

Oceanographic Data of the 16th Japanese Antarctic Research Expedition 1974–1975

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第16次南極地域観測隊海洋部門報告

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要旨: 第16次南極地域観測において、定常観測(1974-1975)として、海上保安庁水路部の担当した表面観測、バシサーモグラフ(BT)観測、温度-塩分-深度記録計(STD)による観測、および各層観測の結果を報告する。

Abstract: This is a report of the results of oceanographic observation carried out on board FUJI during the mission of the 16th Japanese Antarctic Research Expedition in 1974–1975.

This report deals with the data of the oceanographic observations made on board the icebreaker FUJI during the summer mission of the 16th Japanese Antarctic Research Expedition in 1974–1975. The track chart of the cruise is shown in Fig. 1. The locations of the Salinity-Temperature-Depth (STD) recorder observation, the serial vertical observation stations and the bathythermograph (BT) observation stations in the Southern Ocean are given in Fig. 2.

Surface observation: Surface temperature measurements and surface water samplings for chemical analysis were made three times a day during the cruise from Fremantle to Syowa Station and twice a day for the rest of the route so far as the circumstances permitted. The results are given in Table 1.

Current measurement: Measurements of surface current were made by Geomagnetic Electrokinetograph (GEK) through the cruise except in the magnetic equator region and in the pack ice area. The results are also shown in Table 1.

BT observation: Water temperature in the upper layer (down to about 250 m) was measured with BT at almost the same frequency as the surface observations. The results are given in Table 2.

STD recorder observation: The vertical distribution of temperature and salinity

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was measured at 8 stations in the Southern Ocean along the track from Fremantle to Cape Town through Syowa Station. The results are shown in Fig. 3.

Serial observation: The observations were made at 10 stations in the Southern Ocean along the track from Fremantle to Cape Town (Fig. 2). The observed data are shown in Table 3 with relevant meteorological data. The interpolated and computed values (temperature, salinity, sigma- t and dynamic depth anomalies) at standard depths are also included in Table 3. These values were calculated by the electronic computer at the Hydrographic Department.

Chemical analysis of sea water: The followings are the elements and the methods (or instrument) of analysis. The results are also presented in Table 3.

Salinity	Inductive salinometer (Auto-Lab Model 601 MK III)
pH	pH meter (KPH-51B Yokogawa Electric Works Inc.)
Dissolved oxygen	Winkler's Method
Phosphate-P	Molybdenum blue method*
Reactive silicate-Si	Molybdenum yellow method*
Nitrate-N	Modified Morris and Riley method
Nitrite-N	Sulphanilamide and N-(1-naphtyl)-ethylene-diamine 2 HCl were used as reagent*.
Ammonium-N	Indophenol method
Alkalinity	After 15.00 ml of N/100 HCl was added to 50.0 ml sample, pH of the sample was measured and alkalinity was calculated by STRICKLAND's table*.

Acknowledgements

The authors are indebted to Captain M. MORITA of the icebreaker FUJI and his officers and crew for their co-operation which made these observations possible.

(Received November 14, 1975)

* STRICKLAND, J. D. H. and T. R. PARSONS (1960) : A manual of sea water analysis. Bull. Fish. Res. Bd. Canada, 125, 185 pp.

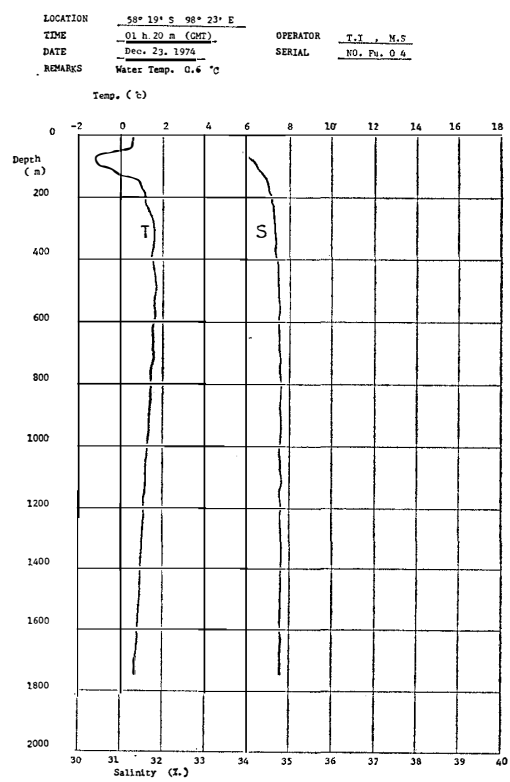
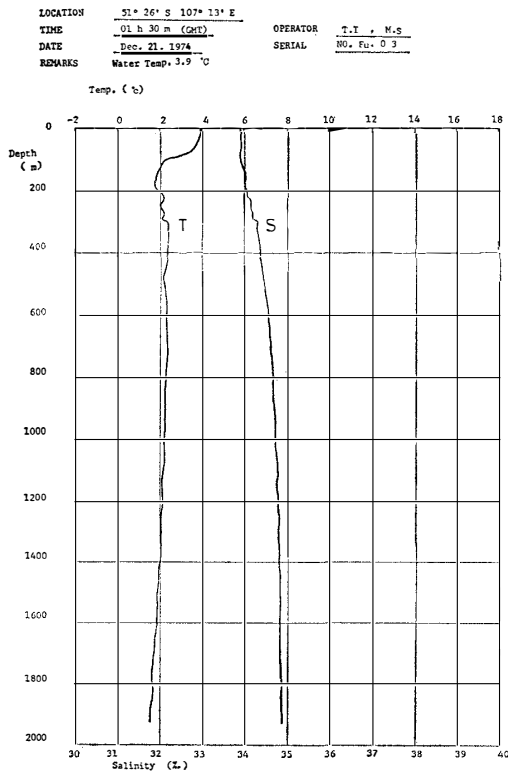
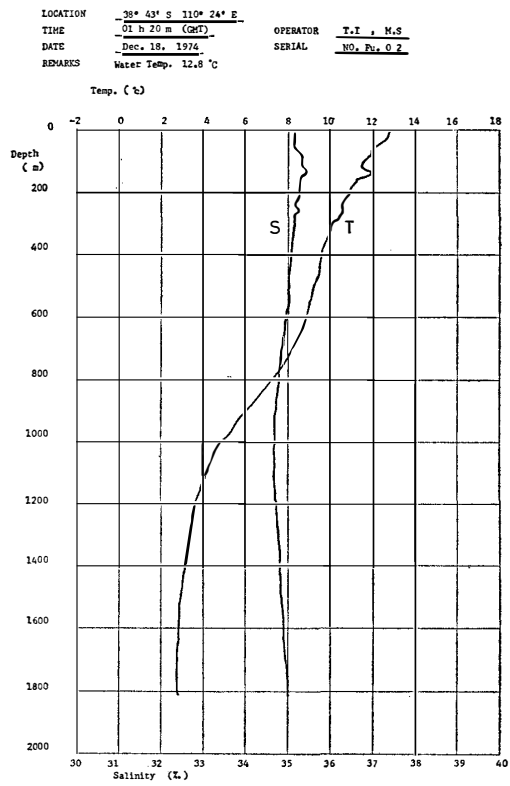
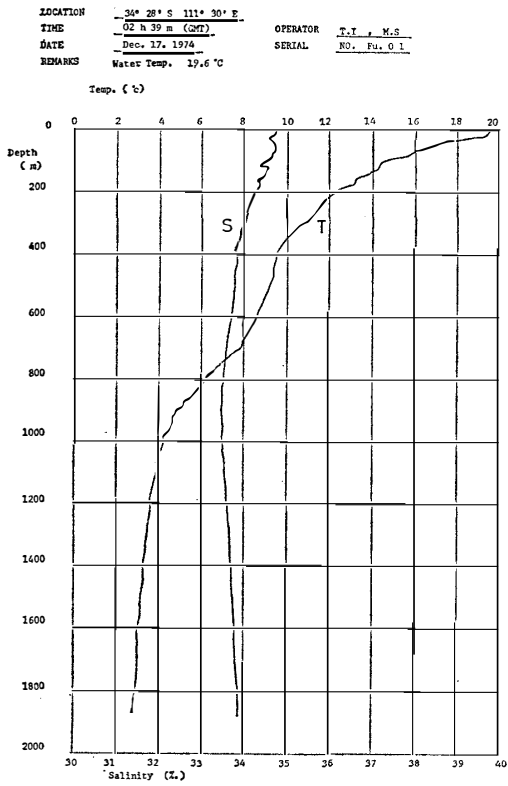
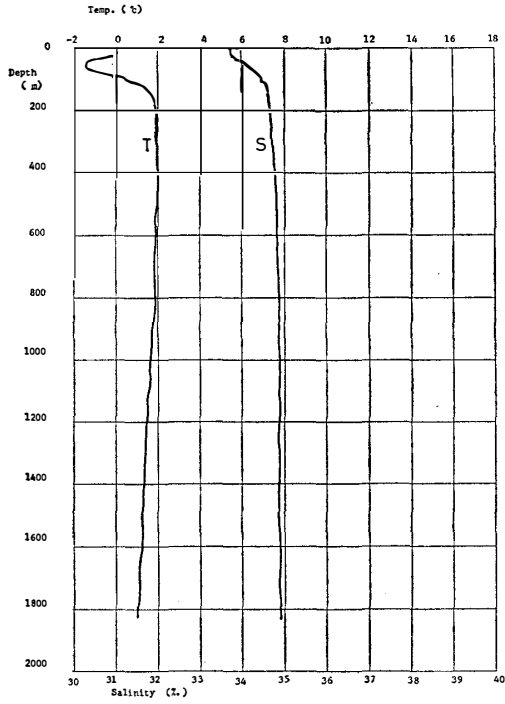
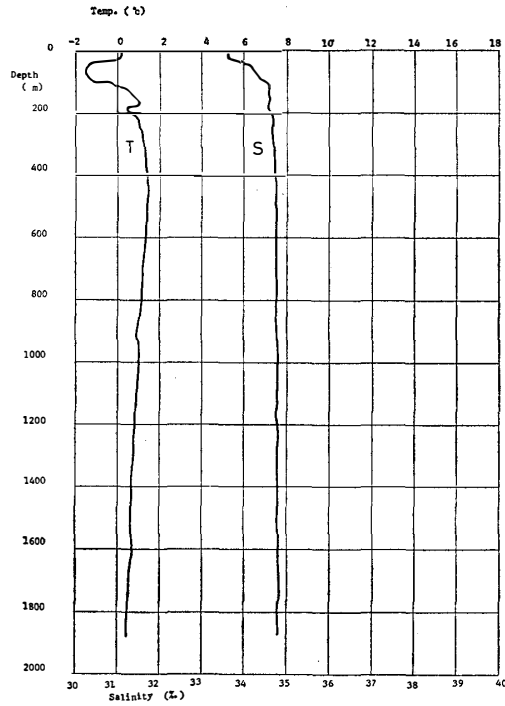


Fig. 3. The results of STD observation.

