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Biogeochemical data of the 51st Japanese Antarctic Research Expedition in the austral summer of 2009–2010

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1. Introduction

This report presents biogeochemical data obtained by the 51st Japanese Antarctic Research Expedition in the austral summer of 2009–2010. The data include measurements of the temperature, salinity, and inorganic nutrient concentrations of seawater shallower than 500 m in the Southern Ocean.

2. Sampling

Sampling was carried out during the 51st Japanese Antarctic Research Expedition (JARE) on the icebreaker *Shirase* (Japan Maritime Self-Defense Force) in the Southern Ocean. Vertical water samples were obtained along north–south transects (40°S–64°S) at 110°E (December 2009) and 150°E (March 2010) (Fig. 1). No samples were collected at Stations L8 and L9. Samples of surface seawater were also collected, pumped from an inlet at the bottom of the ship (about 10 m below sea level).

Vertical profiles of temperature and salinity were collected using a conductivity–temperature–depth (CTD) probe (SBE 19 plus, Sea-Bird Electronics, USA) with a water sampler (SBE 55 ECO, Sea-Bird Electronics) to depths of 500 m. For the CTD sensors, calibration was performed prior to the cruise, although salinity data were not calibrated.

Seawater samples from depths greater than 20 m were collected using a standard 4 L Niskin bottle (Sea-Bird Electronics) at predefined depths of 20, 50, 75, 100, 200, and 500 m for Stations L1–5, and at depths of 20, 50, 75, 100, 200, and 400 m for Stations L6–10. Seawater was sub-sampled into a 10 mL polyethylene screw-cap vial for measuring the concentration of inorganic nutrients. Nutrient samples were immediately stored in a freezer (–20°C) for the duration of the cruise.

Sea surface water (0 m) was collected with a 5 L polyethylene bucket, and was sub-sampled in the same manner as described above for the analysis of nutrients. The temperature of surface water was measured using a needle-type temperature sensor (Testo 110 NTC, Brandt Instruments, USA).

Surface seawater was pumped from an inlet at the bottom of the ship (about 10 m below sea level). Water temperature was measured using a temperature probe (SBE 38, Sea-Bird Electronics) at an inlet in the bottom of the ship. Water salinity was measured using a salinity probe (SBE 45, Sea-Bird Electronics). Water samples for nutrient analysis were collected in the same manner as those collected in Niskin bottles.

3. Analysis

After the cruise, the frozen samples were immediately transferred to a cold room (–30°C) at an onshore laboratory at the National Institute of Polar Research. The samples were then transported in a freezer to the Tokyo University of Marine Science and Technology for nutrient analysis. The frozen samples were thawed shortly before analysis, which was performed at room temperature.

Nutrient concentrations (NO_3, NH_4, NO_2, PO_4, and SiO_2) were determined by an auto-analyzer system: AACS III (Bran+Luebbe, Japan) was employed for NO_3, NH_4, and NO_2; Quaatro-Marine 5ch (SEAL Analytical, UK) was employed for PO_4 and SiO_2, following the spectrophotometric methods described by JGOFS (1994).

4. Results

1. Figure 2 shows vertical profiles of temperature and salinity.
2. Table 1 lists the temperature and salinity data for each depth.
3. Table 1 also lists the nutrient concentrations, temperature, and salinity of the bottle samples.

