16	34.47	5.83	3.74	26.05	1.98	6.3 ± 0.2	2.5 ± 0.4
	998	27.28	34.49	4.98	3.36	25.94	2.07	6.2 ± 0.1	2.7 ± 0.3
	1350	27.55	34.69	3.95	2.62	26.54	2.13	6.0 ± 0.1	2.7 ± 0.2
	2001	27.74	34.72	2.15	3.71	26.54	2.11	5.4 ± 0.1	2.0 ± 0.2
	2501	27.78	34.72	1.82	3.83	27.70	2.24	5.3 ± 0.1	2.0 ± 0.4
	2998	27.79	34.73	1.74	3.91	32.21	2.37	5.2 ± 0.3	1.8 ± 0.6
	3712	27.79	34.73	1.81	3.88	27.78	2.22	6.1 ± 0.2	1.8 ± 0.2

Cruise MSM 59/2 in 2016										
Station	Depth	Sigma-theta	Salinity	Temp	O <sub>2</sub>	NO <sub>3</sub> <sup>-</sup>	PO <sub>4</sub> <sup>3-</sup>	NO <sub>3</sub> <sup>-</sup> δ <sup>15</sup> N	NO <sub>3</sub> <sup>-</sup> δ <sup>18</sup> O	
	[m]	[kg/m <sup>3</sup> ]	[PSU]	[°C]	[ml/l]	[μM]	[μM]	[‰ ± 1 S.D.] <sup>a</sup>	[‰ ± 1 S.D.] <sup>b</sup>	
Station 67	Latitude: 21.72°S		Longitude: 67.67°E				Date: 19 December 2016			
	6	23.31	35.11	25.38	4.60	0.10	0.07	N/D	N/D	
	10	23.31	35.11	25.37	4.61	0.12	0.06	N/D	N/D	
	21	23.37	35.17	25.36	4.60	0.63	0.07	N/D	N/D	
	30	23.51	35.24	25.05	4.66	0.80	0.07	N/D	N/D	
	50	23.99	35.23	23.41	4.89	0.08	0.06	N/D	N/D	
	75	24.37	35.46	22.72	4.89	1.03	0.17	N/D	N/D	
	115	24.82	35.48	21.16	4.38	10.97	0.99	N/D	N/D	
	150	25.18	35.62	20.22	4.32	2.35	0.25	4.5 ± 0.1	2.6 ± 0.2	
	195	25.62	35.69	18.77	4.43	4.06	0.40	5.1 ± 0.2	4.2 ± 0.2	
	300	26.24	35.54	15.70	4.63	7.29	0.60	6.7 ± 0.1	4.0 ± 0.1	
	401	26.57	35.25	13.16	4.95	10.01	0.77	7.3 ± 0.1	4.5 ± 0.7	
	500	26.68	35.04	11.72	5.06	12.28	0.95	7.0 ± 0.3	4.7 ± 0.6	
	601	26.77	34.84	10.43	5.05	19.71	1.50	6.8 ± 0.2	4.6 ± 0.3	
	801	26.97	34.54	7.72	4.49	25.98	1.94	6.3 ± 0.0	1.8 ± 0.1	
	900	27.15	34.46	5.93	3.85	33.81	2.54	6.1 ± 0.0	2.1 ± 0.0	
	1300	27.50	34.65	4.21	2.62	26.54	2.15	6.1 ± 0.1	2.8 ± 0.0	
	2000	27.73	34.72	2.26	3.60	24.56	2.04	5.6 ± 0.0	2.4 ± 0.3	
	3002	27.79	34.73	1.74	3.81	33.17	2.40	5.3 ± 0.0	2.4 ± 0.4	
	3459	27.79	34.72	1.76	3.79	2.79	0.23	4.3 ± 0.1	0.3 ± 0.1	

<sup>a</sup> δ<sup>15</sup>N in ‰ versus air and <sup>b</sup> δ<sup>18</sup>O in ‰ versus VSMOW; S.D. = standard deviation; n/D = no data; N/D = not detectable.

