Oceanographic Data of the 43rd Japanese Antarctic Research Expedition from December 2001 to March 2002

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The results of oceanographic observations on board the icebreaker "Shirase" and tidal observations at Syowa Station, Antarctica are presented in this report. The oceanographic observations were carried out by the summer party of the 43rd Japanese Antarctic Research Expedition (JARE-43) during the austral summer of 2001/2002. The tidal observations were carried out by the winter party of JARE-42 from February 2001 to January 2002.

1. Oceanographic observations

The track of the icebreaker "Shirase" and the sites of oceanographic stations are shown in Fig. 1. Surface water samplings were carried out using a plastic bucket of 10-liter capacity. XCTD (Expendable Conductivity, Temperature and Depth profiler), XBT (Expendable Bathy-Thermograph), CTD (Conductivity, Temperature and Depth profiling system) and serial observations were made in the Southern Ocean. Three surface drifting buoys were deployed and LADCP (Lowered Acoustic Doppler Current Profiler) observations were made at three sites in the Antarctic Circumpolar Current region. These observations were carried out in the Southern Ocean from Fremantle to Antarctica and on the way back to Sydney and each observation and analytical method are summarized below.

(1) Surface water samplings

Surface water samplings were carried out at 46 stations and the results are given in Table 1.

(2) Monitoring of marine pollution

Surface water samplings for monitoring of marine pollution were made at 12 stations. Items and methods of analysis are given in the following section of (5).

(3) XCTD and XBT observations

XCTD and XBT observations were carried out at 200 stations (XCTD: 152 stations, XBT: 48 stations). The results are listed in Table 2 and Table 3. The thickness of the surface mixed layer in Table 3 is the depth at which the water temperature gradient is bigger than 0.3°C/m. The vertical profiles of water temperature and salinity are shown in Fig. 2 to Fig. 7.

(4) CTD and Serial observations

CTD (Falmouth Scientific Inc. TRITON ICTD) and Serial observations with Rosette sampler (2.5L Niskin sampler × 22) were carried out at 14 stations. The results including

chemical analysis of sampled water and measured values of temperature and salinity with CTD at each standard depth together with meteorological data are given in Table 4.

(5) Chemical analysis of sampled water

Chemical analysis of seawater sampled with a bucket (10L) for surface observation or Niskin bottles (2.5L) for serial observation was made according to the following methods. The item (a) was calculated from conductivity using the 1978 practical salinity scales (UNESCO, 1981). Items (b), (d) and (h) were carried out with the method described by Strickland and Parsons (1972). Item (c) was analyzed by the winkler method as modified by Carpenter (1965) for more precision. Item (e) was analyzed with the method in Motomizu and Korechika (1988). Items (f) and (g) were analyzed with the method in Andersson (1979). Items (i), (j) and (k) were analyzed with the method in Hydrographic Department (1995).

(a) Practical salinity: Conductive salinometer (Guildline Autosal salinometer model 8400B).

(b) pH: Glass electrode method (Horiba digital pH meter F-16).

(c) Dissolved oxygen: Carpenter method (Hirama model ART-3 DO-1).

(d) Phosphate: Molybdenum blue method (BRAN+LUEBBE model Traacs 800 auto analyzer).

(e) Silicate: Molybdenum blue method (BRAN+LUEBBE model Traacs 800 auto analyzer).

(f) Nitrite: Naphthylethylenediamine method (BRAN+LUEBBE model Traacs 800 auto analyzer).

(g) Nitrate: Cadmium (Cd) – copper (Cu) reduction column, Naphthylethylenediamine method (BRAN+LUEBBE model Traacs 800 auto analyzer).

(h) Ammonium: Indophenol blue method (Shimadzu Model UV-1600 Spectrophotometer).

(i) Petroleum oil: N-hexane extraction – fluorophotometric analysis.

(j) Cadmium (Cd): Solvent extraction – atomic absorption spectrophotometry.

(k) Mercury (Hg): Cold vapor atomic absorption spectrophotometry.

The results of items (a) to (h) are given in Tables 1 and 4. The results of items (i) to (k) are given in Table 5.

(6) Current observations with three surface drifters

Each surface drifter comprises from a spherical buoy of 35 cm in diameter with a drogue of 1 m in diameter, 7 m in length and 15 m in depth (TOYOCOM Co. Model 2ANZ-1388). Signals transmitted from the drifter are sent to CLS (Data Processing Center in CNES) via NOAA satellites, and the CLS distributes drifter's positions and surface water temperature observed by the drifter to the drifter's owners. Three drifters were deployed in the expedition. The first buoy (ID No. 21486) was deployed at 55°08.9'S, 108°44.9'E (CTD station 4; while

CTD observation was not made at station 4 due to rough sea condition) on December 8, 2001. It continued transmitting data until April 28, 2002. The second one (ID No. 21487) was deployed at 59°11.1'S, 150°06.8'E (CTD station 19) on March 14, 2002. It continued transmitting data until April 17, 2003. The third one (ID No. 21488) was deployed at 51°59.4'S, 150°17.9'E (CTD station 21; while CTD observation was canceled at station 21 due to rough sea condition) on March 16, 2002. It was being in operation until September 30, 2003. The trajectories are shown in Fig. 8.

2. Tidal observations

(1) Tidal observations at Syowa Station

Tidal observations have been continued out at Syowa Station since 1965. The tide gauge (QWP-8-303D, Meisei Denki Co.) was installed on the sea bottom, about 15 m water depth, Nisi-no-ura Cove, East Ongul Island by the JARE-36 members on February 2, 1995, and continuing observation. The results obtained from February 2001 to January 2002 are described in this report. The methodology of tidal observations is followed by Odamaki *et al.* (1991). In this system, the relative water pressure compensated for atmospheric pressure is measured with a quartz oscillator. The range of the sensor is 0-50 m and its precision is 0.01 m. The data sampled once per 2 s are averaged over 30 s and recorded on hard disk of recording PC. The gauge was maintained by a member of the winter party of JARE-42, through the year. Hourly sea level was recorded on the hour. Daily and monthly mean sea levels were calculated from the hourly data. The results are given in Table 6. The least squares method was employed to the harmonic analysis for one year. The harmonic constants, characteristics of the tide and other details are given in Table 7.

On the zero level of the tide gauge:

Every summer, the zero level of the tide gauge has been routinely checked. And, since February 1, 2001, the level of 500 cm below the bench mark No. 1040 was adopted as the reference of the tide levels, throughout the year of 2001 until next summer.

(2) Tidal observations at southern Langhovde

Tidal observations at southern Langhovde were carried out for 38 days (from December 28, 2001 to February 3, 2002) with a pressure gauge (WLR-7, AANDERAA INSTRUMENTS). The sensor was placed at the sea bottom about 4 m below the sea surface. In this system pressure is measured with a quartz oscillator. The range of the sensor is 0-60 m and its accuracy is 0.01% to full scale, *i.e.* 0.006 m. The pressure averaged over 40 s is recorded in an EEPROM memory every 5 min. The data were corrected for atmospheric pressure. Hourly sea level was recorded on the hour. Daily mean sea levels were calculated from the hourly data. The results are given in Table 8 and Fig. 9. Figure 9 also includes sea level data at Syowa Station. The least squares method was employed to the harmonic analysis for 32 days. The harmonic constants, characteristics of the tide and other details are given in Table 9.

3. Current observation near Syowa Station

Ocean current observations were carried out for 20 days from December 24, 2001 to January 12, 2002 at 68°59.9'S, 39°38.1'E in the coastal fast ice in Ongul Strait near Syowa Station, with an Acoustic Doppler Current Profiler (WH-300, RD Instruments Co.), 10 m below the sea surface. The results are given in Fig. 10. The least squares method was employed in the harmonic analysis for 15 days. The harmonic constants, characteristics of the tide and other details are given in Table 10.

Outline of the observation is as follows.

Apparatus name	Workhorse Sentinel ADCP Self-Contained 300 kHz
Observation term	20 days
Observation start time	December 24, 2001 13:00 (LMT (UT+3 hours))
Observation end time	January 12, 2002 10:00 (LMT)
Transducer depth	10.0 m
Pings per ensemble	80 pings
Sampling interval	5.0 min
Observation layer interval	4.0 m
Total number of observation layers	32 layers
First bin range	5.92 m
Last bin range	129.92 m
Maximum observed layer	113.92 m
Magnetic variation	-48.0 deg

Acknowledgments

The authors would like to express their sincere thanks to Prof. F. Nishio, the leader of JARE-43, Prof. Y. Motoyoshi, the leader of JARE-42, Prof. K. Kamiyama, the winter party leader of JARE-43, Dr. K. Watanabe, the summer party leader of JARE-42, and to all the members of JARE-43 and JARE-42 for their helpful support and valuable advices. The authors also express their sincere thanks to Ms. S. Iwano, a member of the JARE-42 winter party, who maintained the tide gauge throughout a whole year.

The authors also express their thanks to Captain Y. Ishikado, the officers and all crew of the icebreaker "Shirase".

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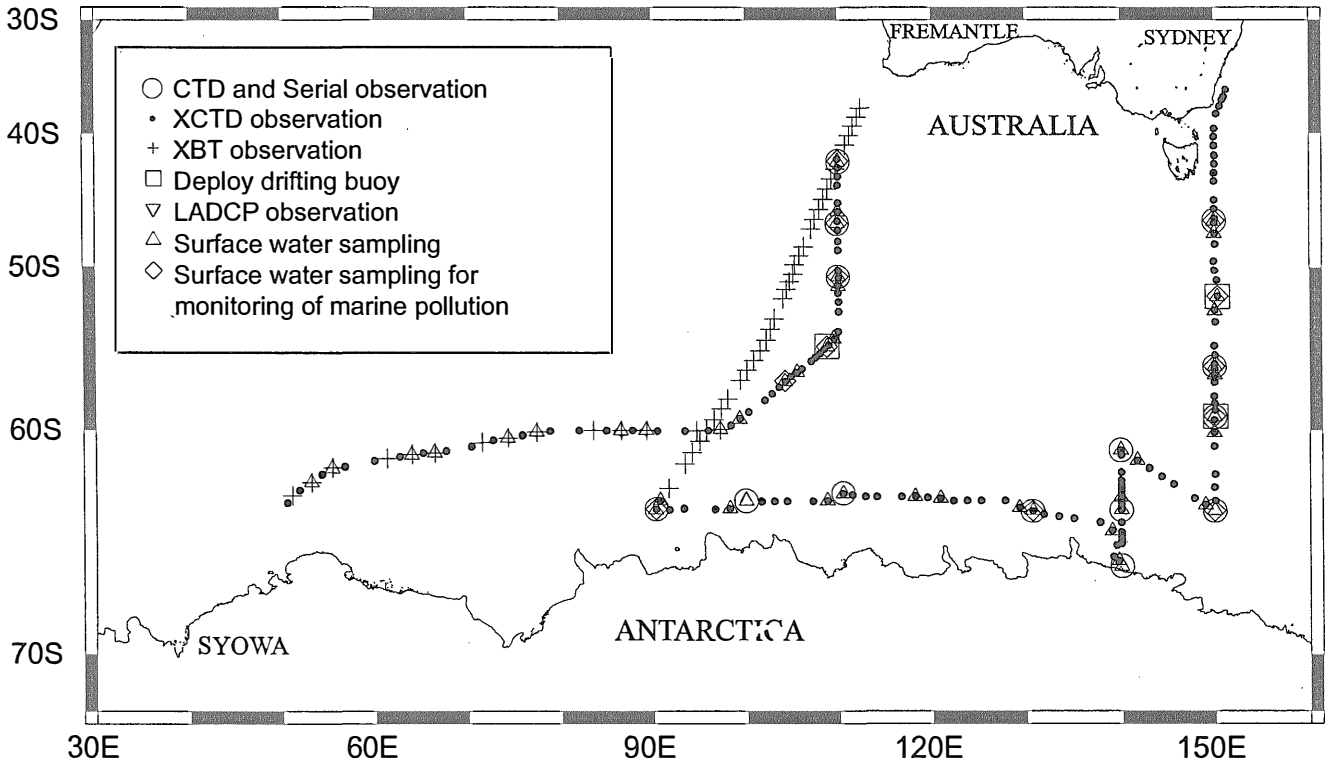


Fig. 1. The track of the icebreaker "Shirase" and the site of oceanographic stations.

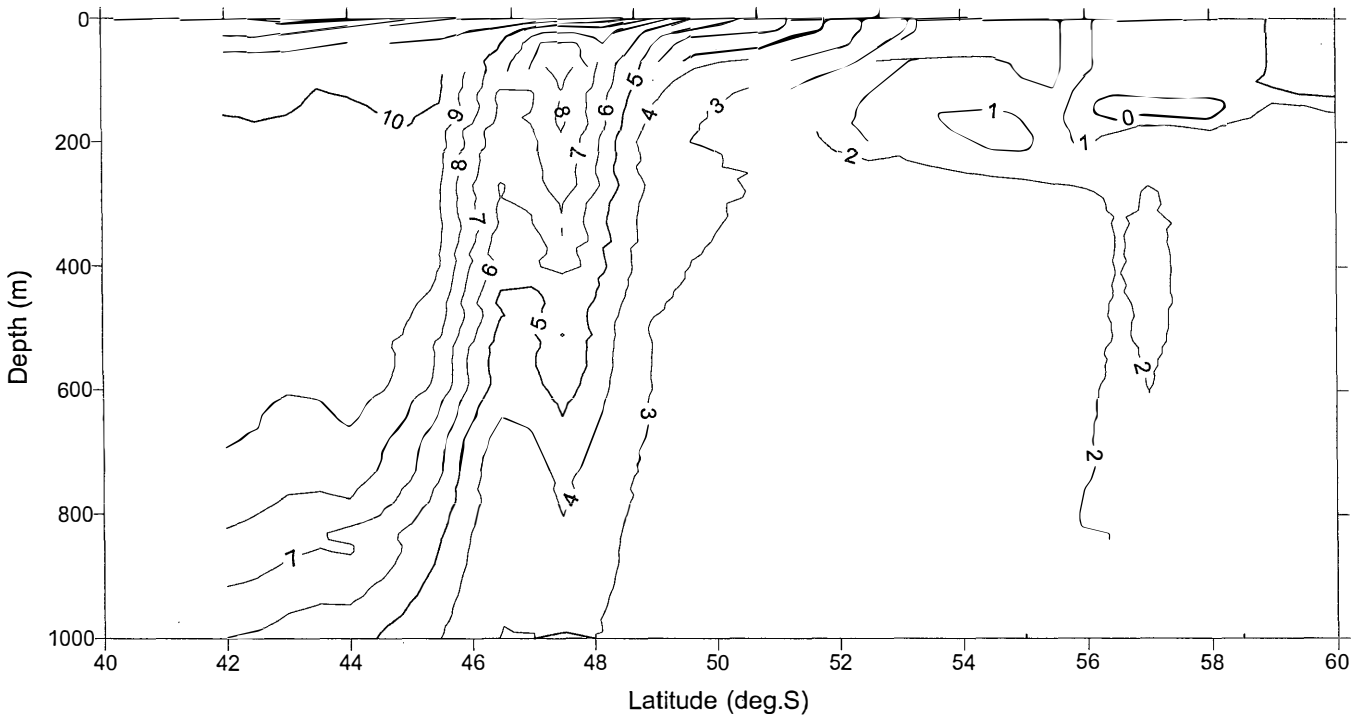


Fig. 2. Vertical profile of water temperature (°C) observed with XCTD along 110°E.

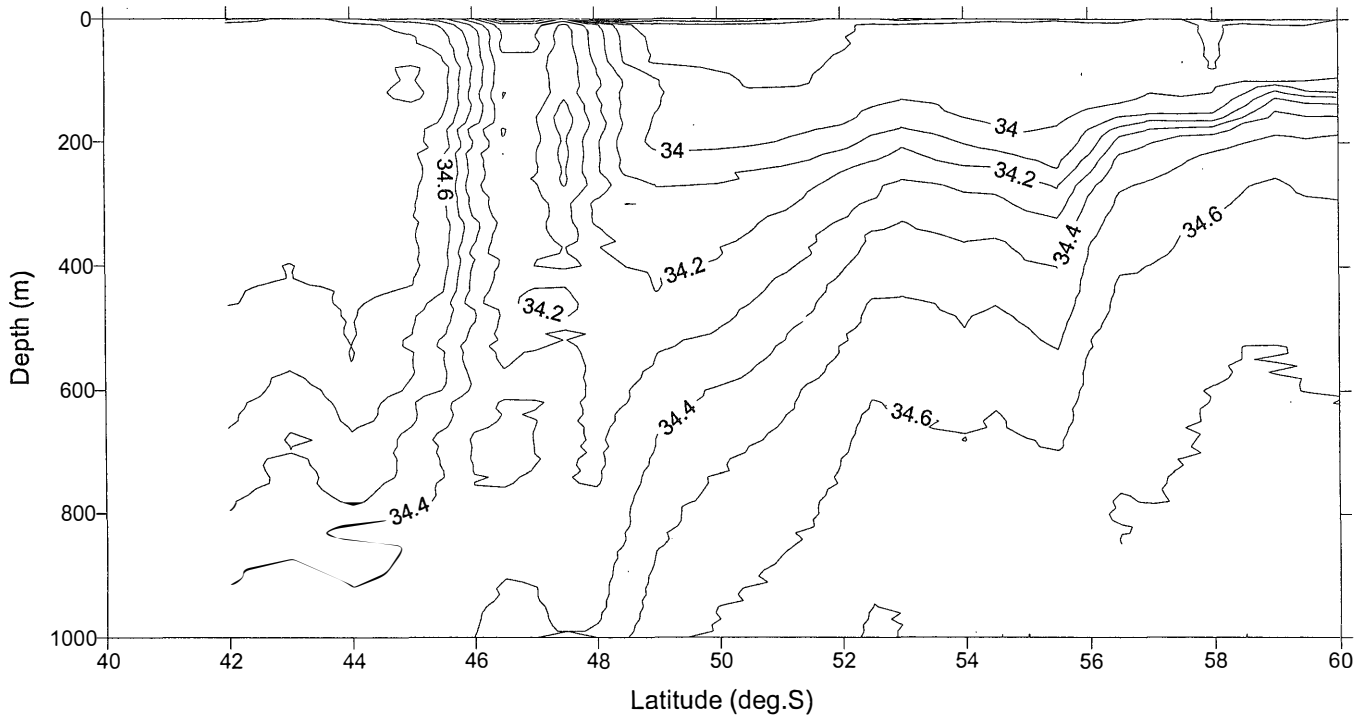


Fig. 3. Vertical profile of water salinity observed with XCTD along 110°E.

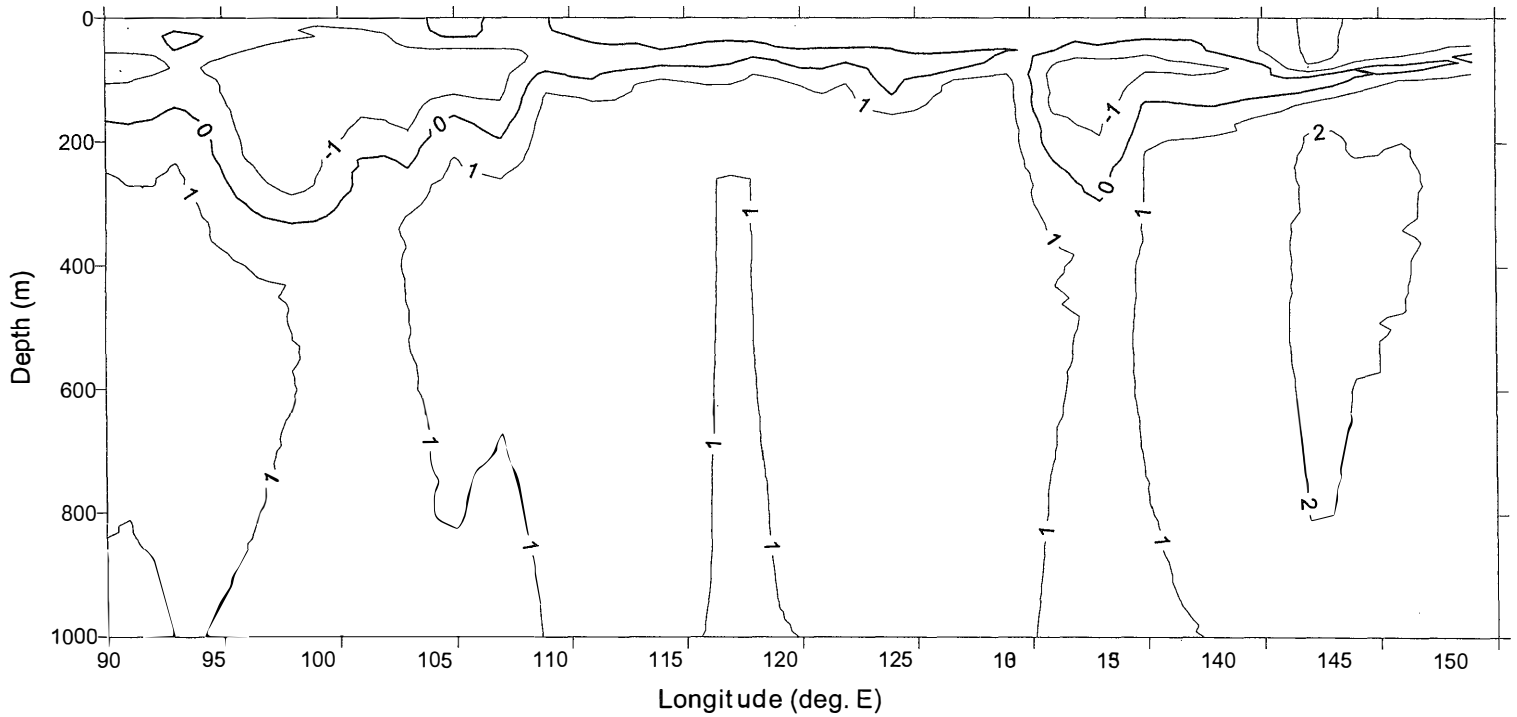


Fig. 4. Vertical profile of water temperature (°C) observed with XCTD along 64°S.

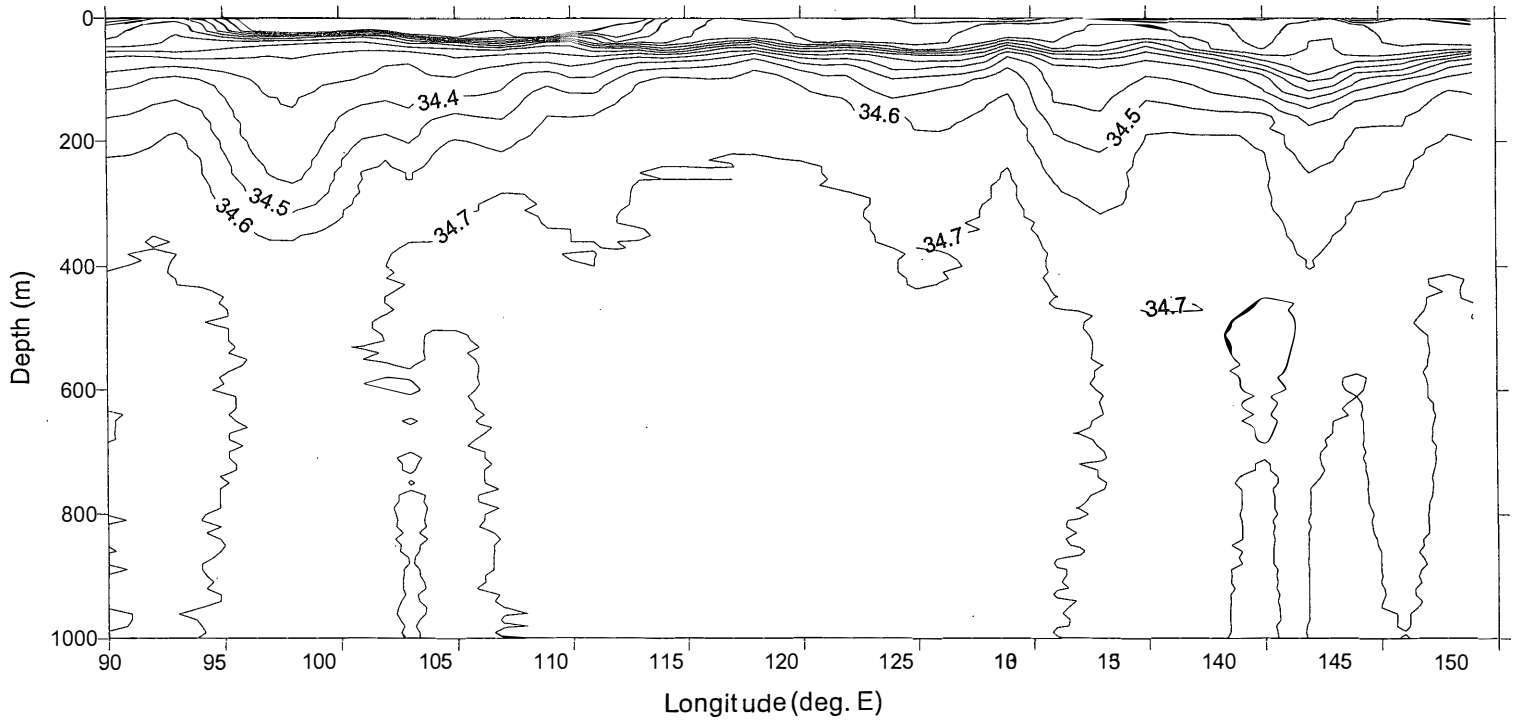


Fig. 5. Vertical profile of water salinity observed with XCTD along 64°S.

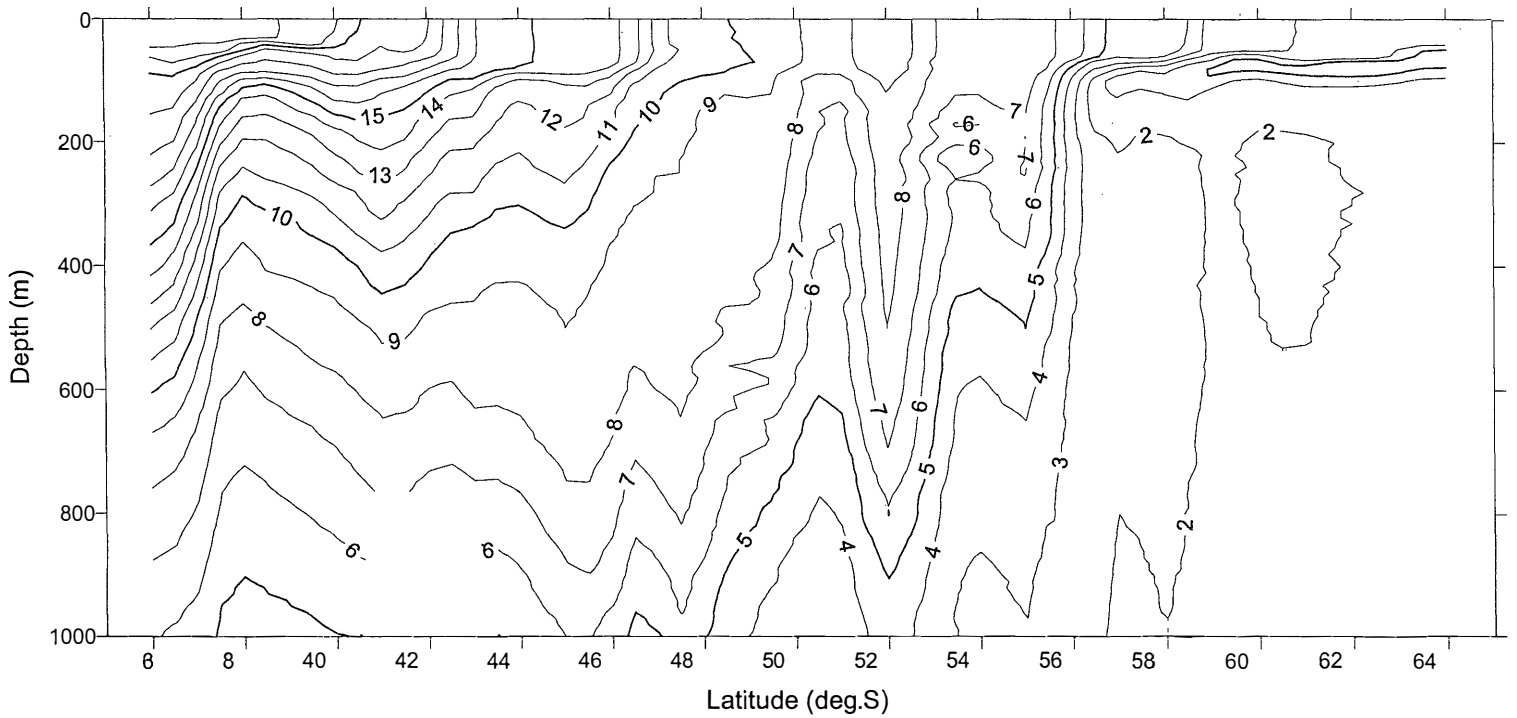


Fig. 6. Vertical profile of water temperature (°C) observed with XCTD along 150°E.