4. Table 2 lists the nutrient concentrations, temperature, and salinity of the surface seawater samples.

Acknowledgements

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References

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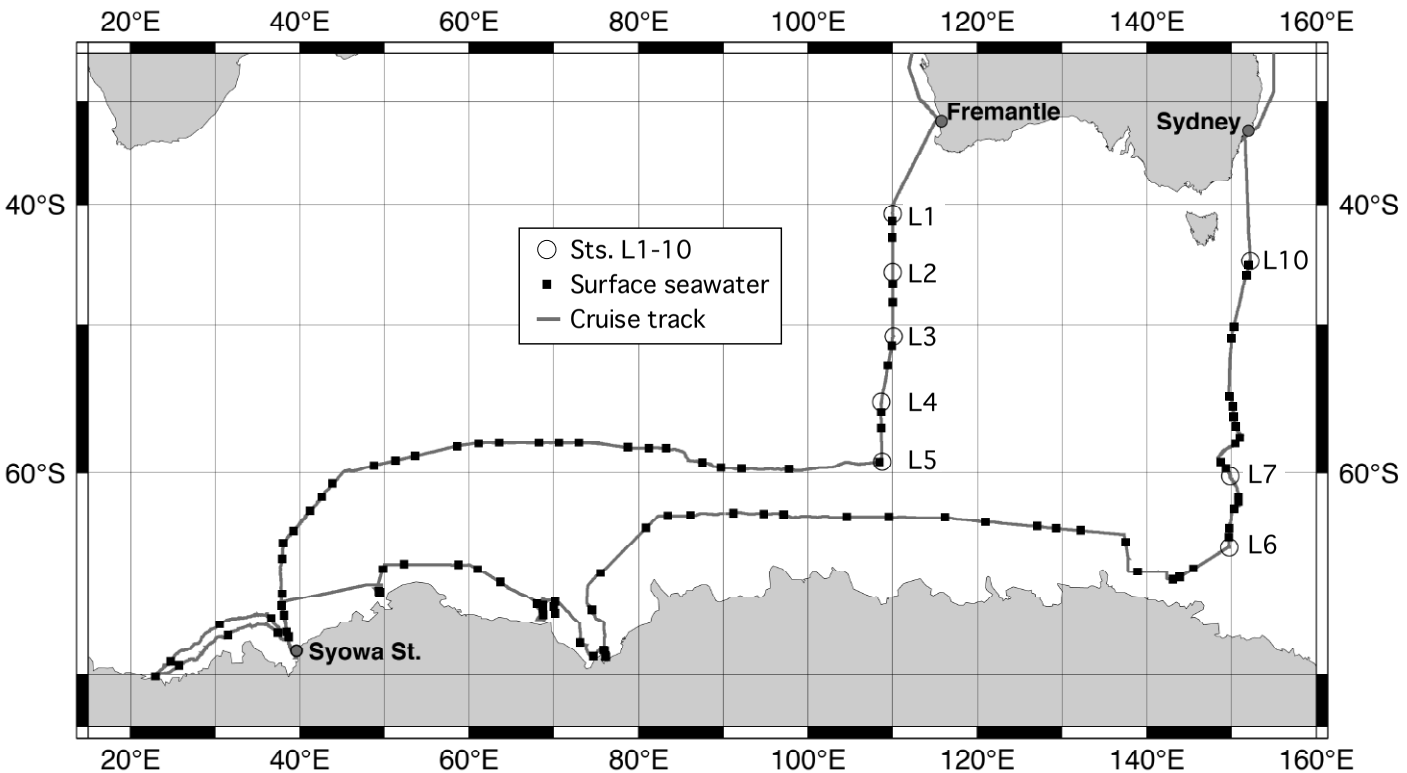

Fig. 1. Location of the sampling station in the Southern Ocean in the austral summer of 2009–2010. Solid line indicates the cruise track.