**Table S2.** Results of CTD casts from cruise SO 259 (2017).

Cruise SO 259 in 2017										
Station	Depth	Sigma-theta	Salinity	Temp	O <sub>2</sub>	NO <sub>3</sub> <sup>-</sup>	PO <sub>4</sub> <sup>3-</sup>	NO <sub>3</sub> <sup>-</sup> δ <sup>15</sup> N	NO <sub>3</sub> <sup>-</sup> δ <sup>18</sup> O	
	[m]	[kg/m <sup>3</sup> ]	[PSU]	[°C]	[ml/l]	[μM]	[μM]	[‰ ± 1 S.D.] <sup>a</sup>	[‰ ± 1 S.D.] <sup>b</sup>	
Station 01	Latitude: 2.98°S		Longitude: 77.16°E				Date: 26 August 2017			
	8	22.09	35.18	29.33	3.97	0.40	0.11	N/D	N/D	
	28	22.09	35.19	29.33	3.97	0.03	0.12	N/D	N/D	
	61	22.91	35.34	27.19	3.76	0.71	0.26	N/D	N/D	
	85	24.17	35.33	23.05	2.75	10.09	0.78	7.3 ± 0.1	4.9 ± 0.1	
	181	26.18	35.05	14.26	1.42	26.38	1.77	6.3 ± 0.1	3.6 ± 0.2	
	302	26.75	34.97	11.04	2.30	26.02	1.74	7.0 ± 0.1	2.5 ± 0.0	
	400	26.86	34.92	10.21	1.90	29.84	1.98	7.2 ± 0.0	2.7 ± 0.1	
	499	26.98	34.89	9.39	1.53	33.26	2.25	7.2 ± 0.2	3.0 ± 0.2	
	600	27.11	34.91	8.67	1.34	35.07	2.45	7.2 ± 0.1	3.0 ± 0.3	
	706	27.22	34.95	8.17	1.07	37.17	2.65	7.3 ± 0.0	3.3 ± 0.0	
	800	27.29	34.93	7.64	1.04	37.93	2.66	7.2 ± 0.1	2.8 ± 0.3	
	910	27.36	34.86	6.68	1.27	32.21	2.40	7.0 ± 0.1	2.6 ± 0.1	
	1001	27.40	34.83	6.23	1.37	38.57	2.72	7.1 ± 0.1	3.1 ± 0.2	
	1100	27.46	34.81	5.59	1.54	38.66	2.72	6.9 ± 0.0	2.9 ± 0.0	
	1201	27.51	34.80	5.15	1.66	38.65	2.73	6.6 ± 0.1	3.4 ± 0.2	
	1302	27.56	34.82	4.88	1.71	38.76	2.73	6.6 ± 0.1	2.5 ± 0.1	
	1801	27.72	34.78	3.03	2.53	37.52	2.53	6.0 ± 0.1	2.2 ± 0.0	
	2998	27.80	34.73	1.68	3.32	36.28	2.45	5.3 ± 0.2	1.8 ± 0.3	
	5018	27.82	34.72	1.45	3.72	35.40	2.36	5.3 ± 0.1	2.3 ± 0.1	
Station 03	Latitude: 8.81°S		Longitude: 75.67°E				Date: 28 August 2017			
	3	22.93	35.15	26.67	4.12	0.60	0.16	N/D	N/D	
	29	22.93	35.15	26.68	4.11	1.07	0.20	N/D	N/D	
	55	23.45	35.08	24.85	3.28	6.35	0.57	7.0 ± 0.1	4.1 ± 0.2	
	100	25.51	35.16	17.54	1.40	17.67	1.21	6.2 ± 0.2	3.0 ± 0.2	
	200	26.40	34.98	12.91	1.44	27.60	1.80	6.4 ± 0.1	3.0 ± 0.0	
	249	26.56	34.96	11.99	1.36	29.24	1.89	6.5 ± 0.0	3.1 ± 0.1	
	299	26.68	34.94	11.32	1.62	27.30	1.77	6.7 ± 0.1	3.0 ± 0.2	