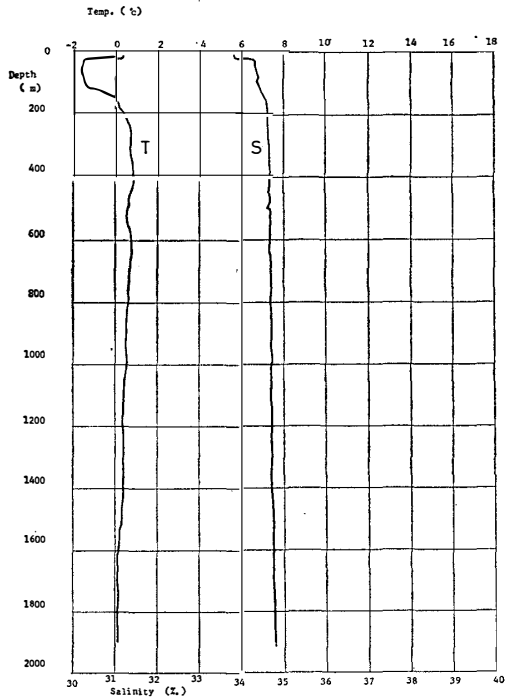
LOCATION 62° 57' S 84° 06' E
 TIME 03 h 10 m (GMT)
 DATE Dec. 25, 1974
 REMARKS Water Temp. 0.1 °C
 OPERATOR T. I. M.S.
 SERIAL NO. Fu. 0.5



LOCATION 64° 14' S 75° 42' E
 TIME 03 h 00 m (GMT)
 DATE Dec. 26, 1974
 REMARKS Water Temp. 0.2 °C
 OPERATOR T. I. M.S.
 SERIAL NO. Fu. 0.6



LOCATION 66° 57' S 12° 42' E
 TIME 08 h 45 m (GMT)
 DATE Feb. 25, 1975
 REMARKS Water Temp. 0.4 °C
 OPERATOR T. I. M.S.
 SERIAL NO. Fu. 0.7



LOCATION 57° 34' S 01° 18' W
 TIME 16 h 18 m (GMT)
 DATE Mar. 1, 1975
 REMARKS Water Temp. 1.9 °C
 OPERATOR T. I. M.S.
 SERIAL NO. Fu. 0.8

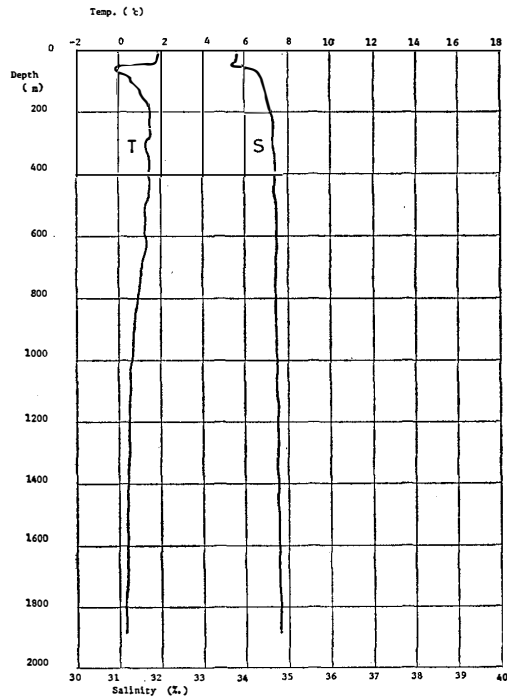


Table 1. Surface observation data.

Date	Time		Position		Air temp.	Water temp.	S	pH	O ₂	Phosphate-P	Silicate-Si	Nitrite-N	Nitrate-N	Ammonia-N	Alkalinity	Current	
	GMT	LMT	Lat.	Long.	°C	‰										cc/L	µg-atoms/L				meq/L	Dir.	Speed (Kn)
1974																	
Nov. 25			Leave Tokyo														
26	2300*	0800	32-27N	137-44 E	20.2	22.7	34.514	8.36	4.94	0.12	3				2.61		
	0900	1800	30-07	136-51	21.9	22.4	34.617	8.35	4.94	0.06	1				2.49		
27	2300*	0800	27-11	136-47	21.5	23.8	34.706	8.32	4.82	0.02	0				2.47		
	0900	1800	25-15	135-50	23.8	26.7	34.747	8.37	4.58	0.14	0				2.40		
28	2300*	0800	22-32	134-35	27.0	27.1	34.555	8.37	4.55	0.06	2				2.38		
	0900	1800	21-15	133-48	26.0	27.7	34.407	8.36	4.50	0.04	0				2.45		
29	2300*	0800	18-45	132-41	28.5	27.5		8.30	4.71	0.00	0						
	0900	1800	16-52	131-17	28.0	27.5	34.622	8.27	4.53	0.06	0				2.27		
30	2300*	0800	14-17	129-54	28.0	27.5	34.440	8.30	4.54		0				2.47		
	1030	1930	11-41	128-53	28.5	28.3	34.144	8.30	4.49	0.06	3	0.03	0.0		2.45	247	0.7
Dec. 1	0000	0800	9-03	127-53	30.0	28.1	34.055	8.32	4.46	0.02	0	0.03	0.0		2.41		
	1000	1800	6-53	126-42	29.5	28.2	33.940	8.29	4.45	0.02	1	0.10	0.1		2.41		
2	0000	0800	4-28	124-36	28.3	28.0	34.259	8.27	4.47	0.00	2	0.10	0.0	0.1	2.45		
	1000	1800	3-12	122-44	28.0	28.4	33.921	8.25	4.47	0.02	3	0.03	0.0		2.45		
3	0000	0800	1-34	120-39	28.5	28.4	33.253	8.31	4.45	0.00	4	0.02	0.1	0.4	2.40		
	1000	1800	0-05S	119-25	28.2	29.0	33.256	8.26	4.45	0.08	6	0.04	0.0	0.4	2.34		
4	0000	0800	3-06	118-36	29.1	28.9	33.179	8.27	4.48	0.02	2	0.03	0.0	0.1	2.40		
	1000	1800	5-15	118-13	28.8	29.3	34.007	8.27	4.46	0.06	4	0.02	0.0		2.43		
5	0000	0800	7-35	116-27	29.7	29.2	34.187	8.28	4.41	0.02	4	0.03	0.0	0.4	2.41		
	1000	1800	9-08	115-34	29.8	30.2	33.239	8.30	4.51	0.04	9	0.03	0.0	0.1	2.35		
6	0000	0800	11-54	115-05	28.9	29.1	34.344	8.28	4.41	0.06	5	0.02	0.0	0.3	2.43	10	0.8
	1000	1800	13-56	114-35	28.7	29.1	33.648	8.30	4.49	0.00	4	0.03	0.0	0.2	2.37		
7	0000	0800	16-45	114-02	27.0	26.8	34.615	8.31	4.55	0.06	6	0.00	0.0	0.3	2.44	0	1.1
	1000	1800	18-45	113-30	26.5	27.3	34.688	8.27	4.60	0.08	3	0.00	0.0	0.1	2.40	312	1.5

Continued Table 1

Date	Time		Position		Air temp.	Water temp.	S	pH	O ₂ cc/L	Phosphate-P	Silicate-Si	Nitrite-N	Nitrate-N	Ammonia-N	Alkalinity meq/L	Current	
	GMT	LMT	Lat.	Long.	°C		‰									Dir.	Speed (Kn)
8	0000	0800	21-20S	113-12E	24.7	24.7	34.853	8.30	4.80	0.10	4	0.01	0.0	0.4	2.47		
	1000	1800	23-13	112-51	24.0	24.7	34.823	8.27	4.80	0.08	5	0.00	0.0	0.1	2.43		
9	0000	0800	25-43	112-22	21.0	21.8	35.166	8.27	5.08	0.13	2	0.01	0.1	0.4	2.49		
	1000	1800	27-18	112-52	21.2	21.5	35.227	8.26	4.80	0.14	4	0.00	0.0	0.0	2.45		
10	2300*	0800	29-50	113-55	19.9	20.3	35.401	8.28	4.92	0.04	0	0.00	0.0	0.0	2.47		
			Arrive in Fremantle														
16			Leave Fremantle														
17	0000	0800	34-28	111-30	19.0	19.6	35.652	8.36	5.37	0.06	1	0.08	0.0	0.4	2.62	257	0.1
	1000	1800	35-45	111-09	17.0	16.5	35.648	8.35	5.58	0.08	0	0.03	0.0	0.3	2.62		
18	0100	0800	38-43	110-24	13.6	12.8	34.919	8.24		0.50	2	0.16	5.6	0.4	2.55	160	0.1
	0600	1300	39-19	110-12	13.9	13.0	34.907	8.31	6.08	0.40	7	0.16	5.7	0.6	2.47		
	1100	1800	40-15	109-59	13.5	12.5	34.907	8.28	5.76	0.60	2	0.18	6.4		2.45		
19	0100	0800	43-02	109-12	12.3	10.9	34.800	8.31	6.20	0.70	3	0.26	9.1	0.4	2.44	17	0.4
	1100	1800	44-20	109-34	11.8	8.1	34.340	8.28	6.73	1.08	4	0.25	16.	0.4	2.41		
20	0100	0800	47-15	109-22	8.0	8.6	34.458	8.26	6.60	1.00	4	0.26	14.	0.3	2.37		
	0600	1300	47-51	109-05	7.7	5.9	33.980	8.26	7.20	1.10	0	0.26	21.	0.0	2.35		
	1100	1800	48-48	108-37	6.9	5.8	33.905	8.22	7.15	1.40	2	0.27	23.	0.2	2.37		
21	0100	0800	51-26	107-13	4.9	3.9	33.905	8.24	6.69	1.32	0	0.28	24.	0.3	2.37	20	0.3
	0600	1300	51-08	106-52	4.9	3.5	33.979	8.25	7.69	1.30	8	0.40	26.	0.4	2.35		
	1100	1800	52-59	106-11	4.2	2.8	33.952	8.23	7.57	1.46	13	0.11	27.	0.3	2.35		
22	0100	0800	55-28	103-39	3.3	2.9	34.021	8.24	7.56	1.62	22	0.32	27.	0.2	2.37	345	0.2
23	0100	0800	58-19	98-23	3.1	0.6	33.945	8.28	7.95	1.38	46	0.21	24.	0.0	2.38	130	0.3
	0600	1300	58-20	98-20	3.3	0.8	33.965	8.30	7.98	1.70	30	0.33	25.	0.1	2.38		
	1100	1800	59-45	97-46	4.0	0.5	33.950	8.25	7.85	1.80	29	0.37	27.	0.4	2.40		
24	0200	0800	61-38	92-36	1.9	0.6	34.080	8.20	7.88	1.78	39	0.23	26.	0.0	2.17	39	0.7

Continued Table 1.