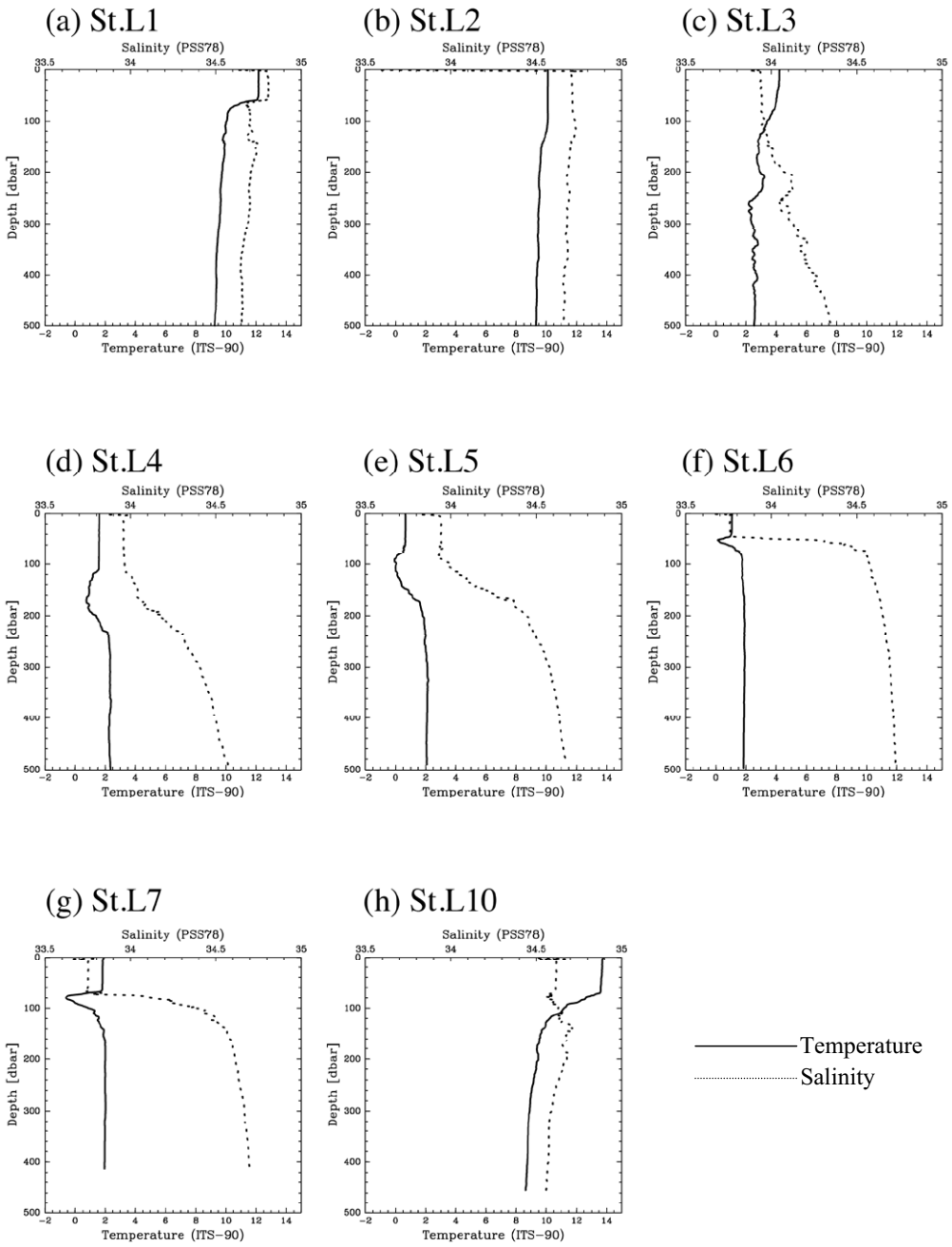

Fig. 2. Vertical profiles of temperature and salinity for each station.

Table 1-1. Sampling date, time, position, air temperature, and sea level pressure for Sts. L1–5. Temperature and salinity are also shown for each defined depth.

Station	Unit	L1			L2			L3			L4			L5		
Date	UTC	1 December 2009			2 December 2009			3 December 2009			4 December 2009			5 December 2009		
Time	UTC	1:14			1:09			1:05			1:15			1:14		
Latitude	deg S	40°51′			45°52′			50°54′			55°33′			59°21′		
Longitude	deg E	109°59′			110°01′			110°07′			108°39′			108°44′		
Air Temperature	deg C	10			7.9			5.9			2.3			0		
SLP	hPa	1007.5			1010.6			985.5			987.9			979.6		
		Depth (dbar)	Temp. (ITS-90)	Sal. (PSS78)	Depth (dbar)	Temp. (ITS-90)	Sal. (PSS78)	Depth (dbar)	Temp. (ITS-90)	Sal. (PSS78)	Depth (dbar)	Temp. (ITS-90)	Sal. (PSS78)	Depth (dbar)	Temp. (ITS-90)	Sal. (PSS78)
		10	12.17	34.804	10	10.11	34.703	10	4.22	33.939	10	1.59	33.960	10	0.66	33.941
		20	12.16	34.806	20	10.11	34.707	20	4.22	33.941	20	1.59	33.960	20	0.66	33.942
		30	12.16	34.809	30	10.12	34.708	30	4.19	33.944	30	1.58	33.959	30	0.66	33.941
		50	12.16	34.806	50	10.11	34.711	50	4.06	33.945	50	1.58	33.960	50	0.64	33.942
		75	10.32	34.682	75	10.11	34.712	75	3.91	33.948	75	1.57	33.962	75	0.50	33.938
		100	10.04	34.699	100	10.11	34.724	100	3.39	33.955	100	1.56	33.966	100	0.06	33.990
		125	9.91	34.691	125	9.96	34.723	125	2.97	33.968	125	1.17	34.010	125	0.18	34.072
		150	9.91	34.735	150	9.67	34.699	150	2.82	34.003	150	0.95	34.043	150	0.83	34.216
		200	9.74	34.704	200	9.54	34.683	200	2.94	34.075	200	1.39	34.185	200	1.79	34.426
		250	9.66	34.703	250	9.54	34.688	250	2.55	34.069	250	2.25	34.320	250	1.92	34.510
		300	9.57	34.685	300	9.46	34.681	300	2.40	34.127	300	2.31	34.405	300	2.10	34.577
		400	9.36	34.646	400	9.38	34.667	400	2.70	34.259	400	2.27	34.496	400	2.08	34.635
		500	9.24	34.650	500	9.32	34.661	500	2.54	34.350	500	2.34	34.572	490	2.07	34.673
		560	9.04	34.632	566	8.99	34.610	557	2.49	34.394	555	2.32	34.608			

Table 1-2. Sampling date, time, position, air temperature, and sea level pressure for Sts. L6–10. Temperature and salinity are also shown for each defined depth.