	399	26.85	34.87	10.06	1.93	22.67	1.65	6.8 ± 0.1	2.9 ± 0.2	
	500	26.96	34.83	9.19	1.77	19.60	1.46	7.0 ± 0.0	2.2 ± 0.1	
	600	27.07	34.82	8.48	1.68	23.08	1.75	6.9 ± 0.1	2.5 ± 0.4	
	700	27.15	34.81	7.88	1.53	35.78	2.44	6.8 ± 0.1	2.7 ± 0.1	
	801	27.24	34.79	7.15	1.34	27.57	2.14	6.8 ± 0.1	2.7 ± 0.1	
	900	27.31	34.77	6.62	1.41	38.09	2.66	6.7 ± 0.0	3.0 ± 0.2	
	1000	27.36	34.74	5.98	1.50	38.59	2.71	6.4 ± 0.2	2.4 ± 0.1	
	1100	27.42	34.75	5.59	1.63	26.38	2.04	6.5 ± 0.1	2.6 ± 0.3	
	1200	27.47	34.74	5.14	1.74	34.41	2.48	6.5 ± 0.1	3.1 ± 0.3	
	1300	27.52	34.74	4.74	1.87	26.72	2.05	6.3 ± 0.0	3.1 ± 0.3	
	1399	27.56	34.74	4.30	2.03	19.97	1.73	6.2 ± 0.2	1.9 ± 0.1	
	1500	27.61	34.74	3.84	2.24	26.42	2.14	6.0 ± 0.0	2.2 ± 0.1	
	1599	27.65	34.75	3.54	2.40	37.76	2.62	6.0 ± 0.1	2.7 ± 0.1	
	3000	27.80	34.73	1.64	3.47	35.54	2.40	5.3 ± 0.1	2.0 ± 0.2	
	5151	27.82	34.72	1.44	3.78	35.34	2.36	5.0 ± 0.1	2.1 ± 0.2	

**Cruise SO 259 in 2017**

Station	Depth	Sigma-theta	Salinity	Temp	O <sub>2</sub>	NO <sub>3</sub> <sup>-</sup>	PO <sub>4</sub> <sup>3-</sup>	NO <sub>3</sub> <sup>-</sup> δ <sup>15</sup> N	NO <sub>3</sub> <sup>-</sup> δ <sup>18</sup> O	
	[m]	[kg/m <sup>3</sup> ]	[PSU]	[°C]	[ml/l]	[μM]	[μM]	[‰ ± 1 S.D.] <sup>a</sup>	[‰ ± 1 S.D.] <sup>b</sup>	
Station 05	Latitude: 15.08°S		Longitude: 74.05°E				Date: 29 August 2017			
	8	23.50	35.02	24.52	4.27	0.54	0.24	N/D	N/D	
	126	24.10	35.09	23.52	3.72	2.83	0.36	7.2 ± 0.2	N/D	
	199	25.47	35.68	20.04	4.07	1.14	0.22	N/D	N/D	
	301	26.58	35.34	14.12	4.19	7.69	0.52	7.1 ± 0.1	3.6 ± 0.3	
	400	26.73	34.94	11.05	4.66	12.49	0.95	7.6 ± 0.2	4.6 ± 0.1	
	499	26.84	34.69	9.31	4.55	17.89	1.28	7.0 ± 0.1	3.9 ± 0.1	
	595	27.03	34.55	7.29	3.55	27.44	1.92	6.7 ± 0.0	2.9 ± 0.4	
	701	27.23	34.63	6.31	2.43	34.04	2.44	6.6 ± 0.2	3.0 ± 0.1	
	799	27.33	34.69	5.92	2.00	36.05	2.21	6.6 ± 0.1	2.6 ± 0.1	
	899	27.39	34.71	5.52	1.96	36.00	2.64	6.6 ± 0.1	3.4 ± 0.0	
	1000	27.44	34.71	5.17	2.01	36.93	2.70	6.5 ± 0.2	3.5 ± 0.3	
	1102	27.48	34.72	4.83	2.06	37.15	2.73	6.4 ± 0.1	3.6 ± 0.0	