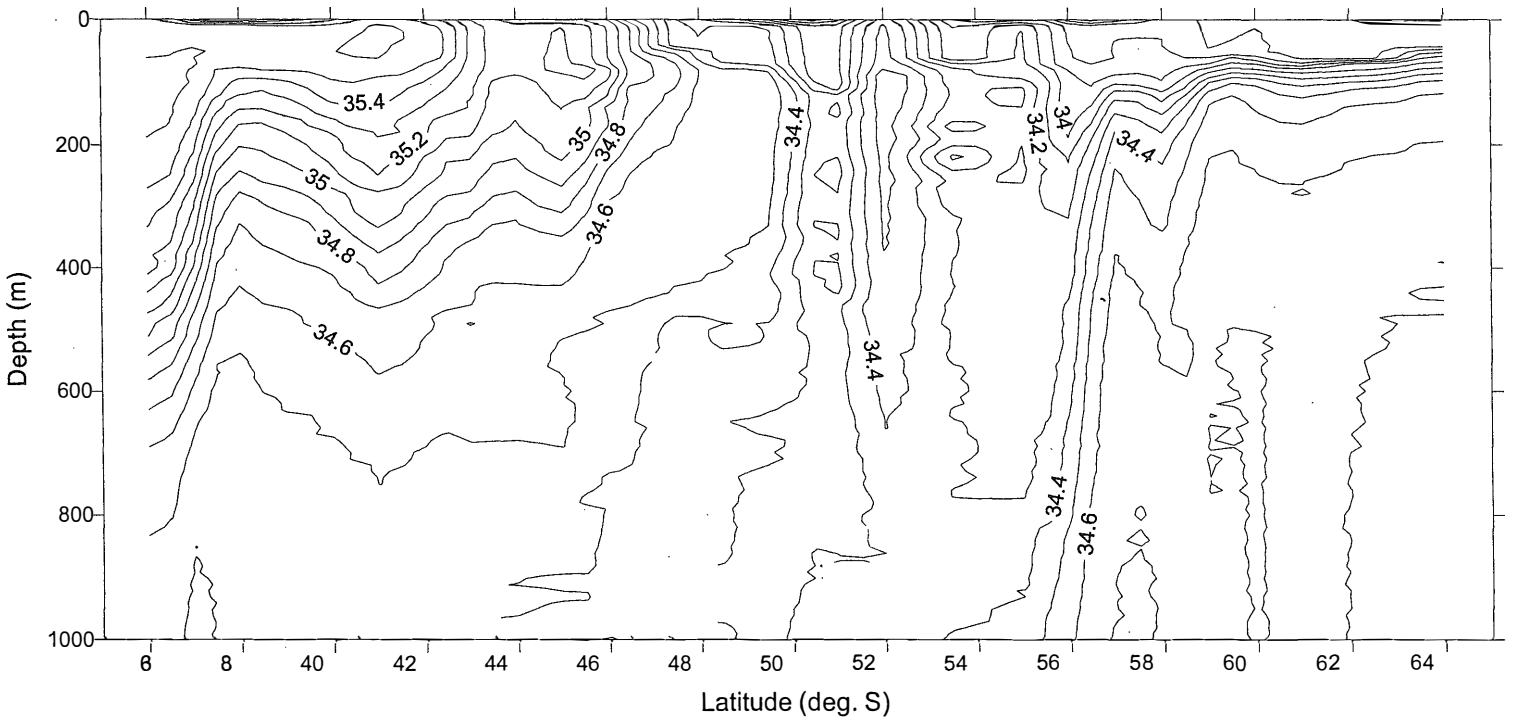


Fig. 7. Vertical profile of water salinity observed with XCTD along 150°E.

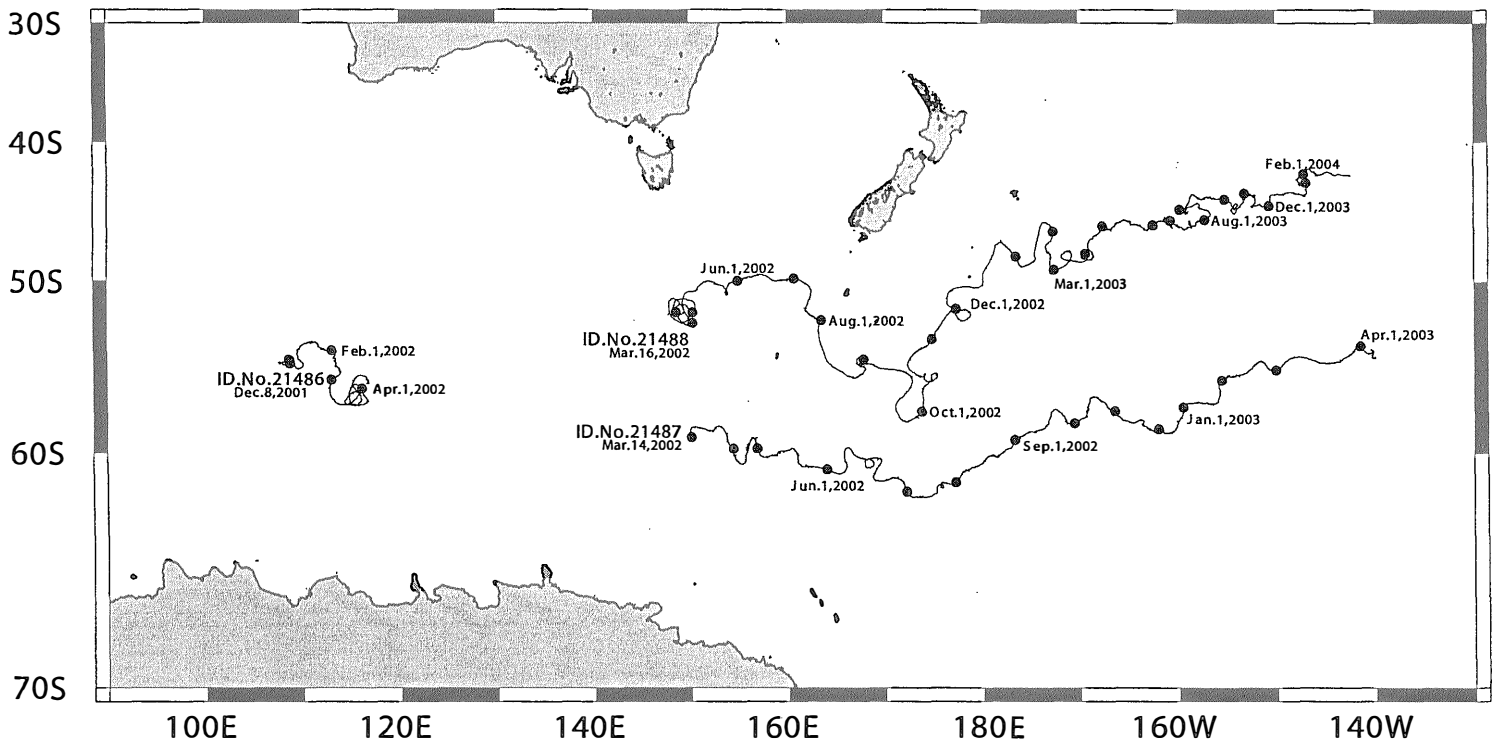


Fig. 8. Trajectories of three surface drifting buoys. Solid circles denote the deployment location and the location on the first day of every month.

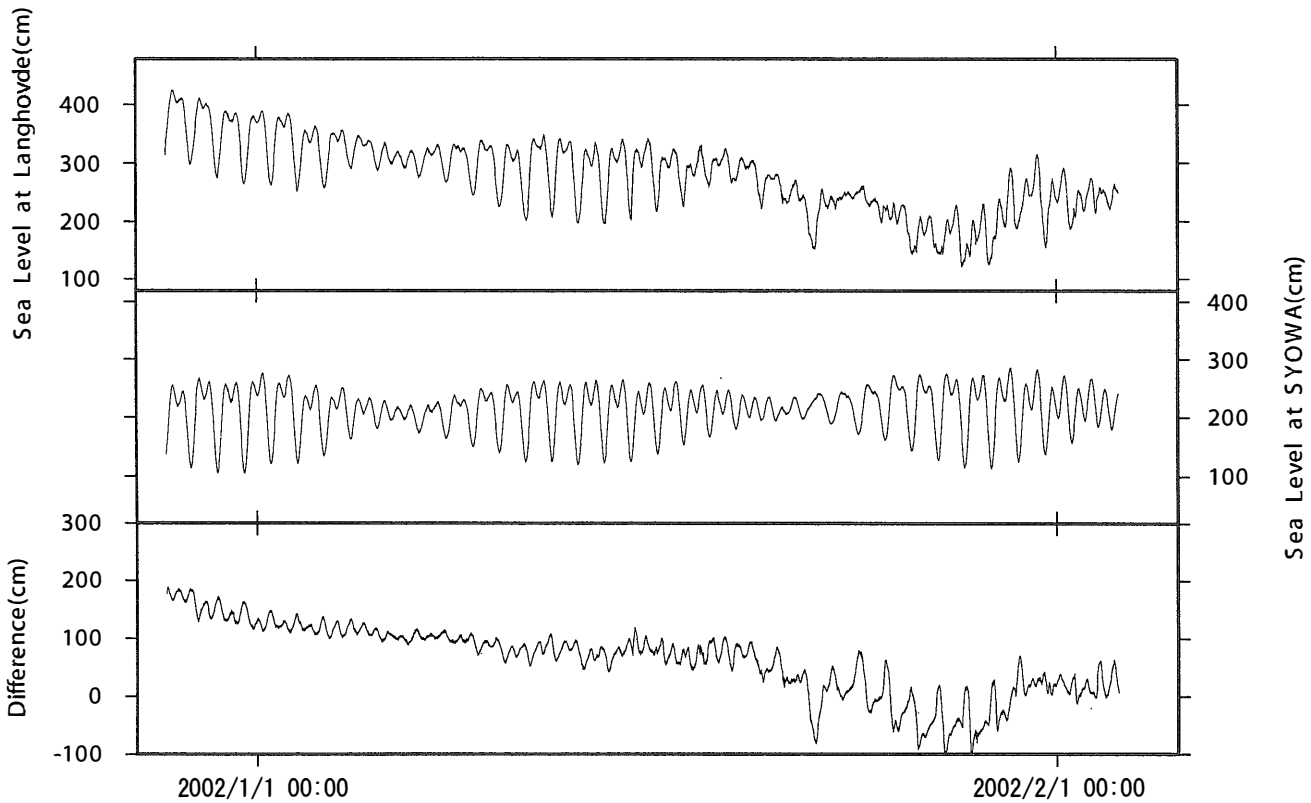


Fig. 9. Sea levels at Langhovde and Syowa Station (time is LMT (UT+3 hours)). The fixed point at Langhovde has not been connected to the benchmark at Syowa Station.

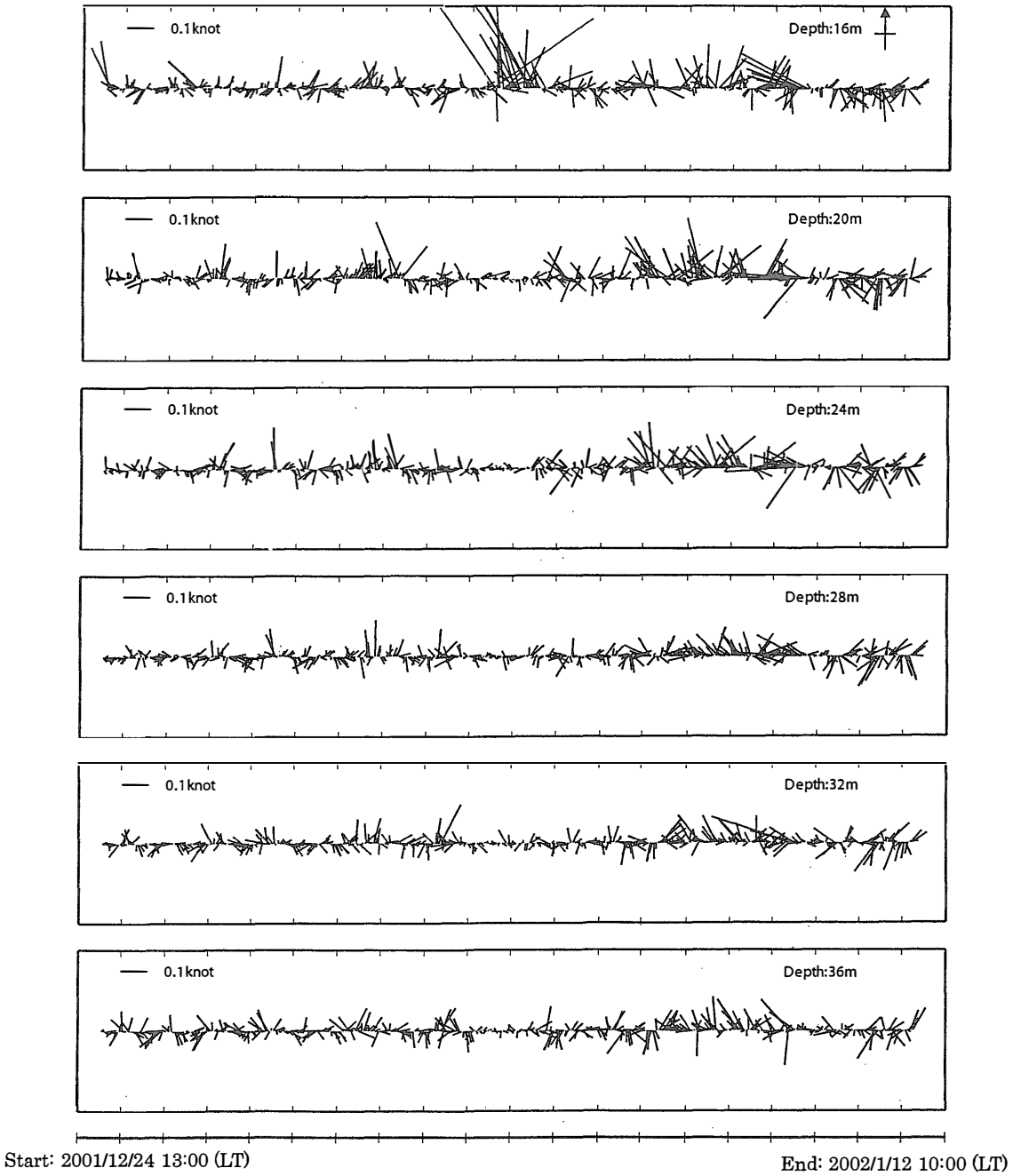
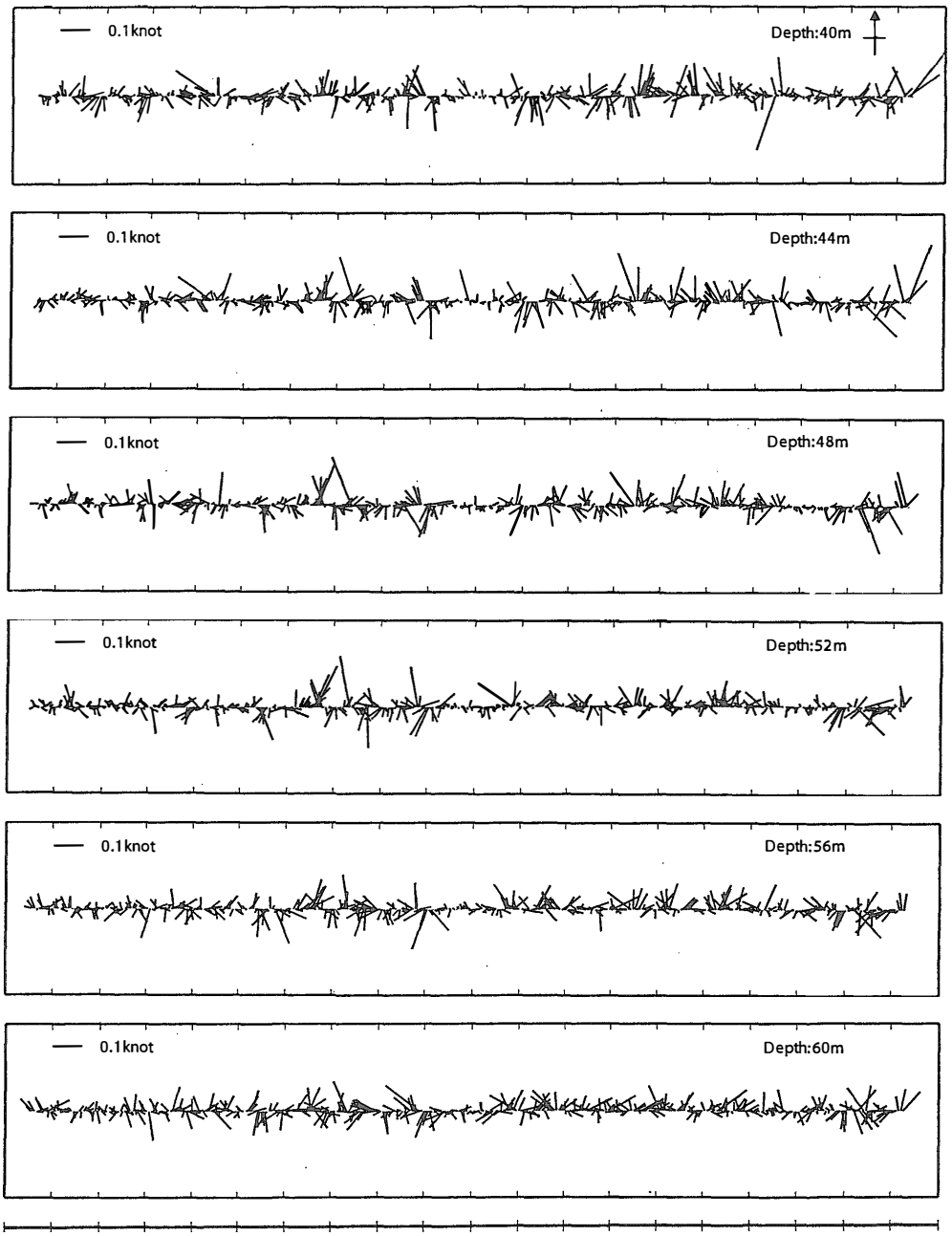


Fig. 10. The result of the current observation near Syowa Station.



Start: 2001/12/24 13:00 (LT)

End: 2002/1/12 10:00 (LT)

Table 1. Data of surface water ovservations on board the icebreaker "Shirase" in 2001-2002.

Date	Time	Position		Air Temp.	Water Temp.	Salinity	pH	DO2	PO4-P	SiO3-Si	NO2-N	NO3-N	NH4-N
(UT)		Lat.	Long.	℃				(μmol/l)					
2001													
Dec.		Left Fremantle											
5	0555	42-11.4 S	109-59.5 E	12.3	12.6	33.570	8.27	277	0.63	2	0.10	11	—
6	0155	46-04.7	110-00.0	11.8	11.8	34.416	8.12	273	0.98	0	0.30	13	—
6	0610	46-55.1	109-55.5	11.9	11.7	34.289	8.24	291	1.21	2	0.36	15	1.0
7	0140	50-39.7	109-58.6	5.7	4.9	33.888	8.24	—	—	0	0.21	8	0.4
7	0810	51-18.1	109-59.3	3.0	3.2	33.939	8.25	346	1.47	2	0.27	6	0.5
8	0150	54-39.8	109-30.1	2.8	2.2	33.956	8.23	346	1.54	9	0.26	27	0.1
8	0605	55-08.9	108-44.9	2.7	2.0	33.957	8.23	347	1.57	9	0.21	26	0.4
9	0155	56-42.1	105-31.2	2.4	1.7	33.989	8.19	352	1.80	27	0.23	28	0.9
9	0800	57-13.7	104-12.9	3.0	1.2	34.006	8.18	344	1.82	17	0.18	27	0.8
10	0200	59-21.6	99-19.2	0.8	-0.3	33.873	8.20	358	1.51	26	0.22	25	0.6
10	0755	59-56.4	97-12.2	1.0	-0.1	34.019	8.17	354	1.87	46	0.24	31	0.6
11	0250	59-59.7	89-17.7	1.3	0.1	34.009	8.25	346	1.75	37	0.22	29	0.7
11	0850	60-00.3	86-36.0	0.7	-0.6	34.030	8.23	356	1.83	54	0.17	30	0.7
12	0255	60-04.7	77-27.2	0.2	-0.8	33.943	8.18	356	1.14	27	0.10	21	0.6
12	0855	60-24.1	74-22.5	0.2	-1.1	33.790	8.19	352	1.87	37	0.23	32	0.7
13	0355	61-10.8	66-29.0	0.3	-1.5	33.678	8.22	358	1.65	33	0.26	28	0.5
13	0955	61-16.3	63-59.0	0.2	-1.7	33.574	8.22	363	1.72	30	0.30	29	0.5
14	0455	61-57.4	55-24.4	0.8	-1.8	33.738	8.20	357	1.41	35	0.23	23	1.0
14	1055	62-39.1	53-08.1	1.2	-1.4	33.764	8.22	360	1.79	44	0.31	28	0.5
		Arrived at the ice edge of SYOWA station											

Date	Time	Position		Air Temp.	Water Temp.	Salinity	pH	DO2	PO4-P	SiO3-Si	NO2-N	NO3-N	NH4-N
(UT)		Lat.	Long.	℃				(μmol/l)					
2002		Left at the ice edge of SYOWA station											
Mar. 4	0150	63-31.6	90-43.1	2.7	-0.1	33.988	8.22	338	1.78	46	0.18	26	0.2
4	0605	63-57.5	90-14.7	3.6	-0.6	33.853	8.25	340	1.93	52	0.14	29	0.5
5	0155	63-55.8	98-16.3	2.6	-1.3	33.065	8.33	355	0.45	18	0.05	10	1.5
5	0605	63-33.5	100-01.6	1.6	-0.6	33.325	8.33	363	0.47	25	0.14	18	0.5
6	0150	63-35.1	108-47.0	0.7	-0.4	33.132	8.22	353	1.84	44	0.16	25	1.6
6	0610	63-13.4	115-28.5	1.2	0.1	33.257	8.25	351	1.85	41	0.16	25	0.4
7	0205	63-20.9	118-12.0	1.3	0.2	33.721	8.23	343	1.67	47	0.06	26	0.8
7	0750	63-23.5	120-53.2	0.0	0.3	33.691	8.23	348	1.66	44	0.08	27	1.1
8	0115	63-50.1	129-18.7	0.6	0.2	33.739	8.24	345	1.73	44	0.23	26	0.5
8	0455	63-59.9	130-40.4	0.0	-1.7	33.753	8.23	345	1.82	45	0.22	27	0.4
8	2350	64-55.8	139-02.4	3.3	-0.1	33.820	8.24	351	1.77	43	0.24	27	1.5
9	0550	66-14.6	139-44.4	4.6	-1.1	34.186	8.21	352	1.81	43	0.25	27	2.0
9	2255	66-28.0	140-03.0	6.3	-2.0	34.391	8.21	360	1.82	65	0.15	27	1.6
10	2250	63-58.4	140-00.6	2.7	0.8	33.690	8.23	346	1.62	22	—	—	0.9
11	0540	63-22.0	140-00.3	1.0	0.7	33.692	8.22	343	1.71	26	—	—	0.8
11	2250	61-01.0	139-58.4	3.2	1.8	33.805	8.13	338	1.79	18	—	—	—
12	0550	61-32.7	141-43.8	3.2	2.8	33.809	8.11	334	1.83	17	—	—	1.1
12	2250	63-42.7	149-00.1	1.8	0.8	33.659	8.14	343	1.60	14	—	—	—
13	0250	63-59.6	149-59.6	2.3	0.8	33.739	8.11	340	1.64	19	—	—	0.8
13	2255	60-03.7	150-00.0	2.0	1.8	33.728	8.11	334	1.60	16	0.27	25	1.5
14	0250	59-12.1	150-00.4	3.2	2.1	—	8.12	333	1.39	8	0.28	24	1.2
14	2250	56-48.8	149-58.8	4.2	2.8	33.795	8.11	328	1.73	14	—	—	—
15	0255	56-17.6	149-58.2	4.6	5.9	33.793	8.13	307	1.46	0	—	—	1.6
15	2250	52-54.1	150-00.0	5.6	8.6	34.130	8.15	291	1.14	0	0.21	17	0.6
16	0305	51-59.5	150-17.9	6.3	9.8	34.566	8.17	282	0.84	0	0.22	11	0.6
16	2250	47-37.2	150-00.1	8.7	9.9	34.305	8.15	287	0.97	0	—	—	—
17	0300	46-44.8	149-57.3	10.8	13.4	34.956	8.21	262	0.35	0	—	—	0.7

Table 2. XCTD observation data.

station	JA430001		JA430002		JA430003		JA430004		JA430005		JA430006		JA430007		JA430008	
date	2001/12/5		2001/12/5		2001/12/5		2001/12/5		2001/12/5		2001/12/6		2001/12/6		2001/12/6	
time(UT)	5:01		10:57		13:54		16:55		22:54		1:55		4:59		10:54	
latitude	42-00.2 S		42-40.6 S		43-20.8 S		44-01.8 S		45-25.1 S		46-04.7 S		46-46.5 S		47-24.9 S	
longitude	109-58.7 E		109-59.6 E		109-59.9 E		109-59.3 E		110-00.0 E		110-00.0 E		109-58.8 E		109-59.8 E	
depth	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity
0	12.75	34.40	13.07	34.74	13.24	34.77	12.54	34.60	11.87	34.48	11.74	34.22	11.74	33.56	12.27	34.40
10	12.66	34.74	12.93	34.77	12.90	34.75	11.94	34.73	11.76	34.64	11.16	34.37	9.68	33.96	10.80	34.44
20	11.96	34.74	12.58	34.77	11.59	34.72	11.55	34.74	11.02	34.66	10.21	34.44	8.60	33.99	9.98	34.46
30	11.71	34.75	12.15	34.80	11.42	34.72	11.34	34.75	10.93	34.69	9.79	34.44	7.69	34.01	9.72	34.45
50	11.06	34.75	11.20	34.76	10.94	34.70	10.54	34.75	10.68	34.74	9.61	34.46	6.37	33.97	9.62	34.48
75	10.29	34.74	10.53	34.75	10.19	34.71	10.13	34.75	10.55	34.81	8.68	34.44	6.43	34.06	9.17	34.48
100	10.10	34.75	10.34	34.75	10.01	34.71	10.06	34.76	10.57	34.83	8.43	34.43	6.22	34.07	8.65	34.45
125	10.03	34.75	10.34	34.79	9.88	34.72	9.98	34.75	10.62	34.86	8.09	34.40	5.83	34.06	8.68	34.49
150	9.93	34.75	10.23	34.79	9.84	34.72	9.86	34.75	10.30	34.79	8.25	34.45	5.76	34.07	8.91	34.55
200	9.73	34.70	9.92	34.74	9.76	34.71	9.76	34.73	9.95	34.73	7.40	34.34	5.50	34.11	8.62	34.52
250	9.73	34.71	9.79	34.72	9.69	34.70	9.72	34.73	9.79	34.74	6.91	34.29	5.39	34.15	8.42	34.51
300	9.76	34.73	9.72	34.70	9.66	34.70	9.67	34.71	9.63	34.71	6.76	34.30	5.16	34.19	7.73	34.41
400	9.79	34.74	9.65	34.69	9.67	34.70	9.68	34.73	9.64	34.72	6.47	34.32	4.80	34.24	7.17	34.39
500	9.68	34.71	9.47	3 ..	9.49	34.67	9.67	34.72	8.62	34.55	6.01	34.36	3.81	34.22	6.34	34.30
600	9.49	34.68	9.20	34.58	8.88	34.56	9.62	34.70	8.03	34.52	5.28	34.35	3.67	34.28	5.96	34.37
700	9.22	34.64	8.61	34.49	8.31	34.51	8.80	34.58	6.61	34.40	4.01	34.26	3.05	34.28	4.96	34.34
800	8.52	34.55	7.84	34.44	7.46	34.45	7.74	34.50	5.57	34.36	3.87	34.34	2.93	34.36	4.31	34.33
900	7.42	34.45	6.91	34.36	6.36	34.38	6.74	34.43	4.83	34.34	3.45	34.37	2.95	34.42	3.79	34.34
1000	6.18	34.38	5.75	34.28	5.43	34.34	5.36	34.34	4.11	34.33	3.18	34.41	2.77	34.47	–	–

station	JA430009		JA430010		JA430011		JA430012		JA430013		JA430014		JA430015		JA430016	
date	2001/12/6		2001/12/6		2001/12/6		2001/12/7		2001/12/7		2001/12/7		2001/12/7		2001/12/7	
time	14:06		16:54		22:53		5:04		7:54		11:00		13:53		16:55	
latitude	48-10.9 S		48-49.5 S		50-14.4 S		50-44.9 S		51-18.1 S		51-46.6 S		52-21.5 S		52-59.7 S	
longitude	110-00.1 E		110-00.1 E		109-59.8 E		110-02.3 E		109-59.3 E		109-58.4 E		110-00.6 E		109-59.9 E	
depth	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity
0	10.54	33.24	8.06	33.67	6.44	33.55	5.01	33.73	3.43	33.86	3.90	33.81	2.97	33.86	2.71	33.73
10	9.06	34.03	7.46	33.81	6.41	33.81	5.01	33.81	3.44	33.90	3.90	33.85	2.97	33.93	2.71	33.91
20	7.90	34.06	6.82	33.83	6.27	33.83	4.92	33.82	3.45	33.90	3.89	33.85	2.95	33.93	2.71	33.91
30	7.74	34.07	5.90	33.86	5.31	33.85	4.44	33.84	3.30	33.90	3.88	33.87	2.58	33.94	2.71	33.92
50	7.25	34.06	5.06	33.87	4.99	33.85	3.73	33.85	2.74	33.93	3.51	33.85	1.97	33.95	2.31	33.92
75	6.69	34.11	4.66	33.91	3.84	33.89	3.58	33.86	2.42	33.94	2.89	33.88	1.89	33.96	1.82	33.94
100	6.69	34.15	4.32	34.02	3.36	33.89	2.66	33.89	1.78	33.94	2.23	33.90	1.80	33.97	1.51	33.95
125	6.14	34.12	4.20	34.02	2.95	33.91	2.31	33.91	–	–	2.03	33.92	1.62	33.97	1.10	33.99
150	6.03	34.12	4.01	34.01	2.65	33.92	2.19	33.92	–	–	2.01	33.94	1.16	34.01	1.15	34.03
200	5.80	34.13	3.31	33.97	2.74	33.96	–	–	–	–	2.09	34.05	1.52	34.10	1.90	34.19
250	5.47	34.12	3.47	34.04	3.16	34.10	–	–	–	–	2.39	34.17	2.21	34.25	2.17	34.29
300	5.08	34.09	3.67	34.10	2.96	34.13	–	–	–	–	2.44	34.23	2.07	34.31	2.28	34.37
400	5.13	34.22	3.37	34.17	2.68	34.22	–	–	–	–	2.42	34.34	2.33	34.46	2.35	34.47
500	4.41	34.23	2.81	34.22	2.54	34.31	–	–	–	–	2.46	34.45	2.35	34.53	2.31	34.53
600	3.98	34.23	2.96	34.35	2.58	34.42	–	–	–	–	2.48	34.53	2.35	34.60	2.28	34.58
700	3.46	34.26	2.83	34.41	2.53	34.49	–	–	–	–	2.43	34.56	2.24	34.65	2.24	34.62
800	3.26	34.31	2.75	34.47	2.50	34.55	–	–	–	–	2.36	34.60	2.18	34.68	2.20	34.65
900	3.05	34.36	2.68	34.53	2.41	34.59	–	–	–	–	2.30	34.63	2.14	34.70	2.13	34.69
1000	2.93	34.42	2.61	34.57	2.37	34.63	–	–	–	–	2.23	34.65	2.10	34.73	2.08	34.69