Date	Time		Position		Air temp.	Water temp.	S ‰	pH	O ₂ cc/L	Phosphate-P	Silicate-Si	Nitrite-N	Nitrate-N	Ammonia-N	Alkalinity meq/L	Current		
	GMT	LMT	Lat.	Long.	°C											Dir.	Speed (Kn)	
24	1200	1800	62-03S	89-44E	0.9	0.1	34.068	8.13	7.74	1.82	52	0.18	24.	0.0	2.35			
25	0300	0800	62-57	84-06	1.0	0.1	33.717	8.20	7.99	1.64	37	0.30	25.	0.0	2.19			
	0800	1300	63-11	82-20	0.3	-0.2	33.312	8.20	8.19	1.76	44	0.34	25.	0.0	2.34			
	1300	1800	63-32	80-41	1.0	0.4	33.569	8.18	8.14	1.64	50	0.32	26.	0.1	2.34			
26	0300	0800	64-14	75-42	0.8	0.2	33.637	8.20	8.10	1.66	42	0.30	25.	0.3	2.21			
	0800	1300	64-53	74-07	-0.2	0.3	33.653	8.19	7.95	1.72	50	0.30	27.	0.3	2.21			
	1300	1800	64-37	72-45	0.1	0.2	33.733	8.17	7.97	1.76	44	0.26	29.	0.5	2.37			
27	0400	0800	63-42	67-19	-0.1	0.8	33.618	8.16	7.95	1.76	48	0.22	26.	0.1	2.34			
	0900	1300	63-12	65-39	1.0	0.0	33.653	8.18	7.95	1.94	46	0.34	27.	0.3	2.35			
	1400	1800	63-24	63-28	1.8	2.2	33.751	8.11	7.84	2.00	47	0.32	29.	0.4	2.38			
28	0400	0800	63-56	56-55	1.4	-0.4	33.810	8.15	8.03	1.86	54	0.18	28.	0.0	2.35			
	0900	1300	64-05	55-33	2.0	-0.3	33.885	8.18	8.13	1.96	49	0.29	25.	0.2	2.37			
	1400	1800	64-16	53-07	-0.6	-0.2	33.928	8.11	8.11	1.94	53	0.32	27.	0.4	2.38			
29	0500	0800	64-48	46-18	-2.3	-0.7	33.889	8.15	8.08	2.04	58	0.23	28.		2.34			
	1000	1300	65-17	44-50	0.1	-0.7	33.671	8.16	7.99	2.08	61	0.30	22.		2.34			
	1500	1800	65-46	43-54	0.0	-1.7	33.770	8.10	7.76	1.98	62	0.24	28.		2.35			
Arrive at Ongul Island																		
Leave Ongul Island																		
1975 Feb.	23	1500	1800	67-21	31-23	-1.1	-0.1	33.746	8.16	7.85	1.90	64	0.27	24.	1.0	2.40		
24	0600	0800	67-08	23-18	0.6	0.4	33.911	8.14	7.63	1.94	68	0.26	28.	0.4	2.35	333	0.3	
	1600	1800	67-04	19-37	1.0	0.4	33.772	8.17	7.76	2.00	66	0.29	27.	1.0				
25	0600	0800	66-57	12-42	-0.5	0.4	33.830	8.15	7.76	1.92	77	0.26	28.	0.2	2.37	270	0.5	
	1600	1800	66-57	9-21	-0.5	1.2	34.149	8.17	7.71	1.49	53	0.19	22.	0.7	2.44			
26	0600	0800	67-26	4-06	-1.7	1.2	34.508	8.14	7.59	1.80	83	0.16	21.	1.3	2.44			
	1030	1230	67-27	2-04	0.7	1.2	34.485	8.19	7.69	1.75	77	0.16	23.	1.8	2.43	326	0.4	
27	0600	0800	66-13	4-54W	1.6	1.6	34.372	8.21	8.06	1.43	34	0.19	21.	0.8	2.45			

Continued Table 1.

Date	Time		Position		Air temp.	Water temp.	S ‰	pH	O ₂ cc/L	Phosphate-P	Silicate-Si	Nitrite-N	Nitrate-N	Ammonia-N	Alkalinity meq/L	Current		
	GMT	LMT	Lat.	Long.	°C	µg-atoms/L					Dir.	Speed (Kn)						
27	1600	1800	65-01S	4-50W	2.6	1.6	34.318	8.19	7.73	1.55	43	0.18	21.	0.9	2.45			
28	0600	0800	62-38	4-33	3.0	1.4	34.193	8.09	7.63	1.71	50	0.33	24.	1.8	2.40			
	1100	1300	61-48	4-25	3.2	1.3	34.172	8.16	7.61	1.88	63	0.36	24.	1.9	2.41			
Mar. 1	1600	1800	60-58	4-03	3.0	1.5	34.086	8.11	7.63	1.86	65	0.37	25.	1.3	2.44			
	0600	0800	58-42	3-08	2.8	1.7	33.990	8.10	8.06	1.77	63	0.31	26.	0.8	2.40	50	0.1	
2	1600	1800	57-34	1-18	3.9	1.9	33.800	8.15	7.64	1.80	62	0.31	25.	0.4	2.44	320	0.6	
	0600	0800	55-24	1-48E	2.5	1.8	33.704	8.14	8.15	1.80	56	0.27	26.	0.5	2.43	344	1.1	
3	1600	1800	54-17	3-18	3.7	1.6	33.652	8.13	7.66	1.82	54	0.27	25.	0.4	2.43			
	0600	0800	51-44	5-44	5.0	3.4	33.693	8.27	7.51	1.45	3	0.25	20.	0.6	2.41			
4	1100	1300	50-44	6-39	5.5	4.6	33.738	8.24	7.27	1.59	2	0.23	19.	0.7	2.45			
	1600	1800	49-45	7-33	5.9	5.1	33.751	8.17	7.24	1.55	2	0.21	20.	0.6	2.37			
	0600	0800	46-59	9-53	9.0	7.8	33.822	8.16	6.78	1.45	7	0.26	20.	0.5	2.41			
5	1100	1300	45-54	10-28	10.2	8.4	33.866	8.19	6.75	1.43	6	0.25	18.	0.1	2.43			
	1600	1800	44-50	11-04	11.0	8.9	33.913	8.18	6.67	1.42	6	0.22	18.	0.4	2.43			
	0600	0800	41-54	12-43	17.9	17.8	35.500	8.38	5.29	0.12	3	0.11	0.3	0.3	2.52			
6	1100	1300	40-50	13-17	18.7	18.6	35.542	8.40	5.28	0.16	3	0.11	0.3	0.2	2.52			
	1600	1800	39-49	13-59	19.0	18.2	35.423	8.40	5.46	0.20	2	0.07	0.2	0.2	2.53			
	0600	0800	37-21	15-53	21.0	20.8	35.516	8.39	5.17	0.03	2	0.02	0.0		2.55			
15	1100	1300	36-35	16-35	21.6	20.6	35.475	8.42	5.19	0.07	1	0.02	0.0		2.56			
	Arrive in Cape Town																	
16	Leave Cape Town																	
	0600	0800	34-37	23-35	20.0	16.8	35.173	8.32	5.31	0.18	4	0.05	0.4	0.2	2.49			
17	1600	1800	34-10	26-30	20.0	19.5	35.303	8.31	5.23	0.39	4	0.13	1.7	0.2	2.52			
	0600	0800	32-48	29-54	22.8	24.7	35.462	8.37	4.94	0.10	1	0.01	0.1	0.0	2.53	288	0.8	
18	1600	1800	31-45	32-16	21.9	23.8	35.508	8.40	4.95	0.10	1	0.04	0.1	0.1	2.54	334	2.1	
	0500	0800	30-14	35-08	22.0	23.8	35.548	8.38	4.94	0.06	1	0.02	0.0	0.9	2.55	277	1.3	

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Oceanographic Data of the 16th JARE 1974-1975

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Continued Table 1.