Station	Unit	L6			L7			L8			L9			L10		
Date	UTC	6 March 2010			8 March 2010			Cancel			Cancel			13 March 2010		
Time	UTC	23:23			23:23			—			—			6:10		
Latitude	deg S	64°07′			60°12′			—			—			44°55′		
Longitude	deg E	149°43′			149°52′			—			—			152°12′		
Air Temperature	deg C	2.5			3.8			—			—			14.5		
SLP	hPa	975.2			1005.7			—			—			1033.1		
		Depth (dbar)	Temp. (ITS-90)	Sal. (PSS78)	Depth (dbar)	Temp. (ITS-90)	Sal. (PSS78)	Depth (dbar)	Temp. (ITS-90)	Sal. (PSS78)	Depth (dbar)	Temp. (ITS-90)	Sal. (PSS78)	Depth (dbar)	Temp. (ITS-90)	Sal. (PSS78)
		10	1.07	33.757	10	1.83	33.753	—	—	—	—	—	—	10	13.71	34.617
		20	1.07	33.759	20	1.83	33.754	—	—	—	—	—	—	20	13.71	34.617
		30	1.06	33.758	30	1.83	33.754	—	—	—	—	—	—	30	13.70	34.618
		50	0.16	34.202	50	1.82	33.754	—	—	—	—	—	—	50	13.64	34.614
		75	1.56	34.529	75	−0.28	34.023	—	—	—	—	—	—	75	13.13	34.585
		100	1.74	34.573	100	0.86	34.368	—	—	—	—	—	—	100	11.20	34.626
		125	1.73	34.587	125	1.52	34.493	—	—	—	—	—	—	125	10.05	34.635
		150	1.82	34.618	150	1.88	34.565	—	—	—	—	—	—	150	9.61	34.674
		200	1.88	34.652	200	2.02	34.614	—	—	—	—	—	—	200	9.46	34.680
		250	1.89	34.674	250	1.99	34.642	—	—	—	—	—	—	250	9.11	34.621
		300	1.91	34.692	300	2.02	34.667	—	—	—	—	—	—	300	8.90	34.589
		400	1.88	34.716	400	1.97	34.693	—	—	—	—	—	—	400	8.74	34.571
		497	1.84	34.730	413	1.96	34.700	—	—	—	—	—	—	455	8.62	34.560

"—" indicates no data.

Table 2-1. Nutrient concentrations, temperature and salinity of the bottle samples at St. L1.

Staion	Collected depth (dbar)	Nutrient concentration (μM)					Temp. (°C)	Sal.
		NO_3	NH_4	NO_2	PO_4	SiO_2		
L1	0 (surface water)	7.32	0.79	0.22	0.70	3.54	12.2	—
	20	7.54	0.33	0.21	0.69	3.57	12.17	34.805
	49	7.59	0.65	0.24	0.71	3.63	12.16	34.807
	75	10.62	0.89	0.22	0.85	4.42	10.33	34.678
	100	11.10	0.57	0.30	0.89	4.55	10.05	34.699
	197	12.56	0.54	0.03	0.91	4.33	9.77	34.707
	497	16.53	0.14	0.04	1.15	6.46	9.26	34.650

"—" indicates the no data.

Table 2-2. Nutrient concentrations, temperature and salinity of the bottle samples at St. L2.

Staion	Collected depth (dbar)	Nutrient concentration (μM)					Temp. (°C)	Sal.
		NO_3	NH_4	NO_2	PO_4	SiO_2		
L2	0 (surface water)	11.16	0.41	0.26	0.87	4.58	10.4	—
	20	10.92	0.40	0.27	0.87	4.63	10.11	34.707
	49	10.76	0.27	0.22	0.85	4.48	10.11	34.710
	74	10.55	0.52	0.29	0.86	4.44	10.11	34.713
	99	11.00	0.61	0.28	0.86	4.52	10.11	34.725
	198	13.74	0.61	0.09	0.97	5.14	9.56	34.685
	498	12.97	0.14	0.01	1.01	5.41	9.32	34.661

"—" indicates the no data.

Table 2-3. Nutrient concentrations, temperature and salinity of the bottle samples at St. L3.

Staion	Collected depth (dbar)	Nutrient concentration (μM)					Temp. (°C)	Sal.
		NO_3	NH_4	NO_2	PO_4	SiO_2		
L3	0 (surface water)	23.66	0.41	0.29	1.61	9.67	4.4	—
	20	24.73	0.37	0.27	1.63	9.68	4.22	33.941
	49	24.70	0.48	0.26	1.65	9.83	4.06	33.945
	74	24.10	0.68	0.24	1.67	9.83	3.91	33.949
	98	25.25	0.64	0.23	1.73	11.91	3.45	33.952
	199	29.57	0.69	0.09	1.86	22.10	2.91	34.064
	500	35.02	0.32	0.03	2.30	52.06	2.54	34.350

"—" indicates the no data.