	1201	27.52	34.73	4.54	2.12	37.20	2.74	6.3 ± 0.0	3.0 ± 0.1	
	1299	27.56	34.73	4.22	2.23	37.10	2.57	6.3 ± 0.2	3.4 ± 0.0	
	1400	27.59	34.73	3.91	2.38	36.77	2.55	5.9 ± 0.1	2.5 ± 0.2	
	1502	27.62	34.72	3.62	2.51	36.63	2.67	6.0 ± 0.0	3.2 ± 0.3	
	1800	27.70	34.73	2.79	2.85	36.08	2.62	5.8 ± 0.1	3.2 ± 0.0	
	3001	27.80	34.73	1.63	3.56	34.66	2.45	5.3 ± 0.1	3.0 ± 0.1	
	5170	27.82	34.72	1.47	3.76	34.56	2.48	5.0 ± 0.0	2.1 ± 0.3	
Station 15	Latitude: 20.96°S		Longitude: 68.92°E				Date: 1 September 2017			
	4	23.76	35.07	23.78	4.37	0.03	0.10	N/D	N/D	
	101	23.86	35.11	23.57	4.35	0.01	0.09	N/D	N/D	
	145	24.06	35.24	23.21	4.08	2.38	0.25	5.4 ± 0.1	N/D	
	200	25.01	35.53	20.62	3.75	2.41	0.29	5.9 ± 0.1	N/D	
	279	25.66	35.70	18.67	3.89	3.01	0.30	5.4 ± 0.1	1.8	
	403	26.49	35.33	13.82	4.51	5.32	0.42	7.5 ± 0.0	4.6 ± 0.1	
	500	26.68	35.03	11.74	4.74	10.46	0.68	7.7 ± 0.1	4.9 ± 0.4	
	600	26.79	34.78	10.01	4.81	14.88	0.98	7.3 ± 0.1	4.3 ± 0.2	
	700	26.87	34.62	8.74	4.56	19.41	1.15	6.9 ± 0.1	3.8 ± 0.2	
	801	27.02	34.50	7.11	4.05	25.94	1.71	6.7 ± 0.1	3.1 ± 0.0	
	899	27.21	34.44	5.31	3.61	32.00	2.11	6.3 ± 0.0	3.1 ± 0.2	
	999	27.35	34.56	4.82	2.73	35.51	2.21	6.4 ± 0.2	2.8 ± 0.1	
	1100	27.42	34.59	4.47	2.65	36.13	2.57	6.3 ± 0.0	3.1 ± 0.2	
	1199	27.47	34.62	4.18	2.61	35.62	2.52	6.3 ± 0.0	3.0 ± 0.1	
	1300	27.53	34.65	3.89	2.60	36.53	2.66	6.2 ± 0.2	2.9 ± 0.0	
	1400	27.57	34.69	3.76	2.59	36.50	2.28	6.3 ± 0.0	3.2 ± 0.0	
	1499	27.61	34.70	3.51	2.68	36.49	2.74	6.3 ± 0.1	3.1 ± 0.1	
	1799	27.71	34.70	2.47	3.41	34.23	2.53	5.8 ± 0.2	2.4 ± 0.4	
	2500	27.78	34.72	1.78	3.70	33.83	2.29	5.5 ± 0.1	2.4 ± 0.2	
	2999	27.79	34.73	1.74	3.76	33.85	2.18	5.4 ± 0.0	2.4 ± 0.0	
	3266	27.79	34.73	1.76	3.77	33.59	2.47	5.4 ± 0.1	2.3 ± 0.3	

**Cruise SO 259 in 2017**

Station	Depth	Sigma-theta	Salinity	Temp	O <sub>2</sub>	NO <sub>3</sub> <sup>-</sup>	PO <sub>4</sub> <sup>3-</sup>	NO <sub>3</sub> <sup>-</sup> δ <sup>15</sup> N	NO <sub>3</sub> <sup>-</sup> δ <sup>18</sup> O	
	[m]	[kg/m <sup>3</sup> ]	[PSU]	[°C]	[ml/l]	[μM]	[μM]	[‰ ± 1 S.D.] <sup>a</sup>	[‰ ± 1 S.D.] <sup>b</sup>	