Date	Time		Position		Air temp.	Water temp.	S ‰	pH	O ₂ cc/L	Phosphate-P	Silicate-Si	Nitrite-N	Nitrate-N	Ammonia-N	Alkalinity meq/L	Current	
	GMT	LMT	Lat.	Long.	°C											Dir.	Speed (Kn)
18	1500	1800	29-27S	37-16E	22.2	25.8	35.226	8.39	4.81	0.14	1	0.00	0.0	0.5	2.55	127	0.7
19	0500	0800	28-21	40-16	24.5	25.7	35.336	8.37	4.73	0.02	3	0.00	0.0	0.2	2.57	124	0.4
	1500	1800	27-30	42-15	24.3	26.1	35.450	8.41	4.71	0.06	1	0.02	0.0	0.2	2.57	311	0.6
20	0500	0800	26-14	44-52	25.4	24.8	35.148	8.34	4.74	0.08	1	0.01	0.0	0.2	2.49	254	0.6
	1500	1800	25-21	46-53	26.2	24.8	34.221	8.37	4.81	0.08	3	0.07	0.1	0.1	2.45		
21	0500	0800	24-08	49-34	25.3	26.5	35.109	8.36	4.57	0.08	2	0.01	0.0	0.1	2.55	27	0.7
	1500	1800	22-52	51-38	27.2	27.2	35.289	8.40	4.62	0.04	1	0.03	0.0	0.3	2.55	21	1.7
22	0400	0800	21-17	54-17	26.5	26.8	35.389	8.36	4.50	0.14	0	0.01	0.0	0.1	2.58	355	1.8
22	1400	1800	20-14	56-15	27.0	27.9	35.371	8.38	4.58	0.16	0	0.02	0.1	0.3	2.57		
23	0400	0800	18-52	59-14	27.2	26.5	35.357	8.35	4.42	0.12	1	0.02	0.0	1.4	2.55		
	1400	1800	17-40	61-00	27.2	27.7	35.219	8.37	4.56	0.18	0	0.03	0.0	0.4	2.54		
24	0400	0800	15-57	63-31	27.8	28.0	34.790	8.35	4.48	0.12	2	0.02	0.0	0.2	2.55		
	1400	1800	14-38	65-21	28.1	28.3	34.467	8.39	4.60	0.10	2	0.04	0.0	0.4	2.54		
25	0300	0800	13-00	67-33	28.2	28.1	33.950	8.39	4.51	0.02	2	0.03	0.0	0.1	2.51		
	1300	1800	11-42	69-27	28.7	27.7	33.856	8.41	4.54	0.08	2	0.03	0.0	0.2	2.51		
26	0300	0800	9-11	71-12	28.3	28.1	34.050	8.36	4.59	0.02	3	0.01	0.0	0.3	2.49		
	1300	1800	7-31	72-37	29.3	28.7	33.996	8.38	4.71	0.00	2	0.00	0.0	0.3	2.51		
27	0300	0800	5-52	75-27	28.6	28.4	34.088	8.39	4.57	0.02	2	0.01	0.0	0.3	2.51		
	1300	1800	4-38	77-33	26.3	28.6	34.906	8.40	4.55	0.04	1	0.02	0.0	0.4	2.54		
28	0300	0800	2-54	80-24	29.4	28.6	35.069	8.38	4.42	0.08	3	0.00	0.0	0.1	2.57		
	1300	1800	1-46	82-09	29.8	28.6	34.913	8.40	4.53	0.12	3	0.01	0.0	0.1	2.57		
29	0200	0800	0-22	84-26	30.0	28.9	34.683	8.43	4.54	0.08	2	0.00	0.0	0.1	2.47		
	1200	1800	0-38N	86-13	28.3	28.9	34.670	8.41	4.82	0.08	2	0.00	0.0	0.1	2.48		
30	0200	0800	2-04	88-42	29.6	28.9	34.836	8.37	4.95	0.04	2	0.02	0.0	0.3	2.49		
	1200	1800	3-07	90-20	29.1	29.7	34.480	8.31	4.89	0.08	2	0.01	0.0	0.1	2.47		
31	0200	0800	4-43	92-40	29.7	29.1	34.187	8.39	4.75	0.04	1	0.00	0.0	0.2	2.45		

Continued Table 1.

Date	Time		Position		Air temp.	Water temp.	S ‰	pH	O ₂ cc/L	Phosphate-P	Silicate-Si	Nitrite-N	Nitrate-N	Ammonia-N	Alkalinity meq/L	Current	
	GMT	LMT	Lat.	Long.	°C					µg-atoms/L						Dir.	Speed (Kn)
Apr. 31	1200	1800	5-48N	94-21E	29.3	29.4	34.174	8.38	4.70	0.06	1	0.02	0.0		2.40		
	0100	0800	5-45	96-45	29.2	29.2	32.649	8.38	4.60	0.10	1	0.03	0.0	0.2	2.38		
	1100	1800	4-50	98-30	29.1	29.3	32.049	8.40	4.55	0.04	2	0.00	0.0	0.1	2.32		
2	0100	0800	3-33	100-16	29.2	29.6	31.512	8.34	4.77	0.04	1	0.02	0.0		2.34		
	1000	1700	2-37	101-21	29.1	29.5	31.321	8.35	4.63	0.04	1	0.00	0.0	0.1	2.34		
3	0030	0800	1-12	103-34	28.0	29.0	31.709	8.40	4.34	0.12	3	0.09	0.0	0.1	2.34		
9			Arrive in Singapore														
9			Leave Singapore														
9	1030	1800	2-15	105-04	29.6	29.6	32.128	8.35	4.71	0.04	3	0.11	0.0	1.1	2.44		
10	0000	0800	4-33	106-15	29.0	28.7	33.286	8.37	4.54	0.06	3	0.04	0.0	0.1	2.37		
	1000	1800	6-09	107-28	29.2	28.7	33.314	8.42	4.57	0.00	2	0.04	0.0	0.2	2.37		
11	0000	0800	8-23	109-00	28.8	28.6	33.570	8.38	4.56	0.02	2	0.01	0.0	0.0	2.53		
	1000	1800	9-52	110-28	29.3	28.7	33.496	8.39	4.54	0.06	2	0.04	0.0	0.0	2.53		
12	0000	0800	11-52	112-38	29.1	28.5	33.177	8.35	4.57	0.00	1	0.00	0.0	0.0	2.52		
	1000	1800	13-12	114-15	29.5	28.8	33.209	8.38	4.79	0.02	2	0.00	0.0	0.0	2.54		
13	0000	0800	15-09	116-31	28.8	28.2	33.351	8.37	4.64	0.01	2	0.00	0.0	0.0	2.52		
	1000	1800	16-34	118-10	29.9	29.0	33.399	8.36	4.71	0.05	2	0.00	0.0	0.0	2.52		
14	0000	0800	18-45	120-28	29.0	28.4	33.478	8.37	4.63	0.02	1	0.00	0.0	0.0	2.53		
	1000	1800	20-16	122-08	27.6	26.8											
15	2300*	0800	22-37	123-29	26.3	25.8										84	0.8
	0900	1800	24-13	124-29	26.2	25.8										88	0.4
16	2300*	0800	25-29	127-14	25.2	23.0										217	0.4
	0900	1800	26-48	128-54	24.5	23.5										237	1.0
17	2300*	0800	29-07	131-12	23.8	23.9										165	0.8
	0900	1800	30-55	135-26	20.1	19.3										63	1.4

* The time of the date of the preceding day.

No. 55. 1976]

Oceanographic Data of the 16th JARE 1974-1975

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Table 2. Bathythermograph data.

St. No.	Date			Time		Position		Temperature (°C) at indicated depth (m)											
	Day	Month	Year	GMT	LMT	Lat.	Long.	0	10	20	30	50	75	100	125	150	200	250	
1	30	Nov.	1974	1050	1950	11-41N	128-53E	28.5	28.3	28.1	28.1	27.9	26.7	23.9	21.1	19.2	16.0		
2	6	Dec.		0000	0800	11-54S	115-05	29.2	29.2	29.2	28.9	26.0	22.8	20.3	18.9	17.7	14.2		
3	7			0000	0800	16-45	114-02	26.8	26.8	26.6	26.0	25.0	24.2	23.6	22.6	21.4	18.9		
4	7			1000	1800	18-45	113-30	27.6	27.6	27.3	26.7	24.8	23.6	22.9	22.2	21.1	19.0	17.9	
	11					Arrive in Fremantle													
	16					Leave Fremantle													
5	17			0000	0800	34-28	111-30	20.0	20.0	19.8	16.7	17.8	16.7	15.9	15.2				
6	18			0100	0800	38-43	110-24	12.8	12.8	12.8	12.8	12.4	11.7	12.2	11.6				
7	19			0100	0800	43-02	109-12	10.9	10.9	10.9	10.9	10.9	10.9						
8	21			0100	0800	51-26	107-13	3.9	3.9	3.7	3.7	3.7	3.5						
9	22			0100	0800	55-28	103-39	2.9	2.9	2.4	2.3	1.4	0.6	0.2	0.1	0.4			
10	23		0100	0800	58-19	98-23	0.6	0.6	0.6	0.6									
11	24		0200	0800	61-38	92-36	0.1	0.1	0.0	-0.1	-0.3	-1.5	-1.3	-0.2	0.1	0.7	1.2		
					Arrive at Ongul Island														
					Leave Ongul Island														
12	24	Feb.	1975	1200	1800	67-08S	23-18E	0.6	1.1	1.1	1.0	-0.7	-0.2	1.1	1.4	1.6			
13	25			0300	0800	66-57	12-42	0.4	0.4	-0.8	-1.3	-1.6	-1.5	-1.2	-0.3	0.4	1.0	1.0	
14	26			0800	1300	67-27	02-04	0.7	0.7	0.7	0.7	0.0	-0.3	0.0	0.1	0.1	0.3		
15	27			0500	0900	66-13	04-55W	1.6	1.6	1.6	1.6	0.4	-0.9	-0.8	-0.2	0.1	0.6	0.6	
16	1	Mar.		0700	0900	58-42	03-08	1.7	1.7	1.7	1.8	1.4	-1.1	-1.2	-1.1	-0.6	0.4		
17	2			0700	0900	55-24	01-48E	1.2	1.2	1.2	1.2	1.2	1.2	-0.7	-1.1	-1.2	-0.6	-0.1	
	7					Arrive in Cape Town													
	15					Leave Cape Town													
18	17			0600	0800	32-48	32-16	24.9	24.9	25.0	25.0	25.0	23.0	21.8	20.6	19.5			
19	17			1600	1800	31-45	32-16	23.8	23.8	23.8	23.8	23.1	21.1	19.7	18.7	17.9	17.0		
20	18			0500	0800	30-14	35-08	23.9	23.9	23.9	23.9	23.9	23.8	23.2	18.9	18.2	17.0		

Continued Table 2.

St. No.	Date			Time		Position		Temperature (°C) at indicated depth (m)											
	Day	Month	Year	GMT	LMT	Lat.	Long.	0	10	20	30	50	75	100	125	150	200	250	
21	18	Mar.	1975	1500	1800	29-27S	37-16E	25.9	25.9	25.9	25.9	23.3	21.9	20.8	19.3	18.6	17.2	16.7	
22	19			0500	0800	28-21	40-16	25.7	25.7	25.7	25.7	25.7	23.2	20.8	19.3	18.1			
23	19			1500	1800	27-30	42-15	26.1	25.9	25.8	25.7	25.1	23.4	21.9	20.8	19.7	17.4		
24	21			0500	0800	24-08	49-34	26.6	26.6	26.6	26.6	23.8	20.9	20.0	19.2	18.3	17.1		
25	21			1500	1800	22-52	51-38	27.2	27.1	27.1	27.1	26.6	23.9	22.2	21.5	20.6	18.4		
26	22			0400	0800	21-17	54-17	26.8	26.8	26.7	26.7	26.7	23.3	22.1	21.3	20.6	18.6		
	3	Arrive in Singapore																	
	9	Leave Singapore																	
27	14	Apr.		1000	1800	20-16N	122-08	26.7	25.6	26.4	26.1	25.6	25.6	25.3	24.4	23.9	23.1		
28	15			2300*	0800	22-37	123-29	25.9	25.9	25.9	25.9	25.1	24.6	24.2	23.6	22.8	22.0		
29	15			0900	1800	24-13	124-29	25.8	25.4	24.9	24.7	24.6	23.9	23.6	23.1	22.4	21.4		
30	16			2300*	0800	25-30	127-14	22.9	22.5	21.5	21.4	21.1	21.0	20.7	20.3	19.7	17.9		
31	16			0900	1800	26-48	128-54	23.5	21.6	20.9	20.9	20.9	20.8	20.7	19.8	19.1	17.6		
32	17			2300*	0800	29-07	131-12	23.9	23.9	23.9	23.8	23.5	23.1	22.6	22.6	21.9	20.8		
33	17			0900	1800	30-55	135-26	19.1	19.0	18.7	18.6	18.5	18.3	17.8	16.6	15.7	13.9		

* The time of the date of the preceding day.