Table 2-4. Nutrient concentrations, temperature and salinity of the bottle samples at St. L4.

Staion	Collected depth (dbar)	Nutrient concentration (μM)					Temp. (°C)	Sal.
		NO_3	NH_4	NO_2	PO_4	SiO_2		
L4	0 (surface water)	27.67	0.60	0.29	1.83	24.06	2.4	—
	20	26.79	0.56	0.27	1.87	23.72	1.59	33.958
	49	26.94	0.53	0.27	1.85	23.40	1.58	33.959
	75	27.89	0.63	0.27	1.84	23.81	1.57	33.961
	97	24.16	0.81	0.28	1.87	24.19	1.56	33.964
	197	33.11	0.15	0.06	2.18	43.32	1.17	34.195
	497	35.36	0.22	0.06	2.30	70.69	2.35	34.573

"—" indicates the no data.

Table 2-5. Nutrient concentrations, temperature and salinity of the bottle samples at St. L5.

Staion	Collected depth (dbar)	Nutrient concentration (μM)					Temp. (°C)	Sal.
		NO_3	NH_4	NO_2	PO_4	SiO_2		
L5	0 (surface water)	27.86	0.53	0.31	1.87	27.89	0.8	—
	20	28.00	0.90	0.30	1.89	28.02	0.66	33.943
	50	28.12	0.49	0.30	1.88	28.12	0.65	33.943
	75	28.49	0.52	0.29	1.86	28.71	0.5	33.939
	99	29.46	1.14	0.31	1.96	32.80	0.06	33.993
	196	35.76	0.35	0.08	2.34	65.97	0.15	34.426

"—" indicates the no data.

Table 2-6. Nutrient concentrations, temperature and salinity of the bottle samples at St. L6.

Staion	Collected depth (dbar)	Nutrient concentration (μM)					Temp. (°C)	Sal.
		NO_3	NH_4	NO_2	PO_4	SiO_2		
L6	0 (surface water)	23.72	0.60	0.34	1.56	21.02	1.2	—
	20	23.98	0.66	0.36	1.59	20.74	1.07	33.759
	49	34.72	1.28	0.34	2.35	61.15	0.37	33.994
	74	35.47	0.57	0.16	2.41	72.25	1.56	34.527
	99	35.14	0.35	0.11	2.40	77.19	1.74	34.576
	198	33.99	0.61	0.09	2.23	82.60	1.88	34.652
	398	33.28	0.45	0.09	2.18	82.64	1.88	34.718

"—" indicates the no data.

Table 2-7. Nutrient concentrations, temperature and salinity of the bottle samples at St. L7.

Staion	Collected depth (dbar)	Nutrient concentration (μM)					Temp. (°C)	Sal.
		NO_3	NH_4	NO_2	PO_4	SiO_2		
L7	0 (surface water)	24.21	0.69	0.38	1.60	11.94	2.70	—
	20	25.15	0.86	0.37	1.63	11.90	1.82	33.756
	49	24.86	0.78	0.35	1.64	12.46	1.82	33.752
	74	28.29	1.63	0.28	2.03	34.58	0.16	33.793
	99	36.07	0.35	0.23	2.40	65.40	0.84	34.347
	197	34.30	0.51	0.04	2.34	77.45	2.00	34.614
	397	33.13	0.36	0.02	2.20	79.78	1.97	34.693

"—" indicates the no data.

Table 2-8. Nutrient concentrations, temperature and salinity of the bottle samples at St. L10.

Staion	Collected depth (dbar)	Nutrient concentration (μM)					Temp. (°C)	Sal.
		NO_3	NH_4	NO_2	PO_4	SiO_2		
L10	0 (surface water)	3.91	0.71	0.24	0.49	1.95	13.4	—
	20	3.96	0.80	0.23	0.48	1.99	13.71	34.617
	49	3.98	0.72	0.19	0.46	1.84	13.64	34.614
	74	5.39	1.44	0.30	0.57	1.89	13.22	34.589
	99	9.96	0.47	1.04	0.81	2.43	11.26	34.633
	197	13.83	0.29	0.04	0.98	4.57	9.45	34.678
	397	16.48	0.34	0.05	1.10	5.28	8.74	34.571

"—" indicates the no data.

Table 3-1. Sampling date, time, position, temperature, salinity, and nutrient concentration of the surface seawater during 2009.