Station 45	Latitude: 23.91°S		Longitude: 69.56°E				Date: 9 September 2017			
5		24.25	35.23	22.50	4.40	0.07	0.01	N/D	N/D	
50		24.27	35.25	22.50	4.40	0.04	0.06	N/D	N/D	
103		24.67	35.55	21.91	4.24	0.02	0.03	N/D	N/D	
201		25.59	35.72	18.94	4.14	1.03	0.15	N/D	N/D	
304		26.30	35.51	15.35	4.40	3.75	0.33	7.4 ± 0.1	2.2 ± 0.2	
405		26.60	35.17	12.70	4.55	8.50	0.62	7.6 ± 0.1	4.4 ± 0.3	
506		26.71	34.94	11.13	4.81	11.68	0.81	7.6 ± 0.0	5.0 ± 0.1	
602		26.79	34.77	9.98	4.82	14.77	0.99	7.2 ± 0.2	4.6 ± 0.2	
707		26.85	34.64	9.01	4.65	N.D	N.D	N/D	N/D	
806		26.96	34.53	7.73	4.23	23.40	1.54	6.6 ± 0.1	3.6 ± 0.1	
904		27.13	34.43	5.91	3.85	28.90	1.91	6.6 ± 0.1	3.7 ± 0.3	
1007		27.26	34.44	4.81	3.49	33.07	2.16	6.3 ± 0.0	2.7 ± 0.2	
1110		27.36	34.51	4.45	3.05	N.D	N.D	6.2 ± 0.0	2.7 ± 0.0	
1209		27.42	34.54	4.09	2.93	35.52	2.46	6.2 ± 0.1	2.6 ± 0.2	
1312		27.48	34.59	3.89	2.77	36.06	2.53	6.1 ± 0.2	2.5 ± 0.4	
1413		27.53	34.62	3.66	2.78	35.99	2.55	6.2 ± 0.1	2.7 ± 0.2	
1516		27.58	34.66	3.44	2.81	35.94	2.54	6.1 ± 0.2	2.5 ± 0.0	
1616		27.62	34.67	3.16	2.96	35.49	2.45	6.0 ± 0.2	2.7 ± 0.3	
1716		27.65	34.69	2.96	3.05	35.00	2.42	6.0 ± 0.0	2.5 ± 0.1	
1818		27.68	34.69	2.72	3.21	34.52	2.35	5.8 ± 0.0	2.4 ± 0.1	
2022		27.73	34.71	2.29	3.51	33.70	2.30	5.5 ± 0.1	2.1 ± 0.2	
3042		27.79	34.72	1.72	3.75	33.15	2.27	5.4 ± 0.1	2.2 ± 0.2	
4291		27.79	34.72	1.85	3.76	33.24	2.23	5.4 ± 0.1	2.2 ± 0.0	
Station 49	Latitude: 26.05°S		Longitude: 70.84°E				Date: 11 September 2017			
5		25.20	35.72	20.43	4.57	0.10	0.11	N/D	N/D	
102		25.53	35.79	19.38	4.67	0.03	0.10	N/D	N/D	
151		26.00	35.61	16.95	4.73	0.06	0.23	N/D	N/D	
201		26.37	35.44	14.75	4.57	3.94	0.48	7.8 ± 0.0	3.6 ± 0.0	
250		26.49	35.32	13.77	4.72	4.22	0.48	7.8 ± 0.1	3.7 ± 0.1	
303		26.54	35.27	13.33	4.72	4.57	0.52	7.5 ± 0.0	3.3 ± 0.3	
402		26.65	35.11	12.22	4.75	10.01	0.83	7.2 ± 0.0	5.0 ± 0.3	
505		26.70	34.98	11.36	4.78	11.61	0.91	7.2 ± 0.1	4.6 ± 0.2	
602		26.75	34.86	10.61	4.76	13.78	1.05	7.3 ± 0.0	4.4 ± 0.3	
702		26.82	34.72	9.56	4.58	17.00	1.28	6.9 ± 0.1	3.8 ± 0.3	