station	JA430017		JA430018		JA430019		JA430020		JA430021		JA430022		JA430023		JA430024	
date	2001/12/7		2001/12/8		2001/12/8		2001/12/8		2001/12/8		2001/12/8		2001/12/8		2001/12/8	
time(UT)	22:59		1:52		5:03		7:58		10:54		13:54		16:53		22:55	
latitude	54-13.5 S		54-39.8 S		55-03.9 S		55-17.9 S		55-33.5 S		55-48.1 S		56-01.1 S		56-29.0 S	
longitude	109-58.2 E		109-30.1 E		108-56.3 E		108-26.4 E		107-58.1 E		107-28.7 E		107-01.2 E		106-04.6 E	
depth	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity
0	2.22	33.84	2.37	33.90	1.81	33.85	2.53	33.80	2.41	33.93	2.06	33.92	0.60	33.87	0.86	33.74
10	2.22	33.94	2.37	33.94	1.81	33.95	2.52	33.92	2.40	33.94	2.05	33.94	0.59	33.91	0.85	33.96
20	2.22	33.95	2.36	33.95	1.81	33.96	2.52	33.93	2.41	33.94	2.05	33.94	0.59	33.92	0.85	33.97
30	2.21	33.94	2.36	33.94	1.67	33.95	2.52	33.92	2.41	33.94	2.05	33.95	0.59	33.91	0.85	33.97
50	2.16	33.95	2.36	33.94	1.22	33.95	2.50	33.92	2.42	33.94	2.04	33.95	0.59	33.92	0.86	33.96
75	1.71	33.95	1.68	33.97	0.80	33.97	2.49	33.92	2.41	33.95	2.04	33.95	0.59	33.93	0.86	33.97
100	1.69	33.96	1.61	33.96	0.65	33.96	2.19	33.94	2.37	33.94	1.64	33.96	0.36	33.95	0.85	33.96
125	1.66	33.95	1.46	33.97	0.34	33.98	1.82	33.95	2.27	33.94	1.06	33.98	-0.17	33.99	-0.32	33.95
150	0.87	33.97	0.60	33.99	0.19	34.02	1.52	33.97	1.84	33.95	0.85	34.01	-0.14	34.01	-0.53	34.06
200	1.02	34.07	0.67	34.05	–	–	1.03	33.99	1.46	33.99	1.34	34.13	0.45	34.10	1.73	34.40
250	2.00	34.21	1.80	34.23	–	–	1.90	34.13	1.43	34.06	2.08	34.28	1.34	34.29	1.89	34.49
300	2.36	34.31	2.20	34.33	–	–	2.41	34.25	2.28	34.20	2.18	34.36	2.19	34.45	1.84	34.52
400	2.41	34.42	2.27	34.48	–	–	2.47	34.36	2.49	34.38	2.37	34.48	2.17	34.53	1.92	34.60
500	2.40	34.49	2.30	34.56	–	–	2.44	34.45	2.46	34.45	2.27	34.55	2.13	34.59	1.91	34.65
600	2.34	34.55	2.23	34.62	–	–	2.43	34.50	2.38	34.54	2.22	34.61	2.01	34.64	1.86	34.67
700	2.29	34.60	2.20	34.66	–	–	2.33	34.57	2.35	34.61	2.15	34.64	1.99	34.67	1.83	34.69
800	2.24	34.63	2.20	34.69	–	–	2.29	34.61	2.29	34.63	2.01	34.66	1.89	34.69	1.79	34.71
900	2.17	34.67	2.11	34.71	–	–	–	–	–	–	–	–	1.86	34.71	–	–
1000	2.12	34.68	2.05	34.72	–	–	–	–	–	–	–	–	1.82	34.72	–	–

station	JA430025		JA430026		JA430028		JA430029		JA430030		JA430031		JA430032		JA430033	
date	2001/12/9		2001/12/9		2001/12/9		2001/12/9		2001/12/9		2001/12/9		2001/12/10		2001/12/10	
time	1:55		5:55		10:52		13:56		16:51		22:59		1:57		4:52	
latitude	56-42.1 S		56-57.0 S		57-33.9 S		57-57.0 S		58-19.5 S		58-59.3 S		59-21.6 S		59-43.8 S	
longitude	105-31.2 E		104-51.5 E		103-33.8 E		102-46.9 E		102-01.0 E		100-17.9 E		99-19.2 E		98-22.0 E	
depth	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity
0	0.91	33.90	1.03	33.95	0.80	33.93	0.32	33.68	0.63	33.81	-0.13	33.78	-0.23	33.74	-0.17	33.94
10	0.90	33.97	1.02	33.97	0.80	33.95	0.32	33.81	0.63	33.98	-0.14	33.91	-0.25	33.86	-0.27	33.97
20	0.89	33.97	1.02	33.97	0.80	33.95	0.32	33.80	0.63	33.99	-0.14	33.91	-0.25	33.87	-0.22	33.99
30	0.89	33.97	1.02	33.96	0.80	33.96	0.31	33.81	0.63	33.99	-0.14	33.90	-0.25	33.87	-0.23	33.99
50	0.89	33.97	1.01	33.96	0.87	33.97	0.33	33.82	0.63	33.99	-0.14	33.91	-0.26	33.89	-0.24	33.99
75	0.88	33.97	0.98	33.97	0.87	33.97	0.35	33.84	0.63	34.00	-0.14	33.90	-0.28	33.92	-0.24	34.02
100	0.81	33.98	0.91	33.97	0.86	33.97	-0.02	34.00	0.64	33.99	-0.40	33.98	-0.30	34.00	-0.25	34.01
125	0.19	34.00	-0.03	34.02	0.27	33.99	-0.24	34.00	0.08	34.03	0.91	34.35	0.32	34.19	-0.20	34.17
150	-0.16	34.02	0.00	34.06	-0.04	34.07	-0.51	34.04	0.20	34.18	1.49	34.45	1.51	34.36	0.80	34.33
200	0.57	34.24	1.96	34.41	1.90	34.45	1.48	34.46	1.80	34.48	1.78	34.55	1.88	34.48	1.78	34.53
250	1.81	34.52	2.05	34.48	1.82	34.51	1.83	34.55	1.95	34.56	1.96	34.60	2.03	34.57	1.83	34.58
300	1.90	34.55	2.10	34.52	1.93	34.57	1.90	34.57	1.97	34.61	1.94	34.65	2.03	34.60	1.86	34.61
400	1.94	34.62	2.16	34.59	1.93	34.63	1.88	34.63	1.96	34.67	1.86	34.67	1.98	34.65	1.87	34.65
500	1.88	34.66	2.12	34.63	1.94	34.66	1.86	34.66	1.90	34.69	1.83	34.69	1.92	34.69	1.78	34.68
600	1.87	34.68	2.07	34.65	1.89	34.69	1.94	34.71	1.91	34.72	1.79	34.71	1.89	34.70	1.76	34.69
700	1.85	34.72	2.00	34.67	1.86	34.70	1.88	34.70	1.88	34.72	1.70	34.72	1.89	34.72	1.72	34.71
800	1.83	34.72	1.94	34.70	1.83	34.72	1.82	34.73	1.84	34.75	1.59	34.73	1.81	34.73	1.63	34.73
900	–	–	1.89	34.70	1.76	34.73	1.74	34.73	1.70	34.75	1.56	34.73	1.72	34.73	1.55	34.73
1000	–	–	1.81	34.70	–	–	–	–	–	–	1.48	34.73	1.60	34.74	1.46	34.72

station	JA430035		JA430037		JA430038		JA430040		JA430042		JA430044		JA430045		JA430047	
date	2001/12/10		2001/12/10		2001/12/10		2001/12/11		2001/12/11		2001/12/11		2001/12/11		2001/12/12	
time(UT)	10:54		16:52		23:56		5:53		12:02		17:54		23:52		5:53	
latitude	59-59.8 S		60-00.5 S		60-01.2 S		59-59.2 S		59-59.5 S		60-00.0 S		60-00.5 S		60-15.1 S	
longitude	95-54.8 E		93-24.1 E		90-29.2 E		87-50.7 E		85-01.7 E		82-02.2 E		78-57.1 E		75-57.0 E	
depth	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity
0	0.17	33.77	0.03	33.88	0.11	34.00	0.51	33.92	-0.53	33.88	-0.49	33.93	-0.42	33.72	-0.77	33.77
10	0.17	33.84	0.03	33.92	0.11	34.02	0.50	33.96	-0.54	33.93	-0.49	33.98	-0.42	33.85	-0.77	33.81
20	0.16	33.86	0.03	33.91	0.00	34.03	0.50	33.95	-0.55	33.94	-0.49	33.97	-0.43	33.91	-0.78	33.82
30	0.15	33.87	0.02	33.92	-0.05	34.05	0.49	33.96	-0.55	33.94	-0.49	33.97	-0.43	33.95	-0.78	33.82
50	0.12	33.87	-0.01	33.92	-0.04	34.05	0.47	33.95	-0.61	33.95	-0.50	33.98	-0.43	33.96	-0.78	33.82
75	0.09	33.87	-0.15	33.98	-0.04	34.06	0.21	33.97	-0.29	34.20	-0.58	34.00	-0.46	33.96	-0.79	33.84
100	0.01	33.90	-0.14	34.05	-0.09	34.07	0.21	34.08	0.53	34.40	-0.52	34.13	-0.45	33.97	-0.68	33.93
125	0.61	34.20	0.61	34.21	-0.15	34.12	0.19	34.13	0.85	34.46	0.56	34.44	0.47	34.23	0.29	34.22
150	1.08	34.28	1.44	34.34	0.10	34.22	0.66	34.19	1.29	34.52	1.48	34.60	1.27	34.38	1.28	34.40
200	1.79	34.42	1.94	34.46	0.87	34.38	1.57	34.38	1.56	34.59	1.74	34.66	1.74	34.48	1.93	34.53
250	2.04	34.50	1.86	34.51	1.04	34.48	2.09	34.49	1.69	34.64	1.86	34.69	1.94	34.55	2.03	34.58
300	2.06	34.55	2.02	34.56	1.11	34.56	2.12	34.54	1.73	34.67	1.86	34.71	2.01	34.59	2.04	34.60
400	1.99	34.62	2.00	34.63	1.14	34.61	1.61	34.58	1.70	34.70	1.80	34.72	2.02	34.65	2.04	34.65
500	2.02	34.66	1.95	34.67	1.53	34.69	1.69	34.64	1.64	34.71	1.70	34.73	2.01	34.68	2.04	34.67
600	1.93	34.69	1.90	34.69	1.74	34.72	1.69	34.67	1.59	34.73	1.63	34.74	1.98	34.71	1.99	34.70
700	1.87	34.72	1.82	34.70	1.68	34.73	1.72	34.70	1.46	34.72	1.52	34.73	1.94	34.72	1.94	34.71
800	1.80	34.74	1.78	34.72	1.61	34.73	1.74	34.72	1.40	34.73	1.39	34.74	1.86	34.73	1.88	34.72
900	1.74	34.73	1.69	34.71	1.53	34.73	1.69	34.73	1.28	34.71	1.27	34.73	1.79	34.73	1.80	34.73
1000	1.65	34.72	1.61	34.73	1.45	34.73	1.60	34.74	1.18	34.72	1.11	34.72	-	-	1.72	34.73

station	JA430049		JA430051		JA430052		JA430054		JA430056		JA430058		JA430059		JA430061	
date	2001/12/12		2001/12/12		2001/12/13		2001/12/13		2001/12/13		2001/12/13		2001/12/14		2001/12/14	
time	11:57		17:54		0:49		6:54		12:50		18:54		1:55		7:55	
latitude	60-30.7 S		60-49.8 S		61-05.5 S		61-11.4 S		61-21.8 S		61-34.6 S		61-52.0 S		62-15.5 S	
longitude	72-50.3 E		70-27.8 E		67-40.3 E		65-14.2 E		62-41.2 E		59-56.5 E		56-44.2 E		54-15.3 E	
depth	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity
0	-1.04	33.74	-1.14	33.62	-1.29	33.62	-1.27	33.64	-1.39	33.34	-1.53	33.59	-1.42	33.62	-1.49	33.70
10	-1.05	33.76	-1.14	33.71	-1.29	33.66	-1.27	33.68	-1.39	33.66	-1.52	33.66	-1.43	33.65	-1.49	33.74
20	-1.05	33.77	-1.14	33.70	-1.29	33.67	-1.28	33.68	-1.39	33.67	-1.53	33.69	-1.43	33.64	-1.50	33.76
30	-1.05	33.76	-1.14	33.71	-1.29	33.67	-1.28	33.69	-1.40	33.67	-1.53	33.69	-1.46	33.66	-1.60	33.83
50	-1.05	33.75	-1.14	33.72	-1.30	33.67	-1.31	33.69	-1.41	33.68	-1.60	33.72	-1.55	33.72	-1.73	34.01
75	-1.07	33.76	-1.13	33.72	-1.50	33.80	-1.56	33.86	-0.38	34.11	-1.75	33.82	-1.77	33.88	-1.35	34.14
100	-1.10	33.79	0.56	34.15	-0.87	34.03	-0.58	34.14	1.24	34.37	-1.79	33.89	-1.67	33.96	0.83	34.41
125	0.43	34.19	1.34	34.29	0.68	34.25	1.01	34.37	1.59	34.43	-1.11	34.05	-0.51	34.14	1.43	34.49
150	1.58	34.37	1.65	34.36	1.61	34.41	1.60	34.46	1.79	34.48	0.85	34.34	0.86	34.34	1.55	34.52
200	1.81	34.46	1.93	34.46	1.89	34.49	1.87	34.55	1.89	34.54	1.74	34.50	1.78	34.52	1.75	34.60
250	2.02	34.53	2.06	34.53	2.01	34.56	1.90	34.60	1.95	34.59	1.89	34.59	1.94	34.57	1.74	34.64
300	2.07	34.56	2.10	34.56	2.06	34.60	1.94	34.64	1.98	34.61	1.95	34.63	1.97	34.60	1.83	34.67
400	2.09	34.62	2.12	34.63	2.10	34.65	1.95	34.69	1.96	34.66	1.94	34.66	2.00	34.65	1.78	34.70
500	2.06	34.66	2.07	34.65	2.07	34.68	1.93	34.72	1.91	34.69	1.93	34.70	1.98	34.68	1.73	34.72
600	2.04	34.68	2.04	34.68	2.03	34.70	1.91	34.73	1.90	34.70	1.88	34.72	1.90	34.72	1.66	34.73
700	2.00	34.71	1.99	34.71	1.96	34.72	1.87	34.76	1.82	34.71	1.84	34.73	1.88	34.74	1.56	34.74
800	1.93	34.73	1.94	34.71	1.91	34.73	1.79	34.77	1.74	34.72	1.76	34.75	1.80	34.75	1.45	34.73
900	1.87	34.73	1.87	34.73	1.80	34.73	1.72	34.77	1.67	34.73	1.69	34.75	1.74	34.74	1.33	34.73
1000	-	-	1.81	34.73	1.70	34.73	1.64	34.77	1.57	34.73	1.61	34.74	1.66	34.74	1.26	34.73

station	JA430063		JA430065		JA430100		JA430101		JA430102		JA430103		JA430104		JA430105	
date	2001/12/14		2001/12/14		2002/3/4		2002/3/4		2002/3/4		2002/3/4		2002/3/4		2002/3/5	
time(UT)	13:56		19:52		1:51		6:19		10:56		16:54		22:54		1:53	
latitude	63-02.9 S		63-40.2 S		63-31.6 S		63-57.3 S		63-58.2 S		63-55.6 S		63-58.7 S		63-55.8 S	
longitude	51-49.4 E		50-32.8 E		90-43.1 E		90-15.3 E		91-40.9 E		93-18.4 E		96-38.3 E		98-16.0 E	
depth	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity
0	-1.09	33.62	-1.53	33.69	0.32	33.95	-0.28	33.48	-0.14	33.78	0.03	33.88	-0.68	33.20	-0.99	32.95
10	-1.10	33.67	-1.53	33.81	0.32	33.98	-0.28	33.73	-0.15	33.93	0.04	34.00	-0.66	33.26	-1.02	33.02
20	-1.11	33.68	-1.53	33.82	0.32	33.97	-0.09	33.86	-0.15	33.94	0.05	34.01	-0.47	33.33	-1.09	33.05
30	-1.36	33.76	-1.55	33.85	0.32	33.98	-0.10	33.87	-0.16	33.95	0.17	34.04	-0.43	33.75	-0.85	33.83
50	-1.71	33.96	-1.74	34.01	0.30	33.97	-0.74	34.03	-0.52	34.03	0.21	34.06	-1.23	34.13	-1.50	34.15
75	-1.71	34.06	-1.80	34.09	-0.64	34.24	-1.51	34.23	-1.40	34.29	-0.74	34.27	-1.67	34.23	-1.66	34.21
100	-0.51	34.24	-1.38	34.17	-0.20	34.42	-1.12	34.31	-1.01	34.41	-0.35	34.44	-1.78	34.28	-1.78	34.24
125	0.84	34.41	1.00	34.50	0.18	34.48	-0.69	34.40	-0.72	34.45	-0.17	34.50	-1.81	34.30	-1.82	34.29
150	1.42	34.51	1.49	34.57	0.44	34.52	-0.16	34.46	-0.41	34.51	0.33	34.56	-1.82	34.31	-1.84	34.30
200	1.80	34.60	1.65	34.64	0.99	34.61	0.42	34.55	0.14	34.58	1.02	34.64	-1.67	34.34	-1.82	34.32
250	1.73	34.63	1.67	34.68	1.37	34.67	1.07	34.63	0.78	34.66	1.23	34.66	-1.18	34.41	-1.64	34.35
300	1.80	34.66	1.66	34.70	1.45	34.69	1.21	34.67	1.01	34.69	1.33	34.70	-0.30	34.51	-0.87	34.45
400	1.77	34.69	1.58	34.72	1.42	34.71	1.26	34.69	1.15	34.72	1.32	34.69	0.92	34.65	0.82	34.65
500	1.70	34.70	1.47	34.74	1.42	34.72	1.24	34.70	1.18	34.74	1.34	34.61	1.11	34.68	0.97	34.68
600	1.61	34.71	1.40	34.74	1.29	34.71	1.18	34.70	1.13	34.73	1.39	34.48	1.14	34.67	1.00	34.69
700	1.51	34.72	1.31	34.73	1.23	34.72	1.14	34.69	1.04	34.75	1.49	34.30	1.07	34.67	0.90	34.69
800	1.41	34.72	1.18	34.73	1.16	34.73	1.06	34.70	0.96	34.72	1.50	34.19	0.97	34.67	0.82	34.70
900	1.30	34.72	1.05	34.73	1.08	34.72	0.98	34.69	0.88	34.72	1.25	34.33	0.86	34.67	0.68	34.69
1000	1.22	34.70	0.96	34.73	0.99	34.71	0.91	34.70	0.81	34.72	1.10	34.42	0.74	34.66	0.46	34.67

station	JA430106		JA430107		JA430108		JA430109		JA430110		JA430111		JA430112		JA430113	
date	2002/3/5		2002/3/5		2002/3/5		2002/3/5		2002/3/6		2002/3/6		2002/3/6		2002/3/6	
time	10:53		13:54		16:52		22:53		1:51		6:27		10:53		13:50	
latitude	63-35.5 S		63-33.6 S		63-35.0 S		63-35.8 S		63-35.1 S		63-13.9 S		63-18.0 S		63-18.4 S	
longitude	101-38.7 E		103-05.9 E		104-24.2 E		107-14.0 E		108-47.0 E		110-27.7 E		111-27.2 E		112-50.7 E	
depth	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity
0	-0.66	32.64	-0.21	32.95	0.18	33.08	-0.09	33.29	-0.14	33.09	0.38	33.15	0.41	33.40	0.31	33.19
10	-0.70	33.04	-0.21	32.99	0.17	33.30	-0.10	33.35	-0.14	33.10	0.37	33.23	0.41	33.39	0.31	33.41
20	-1.08	33.66	-0.26	33.01	0.15	33.32	-0.08	33.44	-0.16	33.12	0.30	33.39	0.41	33.41	0.27	33.44
30	-1.48	34.04	-0.32	33.73	0.10	33.36	-0.07	33.49	-0.21	33.21	0.03	33.96	0.41	33.40	0.12	33.56
50	-1.56	34.18	-1.09	34.14	-1.06	34.11	-1.18	34.06	-0.73	34.16	-0.51	34.15	-0.52	33.94	-0.62	34.11
75	-1.62	34.29	-1.65	34.31	-1.34	34.22	-1.60	34.29	-0.51	34.31	-0.74	34.24	-0.36	34.34	-0.26	34.43
100	-1.54	34.32	-1.77	34.34	-1.40	34.29	-1.49	34.37	0.87	34.49	-0.19	34.37	0.14	34.44	0.88	34.59
125	-1.36	34.41	-1.70	34.36	-0.84	34.38	-1.35	34.41	1.30	34.56	0.59	34.48	0.59	34.53	1.17	34.63
150	-0.94	34.46	-1.71	34.38	0.08	34.50	-1.05	34.45	1.50	34.60	1.33	34.57	1.08	34.60	1.27	34.65
200	-0.25	34.55	-1.10	34.47	1.05	34.63	-0.12	34.56	1.65	34.65	1.50	34.63	1.35	34.65	1.40	34.67
250	0.75	34.67	-0.12	34.57	1.27	34.66	0.77	34.67	1.70	34.67	1.52	34.65	1.52	34.68	1.51	34.70
300	0.79	34.67	0.80	34.67	1.28	34.67	1.17	34.72	1.72	34.70	1.59	34.68	1.46	34.68	1.49	34.71
400	0.69	34.69	1.12	34.72	1.35	34.70	1.21	34.75	1.68	34.71	1.60	34.70	1.51	34.70	1.49	34.71
500	0.68	34.70	0.99	34.72	1.37	34.69	1.13	34.75	1.57	34.72	1.53	34.72	1.58	34.58	1.51	34.67
600	0.61	34.69	0.91	34.72	1.31	34.68	1.01	34.72	1.45	34.70	1.47	34.72	1.78	34.31	1.58	34.52
700	0.47	34.69	0.74	34.71	1.21	34.68	0.92	34.71	1.37	34.71	1.38	34.73	1.97	34.04	1.61	34.39
800	0.28	34.68	0.76	34.72	1.13	34.67	0.75	34.71	1.28	34.71	1.37	34.72	1.89	34.03	1.63	34.28
900	0.15	34.67	0.71	34.72	1.04	34.67	0.59	34.72	1.20	34.72	1.24	34.72	1.69	34.17	1.42	34.41
1000	0.09	34.67	0.63	34.72	0.93	34.66	0.48	34.71	1.13	34.71	1.15	34.72	1.49	34.29	1.19	34.57

station	JA430114		JA430115		JA430116		JA430117		JA430118		JA430119		JA430120		JA430121	
date	2002/3/6		2002/3/6		2002/3/7		2002/3/7		2002/3/7		2002/3/7		2002/3/7		2002/3/7	
time(UT)	16:49		22:52		1:53		4:56		7:52		10:52		13:51		16:48	
latitude	63-16.7 S		63-14.5 S		63-20.9 S		63-20.6 S		63-23.5 S		63-30.1 S		63-29.6 S		63-31.0 S	
longitude	114-05.7 E		116-40.5 E		118-09.0 E		119-30.5 E		120-53.2 E		122-15.8 E		123-44.5 E		125-12.5 E	
depth	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity
0	0.52	33.63	0.29	33.72	0.50	33.65	0.52	33.67	0.59	33.63	0.52	33.57	0.20	33.63	0.72	33.48
10	0.52	33.64	0.29	33.73	0.50	33.72	0.52	33.69	0.59	33.66	0.52	33.63	0.20	33.67	0.72	33.59
20	0.52	33.66	0.29	33.74	0.50	33.72	0.52	33.70	0.59	33.67	0.52	33.64	0.20	33.67	0.72	33.64
30	0.51	33.66	0.31	33.75	0.51	33.71	0.52	33.71	0.59	33.67	0.52	33.65	0.20	33.68	0.72	33.66
50	0.18	33.84	-1.13	34.24	-0.51	34.27	-0.05	33.95	-0.23	34.01	-0.21	34.09	-0.34	33.90	0.72	33.68
75	0.09	34.42	-0.30	34.47	1.04	34.60	-0.05	34.44	-0.48	34.35	0.57	34.41	-0.96	34.24	-0.68	34.22
100	1.09	34.62	0.69	34.59	1.22	34.63	0.97	34.61	0.37	34.52	1.26	34.53	-0.90	34.38	0.64	34.44
125	1.25	34.64	1.14	34.65	1.41	34.67	1.27	34.65	0.87	34.59	1.46	34.58	-0.47	34.46	0.88	34.52
150	1.30	34.66	1.25	34.66	1.47	34.68	1.35	34.66	1.25	34.66	1.40	34.59	0.65	34.58	1.10	34.55
200	1.40	34.68	1.33	34.69	1.48	34.70	1.40	34.68	1.41	34.69	1.65	34.64	1.21	34.65	1.42	34.60
250	1.50	34.71	1.39	34.71	1.52	34.71	1.49	34.71	1.49	34.71	1.66	34.68	1.44	34.68	1.66	34.66
300	1.49	34.71	1.39	34.70	–	–	–	–	1.51	34.73	1.67	34.69	1.52	34.71	1.66	34.67
400	1.46	34.72	1.39	34.73	–	–	–	–	1.50	34.74	1.67	34.71	1.43	34.71	1.62	34.69
500	1.38	34.67	1.31	34.73	–	–	–	–	1.44	34.75	1.63	34.73	1.47	34.72	1.60	34.71
600	1.37	34.58	1.20	34.71	–	–	–	–	1.39	34.74	1.56	34.74	1.41	34.73	1.49	34.70
700	1.37	34.51	1.11	34.72	–	–	–	–	1.31	34.75	1.45	34.73	1.32	34.72	1.45	34.71
800	1.38	34.41	1.02	34.71	–	–	–	–	1.24	34.74	1.40	34.73	1.24	34.73	1.37	34.70
900	1.41	34.33	0.94	34.70	–	–	–	–	1.16	34.75	1.28	34.73	1.13	34.71	1.29	34.71
1000	1.33	34.28	0.82	34.70	–	–	–	–	1.07	34.74	1.21	34.73	1.00	34.71	1.21	34.71

station	JA430122		JA430123		JA430124		JA430125		JA430126		JA430127		JA430128		JA430129	
date	2002/3/7		2002/3/8		2002/3/8		2002/3/8		2002/3/8		2002/3/8		2002/3/8		2002/3/8	
time	21:50		1:14		5:08		9:53		12:53		15:49		20:50		23:49	
latitude	63-30.1 S		63-50.1 S		64-00.2 S		64-10.0 S		64-16.2 S		64-21.9 S		64-32.6 S		64-55.8 S	
longitude	127-47.0 E		129-18.7 E		130-39.3 E		131-48.4 E		133-25.3 E		134-59.7 E		137-44.4 E		139-02.4 E	
depth	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity
0	0.79	33.54	0.71	33.36	0.47	33.63	0.36	33.71	0.17	33.73	0.17	33.54	0.03	33.59	0.21	33.80
10	0.79	33.70	0.70	33.74	0.47	33.68	0.36	33.78	0.15	33.83	0.17	33.80	0.02	33.77	0.20	33.81
20	0.79	33.72	0.70	33.74	0.47	33.69	0.36	33.78	0.16	33.84	0.17	33.82	0.03	33.77	0.20	33.81
30	0.79	33.74	0.70	33.76	0.47	33.71	0.09	33.86	0.16	33.85	0.16	33.82	0.04	33.78	0.20	33.81
50	-0.08	33.94	-0.04	34.33	0.15	33.84	-0.22	33.92	-0.15	33.92	-0.92	34.19	0.03	33.78	-0.30	34.01
75	-0.07	34.27	1.14	34.55	-0.79	34.25	-1.54	34.30	-1.49	34.26	-1.14	34.33	-1.10	34.24	-1.13	34.33
100	1.27	34.49	1.47	34.61	-1.31	34.34	-1.67	34.35	-1.65	34.33	-0.67	34.42	-0.93	34.37	-0.87	34.38
125	1.57	34.55	1.44	34.63	-1.18	34.38	-1.52	34.39	-1.62	34.36	-0.02	34.49	-0.47	34.43	-0.59	34.43
150	1.68	34.59	1.57	34.66	-1.17	34.41	-1.40	34.42	-1.46	34.38	0.45	34.55	0.07	34.50	-0.42	34.46
200	1.72	34.63	1.58	34.69	-0.48	34.50	-0.78	34.51	-1.03	34.45	1.01	34.62	1.20	34.63	0.12	34.53
250	1.81	34.68	1.65	34.73	0.34	34.57	-0.14	34.56	-0.34	34.53	1.23	34.67	1.33	34.66	0.41	34.57
300	1.82	34.69	1.69	34.74	0.52	34.62	0.39	34.62	-0.12	34.55	1.17	34.67	1.39	34.68	0.97	34.62
400	1.81	34.71	1.61	34.75	1.05	34.68	1.03	34.71	0.43	34.64	1.28	34.68	1.35	34.70	1.15	34.67
500	1.79	34.74	1.56	34.76	1.18	34.70	1.05	34.71	0.68	34.67	1.19	34.70	1.45	34.66	1.09	34.68
600	1.74	34.74	1.50	34.77	1.09	34.70	0.97	34.71	0.74	34.69	1.14	34.69	1.47	34.50	0.69	34.65
700	1.66	34.75	1.43	34.77	1.04	34.70	0.87	34.72	0.69	34.70	1.05	34.68	1.53	34.30	0.81	34.66
800	1.56	34.75	1.34	34.77	1.00	34.71	0.72	34.71	0.42	34.67	0.99	34.68	1.36	34.39	0.64	34.66
900	1.50	34.76	1.28	34.77	0.95	34.70	0.63	34.70	0.27	34.66	0.90	34.68	1.18	34.49	0.68	34.66
1000	1.43	34.75	1.20	34.76	0.88	34.70	0.49	34.70	0.30	34.67	0.81	34.67	1.03	34.55	0.62	34.65