Table 3. Vertical observation data.

St. 1				Meteorological observation			
Date	: Dec. 17, 1974	Time (GMT)	: 01-00	Wind direction	: SSW		
Time (GMT)	: 0100-0230	(LMT)	: 10-00	velocity	: 8 m/s		
(LMT)	: 0900-1030	Weather	: Cloudy	Humidity	: 73%		
Lat.	: 34-28 S	Air temperature	: 18.9°C	Sea	: 1		
Long.	: 111-30 E	Atm. pressure	: 1020.5 mb	Swell	: SW 3		

Observed											Interpolated				
Depth (m)	T(°C)	S (‰)	pH	O ₂ (cc/L)	PO ₄ -P	SiO ₃ -Si	NO ₂ -N	NO ₃ -N	NH ₄ -N	Alkalinity	Depth (m)	T (°C)	S (‰)	σ_t	ΔD
					($\mu\text{g-atoms/L}$)					(meq/L)					
0	19.6	35.652	8.36	5.37	0.06	1	0.08	0.0	0.4	2.62	0	19.60	35.652	25.38	0.000
10	19.61	35.635	8.36	5.36	0.14	3	0.23	0.1	0.8	2.62	10	19.61	35.635	25.37	0.026
20	19.49	35.631	8.38	5.35	0.06	3	0.23	0.0	0.1	2.64	20	19.49	35.631	25.40	0.052
49	19.38	35.631	8.36	5.33	0.14	4	1.26	5.5	0.1	2.62	30	19.45	35.632	25.41	0.077
74	16.05	35.641	8.35	5.38	0.26	1	0.11	0.5	0.8	2.63	50	19.25	35.633	25.47	0.128
99	15.05	35.574	8.35	5.38	0.36	1	0.16	2.4	0.5	2.64	75	15.98	35.647	26.27	0.174
123	14.35	35.489	8.32	5.46	0.42	0	0.08	3.1	0.8	2.62	100	14.98	35.573	26.43	0.182
148	13.83	35.415	8.33	5.52	0.48	0	0.23	4.7	1.4	2.62	125	14.28	35.483	26.52	0.225
184	12.91	35.270	8.30	5.68	0.56	1			0.6	2.61	150	13.76	35.412	26.57	0.265
196	12.64	35.239	8.30	5.69	0.56	1	0.23	4.9	0.7	2.61	200	12.60	35.223	26.67	0.303
246	11.78	35.116	8.30	5.73	0.62	2	0.25	6.2	0.4	2.61	250	11.65	35.103	26.76	0.377
293	11.08	34.991	8.27	5.79	0.68	2	0.23	7.4	0.2	2.61	300	10.96	34.978	26.78	0.447
401	9.82	34.802	8.26	5.74	0.88	5	0.04	14.	0.5	2.62	400	9.86	34.803	26.84	0.515
510	9.16	34.723	8.23	5.72	1.08	4	0.06	16.	0.8	2.58	500	9.23	34.730	26.88	0.648
619	8.45	34.602	8.22	5.28	1.26	9	0.09	18.	0.2	2.58	600	8.57	34.628	26.92	0.777
835	5.89	34.420	8.12	4.52	1.90	26	0.08	25.	0.1	2.60	700	6.33	34.436	27.08	0.904
1050	3.76	34.413	8.08	4.19	2.24	52	0.30	34.	0.6	2.62	800	4.10	34.408	27.33	1.140
1371	3.00	34.550	8.03	3.62	2.44	77	0.06	32.	0.0	2.63	1000	3.27	34.473	27.46	1.336
1903	2.41	34.695	8.08	3.69	2.38	102	0.04	32.	0.2	2.67	1200	2.85	34.587	27.58	1.492
											1500	2.33	34.725	27.75	1.690

Masashi Sue and Taiji Imoro

[南極資料]

St. 2
 Date : Dec. 19, 1974
 Time (GMT) : 0840-1120
 (LMT) : 0140-0420
 Lat. : 34-28 S
 Long. : 111-30 E

Meteorological observation
 Time (GMT) : 01-00
 (LMT) : 08-00
 Weather : Cloudy
 Air temperature : 12.4°C
 Atm. pressure : 1009.8 mb

Wind direction : NW
 velocity : 15 m/s
 Humidity : 79%
 Sea : 4
 Swell : WNW14

Observed											Interpolated				
Depth (m)	T(°C)	S (‰)	pH	O ₂ (cc/L)	PO ₄ -P	SiO ₃ -Si	NO ₂ -N	NO ₃ -N	NH ₄ -N	Alkalinity	Depth (m)	T (°C)	S (‰)	σ_t	ΔD
					(μg-atoms/L)					(meq/L)					
0	10.90	34.800	8.31	6.20	0.70	3	0.26	9.1	0.4	2.44	0	10.90	34.800	26.66	0.000
6	10.97	34.789	8.31	6.31	0.70	2	0.27	5.5	0.1	2.41	10	10.97	34.785	26.63	0.014
14	10.95	34.784	8.31	6.31	0.70	3	0.27	9.0	0.3	2.41	20	10.97	34.787	26.64	0.028
21	10.97	34.788	8.30	6.30	0.70	2	0.23	9.8	0.2	2.40	30	10.93	34.777	26.63	0.042
35	10.90	34.770	8.31	6.26	0.70	3	0.27	9.8	0.2	2.41	50	10.86	34.776	26.64	0.071
54	10.86	34.778	8.31	6.27	0.70	2	0.23	9.2	0.1	2.41	75	10.85	34.769	26.64	0.106
72	10.86	34.766	8.31	6.31	0.72	2	0.22	9.3	0.2	2.40	100	10.34	34.748	26.72	0.141
90	10.67	34.775	8.30	6.28	0.80	2	0.23	9.5	0.4	2.40	125	10.11	34.780	26.78	0.174
108	10.08	34.729	8.30	6.16	0.84	3	0.41	12.	0.4	2.40	150	10.32	34.852	26.80	0.207
144	10.34	34.855	8.29	6.03	0.80	3	0.12	11.	0.1	2.40	200	10.09	34.823	26.82	0.271
180	10.16	34.834	8.29	6.01	0.80	3	0.05	12.	0.2	2.41	250	9.82	34.765	26.82	0.335
216	10.04	34.812	8.29	6.07	0.80	3	0.00	12.	0.2	2.41	300	9.62	34.736	26.83	0.400
274	9.67	34.733	8.26	6.16	0.82	3	0.01	12.	0.1	2.40	400	9.53	34.740	26.85	0.529
365	9.59	34.742	8.26	6.05	0.84	4	0.00	12.	0.0	2.40	500	9.41	34.724	26.85	0.659
441	9.45	34.735	8.25	5.94	0.92	4	0.01	13.	0.1	2.41	600	8.63	34.617	26.90	0.788
518	9.37	34.715	8.23	5.84	1.00	5	0.01	15.	0.0	2.40	700	8.00	34.552	26.94	0.914
596	8.65	34.620	8.21	5.92	1.20	8	0.02	19.	0.2	2.41	800	6.95	34.471	27.03	1.034
691	8.09	34.559	8.18	5.20	1.38	9	0.00	20.	0.0	2.40	1000	4.84	34.358	27.21	1.248
844	6.43	34.436	8.12	4.79	1.70	19	0.02	23.	0.0	2.40	1200	3.57	34.363	27.34	1.429
1079	4.16	34.339	8.08	4.72	2.04	36	0.01	32.	0.1	2.40	1500	2.91	34.497	27.51	1.655
1503	2.91	34.499	8.01	3.93	2.30	71	0.01	36.	0.2	2.45	2000	2.46	34.668	27.69	1.955
1931	2.51	34.651	8.04	3.88	2.40	86	0.01	34.	1.0	2.48	2500	2.10	34.742	27.78	2.197
2370	2.20	34.730	8.02	4.20	2.20	95	0.00	31.	0.3	2.47					
2818	1.84	34.747	8.05	4.56	2.20	99	0.02	30.	0.7	2.47					

St. 3

Date : Dec. 22, 1974
 Time (GMT) : 0140-0420
 (LMT) : 0840-1120
 Lat. : 55-28 S
 Long. : 103-39 E

Meteorological observation
 Time (GMT) : 01-00
 (LMT) : 08-00
 Weather : Cloudy
 Air temperature : 3.3°C
 Atm. pressure : 999.4 mb
 Wind direction : WNW
 velocity : 8 m/s
 Humidity : 74%
 Sea : 2
 Swell : W16