Date	Time	Latitude	Longitude	Temp.	Salinity	Nutrient concentration (μM)				
(UTC)	(UTC)	(deg S)	(deg E)	(deg C)		NO_3	NH_4	NO_2	PO_4	SiO_2
1 December 2009	5:30	41°29′	109°55′	11.63	34.630	9.89	0.09	0.13	0.77	1.77
1 December 2009	12:00	42°58′	109°56′	10.85	34.630	11.29	0.26	0.17	0.80	2.53
2 December 2009	6:00	46°49′	110°00′	8.97	34.410	14.72	0.37	0.20	0.98	0.06
2 December 2009	12:00	48°16′	110°00′	6.59	33.990	23.81	0.83	0.24	1.43	3.90
3 December 2009	6:00	51°37′	109°52′	3.29	33.890	28.38	0.28	0.22	1.75	12.87
3 December 2009	12:00	53°00′	109°25′	2.91	33.870	28.92	0.34	0.19	1.78	14.56
4 December 2009	6:00	56°12′	108°38′	1.59	33.870	30.44	0.28	0.20	1.89	21.34
4 December 2009	12:00	57°14′	108°37′	1.68	33.870	30.27	0.44	0.20	1.88	19.95
5 December 2009	5:48	59°20′	108°24′	−0.32	33.850	30.36	0.09	0.24	1.89	30.01
5 December 2009	12:00	59°20′	108°24′	−0.80	33.770	30.19	0.08	0.25	1.89	34.14
6 December 2009	0:00	59°20′	108°24′	−0.47	33.890	30.72	0.24	0.26	1.89	34.43
6 December 2009	6:11	59°20′	108°24′	−0.32	33.800	29.35	0.12	0.21	1.83	30.62
6 December 2009	12:13	59°47′	97°46′	−0.32	33.770	29.14	0.08	0.21	1.79	29.97
7 December 2009	0:00	59°43′	92°11′	−0.38	33.720	29.57	0.26	0.22	1.76	29.13
7 December 2009	5:40	59°42′	89°44′	−0.34	33.580	27.89	0.14	0.22	1.67	27.33
7 December 2009	12:00	59°23′	87°32′	0.80	33.850	27.52	0.34	0.18	1.75	16.67
8 December 2009	1:00	58°32′	83°16′	−0.37	33.850	29.92	0.06	0.17	1.81	48.19
8 December 2009	6:00	58°31′	81°12′	−0.49	33.850	28.96	0.17	0.20	1.88	48.35
8 December 2009	12:00	58°28′	78°45′	−0.38	33.770	28.64	0.27	0.23	1.70	39.47
9 December 2009	2:25	58°11′	72°58′	0.21	33.820	29.84	0.16	0.20	1.90	32.89
9 December 2009	8:13	58°11′	70°36′	0.20	33.800	30.59	0.09	0.22	1.89	33.55
9 December 2009	14:08	58°11′	68°14′	1.40	33.920	29.89	0.23	0.22	1.93	29.82
10 December 2009	2:00	58°11′	63°33′	0.21	33.850	30.79	0.10	0.21	1.93	37.27
10 December 2009	8:00	58°12′	61°08′	0.36	33.900	31.62	0.15	0.22	1.97	38.72
10 December 2009	14:12	58°24′	58°33′	0.25	33.900	32.00	0.42	0.22	1.95	37.07
11 December 2009	3:20	58°59′	53°35′	−0.79	33.650	31.63	0.36	0.28	1.93	40.91
11 December 2009	9:00	59°15′	51°18′	−0.84	33.630	31.47	0.41	0.26	1.91	41.41
11 December 2009	14:57	59°35′	48°45′	−0.96	33.550	31.53	0.39	0.27	1.93	40.52
12 December 2009	4:00	60°37′	43°52′	−1.20	33.510	30.94	0.29	0.27	1.90	41.74
12 December 2009	10:01	61°24′	42°36′	−1.50	33.700	30.41	0.21	0.26	1.88	49.16
12 December 2009	16:00	62°09′	41°10′	−1.32	33.750	31.16	0.08	0.26	1.91	51.84
13 December 2009	4:10	63°16′	39°15′	−1.62	33.860	32.44	0.12	0.23	1.99	56.40
13 December 2009	10:20	63°55′	38°02′	−1.58	33.780	32.68	0.02	0.22	2.00	59.11
13 December 2009	16:00	64°43′	37°54′	−1.51	33.870	32.54	0.12	0.26	2.00	61.12
14 December 2009	4:14	66°26′	37°55′	−1.72	33.990	33.88	0.14	0.21	2.11	66.89
14 December 2009	10:07	67°00′	37°52′	−1.79	34.070	33.90	0.06	0.19	2.12	67.12
14 December 2009 *	16:41	67°25′	38°10′	−1.67	34.140	34.08	0.07	0.17	2.14	68.09
15 December 2009 *	5:06	68°12′	38°24′	−1.58	33.940	32.97	0.12	0.06	2.01	56.73
15 December 2009 *	8:00	68°23′	38°40′	−1.73	33.940	32.79	0.23	0.05	2.04	58.73
15 December 2009 *	16:20	68°24′	38°41′	−1.66	33.940	32.83	0.08	0.04	2.04	59.77
16 December 2009 *	16:30	68°24′	38°41′	−1.74	33.990	33.77	0.14	0.04	2.02	61.19
20 December 2009 *	16:30	68°13′	37°23′	−1.50	33.790	31.59	0.10	0.06	1.96	57.13
21 December 2009 *	16:23	68°20′	31°32′	−1.06	33.870	29.72	0.32	0.12	2.15	65.49
22 December 2009 *	16:00	69°37′	25°44′	−1.23	33.460	28.10	0.19	0.09	1.98	61.99
24 December 2009 *	14:36	70°03′	22°57′	−1.18	33.700	24.34	0.38	0.10	2.12	69.83
25 December 2009 *	15:53	69°27′	24°45′	−0.75	33.320	29.47	0.29	0.20	2.62	80.20
26 December 2009 *	15:38	67°51′	30°32′	−0.96	33.610	30.82	0.28	0.14	2.82	87.85
27 December 2009 *	15:43	67°34′	36°38′	−1.51	33.940	30.86	0.20	0.09	3.00	94.55
29 December 2009 *	6:41	68°25′	38°42′	−1.67	33.940	31.41	0.08	0.03	2.84	97.22