station	JA430130		JA430131		JA430132		JA430133		JA430134		JA430135		JA430136		JA430137	
date	2002/3/9		2002/3/9		2002/3/9		2002/3/9		2002/3/10		2002/3/10		2002/3/10		2002/3/10	
time	2:54		5:47		8:52		20:52		6:56		7:36		8:19		8:47	
latitude	65-34.8 S		64-14.6 S		66-04.0 S		66-17.6 S		65-30.1 S		65-25.0 S		65-19.4 S		65-15.9 S	
longitude	139-30.5 E		139-44.4 E		139-10.7 E		139-42.5 E		140-00.1 E		140-00.4 E		140-00.2 E		140-00.0 E	
depth	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity
0	-1.03	34.01	-1.17	34.17	-1.19	33.99	-1.28	33.84	-0.93	33.92	-0.89	34.02	-0.57	33.93	-0.47	33.94
10	-1.04	34.11	-1.21	34.19	-1.24	34.16	-1.28	34.12	-0.93	34.02	-0.91	34.05	-0.57	33.96	-0.47	33.96
20	-1.05	34.13	-1.26	34.20	-1.26	34.17	-1.22	34.15	-0.93	34.05	-0.96	34.12	-0.57	33.96	-0.46	33.96
30	-1.05	34.13	-1.25	34.20	-1.28	34.17	-1.23	34.16	-1.01	34.13	-0.97	34.12	-0.57	33.98	-0.53	34.01
50	-1.05	34.16	-1.24	34.22	-1.28	34.18	-1.24	34.17	-1.04	34.15	-0.96	34.14	-0.89	34.09	-1.01	34.14
75	-1.04	34.15	-1.28	34.28	-1.19	34.24	-1.24	34.20	-1.31	34.26	-1.19	34.24	-1.42	34.28	-1.55	34.35
100	-1.10	34.18	-1.23	34.36	-1.09	34.41	-1.21	34.25	-1.44	34.37	-1.46	34.36	-1.58	34.36	-1.55	34.38
125	-1.31	34.37	-1.25	34.47	-1.16	34.44	-1.22	34.37	-1.29	34.39	-1.43	34.39	-1.37	34.40	-1.41	34.41
150	-1.40	34.46	-1.21	34.50	-1.40	34.45	-1.30	34.42	-1.12	34.41	-1.39	34.43	-0.95	34.43	-1.13	34.44
200	-1.32	34.49	-1.22	34.54	-1.32	34.48	-1.24	34.48	-0.14	34.53	-1.15	34.47	0.14	34.55	-0.22	34.54
250	-1.07	34.53	-0.85	34.59	-1.49	34.50	-1.18	34.51	-0.13	34.54	-0.79	34.52	0.65	34.62	0.76	34.64
300	-0.70	34.59	-1.33	34.56	-1.52	34.52	-1.14	34.52	0.26	34.59	-0.45	34.56	0.85	34.65	0.87	34.66
400	–	–	-1.25	34.59	-1.53	34.53	-1.12	34.56	0.44	34.65	0.24	34.64	1.02	34.67	1.03	34.69
500		–	–	–	-1.26	34.58	-1.37	34.56	0.72	34.68	0.46	34.67	0.97	34.69	1.02	34.69
600	–	–	–	–	–	–	–	–	0.67	34.69	0.53	34.67	0.91	34.69	–	–
700	–	–	–	–	–	–	–	–	0.22	34.65	0.67	34.70	0.81	34.67	–	–
800	–	–	–	–	–	–	–	–	0.33	34.67	0.50	34.69	0.74	34.68	–	–
900	–	–	–	–	–	–	–	–	0.15	34.65	0.45	34.69	0.67	34.68	–	–
1000	–	–	–	–	–	–	–	–	0.25	34.68	0.40	34.68	0.56	34.67	–	–

station	JA430138		JA430139		JA430140		JA430141		JA430142		JA430143		JA430144		JA430145	
date	2002/3/10		2002/3/10		2002/3/10		2002/3/10		2002/3/10		2002/3/10		2002/3/11		2002/3/11	
time	9:35		10:15		10:57		14:54		20:50		23:03		3:33		4:35	
latitude	65-15.9 S		65-05.0 S		64-59.9 S		64-32.5 S		63-50.1 S		63-58.6 S		63-40.8 S		63-31.9 S	
longitude	140-00.0 E		140-00.0 E		140-00.0 E		139-59.8 E		140-01.3 E		140-00.8 E		140-00.0 E		140-00.0 E	
depth	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity
0	-0.59	33.98	-0.44	33.87	-0.56	33.91	0.48	33.55	1.04	33.59	1.00	33.60	1.03	33.48	1.10	33.18
10	-0.59	33.99	-0.44	33.90	-0.57	33.99	0.49	33.66	1.04	33.59	0.99	33.66	1.02	33.62	1.09	33.57
20	-0.59	33.99	-0.43	33.91	-0.59	34.04	0.49	33.68	1.04	33.61	0.97	33.68	1.02	33.63	1.08	33.58
30	-0.59	33.98	-0.48	33.95	-0.57	34.06	0.50	33.69	1.05	33.64	0.94	33.72	1.02	33.63	1.02	33.64
50	-0.59	33.99	-0.57	33.99	-0.67	34.13	-0.30	34.03	1.01	33.68	0.91	33.73	0.81	33.71	0.43	33.76
75	-1.33	34.24	-1.36	34.28	-1.14	34.29	-0.95	34.27	-0.31	33.93	0.28	34.23	-0.46	33.92	-1.23	34.07
100	-1.62	34.34	-1.26	34.35	-1.07	34.41	-0.60	34.40	-0.02	34.27	1.00	34.47	-1.24	34.13	-1.01	34.24
125	-1.42	34.38	-0.80	34.40	-1.02	34.45	0.19	34.48	-0.09	34.37	1.55	34.57	-1.07	34.22	-0.53	34.34
150	-1.22	34.40	-0.30	34.47	–	–	0.89	34.57	0.70	34.48	1.56	34.59	-0.60	34.34	-0.04	34.43
200	-0.35	34.51	0.30	34.55	–	–	1.11	34.61	1.57	34.59	1.55	34.63	0.17	34.47	0.59	34.54
250	0.33	34.59	–	–	–	–	1.23	34.63	1.70	34.63	1.58	34.64	0.66	34.55	0.90	34.60
300	0.76	34.63	–	–	–	–	1.23	34.64	1.49	34.63	1.67	34.67	0.89	34.59	1.09	34.64
400	–	–	–	–	–	–	1.27	34.67	1.69	34.66	–	–	0.78	34.62	1.12	34.65
500	–	–	–	–	–	–	1.38	34.70	1.74	34.52	–	–	0.96	34.65	1.24	34.69
600	–	–	–	–	–	–	1.34	34.71	1.65	34.53	–	–	1.00	34.65	1.35	34.63
700	–	–	–	–	–	–	1.18	34.69	1.58	34.55	–	–	1.02	34.66	1.29	34.58
800	–	–	–	–	–	–	1.13	34.69	1.47	34.51	–	–	0.95	34.68	1.28	34.54
900	–	–	–	–	–	–	1.02	34.70	1.35	34.50	–	–	0.93	34.67	1.22	34.48
1000	–	–	–	–	–	–	0.97	34.70	1.23	34.48	–	–	0.89	34.66	1.22	34.43

station	JA430146		JA430147		JA430148		JA430149		JA430150		JA430151		JA430152		JA430153	
date	2002/3/11		2002/3/11		2002/3/11		2002/3/11		2002/3/11		2002/3/11		2002/3/11		2002/3/11	
time	5:46		6:49		7:54		8:59		10:05		11:50		14:47		20:49	
latitude	63-21.5 S		63-12.2 S		63-03.4 S		62-55.0 S		62-46.2 S		62-31.8 S		62-07.0 S		61-15.4 S	
longitude	140-00.3 E		140-01.1 E		140-01.8 E		140-01.4 E		140-00.3 E		140-00.0 E		139-59.7 E		140-01.0 E	
depth	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity
0	1.02	33.64	1.07	33.58	1.18	33.46	1.16	33.60	1.39	33.45	1.39	33.60	1.57	33.51	1.92	33.76
10	1.01	33.66	1.07	33.69	1.18	33.69	1.16	33.68	1.39	33.63	1.38	33.73	1.58	33.69	1.91	33.78
20	0.98	33.68	1.08	33.70	1.18	33.71	1.15	33.69	1.39	33.65	1.38	33.72	1.58	33.72	1.91	33.79
30	0.96	33.68	1.08	33.72	1.16	33.72	1.15	33.70	1.39	33.65	1.38	33.72	1.56	33.73	1.91	33.79
50	0.76	33.73	1.06	33.77	0.77	33.85	0.65	33.82	0.86	33.76	1.24	33.75	1.05	33.82	1.90	33.79
75	0.42	34.28	-0.23	34.11	-0.05	34.24	0.35	34.23	-0.46	34.10	0.06	33.94	0.38	34.10	1.78	33.79
100	1.07	34.42	0.33	34.33	0.97	34.43	1.55	34.44	0.85	34.36	-0.12	34.24	0.99	34.27	0.18	34.05
125	1.68	34.55	1.29	34.50	1.55	34.52	1.74	34.48	1.56	34.48	1.19	34.45	1.53	34.35	1.09	34.23
150	1.69	34.59	1.62	34.56	1.77	34.58	1.76	34.52	1.77	34.53	1.77	34.54	1.93	34.44	1.82	34.36
200	1.74	34.61	1.81	34.61	1.86	34.62	1.88	34.58	1.80	34.57	1.85	34.59	1.97	34.49	2.06	34.45
250	1.78	34.65	1.82	34.63	1.98	34.65	1.97	34.62	1.90	34.61	1.91	34.63	2.04	34.56	2.12	34.49
300	1.78	34.66	1.81	34.65	1.97	34.66	1.96	34.64	2.00	34.65	1.92	34.66	2.05	34.59	2.12	34.55
400	1.73	34.68	1.79	34.68	1.89	34.70	1.91	34.67	1.97	34.68	1.91	34.69	2.05	34.63	2.12	34.61
500	1.67	34.70	1.76	34.69	1.86	34.72	1.88	34.69	1.93	34.69	1.91	34.69	2.05	34.68	2.09	34.65
600	1.61	34.71	1.71	34.70	1.79	34.73	1.84	34.70	1.82	34.69	1.91	34.65	2.02	34.67	2.06	34.68
700	1.55	34.72	1.66	34.72	1.73	34.74	1.80	34.72	1.77	34.71	1.93	34.56	2.04	34.63	2.03	34.70
800	1.46	34.71	1.57	34.72	1.66	34.74	1.72	34.72	1.70	34.72	1.83	34.61	2.01	34.60	1.97	34.73
900	1.36	34.71	1.48	34.71	1.61	34.73	1.62	34.71	1.63	34.73	1.70	34.66	1.92	34.56	1.93	34.74
1000	1.30	34.72	1.41	34.72	1.51	34.75	1.53	34.72	1.53	34.72	1.58	34.68	1.89	34.54	1.86	34.74

station	JA430154		JA430155		JA430156		JA430157		JA430158		JA430159		JA430160		JA430161	
date	2002/3/11		2002/3/11		2002/3/12		2002/3/12		2002/3/12		2002/3/12		2002/3/12		2002/3/12	
time	23:11		23:19		5:50		8:52		11:59		14:49		19:49		22:52	
latitude	61-01.4 S		61-01.5 S		61-32.7 S		61-55.8 S		62-19.5 S		62-42.5 S		63-22.7 S		63-42.7 S	
longitude	139-58.4 E		139-58.4 E		141-43.8 E		143-00.3 E		144-19.2 E		145-34.3 E		147-50.6 E		149-00.1 E	
depth	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity
0	1.99	33.75	1.98	33.64	2.32	33.61	2.12	33.77	1.79	33.20	1.82	33.64	1.09	33.56	1.09	33.40
10	1.99	33.76	1.96	33.75	2.31	33.77	2.12	33.79	1.78	33.69	1.81	33.66	1.09	33.65	1.08	33.61
20	1.98	33.77	1.96	33.76	2.30	33.79	2.11	33.80	1.73	33.71	1.82	33.67	1.09	33.67	1.08	33.63
30	1.97	33.78	1.95	33.77	2.27	33.79	2.09	33.81	1.73	33.73	1.82	33.67	1.09	33.69	1.09	33.63
50	1.92	33.78	1.94	33.77	2.26	33.81	2.09	33.81	1.71	33.74	1.76	33.69	0.81	33.77	0.53	33.79
75	1.68	33.80	1.69	33.80	2.21	33.82	1.81	33.84	-0.08	33.96	-0.27	33.95	-0.13	34.23	0.60	34.35
100	0.27	33.97	0.55	33.91	-0.40	33.95	-0.62	33.98	0.46	34.26	1.03	34.26	1.17	34.44	1.33	34.44
125	1.09	34.22	0.89	34.19	0.24	34.12	0.82	34.22	1.45	34.42	1.80	34.39	1.67	34.54	1.52	34.50
150	1.66	34.33	1.53	34.30	1.36	34.28	1.74	34.37	1.81	34.50	1.79	34.42	1.70	34.57	1.68	34.53
200	2.05	34.44	2.00	34.43	2.07	34.42	2.06	34.46	1.92	34.55	2.04	34.53	1.86	34.62	1.88	34.60
250	2.23	34.50	2.22	34.49	2.11	34.48	2.10	34.52	2.01	34.59	2.12	34.57	1.89	34.66	1.89	34.62
300	2.19	34.53	2.19	34.53	2.12	34.52	2.15	34.55	2.07	34.63	2.11	34.59	1.89	34.67	1.90	34.67
400	2.17	34.59	2.17	34.53	2.17	34.59	2.16	34.61	2.07	34.67	2.07	34.65	1.88	34.70	1.85	34.69
500	-	-	2.14	34.58	2.17	34.63	2.14	34.65	1.99	34.70	2.03	34.66	1.83	34.73	1.82	34.70
600	-	-	2.20	34.48	2.15	34.66	2.09	34.69	1.93	34.73	2.03	34.62	1.77	34.75	1.74	34.72
700	-	-	2.27	34.37	2.10	34.69	2.05	34.71	1.89	34.75	1.96	34.57	1.72	34.75	1.71	34.71
800	-	-	2.07	34.55	2.05	34.71	2.01	34.73	1.83	34.76	1.83	34.62	1.63	34.75	1.64	34.73
900	-	-	1.98	34.59	1.99	34.72	1.92	34.73	1.78	34.76	1.75	34.65	1.58	34.75	1.56	34.74
1000	-	-	1.92	34.62	1.93	34.74	1.87	34.73	1.71	34.75	1.65	34.68	1.49	34.74	1.48	34.74

station	JA430162		JA430163		JA430164		JA430165		JA430166		JA430167		JA430168		JA430169	
date	2002/3/13		2002/3/13		2002/3/13		2002/3/13		2002/3/13		2002/3/14		2002/3/14		2002/3/14	
time	7:53		10:50		13:48		19:51		22:53		1:51		7:57		10:48	
latitude	63-30.7 S		62-51.0 S		62-10.9 S		60-46.7 S		60-03.7 S		59-22.5 S		58-50.4 S		58-27.5 S	
longitude	150-00.1 E		149-59.7 E		150-00.6 E		150-00.0 E		150-00.0 E		149-59.7 E		150-04.0 E		150-00.2 E	
depth	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity
0	1.21	33.47	1.34	33.41	1.92	33.61	1.97	33.64	2.21	33.58	2.26	33.66	2.43	33.64	4.53	33.79
10	1.20	33.64	1.34	33.66	1.92	33.63	1.96	33.66	2.21	33.71	2.22	33.67	2.42	33.65	4.49	33.80
20	1.20	33.64	1.34	33.67	1.91	33.65	1.97	33.66	2.20	33.72	2.22	33.69	2.39	33.66	4.45	33.80
30	1.20	33.64	1.34	33.67	1.91	33.65	1.96	33.67	2.20	33.71	2.22	33.70	2.36	33.66	4.38	33.80
50	-0.17	33.89	1.32	33.69	1.79	33.65	1.94	33.68	2.16	33.72	2.16	33.70	2.36	33.69	4.16	33.80
75	-0.11	34.20	-0.63	34.03	-0.69	34.09	-0.57	33.97	-0.41	34.06	-0.47	34.11	0.42	33.92	0.63	33.93
100	1.33	34.43	0.72	34.31	0.48	34.32	0.59	34.23	1.41	34.38	1.16	34.41	0.00	34.27	0.05	34.00
125	1.71	34.52	1.58	34.47	1.45	34.48	1.51	34.39	1.87	34.46	1.86	34.53	1.37	34.48	0.64	34.19
150	1.84	34.56	1.80	34.52	1.78	34.53	1.82	34.45	1.87	34.50	1.92	34.56	1.65	34.53	1.32	34.32
200	1.92	34.61	1.91	34.58	1.95	34.59	2.07	34.54	2.02	34.57	1.98	34.59	1.92	34.59	1.98	34.45
250	1.99	34.65	1.97	34.62	1.98	34.62	2.05	34.58	2.04	34.60	1.99	34.63	1.92	34.63	2.09	34.49
300	1.97	34.66	1.96	34.65	1.99	34.63	2.08	34.61	2.07	34.62	1.98	34.65	1.92	34.64	2.14	34.54
400	1.97	34.69	1.94	34.68	1.97	34.66	2.07	34.65	2.04	34.67	1.94	34.69	1.91	34.67	2.17	34.62
500	1.87	34.71	1.94	34.70	1.91	34.69	2.03	34.69	2.01	34.70	1.89	34.71	1.88	34.70	2.26	34.56
600	1.83	34.72	1.88	34.71	1.84	34.70	1.99	34.66	1.94	34.71	1.87	34.69	1.83	34.72	2.23	34.58
700	1.76	34.72	1.84	34.72	1.79	34.71	2.01	34.64	1.88	34.72	1.83	34.68	1.78	34.72	2.15	34.64
800	1.69	34.74	1.75	34.74	1.73	34.73	1.97	34.63	1.82	34.73	1.78	34.66	1.71	34.72	2.04	34.60
900	1.62	34.73	1.68	34.74	1.65	34.73	1.91	34.60	1.76	34.74	1.72	34.65	1.62	34.72	2.02	34.58
1000	1.52	34.73	1.60	34.74	1.59	34.72	1.81	34.62	1.66	34.74	1.63	34.64	1.53	34.73	1.97	34.56

station	JA430170		JA430171		JA430172		JA430173		JA430174		JA430175		JA430176		JA430177	
date	2002/3/14		2002/3/14		2002/3/14		2002/3/15		2002/3/15		2002/3/15		2002/3/15		2002/3/15	
time	13:47		19:46		22:51		1:49		7:50		10:48		13:56		19:49	
latitude	58-03.3 S		57-14.2 S		56-48.8 S		56-24.9 S		56-09.2 S		55-37.7 S		55-03.3 S		53-36.7 S	
longitude	149-59.6 E		150-00.0 E		149-58.8 E		149-59.6 E		150-00.0 E		150-00.2 E		149-59.8 E		150-00.3 E	
depth	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity
0	4.80	33.76	4.77	33.55	3.97	33.57	6.21	33.40	6.54	33.48	6.97	33.71	7.86	33.73	6.97	33.74
10	4.79	33.79	4.77	33.76	3.94	33.78	6.20	33.71	6.54	33.72	6.97	33.86	7.87	34.13	6.97	33.82
20	4.77	33.79	4.77	33.79	3.94	33.80	6.20	33.73	6.54	33.73	6.97	33.89	7.86	34.16	6.97	33.84
30	4.76	33.80	4.77	33.80	3.90	33.80	6.19	33.75	6.54	33.74	6.97	33.89	7.86	34.17	6.97	33.85
50	4.48	33.82	4.47	33.82	3.84	33.80	6.17	33.76	6.54	33.75	6.98	33.90	7.87	34.17	6.96	33.86
75	2.55	33.81	1.59	33.88	3.22	33.80	3.03	33.82	4.37	33.77	7.12	33.97	7.87	34.18	6.81	34.17
100	0.81	33.88	0.23	33.98	0.03	34.00	2.19	33.84	2.97	33.82	6.01	34.11	7.79	34.25	6.72	34.21
125	1.13	34.01	1.77	34.27	-0.09	34.13	1.73	33.85	2.60	33.83	5.53	34.08	7.60	34.37	6.72	34.24
150	1.35	34.15	1.99	34.33	0.73	34.33	1.80	33.93	2.41	33.85	5.30	34.06	7.41	34.34	6.14	34.17
200	2.06	34.32	2.08	34.43	1.72	34.51	2.27	34.12	2.67	33.99	5.10	34.07	7.35	34.35	5.84	34.17
250	2.13	34.40	2.15	34.49	1.96	34.59	2.40	34.22	2.88	34.11	4.91	34.11	7.49	34.36	5.46	34.20
300	2.16	34.45	2.18	34.53	2.05	34.62	2.51	34.30	2.73	34.15	4.88	34.17	6.74	34.27	5.32	34.23
400	2.20	34.53	2.19	34.60	2.06	34.66	2.46	34.42	2.70	34.25	3.96	34.16	5.96	34.28	4.91	34.27
500	2.21	34.58	2.17	34.64	2.03	34.69	2.40	34.48	2.57	34.34	3.82	34.25	5.20	34.28	4.17	34.27
600	2.22	34.63	2.12	34.68	2.03	34.68	2.34	34.55	2.62	34.42	3.15	34.26	4.47	34.27	3.58	34.30
700	2.17	34.66	2.06	34.71	2.01	34.64	2.28	34.59	2.51	34.48	3.09	34.35	3.91	34.28	3.29	34.31
800	2.14	34.68	2.01	34.72	1.93	34.66	2.31	34.63	2.49	34.52	2.96	34.41	3.53	34.33	2.94	34.32
900	2.07	34.70	1.92	34.73	1.85	34.68	2.27	34.66	2.42	34.56	2.74	34.45	3.15	34.39	2.79	34.37
1000	2.03	34.70	1.86	34.73	1.75	34.70	2.22	34.70	2.37	34.60	2.66	34.51	2.99	34.43	2.81	34.43

station	JA430178		JA430179		JA430180		JA430181		JA430182		JA430183		JA430184		JA430185	
date	2002/3/15		2002/3/16		2002/3/16		2002/3/16		2002/3/16		2002/3/16		2002/3/16		2002/3/17	
time	22:52		3:01		7:52		10:49		13:49		19:49		22:52		1:52	
latitude	52-54.1 S		51-59.4 S		50-51.8 S		50-12.0 S		49-34.7 S		48-19.6 S		47-37.2 S		46-54.0 S	
longitude	150-00.0 E		150-17.9 E		150-11.0 E		149-56.9 E		149-53.9 E		150-04.5 E		150-00.1 E		150-00.0 E	
depth	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity
0	8.85	27.12	10.13	34.42	8.29	33.76	8.88	33.71	9.65	33.98	10.11	34.16	9.99	34.23	11.93	34.58
10	8.93	34.09	10.14	34.48	8.28	33.95	8.88	34.04	9.70	34.30	10.11	34.32	9.99	34.24	11.93	34.59
20	8.93	34.10	10.14	34.49	8.28	33.97	8.88	34.06	9.80	34.34	10.11	34.33	9.99	34.25	11.93	34.60
30	8.93	34.11	10.14	34.51	8.28	33.98	8.88	34.07	9.77	34.34	10.10	34.33	10.01	34.26	11.93	34.60
50	9.12	34.32	10.14	34.51	8.28	33.98	8.89	34.07	9.89	34.37	10.09	34.34	10.80	34.59	11.90	34.60
75	8.80	34.54	10.00	34.53	8.20	33.98	8.84	34.08	9.65	34.44	10.35	34.48	10.36	34.71	11.08	34.83
100	8.79	34.56	9.50	34.64	7.11	33.89	7.73	34.26	9.22	34.61	9.66	34.49	9.92	34.70	10.61	34.81
125	–	–	9.20	34.61	6.97	34.12	7.90	34.36	9.11	34.60	8.93	34.50	9.59	34.66	10.22	34.75
150	–	–	9.10	34.60	5.97	34.07	7.87	34.37	9.01	34.59	8.64	34.48	9.32	34.62	9.91	34.71
200	–	–	9.00	34.58	6.13	34.15	7.43	34.33	8.88	34.57	8.62	34.50	9.10	34.59	9.25	34.62
250	–	–	8.95	34.58	5.40	34.07	7.13	34.29	8.80	34.56	8.72	34.54	9.03	34.58	8.98	34.57
300	–	–	8.86	34.55	5.64	34.14	6.74	34.25	8.70	34.54	8.63	34.52	8.96	34.58	8.96	34.58
400	–	–	8.71	34.53	5.06	34.12	6.30	34.25	7.96	34.42	8.58	34.52	8.76	34.52	8.58	34.52
500	–	–	8.40	34.49	5.12	34.21	5.81	34.28	7.73	34.40	7.95	34.45	8.68	–	8.28	34.45
600	–	–	8.08	34.45	4.71	34.23	5.27	34.30	6.80	34.34	7.22	34.38	8.40	–	7.96	34.36
700	–	–	7.33	34.41	4.03	34.20	4.40	34.27	5.87	34.30	6.24	34.33	7.99	–	7.28	34.27
800	–	–	6.36	34.35	3.62	34.24	4.00	34.32	4.69	34.23	5.77	34.33	7.39	–	6.56	34.23
900	–	–	5.28	34.30	3.29	34.29	3.52	34.32	4.01	34.22	4.94	34.31	6.63	–	5.66	34.25
1000	–	–	4.59	34.29	3.16	34.35	3.31	34.36	3.68	34.25	4.32	34.32	5.99	–	4.72	34.25

station	JA430186		JA430187		JA430188		JA430189		JA430190		JA430191		JA430192		JA430193	
date	2002/3/17		2002/3/17		2002/3/17		2002/3/17		2002/3/17		2002/3/18		2002/3/18		2002/3/18	
time	7:50		10:51		13:46		20:00		22:46		1:48		4:48		7:52	
latitude	46-34.1 S		45-52.2 S		45-11.0 S		43-41.3 S		43-02.9 S		42-21.7 S		41-42.1 S		40-58.8 S	
longitude	150-02.4 E		150-00.0 E		150-00.0 E		150-00.0 E		149-58.1 E		150-00.1 E		150-00.1 E		149-58.6 E	
depth	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity
0	13.45	34.53	14.75	35.02	14.67	34.95	15.23	35.08	15.81	35.16	18.07	35.43	20.15	35.48	18.94	35.59
10	13.45	34.77	14.75	35.05	14.67	35.22	15.23	35.10	15.81	35.24	18.07	35.53	20.15	35.58	18.94	35.62
20	13.45	34.79	14.75	35.05	14.67	35.24	15.23	35.11	15.81	35.25	18.07	35.56	20.01	35.59	18.93	35.63
30	13.46	34.79	14.75	35.06	14.68	35.24	15.24	35.11	15.82	35.24	18.07	35.58	19.87	35.60	18.91	35.62
50	13.46	34.80	14.75	35.06	14.68	35.24	15.24	35.12	15.82	35.25	18.01	35.58	19.45	35.57	18.75	35.62
75	12.85	34.78	14.72	35.23	14.68	35.25	15.21	35.12	15.82	35.25	16.58	35.45	17.97	35.54	18.39	35.58
100	10.80	34.74	13.36	35.20	13.17	35.18	12.71	35.01	15.09	35.26	14.69	35.33	16.60	35.45	16.70	35.47
125	10.12	34.69	12.48	35.06	12.78	35.16	11.96	34.99	13.88	35.24	13.84	35.25	15.67	35.39	15.88	35.43
150	10.16	34.73	11.46	34.94	12.47	35.13	11.54	34.96	13.39	35.20	13.19	35.20	14.86	35.32	15.27	35.37
200	9.63	34.66	10.83	34.86	12.00	35.08	10.92	34.89	12.31	35.07	12.10	35.07	13.78	35.25	14.39	35.30
250	9.09	34.58	9.85	34.69	11.43	34.99	10.38	34.80	11.52	34.97	11.40	34.97	12.73	35.13	13.53	35.22
300	8.94	34.57	9.30	34.59	10.82	34.87	9.81	34.72	10.80	34.86	10.59	34.85	11.70	34.99	12.47	35.08
400	8.74	34.55	8.90	34.53	9.51	34.64	9.03	34.62	9.30	34.62	9.44	34.70	10.30	34.79	10.75	34.86
500	8.13	34.47	8.80	34.50	9.08	34.51	8.57	34.58	8.96	34.60	8.43	34.56	9.15	34.66	9.20	34.64
600	7.63	34.46	8.54	34.48	8.91	34.50	8.18	34.56	8.30	34.54	7.73	34.51	8.18	34.55	8.46	34.58
700	6.77	34.42	8.18	34.42	8.47	34.50	7.33	34.48	7.63	34.49	7.01	34.47	7.46	34.50	7.67	34.53
800	5.90	34.38	7.63	–	7.84	34.45	6.38	34.43	6.61	34.43	6.30	34.46	–	–	6.91	34.48
900	5.09	34.36	6.99	–	6.99	34.38	5.56	34.41	–	–	–	–	–	–	–	–
1000	4.34	34.35	5.89	–	6.23	34.37	4.90	34.39	–	–	–	–	–	–	–	–

station	JA430194		JA430195		JA430196		JA430197		JA430198		JA430199		JA430200	
date	2002/3/18		2002/3/18		2002/3/18		2002/3/18		2002/3/19		2002/3/19		2002/3/19	
time	10:50		13:48		19:49		22:50		1:46		4:53		7:49	
latitude	40-15.1 S		39-34.1 S		38-16.0 S		37-38.7 S		37-04.7 S		36-47.6 S		36-09.8 S	
longitude	150-00.0 E		150-00.3 E		150-16.5 E		150-51.2 E		150-51.2 E		150-59.5 E		151-13.3 E	
depth	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity
0	20.85	35.41	21.77	35.28	22.16	35.16	22.21	35.24	22.79	35.11	22.31	35.41	23.01	35.54
10	20.75	35.55	21.78	35.50	22.16	35.52	22.21	35.58	22.79	35.55	22.30	35.58	23.01	35.57
20	20.61	35.57	21.79	35.52	22.16	35.53	22.21	35.58	22.78	35.56	22.27	35.59	23.00	35.57
30	20.04	35.59	21.79	35.52	22.13	35.53	22.22	35.58	22.70	35.57	22.18	35.59	22.95	35.57
50	19.64	35.61	19.63	35.56	18.50	35.54	22.14	35.59	21.39	35.62	21.90	35.60	21.48	35.58
75	18.99	35.57	18.10	35.52	17.52	35.52	18.60	35.55	19.81	35.61	21.18	35.60	20.22	35.62
100	17.95	35.52	16.78	35.44	15.15	35.32	16.43	35.42	18.81	35.61	20.05	35.62	19.65	35.62
125	16.95	35.46	15.41	35.37	13.68	35.23	14.99	35.32	18.08	35.57	19.39	35.62	19.41	35.61
150	15.77	35.38	14.38	35.28	12.92	35.14	13.68	35.20	17.32	35.53	18.78	35.62	19.18	35.62
200	13.76	35.20	12.80	35.11	11.73	35.00	11.89	35.01	15.86	35.42	17.62	35.53	18.59	35.60
250	12.72	35.11	11.78	34.99	11.12	34.92	10.30	34.82	14.55	35.33	16.18	35.45	17.90	35.57
300	11.53	34.97	10.73	34.86	10.11	34.78	9.27	34.70	13.50	35.22	14.77	35.32	16.67	35.48
400	9.60	34.72	9.39	34.69	9.01	34.65	8.01	34.58	11.23	34.92	12.96	35.17	14.78	35.38
500	8.67	34.61	8.42	34.60	7.89	34.55	7.14	34.50	9.56	34.69	10.64	34.85	12.46	35.07
600	7.83	34.55	7.61	34.53	7.01	34.50	6.46	34.44	8.52	34.52	9.13	34.67	10.38	34.78
700	7.08	34.49	6.75	34.49	6.30	34.47	5.82	34.43	7.65	34.41	7.94	34.56	8.85	34.60
800	6.37	34.46	6.04	34.46	5.77	34.45	5.34	34.42	6.87	34.36	7.13	34.49	7.93	34.52
900	5.57	34.44	5.46	34.45	5.14	34.45	4.81	34.45	6.22	34.32	6.37	34.47	6.91	34.46
1000	5.06	34.44	4.83	34.47	4.59	34.47	4.35	34.47	5.68	34.28	5.72	34.45	6.15	34.42

Table 3. XBT observation data.