Observed											Interpolated				
Depth (m)	T(°C)	S (‰)	pH	O ₂ (cc/L)	PO ₄ -P	SiO ₃ -Si	NO ₂ -N	NO ₃ -N	NH ₄ -N	Alkalinity	Depth (m)	T (°C)	S (‰)	σ_t	ΔD
					(μg-atoms/L)					(meq/L)					
0	2.90	34.021	8.24	7.56	1.62	22	0.32	27.	0.2	2.37	0	2.90	34.021	27.14	0.000
8	2.90	34.007	8.23	7.70	1.62	22	0.33	27.	0.2	2.37	10	2.89	34.005	27.12	0.009
17	2.87	34.003	8.23	7.70	1.64	24	0.32	27.	0.3	2.37	20	2.69	34.003	27.14	0.019
25	2.35	34.003	8.23	7.81	1.64	22	0.30	29.	0.2	2.38	30	2.29	34.004	27.17	0.028
42	2.20	34.005	8.24	7.80	1.66	22	0.31	26.	0.2	2.38	50	1.62	34.020	27.24	0.046
63	0.60	34.048	8.22	7.76	1.94	35	0.31	29.	0.4	2.38	75	0.21	34.064	27.36	0.065
84	0.08	34.076	8.20	7.68	2.02	39	0.33	29.	0.4	2.38	100	0.03	34.102	27.40	0.083
105	0.01	34.111	8.17	7.38	2.14	43	0.26	31.	0.2	2.38	125	0.31	34.160	27.43	0.099
126	0.34	34.164	8.15	6.82	2.20	48	0.16	31.	0.2	2.38	150	1.39	34.321	27.50	0.115
153	1.53	34.342	8.07	5.16	2.46	64	0.05	34.	0.0	2.40	200	1.80	34.441	27.56	0.144
213	1.88	34.444	8.04	4.56	2.48	72	0.03	33.	0.1	2.35	250	1.82	34.455	27.57	0.171
257	1.80	.....	8.03	4.43	2.48	78	0.05	34.	0.1	2.43	300	1.86	34.469	27.58	0.197
347	1.95	34.481	8.03	4.26	2.46	84	0.05	33.	0.1	2.43	400	1.93	34.577	27.66	0.247
438	1.91	34.645	8.05	4.23	2.44	89	0.01	31.	0.1	2.43	500	1.96	34.682	27.74	0.289
529	1.99	34.688	8.05	4.25	2.32	91	0.02	32.	0.1	2.44	600	1.96	34.708	27.76	0.327
622	1.94	34.712	8.05	4.38	2.32	92	0.02	32.	0.1	2.44	700	1.88	34.725	27.78	0.363
715	1.87	34.727	8.09	4.38	2.26	95	0.03	31.	0.0	2.44	800	1.80	34.734	27.80	0.399
746	1.83	34.729	8.08	4.54	2.28	95	0.03	33.	0.2	2.44	1000	1.70	34.742	27.81	0.467
914	1.77	34.742	8.11	4.56	2.26	98	0.03	32.	0.2	2.44	1200	1.51	34.742	27.82	0.534
1168	1.54	34.743	8.12	4.58	2.24	105	0.05	33.	0.3	2.44	1500	1.24	34.734	27.84	0.630
1624	1.13	34.728	8.13	4.75	2.32	121	0.03	30.	0.2	2.45	2000	0.81	34.709	27.85	0.783
2089	0.74	34.705	8.14	4.81	2.38	133	0.03	32.	0.3	2.47	2500	0.43	34.691	27.85	0.926
2556	0.39	34.689	8.10	5.14	2.50	137	0.04	33.	0.2	2.45	3000	0.16	34.681	27.86	1.056
3030	0.15	34.681	8.11	5.11	2.51	147	0.04	33.	0.1	2.45					

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St. 4

Date : Dec. 24, 1974
 Time (GMT) : 0225-0400
 (LMT) : 0825-1000
 Lat. : 61-38 S
 Long. : 92-35 E

Meteorological observation
 Time (GMT) : 02-00
 (LMT) : 08-00
 Weather : Snow
 Air temperature : 1.9°C
 Atm. pressure : 969.0 mb
 Wind direction : ESE
 velocity : 11 m/s
 Humidity : 86%
 Sea : 4
 Swell : NE14

Observed											Interpolated				
Depth (m)	T(°C)	S (‰)	pH	O ₂ (cc/L)	PO ₄ -P	SiO ₃ -Si	NO ₂ -N	NO ₃ -N	NH ₄ -N	Alkalinity	Depth (m)	T (°C)	S (‰)	σ _t	ΔD
					(μg-atoms/L)					(meq/L)					
0	0.60	34.080	8.20	7.88	1.78	39	0.23	26.	0.1	2.17	0	0.60	34.080	27.35	0.000
9	0.58	34.045	8.20	8.02	1.78	39	0.23	26.	0.1	2.32	10	0.58	34.043	27.32	0.007
18	0.60	34.035	8.21	8.01	1.82	40	0.24	27.	0.1	2.32	20	0.59	34.032	27.31	0.015
27	0.51	34.022	8.20	8.00	1.76	40	0.23	28.	0.2	2.35	30	0.48	34.012	27.30	0.023
46	0.12	34.001	8.20	7.96	1.74	42	0.23	30.	0.2	2.34	50	-0.12	34.034	27.35	0.038
68	-1.11	34.213	8.16	7.25	2.16	60	0.18	29.	0.1	2.35	75	-1.09	34.252	27.57	0.054
91	-1.06	34.312	8.12	6.68	2.20	68	0.14	32.	0.3	2.35	100	-0.84	34.341	27.63	0.066
114	-0.45	34.378	8.09	6.17	2.20	71	0.07	33.	0.0	2.35	125	-0.24	34.398	27.65	0.077
137	-0.03	34.419	8.09	5.79	2.24	75	0.05	33.	0.0	2.37	150	0.26	34.458	27.68	0.088
183	0.91	34.558	8.05	4.93	2.26	83	0.02	33.	0.0	2.38	200	1.11	34.589	27.73	0.108
228	1.32	34.626	8.05	4.62	2.26	87	0.01	33.	0.0	2.38	250	1.41	34.649	27.76	0.127
274	1.46	34.668	8.03	4.50	2.20	89	0.01	34.	0.0	2.40	300	1.45	34.682	27.78	0.144
365	1.41	34.699	8.03	4.60	2.20	91	0.01	34.	0.0	2.40	400	1.40	34.702	27.80	0.177
456	1.39	34.704	8.06	4.64	2.18	94	0.01	34.	0.0	2.40	500	1.37	34.709	27.81	0.209
547	1.34	34.715	8.06	4.69	2.16	97	0.01	37.	0.0	2.40	600	1.32	34.719	27.82	0.240
637	1.30	.....	8.06	4.71	2.16	100	0.00	32.	0.0	2.41	700	1.28	34.723	27.82	0.271
726	1.27	34.723	8.06	4.65	2.08	104	0.00	32.	0.0	2.41	800	1.20	34.723	27.83	0.301
904	1.09	34.724	8.07	4.79	2.14	109	0.01	32.	0.0	2.43	1000	1.01	34.702	27.83	0.362
1082	0.95	34.681	8.07	4.80	2.14	114	0.02	32.	0.0	2.43	1200	0.86	34.670	27.81	0.424
1357	0.74	34.665	8.06	4.76	2.22	122	0.03	33.	0.0	2.43	1500	0.64	34.659	27.82	0.519
1843	0.41	34.654	8.06	4.92	2.18	131	0.01	33.	0.0	2.44					

St. 5

Date : Feb. 24, 1975
 Time (GMT) : 0635-0915
 (LMT) : 0835-1115
 Lat. : 67-08 S
 Long. : 23-18 E

Meteorological observation

Time (GMT) : 06-00
 (LMT) : 08-00
 Weather : Cloudy
 Air temperature : 2.0°C
 Atm. pressure : 985.5 mb
 Wind direction : E
 velocity : 12 m/s
 Humidity : 64%
 Sea : 3
 Swell : ENE14

Depth (m)	Observed										Interpolated				
	T(°C)	S (‰)	pH	O ₂ (cc/L)	PO ₄ -P	SiO ₃ -Si	NO ₂ -N	NO ₃ -N	NH ₄ -N	Alkalinity	Depth (m)	T (°C)	S (‰)	σ_t	ΔD
					(μg-atoms/L)					(meq/L)					
0	0.40	33.911	8.14	7.63	1.94	68	0.26	28.	0.4	2.35	0	0.40	33.911	27.23	0.000
9	0.48	33.930	8.17	7.70	1.88	67	0.28	26.	0.4	2.35	10	0.48	33.930	27.24	0.008
18	0.47	33.921	8.17	7.70	1.88	67	0.28	26.	1.2	2.37	20	0.47	33.920	27.23	0.017
28	0.45	33.919	8.16	7.69	1.94	67	0.27	24.	0.5	2.35	30	0.27	33.919	27.24	0.025
46	-1.37	33.922	8.18	7.66	1.96	68	0.12	27.	0.3	2.40	50	-1.39	33.932	27.32	0.041
68	-1.48	33.975	8.16	7.29	2.00	68	0.12	26.	0.6	2.40	75	-1.04	34.142	27.48	0.058
91	0.05	34.523	8.05	5.40	2.31	88	0.18	29.	0.3	2.41	100	0.27	34.572	27.77	0.070
114	0.44	34.572	8.04	5.02	2.31	91	0.14	32.	0.1	2.41	125	0.61	34.598	27.77	0.079
138	0.78	34.625	8.02	4.70	2.28	96	0.11	32.	0.3	2.41	150	0.84	34.635	27.78	0.087
185	0.90	34.647	8.04	4.60	2.31	96	0.02	29.	0.3	2.44	200	0.98	34.657	27.79	0.103
234	1.15	34.677	8.02	4.45	2.28	100	0.01	30.	0.2	2.43	250	1.18	34.682	27.80	0.119
283	1.20	34.689	8.02	4.47	2.26	101	0.00	31.	0.2	2.44	300	1.20	34.692	27.81	0.135
381	1.14	34.703	8.05	4.52	2.28	103	0.01	29.	0.4	2.43	400	1.13	34.703	27.82	0.165
478	1.09	34.702	8.05	4.52	2.37	107	0.00	31.	0.0	2.44	500	1.08	34.703	27.82	0.195
573	1.03	34.707	....	4.58	2.18	108	0.00	31.	0.3	2.44	600	1.00	34.709	27.83	0.225
665	0.93	34.710	8.06	4.62	2.26	113	0.00	29.	0.1	2.45	700	0.90	34.707	27.84	0.254
753	0.85	34.702	8.05	4.61	2.24	113	0.00	30.	0.0	....	800	0.80	34.699	27.84	0.282
860	0.73	34.697	8.04	4.63	2.26	114	0.00	32.	0.2	2.47	1000	0.64	34.692	27.84	0.339
1051	0.61	34.691	8.05	4.66	2.28	119	0.00	30.	0.1	2.47	1200	0.53	34.686	27.84	0.395
1338	0.46	34.681	8.05	4.73	2.26	123	0.00	32.	0.3	2.47	1500	0.37	34.677	27.85	0.477
1817	0.21	34.672	8.06	4.94	2.28	127	0.07	31.	0.2	2.45	2000	0.13	34.669	27.85	0.609
2295	0.03	34.664	8.03	5.17	2.28	127	0.02	31.	0.2	2.45	2500	-0.03	34.660	27.85	0.734
2775	-0.10	34.655	8.02	5.26	2.35	130	0.00	30.	0.0	2.45	3000	-0.15	34.651	27.85	0.852
3262	-0.19	34.648	8.02	5.41	2.43	130	0.06	29.	0.1	2.45	3500	-0.22	34.646	27.85	0.965
3754	-0.24	34.644	8.02	5.60	2.43	129	0.04	30.	0.6	2.47					