*Sea surface was covered by sea ice.

Table 3-2. Sampling date, time, position, temperature, salinity, and nutrient concentration of the surface seawater during 2010.

Date (UTC)	Time (UTC)	Latitude (deg S)	Longitude (deg E)	Temp. (deg C)	Salinity	Nutrient concentration (μM)				
						NO_3	NH_4	NO_2	PO_4	SiO_2
17 February 2010 *	9:00	66°21′	49°30′	−1.42	33.210	29.31	1.04	0.17	1.90	57.49
18 February 2010 *	12:36	66°22′	49°27′	−1.41	33.260	27.33	1.25	0.27	1.80	57.33
18 February 2010 *	17:02	66°22′	49°26′	−1.45	33.190	26.47	0.19	0.27	1.78	57.70
19 February 2010 *	5:30	66°18′	49°20′	−1.54	32.910	27.24	1.29	0.24	1.85	56.88
19 February 2010	11:00	65°14′	49°48′	0.33	33.750	27.97	0.80	0.26	1.84	54.13
19 February 2010	17:00	64°59′	52°20′	0.48	33.750	27.59	0.39	0.26	1.77	50.34
20 February 2010	5:30	65°00′	58°46′	0.81	33.800	28.74	0.59	0.28	1.87	53.49
20 February 2010	10:05	65°15′	60°59′	0.78	33.850	28.48	0.66	0.33	1.86	55.43
20 February 2010	16:00	65°52′	63°38′	0.62	33.890	28.54	0.64	0.27	1.91	56.13
21 February 2010	4:10	66°54′	68°00′	−0.06	33.700	26.46	0.91	0.27	1.80	46.68
21 February 2010	8:55	67°23′	68°44′	−0.73	33.990	20.05	1.18	0.15	1.41	39.35
21 February 2010	13:52	66°58′	68°40′	−0.04	33.870	23.83	1.36	0.25	1.61	46.42
22 February 2010	2:00	67°06′	68°40′	−0.16	33.920	23.77	1.43	0.19	1.62	46.35
23 February 2010	9:00	67°20′	70°09′	−0.96	34.280	23.45	0.96	0.13	1.61	43.10
23 February 2010	14:00	66°48′	70°08′	0.05	33.700	24.84	1.42	0.11	2.10	59.96
24 February 2010	8:05	67°02′	69°57′	−0.37	34.090	22.66	0.95	0.21	1.55	43.47
25 February 2010	3:02	68°38′	73°05′	−0.26	33.750	13.35	1.15	0.23	1.00	37.32
25 February 2010	9:34	69°14′	74°39′	−0.13	33.550	8.00	0.71	0.25	0.63	33.58
25 February 2010	14:00	68°58′	75°52′	−0.15	33.920	18.59	0.96	0.21	1.25	37.83
26 February 2010	3:40	69°13′	76°05′	−0.19	33.720	14.13	1.40	0.26	1.17	36.11
26 February 2010	8:54	69°16′	76°08′	−0.20	33.620	13.53	0.72	0.11	0.94	34.58
26 February 2010	14:21	68°59′	75°59′	−0.30	33.970	19.44	0.40	0.11	1.15	35.05
27 February 2010	4:45	67°11′	74°31′	−0.33	33.890	24.17	0.60	0.10	1.39	37.82
27 February 2010	14:05	65°25′	75°30′	−0.26	33.210	26.16	0.63	0.17	1.46	38.46
28 February 2010	3:17	63°06′	80°53′	1.23	33.700	29.64	0.27	0.28	1.78	29.01
28 February 2010	9:07	62°27′	83°27′	1.03	33.460	25.62	0.32	0.24	1.51	20.83
28 February 2010	14:04	62°26′	86°07′	0.24	33.360	25.40	0.10	0.19	1.50	37.17