NUMBER	DATE TIME UT		POSITION LAT.	LONG.	TEMPERATURE (°C) DEPTH (m) 0	10	20	30	50	75	100	125	150	200	250	300	350	400	450	S.L. (M)	AIR TEMP. (°C)
					500	550	600	650	700	750											
J0430034	2001-12-10	07.9	59-56S	97-12E	0.1	0.0	-0.1	-0.1	-0.1	-0.1	-0.2	0.8	1.3	1.6	1.7	1.7	1.7	1.7	1.7	102	1.0
					1.8	1.7	1.7	1.7	1.7	1.6											
J0430036	2001-12-10	13.9	60-00S	94-39E	0.0	0.0	0.0	0.0	-0.1	-0.1	0.1	0.5	1.2	1.6	1.5	1.9	1.8	1.8	1.8	97	0.6
					1.8	1.9	1.8	1.7	1.6	1.7											
J0430039	2001-12-11	02.9	59-59S	89-17E	0.4	0.4	0.3	0.3	0.1	0.1	0.3	0.0	0.3	1.0	1.6	2.0	2.0	2.0	2.0	152	1.3
					1.9	1.8	1.9	1.8	1.8	1.8											
J0430041	2001-12-11	08.9	60-00S	86-35E	-0.2	-0.3	-0.3	-0.3	-0.5	-0.6	-0.4	0.1	0.9	1.8	1.8	1.5	1.8	1.8	1.7	93	0.4
					1.7	1.7	1.7	1.6	1.6	1.5											
J0430043	2001-12-11	14.9	60-00S	83-35E	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.1	0.3	1.3	1.7	1.8	1.8	1.8	1.8	1.8	96	0.3
					1.7	1.7	1.6	1.6	1.6	1.5											
J0430046	2001-12-12	02.9	60-04S	77-27E	-0.4	-0.5	-0.5	-0.5	-0.5	-0.4	-0.3	0.8	1.4	1.9	1.9	2.0	2.0	2.0	2.0	102	0.1
					2.0	2.0	1.9	1.9	1.9	1.8											
J0430048	2001-12-12	08.9	60-24S	74-22E	-0.9	-0.9	-1.0	-1.0	-1.0	-1.0	-0.8	0.6	1.6	1.9	2.0	2.1	2.1	2.1	2.1	97	0.1
					2.0	2.0	2.0	2.0	2.0	1.9											
J0430050	2001-12-12	14.9	60-38S	71-35E	-1.1	-1.1	-1.1	-1.1	-1.1	-1.2	0.6	1.5	1.8	2.0	2.1	2.1	2.2	2.1	2.1	84	0.4
					2.1	2.1	2.1	2.1	2.0	2.0											
J0430053	2001-12-13	03.9	61-10S	66-28E	-1.2	-1.2	-1.3	-1.3	-1.3	-1.5	0.0	1.3	1.7	1.9	2.0	2.0	2.0	2.0	2.0	95	-0.3
					2.0	2.0	2.0	1.9	1.9	1.9											
J0430055	2001-12-13	09.9	61-16S	63-59E	-1.3	-1.3	-1.3	-1.4	-1.4	-0.8	0.8	1.2	1.6	1.8	2.0	2.1	2.1	2.2	2.1	69	-0.2
					2.1	2.1	2.1	2.0	2.0	2.0											
J0430057	2001-12-13	15.9	61-27S	61-17E	-1.5	-1.5	-1.5	-1.5	-1.6	-1.6	0.1	1.6	1.8	1.9	1.9	1.9	1.9	1.9	1.9	84	-1.0
					1.9	1.9	1.8	1.7	1.7	1.6											
J0430060	2001-12-14	04.9	61-57S	55-24E	-1.5	-1.5	-1.6	-1.6	-1.7	-1.8	-1.5	-0.3	1.0	1.6	1.7	1.7	1.7	1.8	1.7	98	-1.5
					1.6	1.7	1.7	1.6	1.6	1.5											
J0430062	2001-12-14	10.9	62-39S	53-08E	-1.3	-1.3	-1.4	-1.4	-1.7	-1.8	-1.5	-0.8	1.1	1.8	1.8	1.8	1.7	1.7	1.7	110	-1.2
					1.6	1.6	1.6	1.5	1.5	1.4											

NUMBER	DATE TIME UT		POSITION LAT.	LONG.	TEMPERATURE (℃) DEPTH (m) 0	10	20	30	50	75	100	125	150	200	250	300	350	400	450	S.L. (M)	AIR TEMP. (℃)
					500	550	600	650	700	750											
J0430064	2001-12-14	17.0	63-18S	51-04E	-1.4	-1.4	-1.4	-1.6	-1.7	-1.8	-0.8	0.6	1.2	1.7	1.8	1.8	1.8	1.7	1.7	83	-1.1
					1.6	1.6	1.6	1.6	1.5	1.5											
J0430066	2002-02-27	03.8	37-48S	112-26E	18.1	18.1	18.1	18.1	18.0	15.9	15.1	14.8	14.5	13.4	12.5	11.8	11.1	10.7	10.2	52	15.0
					9.8	9.6	9.3	9.0	8.9	8.7											
J0430067	2002-02-27	06.8	38-35S	112-02E	16.6	16.6	16.5	16.6	16.6	13.4	12.9	12.2	11.7	11.0	10.6	10.0	9.9	9.6	9.5	64	14.8
					9.4	9.2	9.1	8.9	8.6	8.2											
J0430068	2002-02-27	09.8	39-23S	111-37E	15.7	15.5	15.4	15.4	15.2	13.9	12.0	11.6	11.0	10.4	10.1	9.8	9.6	9.7	9.6	70	14.9
					9.6	9.4	9.3	9.1	8.9	8.6											
J0430069	2002-02-27	12.9	40-09S	111-12E	15.4	15.3	15.2	15.1	15.1	13.8	12.4	11.9	11.5	10.7	10.3	9.9	9.7	9.6	9.6	69	14.1
					9.5	9.4	9.2	9.0	8.8	8.5											
J0430070	2002-02-27	15.8	40-54S	110-47E	14.4	14.3	14.3	14.2	14.1	12.7	11.0	10.6	10.4	10.1	9.9	9.7	9.7	9.6	9.6	64	12.9
					9.6	9.5	9.3	8.9	8.7	8.4											
J0430071	2002-02-27	22.8	42-46S	109-45E	13.1	13.1	13.1	13.1	13.1	13.0	10.8	10.6	10.5	10.3	10.2	10.0	9.9	9.8	9.8	80	11.4
					9.7	9.7	9.3	8.9	8.6	8.2											
J0430072	2002-02-28	01.8	43-33S	109-18E	12.8	12.7	12.7	12.7	12.7	12.3	11.3	10.5	10.4	10.0	9.9	9.8	9.7	9.6	9.3	69	11.6
					9.1	8.6	8.2	7.9	7.5	7.1											
J0430073	2002-02-28	04.8	44-21S	108-50E	12.8	12.7	12.6	12.6	12.6	12.5	10.5	10.3	10.1	9.8	9.7	9.6	9.6	9.3	9.1	83	11.8
					8.7	8.3	8.2	7.8	7.4	7.0											
J0430074	2002-02-28	07.8	45-08S	108-23E	11.7	11.5	11.4	11.3	11.2	11.4	11.1	10.9	10.9	10.7	10.6	10.5	10.2	10.1	9.9	76	11.2
					9.6	9.2	8.7	8.6	8.2	7.7											
J0430075	2002-02-28	10.8	45-55S	107-58E	11.2	11.2	11.2	11.2	11.2	11.3	11.2	10.9	10.8	10.4	10.2	9.6	9.4	9.2	8.7	97	10.9
					8.5	8.1	7.7	7.1	6.6	6.1											
J0430076	2002-02-28	13.8	46-40S	107-28E	11.3	11.2	11.2	11.2	11.2	11.1	11.1	10.4	10.3	9.8	9.4	9.2	8.8	8.5	8.1	107	11.1
					7.8	7.1	6.8	6.2	5.8	5.4											
J0430077	2002-02-28	16.8	47-20S	107-05E	9.5	9.5	9.5	9.4	9.2	9.3	9.7	9.5	9.3	8.7	8.2	7.4	6.7	6.2	5.8	64	11.0
					5.7	5.0	4.8	4.5	4.1	3.7											

NUMBER	DATE TIME UT		POSITION LAT.	LONG.	TEMPERATURE (℃) DEPTH (m) 0	10	20	30	50	75	100	125	150	200	250	300	350	400	450	S.L. (M)	AIR TEMP. (℃)
					500	550	600	650	700	750											
J0430078	2002-02-28	22.9	48-35S	106-17E	7.0	7.0	7.0	7.0	7.0	6.8	5.7	4.8	4.2	4.1	3.4	3.2	3.6	2.8	3.4	76	9.0
					2.9	2.9	3.0	2.8	2.8	2.7											
J0430079	2002-03-01	01.8	49-11S	105-49E	6.8	6.8	6.8	6.8	6.5	5.6	4.1	3.1	2.9	2.7	2.4	2.5	2.5	2.5	2.5	71	9.0
					2.6	2.5	2.6	2.6	2.6	2.5											
J0430080	2002-03-01	04.8	49-48S	105-20E	6.2	6.2	6.2	6.2	6.1	5.5	4.5	4.3	3.8	3.1	3.3	3.1	3.1	3.0	2.9	69	8.8
					2.7	2.7	2.8	2.7	2.6	2.6											
J0430081	2002-03-01	07.8	50-29S	105-06E	5.0	5.0	5.0	5.0	5.0	4.8	3.8	3.4	3.3	2.7	2.3	2.2	2.4	2.4	2.5	71	8.3
					2.4	2.5	2.5	2.5	2.5	2.5											
J0430082	2002-03-01	10.9	51-00S	104-42E	5.5	5.5	5.5	5.5	5.5	5.4	5.1	2.8	1.7	1.0	1.4	1.8	2.1	2.2	2.3	80	8.0
					2.3	2.3	2.3	2.3	2.3	2.3											
J0430083	2002-03-01	13.8	51-32S	104-24E	5.0	5.0	5.0	5.0	5.0	4.7	4.5	3.5	1.8	1.8	1.9	2.2	2.2	2.4	2.4	66	6.8
					2.4	2.4	2.4	2.4	2.3	2.3											
J0430084	2002-03-01	16.9	52-08S	103-58E	4.0	4.0	4.0	4.0	4.0	3.9	3.1	1.9	1.3	1.5	2.1	2.1	2.3	2.4	2.5	80	5.0
					2.5	2.4	2.4	2.3	2.3	2.3											
J0430085	2002-03-01	22.9	53-27S	103-04E	3.2	3.2	3.2	3.2	3.1	3.1	3.1	-0.3	-0.1	1.1	2.0	2.2	2.2	2.2	2.2	102	3.2
					2.2	2.1	2.1	2.1	2.1	2.0											
J0430086	2002-03-02	01.9	54-06S	102-37E	2.8	2.8	2.8	2.8	2.8	2.5	1.3	0.6	0.5	1.5	2.0	2.2	2.2	2.2	2.2	69	3.5
					2.3	2.2	2.2	2.2	2.2	2.2											
J0430087	2002-03-02	04.8	54-46S	102-09E	2.9	2.9	2.8	2.8	2.8	2.7	2.4	0.2	0.4	1.3	2.0	2.0	2.2	2.2	2.2	92	5.0
					2.1	2.1	2.0	2.1	2.1	2.0											
J0430088	2002-03-02	07.8	55-24S	101-31E	2.9	2.9	2.9	2.9	2.8	2.8	1.1	0.5	0.7	1.8	1.9	2.1	2.2	2.2	2.2	84	5.2
					2.1	2.1	2.1	2.1	2.0	2.0											
J0430089	2002-03-02	10.8	55-59S	100-48E	2.4	2.4	2.4	2.4	2.4	2.3	1.7	0.4	0.2	1.7	2.0	2.1	2.1	2.0	2.0	78	1.5
					2.1	2.1	2.0	2.1	2.0	2.0											
J0430090	2002-03-02	13.9	56-34S	100-04E	2.5	2.5	2.5	2.4	2.3	1.9	0.5	0.2	0.6	1.6	2.0	2.1	2.1	2.1	2.1	63	0.9
					2.1	2.1	2.1	2.0	2.0	2.0											

NUMBER	DATE TIME UT		POSITION LAT.	LONG.	TEMPERATURE (℃) DEPTH (m) 0	10	20	30	50	75	100	125	150	200	250	300	350	400	450	S.L. (M)	AIR TEMP. (℃)
					500	550	600	650	700	750											
J0430091	2002-03-02	16.8	57-10S	99-23E	2.1	2.1	2.1	2.1	2.1	2.0	0.2	0.3	1.0	1.8	2.0	2.0	2.0	2.0	2.0	75	0.8
					2.0	1.9	1.9	1.9	1.9	1.9											
J0430092	2002-03-02	22.9	58-16S	98-00E	1.9	1.9	1.9	1.9	1.9	1.4	0.3	0.4	1.2	1.8	1.7	1.8	1.8	1.7	1.9	70	0.2
					1.8	1.8	1.7	1.7	1.7	1.7											
J0430093	2002-03-03	01.8	58-48S	97-16E	2.0	2.0	2.0	1.9	1.9	1.9	0.1	0.5	1.2	1.7	1.6	1.8	1.8	1.8	1.8	77	0.4
					1.8	1.8	1.7	1.7	1.7	1.7											
J0430094	2002-03-03	04.9	59-24S	96-29E	1.6	1.6	1.6	1.6	1.6	1.5	1.1	0.3	0.8	1.7	1.8	1.9	1.9	1.9	1.9	92	-0.2
					1.8	1.8	1.8	1.7	1.7	1.7											
J0430095	2002-03-03	07.9	59-59S	95-43E	1.7	1.7	1.7	1.7	1.6	1.6	0.7	0.5	0.9	2.0	1.9	1.9	2.0	2.0	1.9	76	0.4
					1.9	1.9	1.9	1.9	1.9	1.8											
J0430096	2002-03-03	10.9	60-33S	94-58E	1.4	1.3	1.3	1.2	1.1	1.0	0.5	0.9	1.4	1.8	1.9	1.9	2.0	1.9	1.9	76	0.1
					1.9	1.8	1.9	1.8	1.8	1.7											
J0430097	2002-03-03	13.9	61-08S	94-10E	1.0	1.0	1.0	1.0	1.0	0.9	0.1	1.0	0.8	1.3	1.6	1.8	1.7	1.7	1.7	75	-0.1
					1.7	1.6	1.6	1.6	1.6	1.5											
J0430098	2002-03-03	16.9	61-44S	93-24E	1.0	0.9	0.9	0.9	0.9	0.3	0.1	0.4	0.8	1.2	1.4	1.5	1.6	1.6	1.6	62	-0.6
					1.5	1.5	1.5	1.5	1.4	1.4											
J0430099	2002-03-03	22.8	62-56S	91-37E	0.4	0.4	0.4	0.4	0.3	-0.5	-0.5	0.1	0.4	0.9	1.1	1.4	1.4	1.4	1.4	65	-1.3
					1.3	1.2	1.2	1.2	1.2	1.1											

Table 4. Serial and CTD observation data.

Station 1

Beginning of cast

Date	:	December 5, 2001
Time(UT)	:	05:54
Latitude	:	42-11.4S
Longitude	:	109-59.5E
Depth	:	4347 m

Meteorological observation

Time(UT)	:	06:00	Wind direction	:	E
Weather	:	c	Velocity	:	5m/s
Air temperature(dry)	:	12.3℃	Wave	:	E/3
Humidity	:	67%	Swell	:	ENE/3
Atmospheric Pressure	:	1026.0hPa	Visibility	:	20km

Water Sampling by Niskin bottles										Observed by CTD		
Pressure (dbar)	Temperature (ITS-90)	Salinity (PSS78)	pH	DO2	PO4-P	SiO3-Si	NO2-N	NO3-N	NH4-N	Pressure (dbar)	Temperature (ITS-90)	Salinity (PSS78)
						(μmol/l)						
0	12.600	34.857	8.27	277	0.63	2	0.10	11	—	10	12.758	34.817
46	11.100	34.790	8.27	—	0.67	2	0.06	10	—	20	12.245	34.790
74	10.313	34.759	8.28	—	0.75	2	0.12	11	—	30	11.765	34.790
101	10.080	34.762	8.28	280	0.82	2	0.37	12	—	50	10.843	34.771
151	9.907	34.755	8.26	277	0.79	2	0.25	—	—	75	10.193	34.751
200	9.745	34.741	8.26	277	0.74	2	0.00	—	—	100	10.008	34.738
251	9.707	34.740	8.25	271	0.86	2	0.00	13	—	125	9.962	34.746
301	9.737	34.750	8.23	271	0.85	2	0.00	13	—	150	9.863	34.746
402	9.761	34.761	8.21	275	0.78	2	0.00	—	—	200	9.740	34.735
501	9.634	—	—	—	—	—	—	—	—	250	9.704	34.731
602	9.437	34.700	8.18	267	0.96	3	0.00	17	—	300	9.733	34.739
702	9.050	34.643	8.14	246	1.06	4	0.00	19	—	400	9.732	34.740
802	8.489	—	—	—	—	—	—	—	—	500	9.829	34.766
901	7.521	34.494	8.11	—	1.49	12	0.00	25	—	600	9.508	34.701
1001	6.406	34.423	8.09	217	1.82	18	0.00	30	—	700	9.114	34.641
1251	4.075	34.334	8.08	214	2.19	35	0.00	34	—	800	8.556	34.573
1500	3.156	34.426	8.08	196	2.45	56	0.00	36	—	1000	6.555	34.422
2001	2.531	34.646	8.09	184	2.31	75	0.00	36	—	1200	4.355	34.322
2501	2.194	34.744	8.10	—	2.17	83	0.00	35	—	1500	3.129	34.424
2999	1.654	34.742	8.09	210	2.18	101	0.00	34	—	2000	2.535	34.635
3497	1.176	34.724	8.09	211	2.29	118	0.00	34	—	2500	2.201	34.735
3725	1.080	34.717	8.09	—	2.24	121	0.00	33	—	3000	1.643	34.737
										3500	1.167	34.716

ITS-90 : International Temperture Scale of 1990.
PSS78 : Practical Salinity Scale of 1978.

Station 2

Beginning of cast

Date	:	December 6, 2001
Time(UT)	:	06:12
Latitude	:	46-55.1S
Longitude	:	109-55.5E
Depth	:	3380 m

Meteorological observation

Time(UT)	:	06:00	Wind direction	:	W
Weather	:	bc	Velocity	:	6m/s
Air temperature(dry)	:	11.9℃	Wave	:	W/3
Humidity	:	77%	Swell	:	WSW/3
Atmospheric Pressure	:	1026.9hPa	Visibility	:	20km

Water Sampling by Niskin bottles										Observed by CTD		
Pressure (dbar)	Temperature (ITS-90)	Salinity (PSS78)	pH	DO2	PO4-P	SiO3-Si	NO2-N	NO3-N	NH4-N	Pressure (dbar)	Temperature (ITS-90)	Salinity (PSS78)
				(μmol/l)								
0	11.700	34.289	8.24	291	1.21	2	0.36	15	1.0	10	10.870	34.259
48	7.129	—	—	—	—	—	—	—	—	20	9.749	34.358
74	6.434	34.126	8.23	310	1.13	3	0.25	22	0.8	30	8.863	34.237
99	6.018	34.114	8.21	300	1.60	4	0.42	22	0.2	50	7.159	34.132
125	6.265	34.159	8.21	298	1.61	4	0.17	22	0.2	75	6.711	34.154
149	6.234	34.175	8.21	295	1.18	5	0.15	22	0.2	100	6.181	34.092
198	5.846	—	—	—	—	—	—	—	—	125	6.123	34.120
249	5.571	34.145	8.16	291	1.26	7	0.03	23	—	150	5.946	34.113
301	5.341	—	—	—	—	—	—	—	—	200	5.757	34.117
398	5.014	34.225	8.11	254	—	—	—	—	—	250	5.784	34.166
499	4.518	34.244	8.08	238	2.13	20	0.00	30	0.3	300	5.499	34.169
599	3.923	34.255	—	237	2.31	27	—	32	0.1	400	5.019	34.211
698	3.555	—	—	—	—	—	—	—	—	500	4.578	34.233
798	3.356	34.353	8.00	215	2.48	44	0.01	34	0.2	600	3.890	34.240
899	2.983	34.380	7.99	200	2.63	52	0.03	35	0.4	700	3.641	34.287
999	2.941	34.451	7.98	191	2.60	58	0.00	36	0.4	800	3.369	34.335
1251	2.687	34.557	7.95	182	2.64	69	0.07	37	0.4	1000	2.983	34.439
1496	2.501	34.643	7.93	187	—	74	0.06	35	0.3	1200	2.679	34.521
1999	2.218	34.741	7.90	197	2.39	81	0.09	32	0.1	1500	2.502	34.637
2499	1.798	34.749	7.84	210	2.33	94	0.00	31	0.2	2000	2.214	34.734
2997	1.287	34.731	7.70	209	2.36	112	0.00	33	0.5	2500	1.794	34.745
										3000	1.281	34.726

ITS-90 : International Temperture Scale of 1990.
PSS78 : Practical Salinity Scale of 1978.

Station 3

Beginning of cast

Date	:	December 7, 2001
Time(UT)	:	01:39
Latitude	:	50-39.7S
Longitude	:	109-58.6E
Depth	:	3400 m

Meteorological observation

Time(UT)	:	03:00	Wind direction	:	W
Weather	:	o	Velocity	:	10m/s
Air temperature(dry)	:	5.7℃	Wave	:	W/4
Humidity	:	91%	Swell	:	NW/3
Atmospheric Pressure	:	1004.7hPa	Visibility	:	10km

Water Sampling by Niskin bottles										Observed by CTD		
Pressure (dbar)	Temperature (ITS-90)	Salinity (PSS78)	pH	DO2	PO4-P	SiO3-Si	NO2-N	NO3-N	NH4-N	Pressure (dbar)	Temperature (ITS-90)	Salinity (PSS78)
				(μmol/l)								
0	4.900	33.888	8.24	--	—	0	0.21	8	0.4	10	5.198	33.874
30	4.364	33.888	8.24	336	—	—	—	—	0.3	20	5.111	33.875
51	3.805	33.892	8.24	342	—	0	0.21	8	—	30	4.379	33.884
75	3.031	33.888	--	—	--	—	—	—	--	50	3.975	33.886
97	2.498	33.900	—	—	—	—	—	—	—	75	3.732	33.886
127	2.432	33.909	8.18	322	--	13	0.36	14	0.6	100	2.943	33.897
150	2.488	33.940	8.16	316	—	15	0.10	15	0.3	125	2.306	33.932
204	2.354	34.029	8.13	297	—	22	0.01	17	0.6	150	2.213	33.942
253	2.495	34.104	8.09	274	--	27	0.02	18	0.4	200	2.074	33.586
301	2.857	34.206	8.05	—	—	35	0.00	21	0.2	250	2.826	34.133
402	2.634	34.292	—	225	—	47	0.01	26	0.5	300	2.868	34.201
503	2.507	34.379	8.00	204	1.16	59	0.00	26	0.3	400	2.611	34.282
603	2.545	34.480	7.99	188	1.28	67	0.00	26	0.4	500	2.570	34.388
703	2.439	34.532	7.99	182	1.37	73	0.01	27	0.3	600	2.551	34.458
804	2.388	34.584	7.99	185	1.48	76	0.04	—	0.3	700	2.458	34.524
901	2.375	34.629	8.00	186	1.55	77	0.01	—	0.2	800	2.408	34.575
1002	2.323	34.662	8.00	189	1.59	79	0.04	27	0.3	1000	2.319	34.663
1250	2.179	34.720	8.02	199	1.64	83	0.05	26	0.4	1200	2.216	34.707
1499	1.948	34.742	8.04	207	1.72	89	0.04	25	0.3	1500	1.958	34.736
1995	1.518	34.743	8.02	213	1.82	102	0.06	26	0.5	2000	1.524	34.739
2143	1.384	34.741	7.97	209	1.98	107	0.05	30	—			

ITS-90 : International Temperture Scale of 1990.
PSS78 : Practical Salinity Scale of 1978.

Station 10

Beginning of cast

Date	:	March 4, 2002
Time(UT)	:	06:03
Latitude	:	63-57.5S
Longitude	:	90-14.7E
Depth	:	3733 m

Meteorological observation

Time(UT)	:	06:00	Wind direction	:	WSW
Weather	:	c	Velocity	:	7m/s
Air temperature(dry)	:	-3.7℃	Wave	:	WSW/3
Humidity	:	77%	Swell	:	NW/3
Atmospheric Pressure	:	983.1hPa	Visibility	:	20km

Water Sampling by Niskin bottles										Observed by CTD		
Pressure (dbar)	Temperature (ITS-90)	Salinity (PSS78)	pH	DO2	PO4-P	SiO3-Si	NO2-N	NO3-N	NH4-N	Pressure (dbar)	Temperature (ITS-90)	Salinity (PSS78)
				(μmol/l)								
0	-0.600	33.853	8.25	340	1.93	52	0.14	29	0.5	10	-0.239	33.827
50	-1.309	34.118	8.21	321	2.15	58	0.09	30	—	20	-0.213	33.839
75	-1.277	—	—	--	—	—	--	--	—	30	-0.111	33.905
100	-1.140	34.345	8.16	283	2.25	68	0.12	32	0.2	50	-0.144	33.947
126	-0.945	--	--	—	--	--	--	--	--	75	-1.439	34.224
149	-0.204	34.457	8.14	252	2.27	74	0.00	33	0.2	100	-1.384	34.290
201	0.383	34.546	8.12	235	—	—	—	--	—	125	-0.831	34.394
301	1.236	34.677	8.09	212	2.25	87	0.00	32	0.1	150	-0.245	34.468
400	1.351	34.708	8.10	213	2.21	90	0.00	32	0.3	200	0.277	34.547
501	1.291	34.717	8.11	—	2.19	93	0.00	32	0.4	250	0.912	34.636
605	1.231	—	—	—	—	—	—	—	—	300	1.267	34.686
702	1.158	34.723	8.09	218	2.20	100	0.00	32	0.2	400	1.281	34.708
802	1.048	34.724	8.10	216	2.20	104	0.00	33	0.2	500	1.235	34.719
900	0.977	—	—	—	—	—	—	—	—	600	1.212	34.725
1000	0.893	—	—	--	—	—	—	—	—	700	1.125	34.722
1250	0.679	34.704	8.09	216	2.28	116	0.00	32	0.3	800	1.064	34.722
1502	0.496	34.695	8.07	217	2.30	121	0.00	33	0.5	1000	0.900	34.715
1999	0.208	34.682	8.07	220	2.29	126	0.00	33	0.4	1200	0.730	34.706
2497	0.026	34.678	8.08	228	2.27	126	0.00	33	0.7	1500	0.475	34.692
2997	-0.079	34.673	8.07	234	2.35	125	0.00	33	0.6	2000	0.197	34.678
3382	-0.131	34.671	8.05	244	2.26	126	0.00	32	0.6	2500	0.025	34.672
										3000	-0.080	34.668

ITS-90 : International Temperture Scale of 1990.
PSS78 : Practical Salinity Scale of 1978.

Station 11

Beginning of cast

Date	:	March 5, 2002
Time(UT)	:	06:05
Latitude	:	63-33.5S
Longitude	:	100-01.6E
Depth	:	1700 m

Meteorological observation

Time(UT)	:	06:00	Wind direction	:	NE
Weather	:	o	Velocity	:	5m/s
Air temperature(dry)	:	-1.9℃	Wave	:	NE/2
Humidity	:	74%	Swell	:	NE/1
Atmospheric Pressure	:	976.6hPa	Visibility	:	15km

Water Sampling by Niskin bottles										Observed by CTD		
Pressure (dbar)	Temperature (ITS-90)	Salinity (PSS78)	pH	DO2	PO4-P	SiO3-Si	NO2-N	NO3-N	NH4-N	Pressure (dbar)	Temperature (ITS-90)	Salinity (PSS78)
				(μmol/l)								
0	-0.600	33.325	8.33	363	0.47	25	0.14	18	0.5	10	-0.427	33.370
50	-1.428	34.092	8.20	332	2.01	57	0.07	27	—	20	-0.437	33.372
75	-1.607	34.222	8.15	325	2.13	61	0.06	29	—	30	-0.568	33.533
100	-1.622	34.273	8.14	314	2.12	63	0.07	30	--	50	-1.439	34.117
125	-1.027	34.419	8.12	293	2.12	71	0.07	31	0.6	75	-1.676	34.262
149	-0.700	34.467	8.11	275	2.15	76	0.09	32	0.4	100	-1.657	34.333
201	0.037	—	—	—	—	—	—	--	—	125	-1.575	34.367
249	0.448	34.631	--	233	2.16	91	0.01	32	0.3	150	-1.088	34.419
299	0.670	34.665	8.07	225	2.17	95	0.02	32	0.6	200	-0.106	34.554
399	0.808	—	—	—	—	—	—	—	—	250	0.429	34.634
500	0.828	34.703	8.06	217	2.21	106	0.00	32	0.6	300	0.654	34.670
601	0.789	34.705	8.07	221	2.19	111	0.00	32	—	400	0.960	34.712
701	0.670	34.700	8.07	222	2.19	114	0.00	32	0.6	500	0.883	34.711
799	0.531	34.694	8.04	223	2.20	115	0.00	32	0.4	600	0.792	34.708
901	0.512	34.698	8.03	222	2.21	119	0.00	32	0.4	700	0.696	34.703
1000	0.355	34.683	8.05	226	2.21	117	0.00	33	0.4	800	0.546	34.694
1250	0.103	34.673	8.05	233	2.26	118	0.00	32	0.5	1000	0.403	34.689
1498	-0.040	34.665	8.05	238	2.21	118	0.00	32	--	1200	0.190	34.677
1597	-0.041	34.669	8.05	236	2.20	119	0.00	32	0.5	1500	-0.037	34.663

ITS-90 : International Temperture Scale of 1990.
PSS78 : Practical Salinity Scale of 1978.