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St. 6

Date : Feb. 25, 1975
 Time (GMT) : 0645-0835
 (LMT) : 0845-1035
 Lat. : 66-57 S
 Long. : 12-42 E

Meteorological observation

Time (GMT) : 06-00
 (LMT) : 08-00
 Weather : Cloudy
 Air temperature : -0.5°C
 Atm. pressure : 988.1 mb
 Wind direction : SW
 velocity : 6 m/s
 Humidity : 64%
 Sea : 3
 Swell : ESE13

Observed											Interpolated				
Depth (m)	T(°C)	S (‰)	pH	O ₂ (cc/L)	PO ₄ -P	SiO ₃ -Si	NO ₂ -N	NO ₃ -N	NH ₄ -N	Alkalinity (meq/L)	Depth (m)	T (°C)	S (‰)	σ_t	ΔD
0	0.40	33.830	8.15	7.76	1.92	77	0.26	28.	0.2	2.37	0	0.40	33.830	27.16	0.000
10	0.38	33.851	8.16	7.79	2.02	80	0.26	28.	0.4	2.38	10	0.38	33.851	27.18	0.009
20	0.38	33.838	8.15	7.79	2.00	79	0.27	28.	0.4	2.40	20	0.38	33.838	27.17	0.018
30	-0.87	34.193	8.14	7.56	2.04	75	0.10	28.	0.4	2.41	30	-0.87	34.193	27.51	0.025
50	-1.61	34.384	8.13	7.24	2.10	78	0.08	29.	0.4	2.43	50	-1.61	34.384	27.69	0.035
75	-1.67	34.420	8.10	6.91	2.16	77	0.14	30.	0.1	2.44	75	-1.67	34.420	27.72	0.045
100	-1.52	34.445	8.08	6.72	2.24	80	0.08	32.	0.0	2.43	100	-1.52	34.445	27.74	0.054
125	-1.20	34.474	8.06	6.50	2.26	79	0.04	32.	0.1	2.44	125	-1.20	34.474	27.75	0.063
150	-0.17	34.560	8.04	5.52	2.33	90	0.02	32.	0.1	2.45	150	-0.17	34.560	27.78	0.072
200	0.56	34.632	8.01	4.86	2.33	97	0.01	29.	0.0	2.45	200	0.56	34.632	27.80	0.087
250	0.69	34.655	8.00	4.74	2.35	99	0.01	31.	0.1	2.45	250	0.69	34.655	27.81	0.103
300	0.72	34.660	7.99	4.74	2.31	100	0.00	31.	0.0	2.45	300	0.72	34.660	27.81	0.118
400	0.67	34.669	8.00	4.81	2.35	101	0.00	32.	0.0	2.45	400	0.67	34.669	27.82	0.148
500	0.69	34.669	8.01	4.83	2.31	105	0.00	33.	0.0	2.47	500	0.69	34.669	27.82	0.177
600	0.76	34.684	8.01	4.74	2.41	109	0.00	31.	0.4	2.45	600	0.76	34.684	27.83	0.207
700	0.70	34.684	7.99	4.70	2.33	112	0.01	33.	0.1	2.44	700	0.70	34.684	27.83	0.236
800	0.61	34.684	8.00	4.71	2.33	115	0.00	33.	0.0	2.45	800	0.61	34.684	27.84	0.264
1000	0.44	34.672	8.01	4.78	2.35	118	0.00	33.	0.1	2.45	1000	0.44	34.672	27.84	0.320
1200	0.35	34.668	7.99	4.84	2.33	123	0.00	33.	0.1	2.45	1200	0.35	34.668	27.84	0.376
1500	0.20	34.663	7.98	4.97	2.37	125	0.01	31.	0.0	2.45	1500	0.20	34.663	27.84	0.457
2000	-0.03	34.652	7.98	5.22	2.35	126	0.02	34.	0.0	2.47	2000	-0.03	34.652	27.85	0.587
2500	-0.14	34.656	7.97	5.42	2.35	122	0.01	31.	0.2	2.45	2500	-0.14	34.656	27.86	0.708
3000	-0.22	34.652	7.97	5.49	2.35	121	0.03	33.	0.8	2.47	3000	-0.22	34.652	27.86	0.822

St. 7

Date : Feb. 26, 1975
 Time (GMT) : 1125-1350
 (LMT) : 1325-1550
 Lat. : 67-27 S
 Long. : 02-04 E

Meteorological observation
 Time (GMT) : 10-30
 (LMT) : 12-30
 Weather : Cloudy
 Air temperature : 0.7°C
 Atm. pressure : 1001.2 mb
 Wind direction : WNW
 velocity : 14 m/s
 Humidity : 62%
 Sea : 3
 Swell : WNW13

Observed											Interpolated				
Depth (m)	T(°C)	S (‰)	pH	O ₂ (cc/L)	PO ₄ -P	SiO ₃ -Si	NO ₂ -N	NO ₃ -N	NH ₄ -N	Alkalinity	Depth (m)	T (°C)	S (‰)	σ_t	ΔD
					($\mu\text{g-atoms/L}$)					(meq/L)					
0	1.20	34.485	8.19	7.69	1.75	77	0.16	23.	1.8	2.43	0	1.20	34.485	27.64	0.000
9	1.19	34.460	8.20	7.62	1.75	78	0.10	23.	0.8	2.44	10	1.19	34.457	27.62	0.005
18	1.22	34.439	8.19	7.59	1.77	78	0.11	23.	0.8	2.45	20	1.22	34.439	27.60	0.010
28	1.19	34.440	8.20	7.59	1.77	77	0.13	23.	0.8	2.47	30	1.19	34.440	27.60	0.015
46	1.17	34.440	8.16	7.58	1.75	79	0.12	22.	1.0	2.47	50	0.97	34.456	27.63	0.024
69	0.02	34.548	8.06	6.40	2.22	101	0.11	25.	1.7	2.47	75	0.06	34.571	27.78	0.034
93	0.19	34.625	7.99	5.31	2.35	106	0.33	30.	0.6	2.47	100	0.27	34.636	27.82	0.042
116	0.41	34.650	7.98	5.01	2.35	108	0.32	27.	0.1	2.47	125	0.41	34.656	27.83	0.049
139	0.42	34.661	7.97	4.96	2.37	110	0.20	30.	0.0	2.47	150	0.41	34.661	27.83	0.056
187	0.39	34.660	7.97	4.92	2.37	114	0.06	33.	0.0	2.47	200	0.39	34.662	27.83	0.070
235	0.39	34.667	7.96	4.88	2.41	117	0.04	33.	0.1	2.47	250	0.37	34.667	27.84	0.084
283	0.31	34.666	7.96	4.91	2.41	118	0.02	32.	0.2	2.47	300	0.29	34.665	27.84	0.098
379	0.21	34.661	7.95	4.98	2.41	122	0.01	31.	0.2	2.48	400	0.19	34.661	27.84	0.125
476	0.14	34.661	7.94	5.10	2.45	119	0.02	31.	0.8	2.47	500	0.13	34.661	27.85	0.151
573	0.11	34.659	7.94	5.18	2.39	121	0.03	32.	0.4	2.47	600	0.10	34.659	27.85	0.178
670	0.08	34.658	7.94	5.22	2.39	121	0.02	31.	0.0	2.45	700	0.07	34.659	27.85	0.204
767	0.06	34.660	7.91	5.31	2.39	120	0.01	31.	0.1	2.47	800	0.05	34.659	27.85	0.230
935	0.03	34.656	7.91	5.42	2.37	121	0.02	33.	0.1	2.45	1000	0.03	34.655	27.85	0.282
1131	0.05	34.655	7.90	5.39	2.39	118	0.04	33.	0.5	2.45	1200	0.05	34.656	27.85	0.334
1421	0.05	34.658	7.89	5.36	2.37	120	0.02	32.	0.2	2.47	1500	0.05	34.658	27.85	0.411
1909	0.03	34.659	7.87	5.35	2.35	123	0.02	32.	0.3	2.48	2000	0.01	34.659	27.85	0.538
2398	-0.07	34.657	7.86	5.25	2.33	128	0.02	31.	0.1	2.47	2500	-0.09	34.656	27.85	0.660
2888	-0.17	34.652	7.85	5.40	2.33	126	0.03	30.	0.2	2.47	3000	-0.19	34.652	27.86	0.777
3378	-0.25	34.652	7.85	5.52	2.35	126	0.05	29.	0.2	2.47	3500	-0.26	34.651	27.86	0.886
3871	-0.28	34.648	7.84	5.58	2.31	126	0.04	31.	0.2	2.48					

St. 8

Date : Feb. 27, 1975
 Time (GMT) : 0605-0845
 (LMT) : 0805-1045
 Lat. : 66-13 S
 Long. : 04-55 W

Meteorological observation

Time (GMT) : 06-00
 (LMT) : 08-00
 Weather : Snow
 Air temperature : 2.1°C
 Atm. pressure : 982.8 mb
 Wind direction : NNE
 velocity : 13 m/s
 Humidity : 90%
 Sea : 5
 Swell : N17