1 March 2010	2:02	62°18′	91°12′	1.03	33.580	25.37	0.11	0.25	1.48	24.18
1 March 2010	8:49	62°21′	94°46′	0.64	33.450	24.04	0.14	0.24	1.42	26.75
1 March 2010	13:07	62°23′	97°07′	1.07	33.600	25.11	0.42	0.35	1.61	37.83
2 March 2010	2:36	62°30′	104°34′	1.54	33.770	27.02	1.04	0.44	1.78	31.98
2 March 2010	13:02	62°30′	109°31′	2.05	33.800	26.66	0.73	0.41	1.76	31.38
3 March 2010	1:13	62°32′	116°08′	1.93	33.820	27.25	1.38	0.51	1.76	34.31
3 March 2010	12:16	62°46′	120°58′	2.05	33.870	24.42	0.33	0.38	1.49	18.36
4 March 2010	0:31	63°00′	127°03′	2.03	33.800	25.88	0.43	0.42	1.64	21.72
4 March 2010	5:06	63°07′	129°17′	2.12	33.800	25.19	0.38	0.36	1.50	10.05
4 March 2010	11:02	63°14′	132°12′	1.36	33.820	25.65	0.31	0.32	1.62	16.74
4 March 2010	23:05	63°51′	137°28′	2.07	33.820	24.21	0.32	0.42	1.34	9.30
5 March 2010	10:19	65°22′	138°55′	−0.20	33.890	28.56	0.47	0.28	1.86	45.01
6 March 2010	0:45	65°45′	143°04′	−1.43	33.170	20.96	0.90	0.30	1.74	34.81
6 March 2010	5:04	65°38′	143°53′	−1.18	33.090	25.62	0.91	0.34	1.70	29.13
6 March 2010	10:23	65°13′	145°29′	0.87	33.770	26.22	0.85	0.49	1.78	25.16
7 March 2010	5:25	63°35′	149°41′	1.29	33.680	23.58	0.27	0.37	1.54	16.44
7 March 2010	10:02	63°08′	149°43′	1.54	33.670	21.75	0.16	0.35	1.51	13.94
8 March 2010	0:13	62°04′	150°19′	1.84	33.720	24.12	0.57	0.37	1.58	10.99
8 March 2010	4:07	61°39′	150°47′	1.97	33.720	24.83	0.39	0.32	1.53	11.23
8 March 2010	9:04	61°23′	150°47′	1.86	33.720	24.44	0.42	0.36	1.58	11.97
9 March 2010	4:45	59°44′	149°20′	2.09	33.720	25.62	0.51	0.33	1.66	11.80
9 March 2010	9:06	59°20′	148°43′	2.60	33.700	25.28	0.37	0.39	1.60	9.57
10 March 2010	0:00	58°13′	150°27′	4.76	33.730	23.99	0.56	0.33	1.58	3.33
10 March 2010	4:12	57°52′	151°00′	4.46	33.720	24.61	0.61	0.33	1.63	4.20
10 March 2010	8:47	57°30′	150°48′	3.04	33.700	23.43	0.74	0.33	1.62	10.99
11 March 2010	1:00	56°03′	150°11′	4.00	33.670	23.90	0.31	0.29	1.57	4.51
11 March 2010	4:01	55°45′	150°06′	4.23	33.700	23.44	0.49	0.33	1.58	2.82
11 March 2010	9:01	55°27′	149°59′	5.66	33.700	22.58	0.60	0.26	1.55	2.09
12 March 2010	0:00	52°22′	149°50′	7.59	33.750	19.81	0.38	0.25	1.41	2.38
12 March 2010	9:00	50°11′	150°13′	9.85	34.170	12.98	0.40	0.18	1.01	1.93
13 March 2010	0:00	46°21′	151°37′	13.89	34.800	3.12	0.33	0.20	0.43	1.83
13 March 2010	4:00	45°22′	152°02′	13.63	34.630	3.13	0.56	0.21	0.46	1.77

*Sea surface was covered by sea ice.