Station 12

Beginning of cast

Date	:	March 6, 2002
Time(UT)	:	06:10
Latitude	:	63-13.4S
Longitude	:	115-28.5E
Depth	:	3784 m

Meteorological observation

Time(UT)	:	06:00	Wind direction	:	NE
Weather	:	s	Velocity	:	14m/s
Air temperature(dry)	:	1.0℃	Wave	:	NE/5
Humidity	:	96%	Swell	:	NNE/3
Atmospheric Pressure	:	976.7hPa	Visibility	:	6km

Water Sampling by Niskin bottles										Observed by CTD		
Pressure (dbar)	Temperature (ITS-90)	Salinity (PSS78)	pH	DO2	PO4-P	SiO3-Si	NO2-N	NO3-N	NH4-N	Pressure (dbar)	Temperature (ITS-90)	Salinity (PSS78)
				(μmol/l)								
0	0.100	33.257	8.25	351	1.85	41	0.16	25	0.4	10	0.391	33.255
52	-0.564	34.117	8.16	334	2.17	54	0.06	29	0.9	20	0.351	33.324
75	-0.376	34.258	8.12	297	2.33	64	0.13	31	0.7	30	0.522	33.860
101	0.679	34.461	8.05	234	2.42	74	0.00	33	0.5	50	-0.592	34.136
128	1.275	34.567	8.03	215	2.41	80	0.00	33	0.3	75	-0.611	34.242
152	1.398	34.598	8.04	204	2.44	81	0.00	34	0.4	100	-0.523	34.332
202	1.525	34.645	8.04	199	2.39	84	0.00	33	—	125	0.743	34.494
253	1.586	34.672	8.03	200	2.33	85	0.00	32	0.4	150	1.189	34.569
304	1.635	34.694	8.04	195	2.31	86	0.00	32	0.3	200	1.492	34.632
402	1.634	34.713	8.06	200	2.27	88	0.00	32	0.4	250	1.557	34.663
502	1.576	34.725	8.06	—	2.24	90	0.00	31	0.5	300	1.610	34.685
611	1.451	34.729	8.06	207	2.21	93	0.00	32	—	400	1.603	34.709
703	1.404	34.731	—	207	2.23	96	0.00	31	0.5	500	1.557	34.722
803	1.329	34.732	8.06	210	2.21	99	0.00	31	0.5	600	1.469	34.726
904	1.202	34.728	8.07	217	2.21	102	0.00	31	0.5	700	1.408	34.730
1003	1.119	34.725	8.07	218	2.22	106	0.00	32	0.5	800	1.333	34.731
1252	0.942	34.718	8.05	221	2.23	111	0.00	32	0.6	1000	1.159	34.725
1500	0.714	34.706	8.04	223	2.25	118	0.00	32	0.6	1200	0.982	34.718
1996	0.382	34.691	8.05	227	2.26	126	0.00	32	0.6	1500	0.727	34.704
2400	0.165	34.683	8.04	230	2.27	128	0.00	32	0.7	2000	0.374	34.687

ITS-90 : International Temperture Scale of 1990.
PSS78 : Practical Salinity Scale of 1978.

Station 14

Beginning of cast

Date : March 8, 2002
Time(UT) : 04:54
Latitude : 63-59.9S
Longitude : 130-40.4E
Depth : 3582 m

Meteorological observation

Time(UT) : 05:00
Weather : s
Air temperature(dry) : -1.0℃
Humidity : 88%
Atmospheric Pressure : 986.1hPa

Wind direction : E
Velocity : 11m/s
Wave : E/5
Swell : E/3
Visibility : 15km

Water Sampling by Niskin bottles										Observed by CTD		
Pressure (dbar)	Temperature (ITS-90)	Salinity (PSS78)	pH	DO2	PO4-P	SiO3-Si	NO2-N	NO3-N	NH4-N	Pressure (dbar)	Temperature (ITS-90)	Salinity (PSS78)
				(μmol/l)								
0	-1.700	33.753	8.23	345	1.82	45	0.22	27	0.4	10	0.439	33.732
76	-1.564	34.252	8.15	321	2.15	60	0.10	30	—	20	0.440	33.732
102	-1.686	34.314	8.15	323	2.17	62	0.12	31	0.8	30	0.439	33.732
122	-1.674	34.333	8.14	322	2.15	62	0.10	31	0.6	50	0.226	33.827
150	-0.409	34.449	8.09	283	2.14	68	0.17	32	0.5	75	-0.895	34.236
205	-0.031	34.534	8.08	260	2.13	81	0.03	32	0.3	100	-1.045	34.367
255	0.440	34.599	8.07	243	2.10	87	0.05	32	0.3	125	-1.457	34.378
302	1.013	34.666	8.06	216	2.14	92	0.00	32	—	150	-0.790	34.441
402	1.137	34.693	8.05	214	2.15	96	0.00	32	0.4	200	0.112	34.552
505	1.150	34.705	8.05	214	2.09	101	0.00	32	0.5	250	0.733	34.630
604	1.121	34.714	8.06	216	2.12	103	0.01	31	0.5	300	0.850	34.655
702	1.060	—	—	—	—	—	—	—	—	400	0.959	34.680
804	0.999	34.713	8.05	—	—	109	0.00	31	0.4	500	1.016	34.697
902	0.918	34.710	8.05	216	2.15	113	—	31	0.6	600	1.088	34.713
1003	0.853	34.710	8.06	218	2.17	116	0.00	33	0.4	700	1.068	34.715
1251	0.675	34.702	8.07	217	2.21	123	0.00	33	0.6	800	1.014	34.716
1498	0.494	34.694	8.10	225	2.24	127	0.00	32	0.4	1000	0.885	34.712
1996	0.181	—	—	—	—	—	—	—	—	1200	0.750	34.705
										1500	0.520	34.694
										2000	0.166	34.675
										2500	-0.013	34.671

ITS-90 : International Temperture Scale of 1990.
PSS78 : Practical Salinity Scale of 1978.

Station 15

Beginning of cast

Date	:	March 10, 2002
Time(UT)	:	22:54
Latitude	:	66-28.0S
Longitude	:	140-03.0E
Depth	:	1009 m

Meteorological observation

Time(UT)	:	23:00	Wind direction	:	ESE
Weather	:	bc	Velocity	:	6m/s
Air temperature(dry)	:	-6.4℃	Wave	:	ESE/2
Humidity	:	52%	Swell	:	NW/1
Atmospheric Pressure	:	1001.1hPa	Visibility	:	30km

Water Sampling by Niskin bottles										Observed by CTD		
Pressure (dbar)	Temperature (ITS-90)	Salinity (PSS78)	pH	DO2	PO4-P	SiO3-Si	NO2-N	NO3-N	NH4-N	Pressure (dbar)	Temperature (ITS-90)	Salinity (PSS78)
				(μmol/l)								
0	-2.000	34.391	8.21	360	1.82	65	0.15	27	1.6	10	-1.364	34.390
50	-1.305	34.397	8.21	348	1.81	65	0.13	27	1.5	20	-1.335	34.399
74	-1.305	34.398	8.21	349	1.79	65	0.13	27	1.6	30	-1.330	34.403
100	-1.313	34.402	8.21	346	1.80	65	0.13	26	1.3	50	-1.332	34.403
126	-1.311	34.402	8.21	349	1.80	65	0.13	27	1.4	75	-1.331	34.404
150	-1.308	34.406	8.20	346	1.81	65	0.13	27	1.5	100	-1.332	34.405
200	-1.308	34.405	8.21	347	1.83	65	0.14	27	1.3	125	-1.329	34.408
250	-1.302	34.411	8.20	346	1.86	66	0.14	26	1.3	150	-1.323	34.412
300	-1.288	34.429	8.18	340	1.95	68	0.16	27	1.7	200	-1.320	34.413
401	-1.240	34.481	8.15	313	2.03	74	0.15	29	1.1	250	-1.301	34.424
502	-1.204	34.518	8.13	299	2.13	78	0.15	30	1.2	300	-1.295	34.431
602	-1.198	34.532	8.13	294	2.10	80	0.14	31	0.9	400	-1.261	34.487
698	-1.212	34.549	8.12	297	2.12	81	0.14	31	0.6	500	-1.218	34.507
800	-1.220	34.559	8.11	292	2.13	82	0.14	31	0.6	600	-1.205	34.543
898	-1.178	34.569	8.10	290	2.13	83	0.14	31	0.9	700	-1.225	34.559
951	-1.297	34.568	8.11	294	2.11	82	0.15	31	0.4	800	-1.239	34.565

ITS-90 : International Temperture Scale of 1990.
PSS78 : Practical Salinity Scale of 1978.

Station 16

Beginning of cast

Date : March 11, 2002
Time(UT) : 22:49
Latitude : 63-58.4S
Longitude : 140-00.6E
Depth : 3716 m

Meteorological observation

Time(UT) : 23:00
Weather : m
Air temperature(dry) : 2.5℃
Humidity : 99%
Atmospheric Pressure : 986.4hPa

Wind direction : WNW
Velocity : 11m/s
Wave : WNW/4
Swell : NW/3
Visibility : 2km

Water Sampling by Niskin bottles										Observed by CTD		
Pressure (dbar)	Temperature (ITS-90)	Salinity (PSS78)	pH	DO2	PO4-P	SiO3-Si	NO2-N	NO3-N	NH4-N	Pressure (dbar)	Temperature (ITS-90)	Salinity (PSS78)
				(μmol/l)								
0	0.800	33.690	8.23	346	1.62	22	--	—	0.9	10	1.012	33.667
48	0.683	—	8.21	336	—	—	--	—	—	20	1.002	33.673
75	0.767	34.326	8.07	248	2.42	62	—	—	0.5	30	0.989	33.708
100	1.671	34.526	8.02	194	2.42	74	—	—	0.3	50	0.931	33.736
121	1.671	34.547	8.02	192	2.44	76	--	—	0.1	75	0.248	34.127
149	1.796	34.588	8.01	190	2.43	79	--	—	0.3	100	0.409	34.391
199	1.801	34.626	8.03	192	2.34	80	—	—	0.2	125	1.602	34.563
248	1.807	34.658	8.02	190	2.31	83	—	—	0.2	150	1.564	34.580
299	1.892	34.688	8.04	187	2.25	83	—	--	0.2	200	1.612	34.625
399	1.748	34.702	8.04	195	2.26	85	--	--	0.3	250	1.565	34.644
499	1.619	34.709	8.04	199	2.22	88	—	—	0.1	300	1.799	34.695
598	1.531	34.716	8.05	204	—	88	--	—	0.2	400	1.775	34.719
699	1.445	34.719	8.06	209	2.19	91	—	—	0.1	500	1.746	34.733
799	1.377	34.724	8.06	215	2.17	93	—	--	—	600	1.670	34.737
899	1.324	34.725	8.06	221	2.18	97	--	—	0.1	700	1.584	34.739
1000	1.219	34.721	8.06	220	2.15	99	—	—	0.1	800	1.405	34.730
1249	1.121	34.728	8.05	221	2.17	107	—	—	—	1000	1.219	34.723
1499	0.925	34.719	8.06	214	2.21	113	--	—	0.2	1200	1.134	34.727
1999	0.517	34.696	8.04	221	2.25	123	—	—	0.2	1500	0.831	34.706
2494	0.206	34.682	8.03	233	2.31	126	—	—	0.2	2000	0.504	34.694
2996	-0.003	34.675	8.02	237	2.27	125	—	--	0.2	2500	0.186	34.679
3355	-0.192	34.664	8.02	249	2.23	118	—	—	0.2	3000	0.000	34.671

ITS-90 . International Temperture Scale of 1990.
PSS78 : Practical Salinity Scale of 1978.

Station 17

Beginning of cast

Date	:	March 12, 2002
Time(UT)	:	22:55
Latitude	:	61-01.0S
Longitude	:	139-58.4E
Depth	:	4390 m

Meteorological observation

Time(UT)	:	23:00	Wind direction	:	NNE
Weather	:	m	Velocity	:	7m/s
Air temperature(dry)	:	2.9℃	Wave	:	NNE/3
Humidity	:	99%	Swell	:	NNW/3
Atmospheric Pressure	:	988.5hPa	Visibility	:	0.3km

Water Sampling by Niskin bottles										Observed by CTD		
Pressure (dbar)	Temperature (ITS-90)	Salinity (PSS78)	pH	DO2	PO4-P	SiO3-Si	NO2-N	NO3-N	NH4-N	Pressure (dbar)	Temperature (ITS-90)	Salinity (PSS78)
				(μmol/l)								
0	1.800	33.805	8.13	338	1.79	18	--	—	—	10	1.985	33.795
51	1.941	—	—	--	--	—	--	—	—	20	1.960	33.801
75	1.754	33.817	8.12	336	1.85	18	--	—	0.9	30	1.959	33.802
100	0.089	33.960	8.09	331	2.12	31	—	—	—	50	1.928	33.803
126	0.618	34.131	8.03	274	2.32	45	—	--	0.5	75	1.673	33.825
151	1.476	34.309	7.96	222	2.44	58	--	—	0.2	100	0.528	33.944
202	1.980	34.425	7.94	195	2.47	67	—	—	0.3	125	1.022	34.214
302	2.158	34.539	7.93	183	2.43	74	—	—	0.3	150	1.581	34.335
401	2.131	34.603	7.94	182	2.37	78	—	—	0.4	200	2.060	34.461
501	2.126	34.647	7.95	189	2.32	80	—	—	0.3	250	2.207	34.521
601	2.093	34.678	7.96	195	2.26	82	—	—	0.3	300	2.186	34.557
702	2.051	34.703	7.96	197	2.21	83	—	—	0.3	400	2.181	34.609
801	1.997	34.720	7.97	—	2.16	84	—	—	0.4	500	2.132	34.647
900	1.949	34.733	7.98	206	2.15	86	—	—	0.3	600	2.079	34.682
1002	1.878	34.739	7.98	203	2.15	88	—	—	0.3	700	2.019	34.698
1503	1.445	34.741	7.99	208	2.11	100	—	—	0.4	800	1.968	34.714
2001	1.073	34.725	7.97	221	2.18	113	—	—	0.4	1000	1.885	34.738
2498	0.696	34.704	7.96	221	2.23	124	—	—	0.4	1200	1.728	34.743
3001	0.384	34.691	7.94	227	2.26	131	--	—	—	1500	1.451	34.738
3498	0.181	34.680	7.93	231	2.26	132	—	—	—	2000	1.071	34.721
3976	0.047	34.676	7.93	238	2.22	130	—	—	0.4	2500	0.688	34.701
										3000	0.381	34.688
										3500	0.177	34.679

ITS-90 : International Temperture Scale of 1990.
PSS78 : Practical Salinity Scale of 1978.

Station 18

Beginning of cast

Date	:	March 13, 2002
Time(UT)	:	02:50
Latitude	:	63-59.6S
Longitude	:	149-59.6E
Depth	:	3666 m

Meteorological observation

Time(UT)	:	03:00
Weather	:	f
Air temperature(dry)	:	2.1℃
Humidity	:	97%
Atmospheric Pressure	:	978.3hPa
Wind direction	:	N
Velocity	:	8m/s
Wave	:	N/4
Swell	:	N/3
Visibility	:	0.8km

Water Sampling by Niskin bottles										Observed by CTD		
Pressure (dbar)	Temperature (ITS-90)	Salinity (PSS78)	pH	DO2	PO4-P	SiO3-Si	NO2-N	NO3-N	NH4-N	Pressure (dbar)	Temperature (ITS-90)	Salinity (PSS78)
				(μmol/l)								
0	0.800	33.739	8.11	340	1.64	19	—	—	0.8	10	0.996	33.735
51	0.902	33.813	8.12	336	1.70	25	—	—	1.1	20	0.989	33.735
75	0.646	34.287	7.97	250	2.34	58	—	—	1.0	30	0.925	33.771
101	1.406	34.488	7.91	—	2.47	72	—	—	0.3	50	0.825	33.851
125	1.677	34.551	7.91	189	2.42	76	—	—	0.1	75	0.206	34.309
151	1.757	34.580	7.90	187	2.40	77	—	—	0.2	100	1.438	34.506
200	1.764	34.610	7.91	186	2.39	79	—	—	0.2	125	1.717	34.566
252	1.853	34.645	7.91	188	2.33	81	—	—	0.3	150	1.775	34.589
302	1.881	34.672	7.92	188	2.28	82	—	—	0.2	200	1.902	34.634
408	1.810	34.698	7.93	192	2.24	84	—	—	0.3	250	1.923	34.660
501	1.777	—	7.93	196	2.25	84	—	—	0.2	300	1.921	34.684
600	1.719	34.725	7.95	201	2.18	87	—	—	—	400	1.870	34.707
701	1.676	34.733	7.94	204	2.17	90	—	—	0.4	500	1.828	34.723
800	1.573	34.732	7.96	209	2.17	90	—	—	0.4	600	1.780	34.733
899	1.546	34.741	7.96	213	2.15	93	—	—	0.2	700	1.652	34.732
1001	1.459	34.740	7.96	208	2.15	96	—	—	0.2	800	1.582	34.736
1248	1.202	34.730	7.95	212	2.18	102	—	—	0.3	1000	1.470	34.741
1501	1.023	34.723	7.95	212	2.20	109	—	—	0.3	1200	1.282	34.735
1998	0.630	34.700	7.94	218	2.24	119	—	—	0.4	1500	1.019	34.721
2498	0.324	34.687	7.93	227	2.34	124	—	—	—	2000	0.639	34.700
2996	0.099	34.679	7.91	234	2.25	126	—	—	0.5	2500	0.315	34.685
3136	0.043	34.679	7.91	234	2.28	123	—	—	0.3	3000	0.102	34.678

ITS-90 : International Temperture Scale of 1990.
PSS78 : Practical Salinity Scale of 1978.

Station 19

Beginning of cast

Date	:	March 14, 2002
Time(UT)	:	02:51
Latitude	:	59-12.1S
Longitude	:	150-00.4E
Depth	:	2792 m

Meteorological observation

Time(UT)	:	03:00	Wind direction	:	W
Weather	:	c	Velocity	:	3m/s
Air temperature(dry)	:	3.0℃	Wave	:	W/2
Humidity	:	93%	Swell	:	NW/6
Atmospheric Pressure	:	983.1hPa	Visibility	:	15km

Water Sampling by Niskin bottles										Observed by CTD		
Pressure (dbar)	Temperature (ITS-90)	Salinity (PSS78)	pH	DO2	PO4-P	SiO3-Si	NO2-N	NO3-N	NH4-N	Pressure (dbar)	Temperature (ITS-90)	Salinity (PSS78)
				(μmol/l)								
0	2.100	—	8.12	333	1.39	8	0.28	24	1.2	10	2.290	33.675
50	2.222	33.675	8.12	344	1.53	9	0.25	24	0.9	20	2.274	33.677
77	-0.723	34.014	8.07	346	2.03	37	0.24	28	—	30	2.235	33.682
100	0.169	34.305	7.96	258	2.36	60	0.35	33	—	50	2.175	33.698
126	1.098	34.446	7.92	211	2.41	70	0.46	35	0.4	75	-0.325	34.198
150	1.677	34.554	7.90	183	2.42	77	0.14	36	0.4	100	1.272	34.438
203	1.969	34.623	7.91	184	2.35	80	0.04	34	0.3	125	1.821	34.545
251	1.938	34.646	7.91	186	2.30	81	0.01	34	—	150	1.916	34.583
302	1.946	34.666	7.92	185	2.27	82	0.01	34	—	200	1.978	34.621
397	1.937	34.713	7.93	188	2.21	83	0.00	33	0.3	250	1.999	34.647
501	1.899	34.715	7.94	195	2.18	85	—	33	0.3	300	1.983	34.669
598	1.834	34.725	7.95	197	2.13	87	0.00	32	0.3	400	1.941	34.696
699	1.780	34.733	7.94	—	2.13	88	0.00	32	0.3	500	1.900	34.718
796	1.721	34.738	7.95	203	2.12	90	0.02	31	0.3	600	1.840	34.728
898	1.628	34.742	7.96	204	2.12	92	0.00	31	0.3	700	1.803	34.738
997	1.553	34.744	7.97	204	2.12	94	0.00	31	0.3	800	1.709	34.743
1246	1.307	34.733	7.95	210	2.12	101	0.00	32	0.3	1000	1.526	34.742
1498	1.107	34.728	7.96	219	2.14	109	0.02	32	0.3	1200	1.362	34.738
1994	0.719	34.708	7.94	218	2.18	119	0.00	32	—	1500	1.119	34.727
2303	0.458	34.698	7.94	223	2.20	126	0.00	33	0.3	2000	0.687	34.705

ITS-90 : International Temperture Scale of 1990.
PSS78 : Practical Salinity Scale of 1978.

Station 20

Beginning of cast

Date	:	March 15, 2002
Time(UT)	:	02:54
Latitude	:	56-17.6S
Longitude	:	149-58.2E
Depth	:	3679 m

Meteorological observation

Time(UT)	:	03:00	Wind direction	:	S
Weather	:	c	Velocity	:	9m/s
Air temperature(dry)	:	4.5℃	Wave	:	S/4
Humidity	:	83%	Swell	:	W/6
Atmospheric Pressure	:	984.8hPa	Visibility	:	15km

Water Sampling by Niskin bottles										Observed by CTD		
Pressure (dbar)	Temperature (ITS-90)	Salinity (PSS78)	pH	DO2	PO4-P	SiO3-Si	NO2-N	NO3-N	NH4-N	Pressure (dbar)	Temperature (ITS-90)	Salinity (PSS78)
				(μmol/l)								
0	5.900	33.793	8.13	307	1.46	0	—	—	1.6	10	6.247	33.785
53	6.139	33.779	8.13	308	1.48	0	—	—	1.4	20	6.227	33.783
72	3.210	33.837	—	—	--	—	—	—	--	30	5.982	33.784
102	2.672	33.862	8.09	323	1.89	10	—	—	1.4	50	5.229	33.780
125	2.325	33.866	8.07	320	1.85	11	—	—	0.9	75	2.889	33.827
150	2.032	33.884	8.07	319	1.91	14	—	—	0.4	100	2.453	33.842
202	2.954	34.098	8.00	268	2.04	24	--	—	0.3	125	2.199	33.854
252	2.883	34.165	7.97	253	2.15	30	—	—	0.5	150	1.977	33.870
303	2.799	34.225	7.95	236	2.25	36	--	—	0.6	200	2.292	34.008
402	2.638	34.325	7.92	209	2.34	49	—	--	0.5	250	2.751	34.161
504	2.591	34.420	7.91	197	2.41	59	—	—	0.3	300	2.623	34.210
601	2.548	34.490	7.91	187	2.40	65	—	—	0.2	400	2.639	34.342
703	2.506	34.551	7.90	184	2.39	69	—	--	—	500	2.562	34.422
801	2.385	—	—	--	--	—	--	—	—	600	2.462	34.494
902	2.384	34.633	7.91	192	2.37	74	—	—	0.5	700	2.441	34.554
999	2.324	34.672	7.92	191	2.26	76	—	—	0.5	800	2.369	34.598
1253	2.171	34.719	7.92	202	2.23	80	—	—	—	1000	2.287	34.668
1501	2.003	34.742	7.96	203	2.21	86	--	—	0.5	1200	2.192	34.711
2001	1.566	34.740	7.94	205	2.25	103	—	--	—	1500	1.979	34.742
2497	1.131	34.724	7.94	213	2.25	115	—	—	—	2000	1.543	34.737
3000	0.886	34.712	7.91	218	2.23	121	—	--	—	2500	1.143	34.723
										3000	0.890	34.709

ITS-90 : International Temperture Scale of 1990.
PSS78 : Practical Salinity Scale of 1978.

Station 22

Beginning of cast

Date : March 17, 2002
Time(UT) : 03:02
Latitude : 46-44.8S
Longitude : 149-57.3E
Depth : 4148 m

Meteorological observation

Time(UT) : 03:00
Weather : o
Air temperature(dry) : 10.7℃
Humidity : 78%
Atmospheric Pressure : 999.8hPa

Wind direction : SW
Velocity : 14m/s
Wave : SW/4
Swell : W/3
Visibility : 20km

Water Sampling by Niskin bottles										Observed by CTD		
Pressure (dbar)	Temperature (ITS-90)	Salinity (PSS78)	pH	DO2	PO4-P	SiO3-Si	NO2-N	NO3-N	NH4-N	Pressure (dbar)	Temperature (ITS-90)	Salinity (PSS78)
						(μmol/l)						
0	13.400	34.956	8.21	262	0.35	0	--	—	0.7	10	13.623	34.937
51	13.431	34.839	8.21	264	0.41	0	--	--	—	20	13.631	34.939
75	13.370	34.838	8.20	263	0.43	0	—	—	1.0	30	13.631	34.939
101	11.409	34.939	—	—	0.82	0	--	—	0.7	50	13.659	34.949
127	10.545	34.825	8.12	255	0.96	0	—	--	0.5	75	13.656	34.951
151	10.053	34.760	—	253	1.02	1	—	—	0.4	100	11.230	34.876
202	9.486	34.685	8.11	257	1.07	1	—	—	—	125	10.658	34.844
302	8.910	34.599	8.09	262	1.11	2	—	—	—	150	9.951	34.733
401	8.605	34.562	8.07	255	1.27	3	--	—	0.5	200	9.620	34.692
502	8.103	34.513	8.04	240	1.43	6	—	--	--	250	9.195	34.624
602	7.525	34.484	8.01	223	1.60	10	—	—	0.4	300	8.927	34.600
702	6.747	34.446	7.98	212	1.78	15	—	—	0.5	400	8.638	34.566
802	6.054	34.420	7.96	212	1.93	21	—	—	—	500	8.153	34.518
902	5.223	34.390	7.95	208	2.03	27	—	—	0.6	600	7.481	34.481
1000	4.571	34.384	7.95	208	2.14	34	—	—	0.4	700	6.816	34.454
1249	3.560	34.448	7.92	190	2.30	55	—	—	0.5	800	5.992	34.413
1504	2.913	34.532	7.90	178	2.44	73	—	—	—	1000	4.541	34.376
2002	2.350	34.673	7.90	186	2.31	85	—	—	0.5	1200	3.684	34.426
2498	1.993	34.732	7.91	202	2.21	94	--	--	0.5	1500	2.853	34.528
2999	1.649	34.738	7.91	207	2.18	103	—	—	0.4	2000	2.346	34.673
3230	1.474	34.736	7.91	217	2.14	108	—	--	0.5	2500	1.996	34.728
										3000	1.646	34.735

ITS-90 : International Temperture Scale of 1990.
PSS78 : Practical Salinity Scale of 1978.

Table 5. Petroleum oil, cadmium and mercury concentration in the surface water.

Station No.	Date	Time		Position		Air. Temp.	Water. Temp.	Petroleum Oil	Cadmium	Mercury
		UT	LMT	Latitude	Longitude	(°C)		(μg/l)		
	2001									
1	12 5	0555	1255	42 - 11.4 S	109 - 59.5 E	12.3	12.6	0.09	0.026	0.0018
2	6	0610	1310	46 - 55.1 S	109 - 55.5 E	11.9	11.7	0.10	0.020	0.0020
3	7	0140	0840	50 - 39.7 S	109 - 58.6 E	5.7	4.9	0.08	0.059	0.0010
4	8	0605	1305	55 - 08.9 S	108 - 44.9 E	2.7	2.0	0.03	0.075	0.0044
5	9	0800	1500	57 - 13.7 S	104 - 12.9 E	3.0	1.2	0.13	0.075	0.0012
	2002									
10	3 4	0605	1305	63 - 57.5 S	90 - 14.7 E	3.6	-0.6	0.13	0.099	0.0062
14	8	0455	1255	63 - 59.9 S	130 - 40.4 E	0.0	-1.7	0.05	0.087	0.0024
18	13	0250	1250	63 - 59.6 S	149 - 59.6 E	2.3	0.8	0.09	0.067	0.0034
19	14	0250	1250	59 - 12.1 S	150 - 00.4 E	3.2	2.1	0.15	0.094	0.014
20	15	0255	1255	56 - 17.6 S	149 - 58.2 E	4.6	5.9	0.08	0.037	0.0033
21	16	0305	1305	51 - 59.5 S	150 - 17.9 E	6.3	9.8	0.07	0.010	0.0022
22	17	0300	1300	46 - 44.8 S	149 - 57.3 E	10.8	13.4	0.06	0.013	0.0046

Chrysen was used as the standard material to measure the levels of Petroleum Oil concentration.

Table 6. Hourly tidal observation at Syowa Station from February 2001 to January 2002 (time is LMT (UT+3 hours)).