802		26.93	34.58	8.21	4.32	21.90	1.69	6.5 ± 0.1	3.0 ± 0.3	
903		27.05	34.45	6.60	4.15	26.63	1.99	6.4 ± 0.1	3.6 ± 0.0	
1004		27.22	34.40	4.97	3.87	31.27	2.27	6.3 ± 0.2	2.4 ± 0.2	
1106		27.35	34.45	4.11	3.49	33.91	2.43	6.1 ± 0.1	2.7 ± 0.2	
1205		27.42	34.51	3.93	3.12	34.30	2.49	6.1 ± 0.0	2.4 ± 0.4	
1307		27.48	34.56	3.70	2.98	35.91	2.64	6.2 ± 0.1	2.6 ± 0.2	
1409		27.52	34.59	3.52	2.96	35.75	2.66	6.0 ± 0.2	1.8 ± 0.4	
1507		27.58	34.62	3.14	3.10	35.94	2.58	6.0 ± 0.2	2.4 ± 0.2	
1609		27.61	34.64	2.93	3.24	34.97	2.54	5.7 ± 0.2	2.1 ± 0.1	
1710		27.65	34.66	2.71	3.36	34.39	2.61	5.7 ± 0.1	2.0 ± 0.0	
1811		27.69	34.69	2.47	3.48	33.84	2.51	5.6 ± 0.0	1.9 ± 0.0	
2011		27.74	34.71	2.17	3.62	33.27	2.39	5.4 ± 0.0	2.2 ± 0.0	
3021		27.79	34.72	1.67	3.73	33.67	2.48	5.3 ± 0.2	1.9 ± 0.4	
4020		27.80	34.73		3.84	33.03	2.47	5.2 ± 0.1	1.8 ± 0.3	



**Cruise SO 259 in 2017**

Station	Depth [m]	Sigma-theta [kg/m <sup>3</sup> ]	Salinity [PSU]	Temp [°C]	O <sub>2</sub> [ml/l]	NO <sub>3</sub> <sup>-</sup> [μM]	PO <sub>4</sub> <sup>3-</sup> [μM]	NO <sub>3</sub> <sup>-</sup> δ <sup>15</sup> N [‰ ± 1 S.D.] <sup>a</sup>	NO <sub>3</sub> <sup>-</sup> δ <sup>18</sup> O [‰ ± 1 S.D.] <sup>b</sup>
Station 60	Latitude: 27.78°S		Longitude: 73.92°E			Date: 15 September 2017			
	6	25.17	35.73	20.56	4.56	0.06	0.05	N/D	N/D
	51	25.20	35.74	20.46	4.57	0.01	0.05	N/D	N/D
	101	25.61	35.72	18.86	4.62	0.06	0.11	N/D	N/D
	150	26.15	35.59	16.23	4.50	2.05	0.30	6.8 ± 0.1	1.4 ± 0.1
	200	26.34	35.47	15.01	4.56	3.78	0.40	8.0 ± 0.1	3.3 ± 0.1
	301	26.55	35.22	13.10	4.69	7.94	0.64	7.9 ± 0.1	5.0 ± 0.3
	403	26.66	35.06	11.90	4.79	10.72	0.82	7.4 ± 0.1	5.1 ± 0.3
	502	26.71	34.95	11.21	4.82	12.24	0.90	7.3 ± 0.1	4.8 ± 0.1
	604	26.76	34.82	10.36	4.80	14.47	1.01	7.1 ± 0.0	4.5 ± 0.0
	705	26.83	34.68	9.36	4.65	17.95	1.23	6.8 ± 0.1	3.8 ± 0.1
	804	26.95	34.54	7.87	4.29	18.17	1.39	6.4 ± 0.1	3.0 ± 0.2
	905	27.07	34.43	6.33	4.13	27.70	1.88	6.4 ± 0.1	3.3 ± 0.1
	1005	27.19	34.39	5.08	3.98	31.13	2.11	6.2 ± 0.1	2.6 ± 0.0