Observed											Interpolated				
Depth (m)	T(°C)	S (‰)	pH	O ₂ (cc/L)	PO ₄ -P	SiO ₃ -Si	NO ₂ -N	NO ₃ -N	NH ₄ -N	Alkalinity	Depth (m)	T (°C)	S (‰)	σ_t	ΔD
					($\mu\text{g-atoms/L}$)					(meq/L)					
0	1.60	34.372	8.21	8.06	1.43	34	0.19	21.	0.8	2.45	0	1.60	34.372	27.52	0.000
7	1.62	34.313	8.22	7.65	1.47	31	0.18	21.	0.3	2.41	10	1.63	34.302	27.46	0.006
14	1.63	34.296	8.21	7.63	1.45	33	0.19	23.	0.4	2.41	20	1.62	34.301	27.46	0.012
21	1.62	34.301	8.21	7.63	1.45	32	0.18	21.	0.6	2.43	30	1.62	34.227	27.40	0.019
36	1.62	34.179	8.21	7.64	1.47	32	0.18	21.	0.6	2.43	50	1.54	34.253	27.43	0.032
53	1.42	34.281	8.19	7.63	1.70	41	0.18	23.	1.3	2.43	75	-1.13	34.429	27.72	0.045
71	-1.25	34.416	8.06	7.16	2.28	79	0.16	29.	0.9	2.43	100	-0.40	34.515	27.75	0.055
89	-0.69	34.466	8.02	6.61	2.33	90	0.16	29.	1.2	2.44	125	0.14	34.577	27.78	0.063
106	-0.25	34.541	7.99	5.91	2.41	98	0.23	30.	0.8	2.44	150	0.43	34.604	27.78	0.071
143	0.39	34.593	7.96	5.05	2.39	100	0.09	32.	0.2	2.44	200	0.48	34.644	27.81	0.087
179	0.46	34.642	7.96	4.95	2.39	101	0.05	30.	0.0	2.44	250	0.48	34.652	27.82	0.102
214	0.49	34.646	7.97	4.88	2.41	105	0.03	29.	0.3	2.44	300	0.46	34.653	27.82	0.116
287	0.46	34.656	7.95	4.84	2.41	108	0.04	33.	0.2	2.44	400	0.45	34.641	27.81	0.146
363	0.45	34.638	7.95	4.73	2.53	111	0.02	33.	0.1	2.44	500	0.38	34.637	27.81	0.176
445	0.43	34.645	8.00	4.91	2.39	111	0.03	32.	0.0	2.44	600	0.32	34.647	27.82	0.205
528	0.35	34.633	7.99	4.80	2.41	114	0.03	34.	0.2	2.44	700	0.31	34.651	27.83	0.233
611	0.32	34.650	7.99	4.81	2.35	114	0.02	31.	0.3	2.44	800	0.28	34.655	27.83	0.262
675	0.32	34.650	7.99	4.79	2.41	117	0.03	33.	0.2	2.44	1000	0.20	34.653	27.84	0.317
857	0.25	34.658	7.99	4.90	2.39	117	0.03	30.	0.0	2.45	1200	0.14	34.644	27.83	0.372
1589	0.05	34.619	8.00	5.05	2.35	117	0.03	32.	0.2	2.47	1500	0.07	34.626	27.82	0.456
2049	-0.01	34.619	7.99	5.12	2.35	121	0.04	32.	0.2	2.47	2000	-0.00	34.619	27.82	0.596
2508	-0.14	34.629	7.97	5.31	2.41	121	0.04	32.	0.3	2.44	2500	-0.14	34.629	27.83	0.729
2984	-0.23	34.625	7.96	5.44	2.41	121	0.03	30.	0.3	2.44	3000	-0.23	34.624	27.83	0.852
3469	-0.28	34.557	7.95	5.59	2.37	121	0.04	31.	0.3	2.45					

St. 9

Date : March 1, 1975
 Time (GMT) : 0630-0823
 (LMT) : 0830-1023
 Lat. : 58-42 S
 Long. : 03-08 W

Meteorological observation
 Time (GMT) : 06-00
 (LMT) : 08-00
 Weather : Cloudy
 Air temperature : 2.5°C
 Atm. pressure : 982.5 mb

Wind direction : NW
 velocity : 7 m/s
 Humidity : 82%
 Sea : 5
 Swell : NNW16

Observed											Interpolated				
Depth (m)	T(°C)	S (‰)	pH	O ₂ (cc/L)	PO ₄ -P	SiO ₃ -Si	NO ₂ -N	NO ₃ -N	NH ₄ -N	Alkalinity	Depth (m)	T (°C)	S (‰)	σ_t	ΔD
					($\mu\text{g-atoms/L}$)					(meq/L)					
0	1.70	33.990	8.10	8.06	1.77	63	0.31	26.	0.8	2.40	0	1.70	33.990	27.21	0.000
8	1.74	34.011	8.16	7.62	1.86	63	0.29	23.	0.6	2.41	10	1.75	34.000	27.21	0.009
15	1.75	33.968	8.15	7.61	1.88	64	0.29	25.	0.5	2.43	20	1.74	33.966	27.19	0.017
23	1.73	33.965	8.16	7.61	1.96	62	0.28	25.	0.6	2.43	30	1.71	33.967	27.19	0.026
38	1.69	33.969	8.16	7.61	1.90	62	0.33	25.	0.7	2.44	50	0.46	34.086	27.37	0.042
57	-0.38	34.172	8.14	7.48	2.08	68	0.20	26.	0.6	2.45	75	-1.41	34.345	27.66	0.057
75	-1.41	34.345	8.13	7.28	2.18	73	0.21	29.	0.3	2.47	100	-1.41	34.431	27.73	0.067
94	-1.44	34.421	....	6.92	2.31	80	0.21	...	...	....	125	-1.18	34.464	27.75	0.076
113	-1.30	34.445	8.07	5.74	2.41	83	0.15	31.	0.1	2.47	150	-0.86	34.509	27.77	0.085
152	-0.83	34.513	8.05	5.28	2.49	88	0.02	33.	0.1	2.48	200	-0.06	34.608	27.81	0.101
191	-0.18	34.593	8.01	4.50	2.59	100	0.00	32.	0.1	2.48	250	0.35	34.662	27.83	0.115
230	0.24	34.647	7.99	4.40	2.55	108	0.00	35.	0.2	2.48	300	0.49	34.681	27.84	0.129
310	0.49	34.682	7.94	4.37	2.61	112	0.00	34.	0.2	2.49	400	0.48	34.688	27.85	0.155
393	0.49	34.688	7.94	4.38	2.59	117	0.01	33.	0.1	2.48	500	0.41	34.681	27.85	0.182
478	0.41	34.682	7.95	4.48	2.61	117	0.00	34.	0.1	2.49	600	0.40	34.682	27.85	0.209
566	0.41	34.680	7.95	4.37	2.61	117	0.00	34.	0.1	2.49	700	0.37	34.684	27.85	0.235
656	0.39	34.685	7.96	4.64	2.61	118	0.01	33.	0.1	2.49	800	0.32	34.680	27.85	0.262
809	0.31	34.680	7.96	4.82	2.43	121	0.01	33.	0.2	2.49	1000	0.22	34.682	27.86	0.313
999	0.22	34.682	7.98	....	2.51	119	0.02	34.	0.3	2.51	1200	0.11	34.676	27.86	0.364
1285	0.07	34.673	7.97	4.90	2.35	121	0.00	33.	0.1	2.51	1500	-0.02	34.671	27.86	0.438
1762	-0.10	34.669	7.97	5.23	2.31	121	0.00	33.	0.1	2.49	2000	-0.17	34.665	27.87	0.555
2247	-0.23	34.661	7.98	5.31	2.33	121	0.01	33.	0.1	2.49	2500	-0.28	34.658	27.87	0.666
2736	-0.31	34.657	7.96	5.48	2.33	118	0.00	32.	0.1	2.49					

St. 10

Date : March 2, 1975
 Time (GMT) : 0630-0830
 (LMT) : 0830-1030
 Lat. : 55-24 S
 Long. : 01-48 W

Meteorological observation

Time (GMT) : 06-00
 (LMT) : 08-00
 Weather : Rain
 Air temperature : 2.5°C
 Atm. pressure : 987.5 mb
 Wind direction : NW
 velocity : 10 m/s
 Humidity : 84%
 Sea : 4
 Swell : W14

Depth (m)	T(°C)	S (‰)	pH	O ₂ (cc/L)	Observed						Alkalinity (meq/L)	Interpolated			
					PO ₄ -P	SiO ₃ -Si	NO ₂ -N	NO ₃ -N	NH ₄ -N	Depth (m)		T (°C)	S (‰)	σ _t	ΔD
					(μg-atoms/L)										
0	1.80	33.704	8.14	8.15	1.80	56	0.27	26.	0.5	2.43	0	1.80	33.704	26.97	0.000
9	1.79	33.698	8.18	7.64	1.82	59	0.26	24.	0.4	2.43	10	1.79	33.697	26.97	0.011
18	1.80	33.687	8.17	7.66	1.80	59	0.26	25.	0.4	2.43	20	1.80	33.686	26.96	0.022
26	1.80	33.684	8.17	7.67	1.80	59	0.28	25.	0.5	2.43	30	1.80	33.685	26.96	0.033
44	1.79	33.690	8.16	7.64	1.80	59	0.27	25.	0.5	2.43	50	1.66	33.710	26.99	0.055
65	1.11	33.789	8.17	7.68	1.92	60	0.24	26.	0.5	2.44	75	0.54	33.870	27.19	0.080
87	-0.11	33.968	8.13	7.50	2.02	70	0.20	27.	0.4	2.44	100	-0.48	34.038	27.37	0.100
109	-0.63	34.082	8.11	7.24	2.10	70	0.20	29.	0.4	2.45	125	-0.81	34.175	27.50	0.116
124	-0.81	34.171	8.08	6.99	2.18	74	0.19	30.	0.2	2.47	150	-0.72	34.270	27.57	0.130
176	-0.62	34.338	8.06	6.26	2.31	83	0.02	32.	0.0	2.48	200	-0.37	34.409	27.67	0.154
221	-0.13	34.465	8.03	5.62	2.31	90	0.00	31.	0.0	2.48	250	0.11	34.524	27.74	0.173
267	0.22	34.551	8.00	5.22	2.37	98	0.01	31.	0.0	2.49	300	0.37	34.589	27.77	0.191
358	0.53	34.628	7.98	4.94	2.37	102	0.00	32.	0.0	2.49	400	0.61	34.647	27.81	0.223
448	0.66	34.661	8.00	4.79	2.43	107	0.00	32.	0.0	2.49	500	0.70	34.669	27.82	0.253
540	0.70	34.672	7.98	4.73	2.41	111	0.00	32.	0.1	2.52	600	0.65	34.679	27.83	0.282
631	0.62	34.682	7.97	4.71	2.41	117	0.00	32.	0.0	2.51	700	0.60	34.685	27.84	0.311
723	0.60	34.686	7.96	4.71	2.41	118	0.00	32.	0.0	2.51	800	0.56	34.686	27.84	0.338
835	0.54	.....	.....	.....	.....	...	.....	...	...	.....	1000	0.50	34.681	27.84	0.394
1028	0.49	34.680	7.98	4.71	2.41	123	0.00	33.	0.1	2.52	1200	0.41	34.680	27.85	0.449
1317	0.34	34.681	7.98	4.77	2.41	127	0.00	33.	0.1	2.52	1500	0.25	34.679	27.85	0.528
1798	0.13	34.674	7.97	5.01	2.39	129	0.00	33.	0.2	2.52	2000	0.06	34.670	27.86	0.655
2279	-0.03	34.666	7.96	5.16	2.41	130	0.01	31.	0.1	2.52	2500	-0.09	34.664	27.86	0.775
2760	-0.16	34.664	7.96	5.31	2.45	130	0.00	32.	0.2	2.51					