STATION : SYOWA STATION
LATITUDE : 69°00'28"S
LONGITUDE : 39°34'13"E
DURATION : FEB. 1, – FEB. 28, 2001
UNIT : CENTIMETER

The zero level of the tide gauge :
500 cm below the bench mark No. 1040

Date	Time 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	(24H) SUN	(24H) MEAN	(25H) SUN	(25H) MEAN
1	231	219	210	202	198	203	209	212	221	225	227	227	225	223	224	223	227	231	237	243	246	249	250	247	5409	225	5647	226
2	238	228	220	211	206	203	200	201	206	210	214	220	225	232	238	242	247	251	252	254	255	255	256	256	5520	230	5770	231
3	250	244	238	227	219	212	202	195	195	197	200	207	219	232	243	254	262	266	265	266	263	258	253	254	5623	234	5874	235
4	252	247	246	237	229	219	204	191	185	181	183	190	206	227	251	268	283	294	297	294	290	284	277	276	5811	242	6088	244
5	277	275	274	273	267	255	237	216	198	183	179	177	188	209	235	262	283	298	304	303	296	286	275	271	6021	251	6294	252
6	273	275	276	280	279	269	250	223	197	173	155	149	152	169	200	227	256	278	290	291	287	275	263	258	5746	239	6003	240
7	257	260	267	277	280	280	266	241	211	182	152	136	133	145	171	201	231	260	278	283	279	269	253	244	5557	232	5798	232
8	241	244	256	270	281	286	282	264	237	202	168	143	129	133	153	182	215	245	264	278	279	268	255	241	5518	230	5754	230
9	235	237	246	265	283	297	301	293	271	241	205	174	152	144	154	177	204	235	260	274	278	270	257	240	5694	237	5923	237
10	230	225	232	248	268	291	303	303	294	273	241	208	182	167	169	182	204	230	254	270	275	271	256	240	5818	242	6044	242
11	226	215	215	227	247	272	289	297	300	289	266	238	212	193	188	197	213	235	256	272	281	277	265	247	5916	246	6146	246
12	231	214	206	209	224	245	262	275	282	278	267	247	226	207	196	197	207	221	239	252	259	260	251	232	5688	237	5905	236
13	217	201	186	181	190	204	222	235	246	251	248	240	227	214	209	207	213	225	239	251	259	262	260	248	5436	226	5672	227
14	236	226	213	208	209	220	233	248	259	270	276	274	270	269	267	267	272	276	282	294	297	296	294	285	6241	260	6514	261
15	274	263	250	243	234	233	238	242	248	256	259	265	266	268	271	276	282	285	291	295	298	298	293	287	6413	267	6691	268
16	278	268	258	249	240	232	227	224	224	225	228	233	239	245	254	264	270	272	274	275	274	271	268	262	6054	252	6312	252
17	257	254	247	240	237	226	219	210	204	200	201	206	215	228	242	256	268	275	275	276	273	268	263	262	5802	242	6062	242
18	261	260	258	257	253	245	232	219	206	197	193	196	203	218	238	256	271	280	284	280	273	268	259	255	5862	244	6118	245
19	256	257	259	259	260	254	242	224	207	191	180	178	185	199	220	246	264	276	283	281	273	262	252	247	5756	240	6002	240
20	246	250	256	264	266	264	256	237	212	194	177	170	174	189	210	237	261	274	284	285	275	262	251	243	5736	239	5979	239
21	243	249	259	270	278	279	272	253	232	207	187	174	173	185	207	234	261	279	290	292	284	271	256	244	5879	245	6122	245
22	243	250	263	275	288	294	287	272	251	222	195	178	170	176	197	222	247	270	285	289	281	267	251	239	5913	246	6147	246
23	234	236	250	269	285	296	297	287	265	237	210	187	173	174	191	217	243	266	283	285	279	267	249	232	5913	246	6134	245
24	221	220	233	253	274	289	294	291	275	248	221	198	179	175	186	209	235	259	279	285	282	267	250	231	5855	244	6073	243
25	218	215	223	242	263	284	295	296	286	267	240	214	195	184	189	207	231	253	272	283	281	270	251	231	5894	246	6110	244
26	216	208	214	229	250	272	289	295	293	280	256	232	215	201	200	214	233	255	273	285	286	279	261	238	5974	249	6198	248
27	224	214	211	219	242	264	284	294	294	290	275	253	235	222	216	222	239	257	272	284	286	277	262	241	6076	253	6299	252
28	223	210	203	205	220	242	258	272	279	277	271	257	241	230	227	228	241	256	269	279	283	279	264	247	5963	248	6191	248
1	228																											

MONTHLY MEAN 242.7 cm

STATION : SYOWA STATION
LATITUDE : 69°00'28"S
LONGITUDE : 39°34'13"E
DURATION : MAR. 1, – MAR. 31, 2001
UNIT : CENTIMETRE

Date	Time 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	(24H) SUM	(24H) MEAN	(25H) SUM	(25H) MEAN
1	228	214	204	200	210	226	242	256	266	270	270	262	253	244	243	246	252	263	274	283	286	283	270	256	6001	250	6239	250
2	238	223	211	206	206	214	225	238	247	253	258	256	253	252	253	257	260	268	277	280	282	278	271	259	5966	249	6212	248
3	246	233	221	210	206	206	210	217	223	231	238	244	249	256	262	271	277	282	287	290	290	287	280	274	5989	250	6253	250
4	264	253	244	236	228	224	220	218	219	223	231	240	251	265	280	294	304	309	313	313	309	305	298	293	6338	264	6625	265
5	288	281	276	270	257	246	234	222	215	212	212	219	235	252	272	292	306	315	317	313	306	296	289	284	6408	267	6690	268
6	282	282	283	282	277	266	249	231	211	196	192	193	203	223	247	272	292	304	310	305	296	285	274	268	6221	259	6491	260
7	270	272	279	285	287	277	261	239	212	190	175	169	176	196	222	251	277	297	305	304	293	281	266	257	6041	252	6298	252
8	258	263	275	289	298	299	287	266	236	207	182	167	165	179	201	232	262	284	296	300	287	272	255	242	6002	250	6242	250
9	240	248	264	283	301	309	308	291	264	231	201	177	167	174	195	224	254	279	295	300	288	270	251	233	6047	252	6271	251
10	225	228	248	269	294	312	320	315	296	266	232	206	187	183	198	225	251	276	295	302	294	274	254	232	6183	258	6400	256
11	217	215	230	254	281	304	319	324	314	293	263	234	209	201	205	224	248	270	289	293	289	273	248	225	6221	259	6425	257
12	204	192	200	218	244	271	291	304	304	289	268	243	220	203	202	214	234	255	271	280	279	264	242	218	5912	246	6105	244
13	193	179	178	190	214	242	263	280	289	286	274	258	239	226	224	229	245	265	282	288	289	280	262	239	5913	246	6134	245
14	220	200	194	197	213	233	255	274	287	292	287	278	268	256	250	255	266	277	292	300	301	293	280	259	6229	260	6470	259
15	241	224	213	208	216	228	243	258	270	280	280	277	274	272	272	273	274	287	296	301	301	296	283	265	6333	264	6581	263
16	249	235	221	210	210	214	219	228	237	242	249	251	249	253	255	258	262	269	274	279	278	275	266	255	5937	247	6182	247
17	245	232	222	218	213	210	214	215	217	224	230	235	243	251	260	270	276	282	285	286	287	279	273	267	5936	247	6196	248
18	260	252	247	242	236	231	224	221	218	220	223	228	238	251	264	277	288	293	292	293	287	282	275	270	6112	255	6381	255
19	269	263	260	257	256	248	237	226	215	210	208	214	221	235	254	270	281	290	292	289	281	270	266	259	6073	253	6331	253
20	258	261	263	267	269	263	252	239	223	211	205	205	212	230	248	268	287	294	295	289	279	268	257	253	6097	254	6352	254
21	255	262	268	277	281	280	271	251	232	216	204	200	208	224	244	267	288	299	302	296	284	268	257	253	6187	258	6440	258
22	253	261	274	285	294	296	286	269	249	227	209	202	205	219	242	267	288	302	308	300	285	265	250	243	6279	262	6520	261
23	241	251	268	282	297	304	297	283	258	233	211	197	193	205	224	250	273	287	296	288	274	253	233	220	6119	255	6335	253
24	216	224	242	264	283	295	297	287	264	239	214	195	187	193	211	237	260	279	290	286	271	248	227	211	5924	247	6126	245
25	203	209	228	253	276	296	304	298	279	257	231	209	198	198	212	236	260	278	288	288	274	251	227	209	5961	248	6155	246
26	195	196	213	237	263	284	297	299	288	266	245	222	206	203	213	231	253	273	286	287	276	255	229	206	5922	247	6113	245
27	191	188	199	222	247	274	291	301	298	283	263	244	226	220	223	240	259	277	292	296	288	267	242	219	6051	252	6254	250
28	202	192	197	216	241	268	293	308	308	302	289	271	256	248	246	258	273	288	301	303	296	279	253	227	6314	263	6520	261
29	207	191	189	199	220	245	269	287	295	294	288	277	267	259	257	266	278	293	305	309	305	290	271	246	6308	263	6533	261
30	225	211	200	201	219	236	256	274	286	290	291	288	281	278	278	280	290	300	309	313	310	301	283	261	6459	269	6699	268
31	240	225	210	203	210	221	234	246	258	264	270	273	272	273	277	280	283	293	300	302	299	291	278	262	6264	261	6509	260
1	245																											

MONTHLY MEAN 255.0 cm

STATION : SYOWA STATION
LATITUDE : 69°00'28"S
LONGITUDE : 39°34'13"E
DURATION : APR. 1, - APR. 30, 2001
UNIT : CENTIMETRE

Date	Time 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	(24H) SUM	(24H) MEAN	(25H) SUM	(25H) MEAN
1	245	228	215	209	205	207	212	220	227	236	247	254	255	263	274	281	286	291	295	296	292	285	274	264	6062	253	6315	253
2	253	243	231	225	217	211	208	210	212	215	227	238	248	261	278	289	295	299	301	299	294	286	276	272	6087	254	6356	254
3	269	261	259	252	246	235	225	219	212	209	216	227	240	262	285	302	313	319	318	312	303	293	281	279	6337	264	6616	265
4	279	278	281	281	274	263	246	225	210	197	192	195	207	228	251	269	285	293	289	282	269	254	245	240	6032	251	6276	251
5	244	253	264	274	277	272	259	235	215	194	183	183	191	211	238	263	283	297	297	291	275	262	254	249	5966	249	6222	249
6	257	273	294	313	329	333	327	309	280	255	236	227	228	245	269	293	312	327	329	318	299	275	257	247	6833	285	7083	283
7	250	263	283	307	326	338	337	321	297	267	239	221	214	224	245	267	286	299	304	294	271	245	223	204	6523	272	6719	269
8	196	209	232	257	287	307	316	310	291	264	239	218	207	209	227	250	271	287	295	291	271	243	218	194	6088	254	6272	251
9	184	189	208	237	270	296	313	317	308	288	264	243	226	225	235	254	274	290	298	296	279	251	221	195	6159	257	6338	254
10	178	174	185	209	241	268	292	303	303	292	271	253	236	228	233	246	265	281	290	289	277	252	225	196	5988	250	6165	247
11	177	164	165	186	215	242	270	288	299	294	288	275	265	261	262	277	293	312	323	324	314	298	270	241	6301	263	6524	261
12	223	206	201	209	228	251	275	290	298	304	299	290	283	276	273	279	291	303	313	316	310	297	274	249	6537	272	6767	271
13	229	213	204	204	215	229	249	263	275	283	286	283	278	279	280	282	291	301	312	313	311	302	287	267	6437	268	6686	267
14	249	235	227	221	226	231	244	256	265	273	280	281	283	287	293	293	297	305	310	314	312	303	291	277	6552	273	6815	273
15	264	251	243	237	233	235	237	240	247	254	261	267	271	276	283	288	293	298	299	297	297	288	279	272	6410	267	6675	267
16	265	258	252	247	242	240	238	239	238	238	247	255	265	279	287	294	301	304	301	300	293	287	280	276	6427	268	6698	268
17	271	268	265	263	261	253	246	240	232	232	237	242	256	269	281	292	299	302	299	293	285	275	270	267	6401	267	6668	267
18	268	270	274	277	273	267	258	247	237	229	228	233	245	261	277	292	299	303	300	292	280	269	262	262	6403	267	6668	267
19	265	272	282	289	292	288	277	261	247	234	227	229	237	252	270	287	297	301	297	286	271	254	247	243	6403	267	6652	266
20	249	262	276	288	299	296	289	274	254	238	227	225	232	247	266	283	295	301	296	282	262	242	229	224	6334	264	6563	263
21	229	242	262	279	291	296	292	274	253	234	218	211	211	227	244	263	282	292	285	275	254	232	212	207	6064	253	6278	251
22	214	230	255	283	304	318	322	312	290	271	252	239	239	250	269	290	307	318	318	305	279	256	234	220	6576	274	6798	272
23	223	235	258	283	308	326	334	324	306	286	265	248	241	249	265	283	300	309	309	298	274	245	220	200	6587	274	6779	271
24	193	201	225	253	279	302	316	316	306	290	269	251	240	244	255	269	287	298	301	293	272	243	213	188	6303	263	6479	259
25	176	177	194	223	251	276	300	308	304	292	278	263	249	249	258	273	292	304	311	306	288	261	232	207	6270	261	6460	258
26	190	184	193	216	243	271	295	309	312	308	298	286	270	267	267	281	295	302	310	306	293	271	238	211	6417	267	6606	264
27	190	176	176	189	212	239	262	278	289	290	288	280	271	265	265	273	286	295	302	304	294	278	250	224	6175	257	6376	255
28	201	186	178	186	198	220	241	257	270	278	280	278	276	274	274	276	285	296	303	302	295	282	263	239	6137	256	6354	254
29	217	201	185	184	192	201	215	232	245	258	264	268	271	276	277	280	286	292	297	298	293	282	269	254	6038	252	6276	251
30	237	222	209	198	196	200	206	214	227	237	249	262	270	280	288	292	298	303	305	307	304	297	291	284	6175	257	6450	258
1	274																											

MONTHLY MEAN 262.5 cm

STATION : SYOWA STATION
LATITUDE : 69°00'28"S
LONGITUDE : 39°34'13"E
DURATION : MAY 1, - MAY 31, 2001
UNIT : CENTIMETRE

Date	Time 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	(24H) SUM	(24H) MEAN	(25H) SUM	(25H) MEAN
1	274	265	258	248	238	234	231	231	234	242	252	267	279	292	306	311	315	319	316	311	306	298	295	291	6612	276	6900	276
2	287	287	283	280	269	256	249	238	230	232	237	248	260	275	290	300	305	302	296	288	276	267	261	262	6477	270	6745	270
3	268	274	282	283	281	273	257	242	232	224	224	233	246	265	284	296	305	303	294	284	268	253	247	249	6365	265	6621	265
4	256	267	282	293	296	293	279	257	239	222	214	218	229	241	262	275	285	285	276	261	240	223	211	208	6113	255	6334	253
5	221	238	259	279	294	298	290	269	249	229	215	208	219	232	249	266	277	278	268	252	226	203	185	177	5882	245	6069	243
6	187	208	232	260	280	295	296	280	263	240	220	212	211	224	241	258	271	276	269	252	224	195	174	159	5729	239	5891	236
7	162	180	206	235	265	287	295	292	277	257	237	226	221	226	244	261	278	284	280	266	241	209	184	163	5775	241	5931	237
8	156	168	194	222	253	280	302	306	299	285	269	253	248	250	263	281	295	305	304	293	272	241	211	188	6137	256	6313	253
9	176	175	192	220	249	275	299	311	310	302	289	274	265	263	271	287	303	313	313	309	292	261	231	205	6384	266	6571	263
10	187	179	189	208	235	262	285	300	307	304	299	287	281	275	277	290	306	315	321	318	304	280	255	228	6494	271	6700	268
11	206	191	190	201	221	245	267	285	298	297	293	290	283	278	278	284	298	308	314	315	304	285	263	238	6430	268	6649	266
12	219	202	198	202	212	230	249	264	276	282	284	283	280	278	276	277	285	298	302	305	298	286	269	250	6305	263	6534	261
13	229	217	207	203	208	221	234	246	257	267	271	271	274	276	276	274	280	284	288	290	286	276	262	249	6145	256	6379	255
14	235	222	214	210	210	214	222	230	239	249	258	263	266	272	273	274	277	281	283	282	280	275	268	259	6056	252	6305	252
15	249	242	233	231	225	227	224	228	235	242	249	259	264	272	277	280	282	279	277	278	274	270	267	263	6126	255	6386	255
16	259	257	252	250	247	242	238	238	238	243	249	260	271	277	286	289	291	287	282	276	272	266	264	263	6298	262	6561	262
17	263	268	269	268	267	260	253	247	240	240	245	252	263	274	281	290	290	283	277	266	256	249	246	248	6293	262	6545	262
18	252	260	269	274	271	268	259	247	237	232	233	240	251	262	278	285	285	280	272	259	246	234	229	232	6155	256	6399	256
19	244	258	270	282	287	286	278	263	249	239	231	236	247	259	274	281	284	279	268	250	230	214	205	206	6121	255	6337	253
20	216	233	251	271	280	282	278	265	247	233	222	223	230	241	258	266	274	271	258	239	214	195	180	178	5805	242	5997	240
21	192	211	235	261	277	290	290	277	263	247	235	233	238	252	265	279	287	290	279	258	235	209	191	183	5978	249	6167	247
22	189	210	236	266	292	310	319	315	303	287	272	263	259	269	282	293	301	303	291	273	245	212	187	171	6348	265	6518	261
23	170	181	206	236	263	289	302	305	296	281	266	257	251	254	267	280	290	296	289	273	246	215	189	163	6065	253	6219	249
24	154	160	182	207	237	265	285	293	291	284	272	262	253	252	261	273	281	289	288	275	250	219	186	160	5878	245	6021	241
25	143	138	149	171	203	232	257	275	282	282	276	268	263	261	264	274	289	297	300	296	280	251	224	194	5868	245	6041	242
26	172	161	159	177	203	229	252	275	290	293	293	291	287	283	285	293	304	315	316	317	304	286	262	232	6277	262	6488	260
27	211	194	186	191	203	223	246	264	282	295	296	301	299	296	297	302	308	316	325	323	319	305	287	268	6536	272	6782	271
28	246	226	211	206	209	221	238	252	267	280	290	294	296	298	297	294	300	305	306	313	309	302	293	278	6531	272	6794	272
29	262	247	235	224	220	219	226	238	249	261	272	281	289	291	292	290	289	291	291	291	289	287	283	279	6397	267	6668	267
30	271	261	250	239	231	225	221	222	230	235	245	257	267	274	277	279	274	268	263	261	258	257	256	259	6080	253	6342	254
31	262	262	261	256	247	239	231	225	226	228	235	248	256	266	274	274	273	265	255	248	241	237	241	244	5994	250	6249	250
1	255																											
																							MONTHLY MEAN			257.6	cm	

STATION : SYOWA STATION
LATITUDE : 69°00'28"S
LONGITUDE : 39°34'13"E
DURATION : JUNE 1, - JUNE 30, 2001
UNIT : CENTIMETRE

Date	Time 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	(24H) SUM	(24H) MEAN	(25H) SUM	(25H) MEAN
1	255	265	269	272	269	260	247	239	229	224	229	238	251	260	271	276	271	263	251	237	225	219	215	224	5960	248	6199	248
2	238	254	270	290	292	286	277	264	254	243	242	248	257	269	280	290	289	280	265	249	230	214	209	215	6205	259	6433	257
3	229	250	271	293	305	309	305	293	280	266	260	260	267	278	288	295	298	293	279	256	233	211	195	195	6406	267	6611	264
4	205	232	258	279	298	316	313	307	293	276	265	260	267	275	284	297	306	300	289	266	240	211	195	183	6414	267	6602	264
5	188	204	227	258	278	301	308	304	296	281	269	261	261	266	276	289	298	295	285	272	242	211	188	173	6231	260	6399	256
6	168	179	201	231	259	283	297	305	296	286	274	263	258	262	274	285	290	295	294	276	251	222	194	172	6116	255	6277	251
7	160	163	178	205	236	258	276	288	290	281	269	263	257	257	265	277	288	298	301	289	268	240	216	187	6012	250	6185	247
8	173	171	177	198	223	253	276	292	299	296	290	284	280	276	282	293	304	312	318	312	297	275	249	225	6355	265	6563	263
9	208	194	193	205	225	251	268	284	294	294	290	284	273	268	269	278	287	296	300	298	287	270	245	220	6279	262	6478	259
10	198	186	182	184	199	219	236	251	264	270	268	266	261	254	252	254	259	266	276	274	269	258	237	217	5800	242	5997	240
11	197	182	173	175	184	196	213	230	243	252	255	255	253	249	248	247	248	256	263	268	263	256	244	228	5578	232	5788	232
12	210	200	189	185	190	195	207	222	232	244	250	253	251	249	247	245	248	251	255	258	256	254	247	238	5576	232	5804	232
13	228	216	206	203	202	204	212	220	229	241	247	252	253	254	254	250	250	246	247	250	251	248	245	241	5649	235	5886	235
14	238	231	226	221	216	214	217	221	228	234	242	250	255	257	258	253	251	243	242	244	241	242	242	243	5710	238	5955	238
15	245	245	242	242	236	234	228	228	230	230	236	248	253	256	256	256	248	241	233	225	222	222	221	226	5704	238	5938	238
16	234	239	245	247	245	240	236	228	226	226	228	233	241	247	249	248	246	234	223	210	200	196	195	201	5515	230	5727	229
17	213	227	238	248	252	251	246	237	230	227	225	230	240	247	253	253	250	236	222	205	193	184	179	189	5476	228	5677	227
18	201	217	238	257	262	267	263	255	248	238	232	240	247	256	260	270	265	256	242	224	202	188	182	190	5702	238	5911	236
19	209	230	250	271	289	296	297	289	275	264	254	254	255	263	268	274	273	265	251	226	200	178	163	160	5955	248	6125	245
20	171	187	215	242	267	284	290	289	278	267	258	255	255	266	277	284	284	279	271	249	218	189	167	154	5897	246	6055	242
21	158	174	200	227	260	283	300	304	302	292	281	273	273	277	285	296	302	301	292	273	242	211	180	158	6146	256	6298	252
22	152	157	178	205	233	262	283	293	295	291	283	271	266	267	277	286	294	295	295	280	255	225	192	163	6000	250	6148	246
23	148	143	155	177	205	234	260	279	287	287	282	275	269	266	273	283	293	301	306	296	283	257	225	195	5979	249	6154	246
24	175	163	163	177	201	233	258	281	298	303	302	302	294	292	292	299	311	320	325	325	313	296	269	238	6427	268	6642	266
25	215	192	180	183	196	212	232	251	264	273	271	273	265	261	253	250	260	267	275	282	274	267	250	225	5873	245	6078	243
26	205	186	172	162	169	177	194	212	226	240	244	250	247	241	238	238	237	239	250	260	263	262	255	244	5410	225	5640	226
27	230	218	203	191	191	198	205	218	234	243	255	261	263	260	255	251	244	247	251	256	259	263	265	259	5719	238	5970	239
28	250	245	238	230	221	217	219	223	233	239	245	253	253	250	249	242	230	224	225	220	226	230	234	241	5639	235	5886	235
29	247	244	244	244	236	232	226	223	230	237	239	244	249	249	245	240	230	219	211	207	202	207	214	221	5541	231	5779	231
30	238	245	254	258	258	255	251	244	246	245	251	257	264	268	267	266	256	243	229	219	211	204	209	219	5857	244	6091	244
1	234																											

MONTHLY MEAN 246.0 cm

STATION : SYOWA STATION
LATITUDE : 69°00'28"S
LONGITUDE : 39°34'13"E
DURATION : JULY 1, - JULY 31, 2001
UNIT : CENTIMETRE

Date	Time 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	(24H) SUM	(24H) MEAN	(25H) SUM	(25H) MEAN
1	234	250	268	277	285	286	280	275	268	264	265	272	275	279	284	284	276	264	248	232	215	204	203	206	6195	258	6419	257
2	224	238	261	279	295	300	298	294	284	276	278	276	280	285	288	289	282	270	255	235	210	192	181	181	6252	261	6443	258
3	191	210	232	257	279	290	291	289	279	270	262	260	265	272	279	285	283	280	266	248	223	199	181	176	6069	253	6251	250
4	181	196	220	245	268	290	297	298	291	282	273	270	269	274	284	294	297	292	284	266	239	211	187	174	6184	258	6357	254
5	173	184	204	233	259	282	296	300	299	288	278	273	270	273	284	295	301	303	301	287	260	233	206	184	6268	261	6446	258
6	179	182	200	225	250	277	297	308	306	300	293	283	279	280	289	303	313	319	317	308	289	262	234	212	6505	271	6700	268
7	195	193	202	224	246	275	296	310	313	307	300	290	281	277	281	293	305	311	317	310	290	268	239	211	6532	272	6724	269
8	192	183	184	200	222	247	269	283	289	288	281	275	265	260	259	270	286	291	298	299	285	269	243	218	6154	256	6352	254
9	198	185	185	194	210	234	251	269	282	282	278	271	263	261	255	256	272	281	292	298	290	277	256	237	6078	253	6294	252
10	216	202	195	199	209	228	247	265	274	278	280	275	264	259	249	250	260	265	278	284	281	275	258	241	6032	251	6257	250
11	225	208	196	197	203	214	229	245	259	265	267	262	253	248	238	239	240	249	257	264	267	265	257	247	5796	241	6031	241
12	235	223	218	211	215	224	233	249	260	264	272	267	264	252	242	239	239	240	249	259	262	262	263	255	5898	246	6145	246
13	247	240	233	230	228	235	240	251	260	264	272	274	266	261	255	248	243	238	242	247	250	257	259	260	6001	250	6259	250
14	259	256	254	250	247	249	253	256	259	263	267	269	269	260	252	248	237	228	227	225	227	232	233	240	5960	248	6204	248
15	245	250	253	254	258	253	253	254	255	254	256	258	260	254	250	241	231	220	210	207	201	205	212	217	5750	240	5978	239
16	227	240	248	258	263	266	264	262	258	257	258	263	263	264	260	253	243	231	214	202	194	189	187	197	5759	240	5971	239
17	211	225	245	261	270	276	275	269	263	260	257	260	261	264	268	261	252	241	223	208	191	176	175	176	5771	240	5961	238
18	190	211	233	255	277	288	291	287	280	272	268	266	264	271	274	277	270	257	244	222	196	178	163	162	5898	246	6072	243
19	174	192	217	245	272	291	300	300	292	283	272	269	267	273	279	284	284	276	262	235	209	180	154	145	5955	248	6102	244
20	147	161	187	216	247	271	287	292	292	281	271	263	258	263	271	277	284	283	272	251	220	189	157	135	5774	241	5903	236
21	129	132	152	184	213	243	267	280	280	276	267	258	253	255	264	276	286	292	290	279	251	224	188	159	5699	237	5843	234
22	144	139	149	175	206	235	260	278	286	282	273	268	258	253	262	278	293	301	309	306	292	267	235	205	5954	248	6133	245
23	179	164	165	183	207	235	258	279	293	294	289	283	266	258	258	267	279	294	306	312	305	287	260	229	6149	256	6353	254
24	203	181	174	177	194	217	240	261	271	277	272	265	254	243	239	244	258	271	287	299	302	295	280	259	5961	248	6199	248
25	237	216	204	202	209	223	244	262	275	280	281	274	261	249	238	236	240	251	264	277	285	286	285	270	6052	252	6309	252
26	257	239	227	218	221	229	240	250	263	272	271	265	257	243	232	221	219	222	230	245	253	257	261	261	5855	244	6111	244
27	256	248	240	232	229	234	238	247	254	259	262	260	251	240	231	221	207	208	210	214	223	231	232	245	5671	236	5917	237
28	247	248	248	244	244	247	247	253	260	267	271	270	268	261	255	245	235	223	220	220	221	227	234	238	5892	246	6145	246
29	253	259	264	268	270	269	269	268	267	270	271	271	270	265	258	249	239	226	214	205	199	197	200	207	5929	247	6151	246
30	222	236	246	261	272	274	273	271	272	267	270	268	272	270	272	269	256	246	232	224	206	196	202	206	5986	249	6206	248
31	220	233	257	275	291	300	302	298	294	286	282	286	287	290	292	292	289	278	265	249	230	215	206	206	6424	268	6642	266
1	218																											

MONTHLY MEAN 250.5 cm

STATION : SYOWA STATION
LATITUDE : 69°00' 28"S
LONGITUDE : 39°34' 13"E
DURATION : AUG . 1, – AUG . 31 , 2001
UNIT : CENTIMETRE

Date	Time 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	(24H) SUM	(24H) MEAN	(25H) SUM	(25H) MEAN
1	218	230	254	279	294	309	314	311	304	292	289	284	284	290	296	296	295	291	277	260	236	213	200	190	6504	271	6701	268
2	196	212	234	261	284	300	310	310	308	297	287	284	282	290	297	304	308	307	296	279	255	231	207	195	6533	272	6728	269
3	194	206	227	250	278	297	311	314	308	296	286	279	275	278	288	297	308	310	304	291	265	240	211	194	6508	271	6696	268
4	188	194	212	236	265	291	307	315	307	301	287	279	275	276	286	302	314	320	318	310	286	260	232	207	6569	274	6765	271
5	197	195	209	233	257	279	299	309	308	302	286	272	263	262	270	281	297	306	309	307	289	260	230	207	6426	268	6613	265
6	187	182	190	209	233	258	275	286	293	282	269	255	243	240	242	255	272	286	292	293	284	260	235	209	6032	251	6223	249
7	191	181	178	196	217	241	257	274	276	272	260	249	231	227	228	239	252	270	282	288	284	267	247	223	5832	243	6037	241
8	205	191	190	197	213	238	255	268	275	275	265	248	237	227	222	227	241	258	271	282	279	273	254	235	5827	243	6044	242
9	217	202	198	204	214	229	248	262	269	270	264	250	236	225	221	222	231	242	258	272	275	274	266	247	5798	242	6032	241
10	234	225	218	216	226	237	252	264	271	275	270	259	247	232	224	225	225	237	253	266	276	282	279	274	5965	249	6230	249
11	265	261	256	257	259	269	279	287	290	294	290	280	264	251	240	231	231	233	242	251	258	262	260	262	6273	261	6531	261
12	258	254	253	252	253	256	261	268	270	271	270	264	252	242	232	221	214	210	215	220	227	230	238	245	5878	245	6123	245
13	246	249	253	259	258	262	268	269	269	271	269	265	259	248	241	228	219	212	207	207	210	211	218	228	5825	243	6061	242
14	236	248	261	274	275	280	286	285	283	285	286	283	280	274	267	259	248	238	224	215	207	204	206	218	6122	255	6356	254
15	234	247	267	282	291	299	299	296	291	285	280	276	272	275	266	263	253	239	221	205	191	182	179	183	6076	253	6273	251
16	197	215	243	265	280	297	303	295	287	282	277	273	271	275	278	279	272	260	240	218	198	172	161	160	5997	250	6168	247
17	171	189	214	243	266	284	295	294	288	278	267	259	260	265	270	274	278	269	250	231	202	170	150	136	5805	242	5943	238
18	138	156	181	212	240	267	281	282	277	269	253	244	244	249	259	276	280	285	277	257	231	192	165	142	5657	236	5790	232
19	133	143	165	195	226	255	275	284	282	271	259	244	239	244	258	277	291	306	303	294	269	233	200	174	5819	242	5974	239
20	155	153	166	192	221	248	273	281	277	269	252	237	225	224	234	252	270	289	298	298	285	255	225	192	5771	240	5940	238
21	168	159	164	184	212	242	261	274	281	276	261	242	229	224	227	244	271	292	307	317	314	302	274	249	5974	249	6200	248
22	226	206	206	212	230	258	276	288	298	289	274	258	232	221	214	222	241	266	282	302	305	295	282	264	6147	256	6384	255
23	237	218	213	214	228	243	261	276	276	278	263	245	227	216	201	202	214	233	252	270	282	282	282	272	5886	245	6146	246
24	260	247	240	237	246	259	273	286	290	289	281	264	249	234	219	212	212	224	240	254	266	272	273	271	6100	254	6363	255
25	263	259	254	250	253	261	269	278	279	280	275	262	246	231	218	206	202	204	209	218	230	237	247	247	5878	245	6129	245
26	252	251	256	257	257	261	267	272	273	273	272	266	253	242	230	219	213	208	206	208	213	218	224	234	5826	243	6067	243
27	241	248	257	266	269	275	277	279	279	277	276	272	265	261	254	246	238	229	219	219	212	209	211	221	6000	250	6232	249
28	232	244	258	271	282	285	286	285	277	274	272	268	263	261	256	250	248	237	222	214	201	192	190	194	5961	248	6166	247
29	205	220	238	255	271	279	276	274	267	261	256	255	252	254	255	262	257	248	237	221	203	188	181	186	5804	242	5996	240
30	193	207	233	256	270	286	291	284	276	269	260	260	259	260	265	275	278	270	257	242	218	199	183	181	5971	249	6154	246
31	183	201	226	247	268	283	290	287	275	263	257	247	248	258	267	276	286	283	274	258	232	208	185	173	5975	249	6149	246
1	174																											