	1105	27.29	34.41	4.35	3.71	33.34	2.29	6.4 ± 0.1	3.2 ± 0.1
	1207	27.37	34.45	3.89	3.52	34.58	2.38	6.1 ± 0.1	3.2 ± 0.1
	1307	27.44	34.49	3.56	3.33	35.48	2.47	6.0 ± 0.1	3.1 ± 0.1
	1408	27.50	34.54	3.31	3.22	35.71	2.50	6.0 ± 0.0	2.8 ± 0.1
	1508	27.55	34.58	3.05	3.29	35.35	2.47	5.9 ± 0.1	2.8 ± 0.1
	1606	27.61	34.63	2.86	3.31	34.89	2.45	5.4 ± 0.1	1.9 ± 0.1
	1808	27.68	34.68	2.58	3.42	35.08	2.47	5.8 ± 0.1	2.4 ± 0.3
	2111	27.75	34.72	2.14	3.78	32.55	2.29	5.4 ± 0.1	2.3 ± 0.3
	3021	27.79	34.72	1.66	3.78	33.84	2.39	5.4 ± 0.0	2.4 ± 0.2
	3216	27.79	34.72	1.64	3.79	33.86	2.40	5.3 ± 0.1	2.5 ± 0.1
Station 99	Latitude: 27.01°S		Longitude: 72.40°E			Date: 29 September 2017			
	5	25.23	35.76	20.41	4.56	0.05	0.08	N/D	N/D
	50	25.42	35.77	19.73	4.59	0.36	0.07	N/D	N/D
	99	25.79	35.68	18.03	4.65	0.69	0.16	N/D	N/D
	199	26.45	35.36	14.10	4.54	6.14	0.53	7.6 ± 0.1	4.2 ± 0.2
	300	26.57	35.23	13.03	4.68	8.59	0.67	7.2 ± 0.1	5.0 ± 0.1
	400	26.65	35.09	12.14	4.71	10.48	0.79	7.2 ± 0.1	4.7 ± 0.3
	503	26.71	34.95	11.21	4.74	8.07	0.69	7.1 ± 0.1	3.4 ± 0.1
	602	26.77	34.80	10.20	4.66	15.62	1.10	7.0 ± 0.0	4.4 ± 0.1
	703	26.85	34.66	9.10	4.54	18.63	1.29	6.7 ± 0.1	3.8 ± 0.1
	804	26.96	34.53	7.72	4.22	23.92	1.68	6.7 ± 0.1	3.2 ± 0.2
	904	27.09	34.42	6.10	4.02	28.54	1.95	6.3 ± 0.1	2.8 ± 0.1
	1004	27.22	34.39	4.84	3.89	32.48	2.18	6.4 ± 0.2	3.8 ± 0.1
	1104	27.32	34.43	4.19	3.55	34.12	2.66	6.1 ± 0.1	2.5 ± 0.4
	1205	27.39	34.48	3.85	3.30	33.99	2.33	6.0 ± 0.0	2.4 ± 0.2
	1308	27.46	34.53	3.54	3.16	35.51	2.51	6.0 ± 0.1	2.0 ± 0.2
	1407	27.52	34.57	3.30	3.13	35.73	2.51	6.0 ± 0.1	2.2 ± 0.2
	1507	27.57	34.60	3.04	3.19	35.35	2.47	5.9 ± 0.1	1.9 ± 0.2
	1608	27.62	34.63	2.87	3.24	34.82	2.46	5.7 ± 0.1	1.7 ± 0.0
	1809	27.69	34.68	2.49	3.43	33.57	2.35	5.6 ± 0.0	1.7 ± 0.1
	2111	27.75	34.71	2.02	3.64	33.31	2.33	5.5 ± 0.1	1.8 ± 0.1
	3021	27.79	34.72	1.69	3.72	N.D	N.D	N/D	N/D
	4267	27.80	34.72	1.74	3.82	33.19	2.32	5.2 ± 0.0	2.1 ± 0.3

<sup>a</sup> δ<sup>15</sup>N in ‰ versus air and <sup>b</sup> δ<sup>18</sup>O in ‰ versus VSMOW; S.D. = standard deviation; N/D = not detectable.