MONTHLY MEAN 251.0 cm

STATION : SYOWA STATION
LATITUDE : 69°00'28"S
LONGITUDE : 39°34'13"E
DURATION : SEP. 1, - SEP. 30, 2001
UNIT : CENTIMETRE

Date	Time 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	(24H) SUM	(24H) MEAN	(25H) SUM	(25H) MEAN
1	174	194	210	236	258	277	288	282	275	259	249	238	236	245	260	272	284	287	280	266	243	215	191	177	5896	246	6069	243
2	172	182	203	232	252	272	287	284	274	261	245	233	229	234	255	273	285	295	293	282	264	237	210	190	5946	248	6130	245
3	184	189	206	231	258	279	292	297	285	273	255	240	235	239	254	272	294	306	308	305	289	257	230	207	6187	258	6380	255
4	193	194	205	224	250	269	284	286	277	260	242	225	213	209	221	241	262	282	290	288	278	256	228	206	5883	245	6074	243
5	191	183	190	210	231	255	269	272	266	255	235	217	200	193	202	222	244	261	275	283	279	262	238	218	5652	236	5855	234
6	202	192	196	210	232	252	265	278	269	260	243	222	209	197	206	215	239	260	276	294	289	281	263	249	5797	242	6031	241
7	234	219	221	230	247	264	278	282	285	273	255	234	216	202	198	210	226	247	264	279	287	281	273	257	5962	248	6208	248
8	246	240	238	244	255	271	287	292	293	284	270	248	229	220	209	210	220	236	253	270	278	278	272	265	6107	254	6364	255
9	257	249	247	248	258	269	279	284	284	280	266	245	225	212	202	197	199	211	223	232	246	250	249	247	5861	244	6107	244
10	246	248	247	249	256	265	274	278	275	272	264	250	232	220	211	202	202	205	212	222	228	234	241	243	5776	241	6024	241
11	248	254	263	266	274	278	284	287	283	281	268	260	247	235	228	215	207	205	205	208	209	210	217	228	5858	244	6096	244
12	238	251	264	271	279	281	285	282	278	272	267	257	254	243	240	229	216	210	201	193	185	187	189	198	5768	240	5981	239
13	212	231	251	268	281	287	290	284	276	269	264	257	259	256	251	250	239	227	213	197	183	172	173	176	5767	240	5960	238
14	194	215	236	260	282	289	293	287	279	268	261	257	256	260	266	268	265	255	235	212	191	171	156	155	5811	242	5978	239
15	167	191	215	243	269	283	287	282	270	256	247	242	244	253	266	278	281	278	264	242	216	186	166	156	5782	241	5943	238
16	160	178	204	232	260	278	285	284	268	253	238	227	228	240	257	277	291	296	287	269	238	205	175	156	5787	241	5939	238
17	151	163	184	213	241	262	271	274	257	237	219	207	200	210	233	259	279	297	299	290	267	236	206	182	5638	235	5808	232
18	170	173	195	221	254	270	288	288	277	257	234	217	206	209	229	256	287	313	328	328	321	290	261	236	6113	255	6331	253
19	219	212	224	249	275	294	313	312	300	280	254	228	212	209	218	240	269	295	313	326	321	302	276	253	6391	266	6623	265
20	232	222	220	234	254	274	287	290	281	265	238	214	192	182	184	201	223	251	273	291	297	292	275	258	5930	247	6170	247
21	239	228	229	237	255	272	284	290	284	273	249	225	202	185	177	184	203	228	249	269	280	279	274	265	5861	244	6114	245
22	253	247	244	247	259	276	285	288	290	280	263	238	215	201	189	186	195	212	227	243	258	263	264	261	5885	245	6145	246
23	260	258	257	260	270	280	289	296	293	289	276	258	241	225	217	209	208	214	226	238	245	252	254	260	6075	253	6334	253
24	259	263	267	271	276	282	285	291	288	281	273	258	245	236	224	217	210	211	211	215	218	223	229	240	5973	249	6215	249
25	243	252	262	267	274	279	281	279	273	269	266	259	246	241	235	229	221	215	212	206	206	205	210	220	5852	244	6082	243
26	229	241	258	269	275	280	284	277	273	263	261	253	250	247	247	244	239	231	221	210	203	198	195	203	5850	244	6069	243
27	218	234	249	266	282	289	284	281	276	266	261	257	259	261	264	266	265	256	244	229	215	206	196	200	6026	251	6236	249
28	210	226	248	267	282	288	287	280	268	260	253	252	254	263	273	285	289	286	276	258	238	224	215	214	6197	258	6421	257
29	224	242	263	283	302	309	306	296	281	267	255	251	255	261	276	288	295	295	285	267	245	222	206	201	6375	266	6581	263
30	206	222	244	268	288	297	294	287	273	256	240	236	240	253	269	287	298	302	297	281	255	231	212	201	6236	260	6437	257
1	201																											

MONTHLY MEAN 247.6 cm

STATION : SYOWA STATION
LATITUDE : 69°00′28″S
LONGITUDE : 39°34′13″E
DURATION : OCT. 1, – OCT. 31, 2001
UNIT : CENTIMETRE

Date	Time 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	(24H) SUM	(24H) MEAN	(25H) SUM	(25H) MEAN
1	201	214	237	263	283	295	298	287	270	252	235	226	228	240	259	283	295	305	305	292	267	243	220	205	6204	259	6405	256
2	200	212	231	253	274	285	293	284	262	242	224	207	204	215	237	262	286	304	306	303	286	263	242	221	6095	254	6306	252
3	212	221	239	258	280	296	300	295	277	254	230	210	202	206	227	250	276	298	307	305	290	270	247	226	6175	257	6390	256
4	215	215	226	246	267	283	287	281	266	241	213	193	179	176	193	217	244	266	283	285	279	262	240	219	5778	241	5986	239
5	208	203	211	228	247	261	269	266	254	232	205	179	167	163	169	192	221	244	265	277	277	270	254	240	5505	229	5732	229
6	227	222	229	241	258	275	281	280	268	250	223	201	181	171	175	191	210	236	258	273	278	278	268	256	5730	239	5978	239
7	248	243	244	254	267	282	286	288	278	265	240	213	195	182	174	183	196	216	236	252	261	262	259	256	5783	241	6034	241
8	252	247	249	254	267	275	284	283	277	266	247	225	203	189	180	181	188	199	216	232	242	247	251	252	5706	238	5957	238
9	251	253	258	264	272	279	285	283	279	269	255	237	223	208	200	193	194	199	208	217	227	235	242	251	5782	241	6037	241
10	255	263	274	280	286	293	295	291	289	282	270	261	248	231	224	216	209	205	204	208	211	215	221	236	5967	249	6212	248
11	245	257	271	282	292	293	293	289	285	278	271	264	257	252	247	243	232	225	215	207	203	202	207	218	6030	251	6263	251
12	233	250	269	284	292	294	291	283	275	270	261	260	261	263	265	265	257	243	232	216	204	194	196	203	6060	252	6279	251
13	219	241	266	282	298	302	295	283	272	261	251	253	260	268	277	285	284	275	256	235	215	196	189	191	6154	256	6360	254
14	206	225	248	271	287	293	289	275	260	243	232	230	240	253	269	287	293	290	279	256	230	207	189	184	6037	252	6230	249
15	193	212	236	258	277	287	281	267	246	224	209	203	210	227	251	276	294	300	295	275	248	218	196	183	5864	244	6049	242
16	184	198	220	243	265	276	271	258	234	210	188	174	175	192	220	250	276	293	299	290	268	239	214	198	5635	235	5828	233
17	193	201	222	243	263	278	279	266	243	216	189	170	165	176	202	234	264	290	304	308	294	271	248	229	5748	240	5965	239
18	217	219	233	253	275	288	291	281	260	231	203	178	162	164	183	213	245	274	298	308	304	290	269	252	5890	245	6130	245
19	239	235	245	262	281	294	298	294	278	246	219	191	168	161	172	194	221	248	272	287	291	283	271	258	5907	246	6154	246
20	247	238	242	255	274	285	290	287	277	255	227	200	174	162	163	175	195	219	243	260	274	274	267	260	5744	239	5999	240
21	255	250	252	258	272	285	292	289	281	269	244	219	197	181	172	175	189	202	219	235	246	254	257	255	5748	240	6003	240
22	255	256	256	262	271	280	287	287	280	271	257	234	219	206	194	195	199	210	223	238	248	257	263	267	5916	247	6186	247
23	270	275	280	283	288	296	298	297	291	284	272	256	240	230	220	213	210	208	212	217	222	228	233	240	6064	253	6311	252
24	248	252	260	265	269	271	272	269	265	260	253	244	234	226	224	218	213	209	207	208	207	210	217	227	5728	239	5963	239
25	235	246	259	267	271	273	273	269	262	256	252	247	243	243	244	241	237	230	223	217	213	211	216	225	5854	244	6092	244
26	238	250	263	277	280	280	277	268	260	255	250	246	248	253	256	258	257	248	236	227	215	208	204	210	5963	248	6186	247
27	223	239	254	266	271	274	265	252	241	231	224	226	230	240	249	257	259	254	243	231	214	202	202	205	5754	240	5969	239
28	215	234	253	265	274	276	268	253	238	225	218	218	225	239	255	265	275	273	262	246	228	210	198	203	5816	242	6027	241
29	211	226	246	262	268	271	263	243	223	207	197	193	202	219	238	257	270	272	263	249	227	206	192	188	5593	233	5787	231
30	195	207	225	242	252	257	249	229	207	186	169	165	171	189	212	238	254	264	261	249	228	206	191	179	5223	218	5404	216
31	182	196	214	230	245	252	245	226	204	179	160	150	154	172	197	226	249	264	271	262	246	229	212	198	5163	215	5360	214
1	197																											

MONTHLY MEAN 242.8 cm

STATION : SYOWA STATION
LATITUDE : 69°00'28"S
LONGITUDE : 39°34'13"E
DURATION : NOV. 1, – NOV. 30, 2001
UNIT : CENTIMETRE

Date	Time 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	(24H) SUN	(24H) MEAN	(25H) SUN	(25H) MEAN
1	197	209	225	244	260	266	265	247	221	197	172	158	155	169	196	226	254	274	286	288	274	256	239	225	5501	229	5719	229
2	218	224	237	255	272	281	279	266	242	212	184	165	156	163	185	216	246	268	284	291	284	267	255	240	5689	237	5918	237
3	229	230	243	257	271	282	282	268	249	219	188	165	150	154	168	192	221	247	267	282	283	274	263	255	5639	235	5884	235
4	245	243	251	265	279	289	290	282	265	239	209	184	163	156	162	182	205	231	254	273	278	278	274	268	5763	240	6025	241
5	262	260	263	276	290	300	303	298	287	265	237	213	192	178	178	188	207	227	247	264	276	281	279	277	6047	252	6323	253
6	276	275	275	282	294	302	302	301	292	275	253	229	207	193	181	183	191	203	222	237	245	258	266	263	6005	250	6273	251
7	268	273	273	277	287	295	298	295	290	280	265	248	227	215	202	196	199	203	210	223	235	244	257	265	6024	251	6295	252
8	271	280	284	288	290	295	294	291	289	281	273	263	250	238	226	220	212	208	208	213	214	223	233	242	6088	254	6343	254
9	254	265	273	278	281	282	278	274	269	262	257	254	252	248	244	237	230	218	212	206	205	209	216	229	5934	247	6177	247
10	243	259	272	279	283	282	275	266	259	253	251	254	257	263	268	267	261	251	238	224	214	209	212	223	6065	253	6303	252
11	238	255	271	281	285	282	269	254	240	230	226	230	239	254	267	275	276	269	252	235	218	205	202	205	5960	248	6181	247
12	221	239	257	271	277	274	260	240	225	210	200	206	218	237	261	278	290	288	276	257	236	218	207	210	5858	244	6078	243
13	220	235	253	268	275	276	262	241	218	197	183	184	197	220	248	275	297	303	299	284	262	242	227	220	5888	245	6114	245
14	226	239	257	272	281	281	269	246	219	190	170	160	168	191	219	250	279	293	302	295	277	259	242	229	5814	242	6046	242
15	232	242	258	273	284	288	278	256	227	195	169	152	149	165	193	225	256	280	296	297	285	271	254	239	5764	240	5999	240
16	235	242	256	273	282	291	285	268	244	212	183	159	150	159	181	211	245	273	294	306	305	296	285	271	5908	246	6175	247
17	267	269	280	294	309	319	316	307	285	254	224	195	177	175	188	210	239	264	287	301	305	300	291	281	6339	264	6612	264
18	272	269	274	286	297	308	307	299	285	257	226	201	178	169	170	185	206	230	251	269	279	279	276	270	6042	252	6308	252
19	266	260	262	271	283	292	295	293	280	262	237	212	190	174	171	177	193	212	230	248	260	266	267	265	5867	244	6133	245
20	266	265	262	268	277	287	290	288	283	269	250	229	209	197	186	188	195	206	222	237	247	256	260	261	5898	246	6160	246
21	262	263	262	265	269	275	276	277	272	262	249	236	218	207	198	195	194	201	211	220	230	238	247	250	5777	241	6033	241
22	256	260	263	263	266	271	272	271	269	263	256	248	237	230	224	221	219	220	221	227	234	242	249	259	5943	248	6208	248
23	266	271	277	279	279	280	275	273	271	267	262	257	252	250	245	244	240	235	231	230	231	233	238	247	6136	256	6389	256
24	253	259	268	267	265	262	255	247	242	237	235	235	235	239	243	243	241	235	229	223	220	221	224	235	5812	242	6057	242
25	245	254	263	268	268	263	255	244	235	231	231	233	239	251	259	264	268	262	252	242	238	234	231	239	5970	249	6220	249
26	250	262	272	279	278	273	261	246	234	224	222	228	237	250	266	277	283	282	274	263	252	243	240	244	6140	256	6394	256
27	254	267	278	286	286	281	265	245	229	214	207	210	222	239	260	277	287	288	281	269	253	239	233	232	6102	254	6341	254
28	239	251	263	271	272	269	251	229	209	189	179	180	190	213	236	258	277	286	284	275	260	247	238	235	5799	242	6041	242
29	243	255	271	282	291	290	276	257	236	213	199	199	206	229	255	283	306	319	323	317	302	285	272	263	6374	266	6639	266
30	265	270	281	292	296	295	281	257	229	200	177	163	162	179	206	234	263	284	296	295	286	272	260	251	5994	250	6241	250
1	247																											

MONTHLY MEAN 247.4 cm

STATION : SYOWA STATION
LATITUDE : 69°00'28"S
LONGITUDE : 39°34'13"E
DURATION : DEC. 1, - DEC. 31, 2001
UNIT : CENTIMETRE

Date	Time 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	(24H) SUN	(24H) MEAN	(25H) SUN	(25H) MEAN
1	247	255	269	280	289	292	281	260	232	201	177	157	151	163	185	214	247	274	292	301	298	289	280	270	5906	246	6172	247
2	266	270	279	290	302	306	298	284	259	229	197	171	158	158	175	203	231	258	282	297	300	296	288	280	6078	253	6351	254
3	274	273	280	291	301	309	307	297	278	247	217	189	169	161	166	184	210	237	259	278	289	292	288	282	6079	253	6359	254
4	280	278	279	290	301	310	310	305	291	269	239	213	191	176	172	183	201	223	249	268	283	292	294	293	6190	258	6484	259
5	294	290	292	297	308	317	318	318	312	296	274	250	226	210	198	197	205	219	233	250	263	272	277	277	6391	266	6668	267
6	277	275	272	271	277	283	284	287	281	273	260	241	225	210	196	189	189	192	203	216	227	240	250	253	5871	245	6129	245
7	258	260	258	257	256	258	260	262	259	257	253	245	234	227	216	210	206	204	206	215	224	235	245	254	5757	240	6021	241
8	264	269	272	268	264	264	257	258	259	257	257	259	255	255	252	247	239	231	227	226	227	233	242	250	6032	251	6293	252
9	261	266	270	268	265	259	249	244	241	238	243	250	257	265	267	271	265	254	245	237	232	235	242	248	6072	253	6331	253
10	259	270	274	275	272	262	249	237	226	221	227	232	248	265	277	288	290	284	273	261	252	245	245	249	6183	258	6442	258
11	258	268	275	278	273	261	243	223	205	192	190	195	211	234	255	272	283	285	277	264	253	241	236	239	5914	246	6159	246
12	246	255	265	270	267	258	241	218	193	176	167	170	183	205	233	259	279	288	288	279	266	254	246	242	5747	239	5995	240
13	247	259	270	276	277	271	253	228	202	177	159	153	163	185	213	243	271	288	296	293	282	268	257	250	5780	241	6033	241
14	253	263	274	281	286	284	270	247	218	188	164	151	153	167	194	224	254	278	292	295	287	278	266	259	5828	243	######	######
15	255	262	275	285	291	295	286	267	240	207	176	156	148	156	177	204	236	261	280	289	290	282	272	263	5853	244	6112	244
16	258	260	273	285	295	301	297	281	258	226	196	171	155	155	168	192	221	249	271	289	296	291	284	277	5948	248	6220	249
17	271	269	278	290	304	312	313	304	288	262	232	204	186	178	181	199	222	247	268	285	296	295	289	284	6258	261	6535	261
18	277	273	276	285	298	309	312	308	297	277	249	224	203	189	186	195	212	232	252	269	282	286	283	280	6257	261	6530	261
19	274	268	265	270	281	292	296	297	291	276	255	232	212	198	189	191	205	220	237	254	265	272	274	271	6087	254	6354	254
20	267	263	260	262	267	277	282	287	286	277	262	246	229	217	209	207	212	222	236	252	265	275	280	279	6119	255	6396	256
21	277	275	273	271	272	277	279	280	281	276	267	256	243	233	223	218	218	224	233	246	255	261	268	270	6175	257	6444	258
22	269	265	262	259	257	258	260	261	265	266	260	253	247	241	236	233	231	231	236	240	246	254	257	263	6051	252	6313	253
23	265	265	265	259	256	256	253	253	256	255	254	251	253	252	249	250	247	245	244	244	247	251	255	260	6084	254	6347	254
24	262	260	260	259	253	244	236	232	229	226	227	228	235	239	242	247	247	244	239	236	234	235	238	243	5796	241	6041	242
25	246	249	249	247	243	232	221	212	207	202	204	211	222	233	245	257	260	260	256	251	247	244	243	248	5690	237	5942	238
26	252	259	262	260	255	245	229	216	204	196	195	202	215	232	251	266	279	282	278	273	263	257	254	256	5880	245	6138	246
27	258	267	273	274	271	261	244	223	204	191	182	188	201	217	239	262	278	287	288	283	273	264	257	255	5938	247	6196	248
28	259	262	268	272	268	259	242	218	194	173	158	155	164	184	207	236	258	274	281	279	270	261	252	246	5640	235	5889	236
29	249	254	260	269	272	263	249	226	203	172	151	143	147	165	193	222	252	277	289	294	288	279	268	261	5646	235	5905	236
30	259	264	273	280	285	284	270	248	222	187	157	139	132	144	167	196	225	254	274	281	282	276	267	257	5623	234	5878	235
31	255	256	262	276	283	285	278	264	236	204	173	147	132	136	153	179	210	241	266	283	288	286	280	273	5647	235	5886	235
1	239																											

MONTHLY MEAN 248.0 cm

STATION : SYOWA STATION
LATITUDE : 69°00'28"S
LONGITUDE : 39°34'13"E
DURATION : JAN. 1, - JAN. 31, 2002
UNIT : CENTIMETER

Date	Time 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	(24H) SUN	(24H) MEAN	(25H) SUN	(25H) MEAN
1	266	266	271	284	296	302	300	290	270	240	208	178	154	149	155	171	198	226	253	274	282	284	281	274	5872	245	6140	246
2	268	261	262	274	285	294	298	293	282	260	227	196	171	154	147	157	177	199	223	244	258	264	261	257	5712	238	5964	239
3	252	243	242	248	260	270	278	282	278	264	243	216	192	174	161	164	174	190	211	232	249	260	260	258	5602	233	5857	234
4	255	249	242	244	250	260	269	275	279	274	263	245	226	211	197	190	193	202	215	232	245	253	257	258	5782	241	6035	241
5	254	246	239	234	234	240	246	250	258	260	259	251	239	231	221	212	209	209	218	228	239	247	251	256	5728	239	5981	239
6	253	246	239	231	226	222	223	227	233	240	240	243	243	241	236	231	229	223	223	227	233	239	241	246	5636	235	5882	235
7	246	240	235	227	218	208	204	202	205	208	215	222	232	238	239	245	248	242	237	237	239	244	246	249	5526	230	5779	231
8	253	253	248	242	232	220	209	197	194	194	198	205	218	235	247	257	263	263	258	254	252	249	246	251	5638	235	5894	236
9	256	256	257	251	244	232	213	197	185	178	177	187	196	218	240	256	270	276	273	269	265	257	255	257	5666	236	5927	237
10	261	265	267	269	264	250	233	211	192	176	167	170	181	200	224	249	268	280	284	279	272	264	256	252	5733	239	5989	240
11	256	262	266	271	270	260	244	221	197	173	156	153	159	177	203	232	259	277	285	288	282	272	263	260	5686	237	5947	238
12	261	270	277	285	288	286	272	248	221	194	169	154	153	166	191	217	246	268	283	287	282	270	260	250	5798	242	6047	242
13	249	254	266	274	281	284	276	254	231	201	174	153	147	154	171	200	230	255	273	286	284	276	264	256	5693	237	5943	238
14	250	250	260	272	282	290	288	273	251	224	192	167	152	151	164	189	218	244	266	280	282	275	265	254	5741	239	5986	239
15	246	243	252	266	278	290	291	280	264	240	209	182	159	152	159	177	200	225	247	264	270	267	259	249	5668	236	5906	236
16	237	232	237	249	265	279	287	283	272	254	227	202	178	166	168	180	205	226	249	266	276	274	269	258	5739	239	5988	240
17	249	242	239	249	263	278	287	287	284	269	247	223	200	186	181	188	203	223	243	260	270	274	268	257	5868	245	6118	245
18	250	241	236	238	250	266	277	280	283	272	256	237	217	201	195	197	209	224	241	257	267	273	267	257	5890	245	6140	246
19	250	242	235	234	240	252	263	271	273	270	262	247	229	217	211	207	214	225	237	251	260	265	262	257	5874	245	6122	245
20	248	239	232	227	230	239	245	254	260	261	256	247	237	230	222	224	224	229	239	250	256	262	261	256	5828	243	6077	243
21	249	241	233	226	221	225	230	235	239	243	243	241	238	236	233	234	235	239	244	251	258	261	262	261	5776	241	6033	241
22	256	249	241	233	227	226	226	228	233	235	239	244	247	250	252	256	259	258	261	265	268	267	267	265	5953	248	6214	249
23	262	256	250	242	235	227	221	218	217	219	223	228	234	244	255	262	266	269	271	268	267	268	264	263	5929	247	6191	248
24	263	259	255	249	242	231	220	210	202	200	203	207	221	235	250	265	277	284	284	282	277	274	271	268	5928	247	6197	248
25	269	272	268	264	259	245	229	214	199	192	189	192	204	223	246	266	285	297	301	298	292	285	280	275	6044	252	6320	253
26	276	279	280	278	274	265	246	223	202	186	172	172	182	198	225	252	275	292	300	301	293	283	275	272	6000	250	6270	251
27	270	275	278	282	281	276	261	235	210	185	165	156	160	175	201	231	262	285	298	302	299	289	276	268	5919	247	6187	247
28	268	269	277	286	291	289	277	256	228	197	167	147	145	155	176	205	238	266	285	294	294	286	273	263	5836	243	6094	244
29	258	262	271	282	296	301	295	279	252	219	186	159	143	144	162	188	219	252	275	290	296	290	276	265	5862	244	6119	245
30	258	256	265	280	294	309	313	303	283	253	219	187	160	153	159	178	207	235	260	277	285	283	270	258	5944	248	######	######
31	249	242	246	259	277	296	308	308	297	278	248	215	187	169	166	177	200	225	247	268	278	277	267	255	5939	247	6181	247
1	242																											

MONTHLY MEAN 241.7 cm

Table 7. Harmonic constants at Syowa Station.

SYOWA STATION NISI-NO-URA

(1) POSITION

LAT	69 00 28S
LONG	39 34 13E

(2) EPOCH & DURATION OF ANALYSIS

EPOCH	2001 2 1
CENTRAL DATE	2001 8 2
DURATION IN DAYS	365 DAYS
MISSING HOUR	0 HOURS
ERROR	0

(3) MEAN SEA LEVEL

SO	222.0 CM

(4) SPECIAL REMARKS

O-P MAX	35.3 CM
O-P S.D.	9.9 CM

	H(CM)	κ (DEG)		H(CM)	κ (DEG)
SA	5.56	51.03	M2	24.74	160.43
SSA	3.99	59.86	MKS2	0.14	191.88
MM	2.21	125.75	LAM2	0.27	153.69
MSF	0.72	149.19	L2	1.35	153.61
MF	2.81	209.12	T2	1.21	164.43
2Q1	0.80	319.59	S2	20.03	176.13
SIG1	1.01	328.29	R2	0.16	209.28
Q1	5.67	340.31	K2	5.81	175.14
RHO1	1.03	341.96	MSN2	0.13	358.05
O1	24.57	349.50	KJ2	0.26	33.44
MP1	0.33	350.28	2SM2	0.23	104.42
M1	1.52	344.37	MO3	0.09	197.42
CHI1	0.22	28.80	M3	0.23	264.36
PI1	0.49	357.20	SO3	0.05	331.37
P1	7.40	356.66	MK3	0.02	159.04
S1	0.11	110.18	SK3	0.40	329.80
K1	22.26	356.63	MN4	0.18	48.46
PSI1	0.27	332.27	M4	0.43	111.44
PHI1	0.16	349.77	SN4	0.05	178.23
THE1	0.16	344.92	MS4	0.15	178.00
J1	0.93	355.32	MK4	0.09	167.64
SO1	0.19	343.56	S4	0.04	197.17
OO1	0.56	321.30	SK4	0.07	165.69
OQ2	0.06	143.84	2MN6	0.05	60.47
MNS2	0.11	353.97	M6	0.12	93.70
2N2	0.32	118.95	MSN6	0.10	139.51
MU2	0.57	106.96	2MS6	0.33	180.87
N2	4.19	147.86	2MK6	0.09	187.55
NU2	0.81	162.14	2SM6	0.10	257.09
OP2	0.11	243.42	MSK6	0.09	253.86

Table 8. Hourly tidal observation at Yukidori Zawa, Langhovde from December 28, 2001 to February 3, 2002 (time is LMT (UT+3 hours)).

STATION : LANGHOVDE YUKIDORI ZAWA
LATITUDE : 69° 14′ 38″S
LONGITUDE : 39° 42′ 50″E
DURATION : DEC. 28, 2001 – FEB. 3, 2002
UNIT : CENTIMETER

Time is LMT (UT + 3 hours)

The zero level of the tide gauge relative to the bench mark No.
−5.922m Jan. 14, 2002

Year	Month	Day	Hour 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	SUM	MEAN
2001	12	28	——	——	——	——	——	——	——	——	——	——	——	——	313	343	361	384	401	413	422	422	420	415	406	402	4708	392
2001	12	29	406	406	406	411	410	401	385	366	348	327	307	299	303	316	327	342	363	382	396	407	409	402	400	395	8927	371
2001	12	30	397	398	401	398	396	390	380	364	342	317	295	282	275	282	300	315	337	362	378	387	386	385	381	374	8531	355
2001	12	31	370	372	370	374	385	384	383	374	358	333	305	281	267	264	275	290	312	336	360	375	377	379	380	374	8290	345
2002	1	1	373	369	371	377	382	387	389	380	370	348	322	297	275	265	263	273	292	319	345	366	375	377	376	371	8274	344
2002	1	2	369	365	362	367	374	379	386	382	372	355	331	308	286	266	255	258	272	290	313	332	348	355	353	351	8039	334
2002	1	3	348	340	335	337	344	351	358	363	360	353	339	318	300	283	266	261	259	270	285	306	324	340	349	350	7749	322
2002	1	4	350	349	345	340	338	340	346	351	357	355	346	335	321	308	301	296	292	294	303	316	326	337	343	347	7945	331
2002	1	5	347	343	338	332	328	330	332	332	336	340	338	334	328	321	310	301	294	289	293	298	307	320	325	330	7758	323
2002	1	6	334	330	321	312	307	301	301	301	306	313	314	316	317	315	314	310	302	295	295	293	296	305	310	315	7433	309
2002	1	7	320	321	319	314	306	296	286	279	277	279	287	293	303	311	316	323	324	320	319	316	316	316	320	322	7392	308
2002	1	8	327	329	329	324	315	304	294	285	274	268	270	276	286	302	313	322	329	331	328	324	326	324	320	320	7431	309
2002	1	9	324	325	324	322	315	308	293	279	265	252	245	247	250	267	286	306	323	337	337	336	332	325	322	322	7252	302
2002	1	10	322	324	328	330	328	317	307	285	264	244	229	225	230	239	259	284	305	321	330	330	326	321	314	308	7080	295
2002	1	11	304	304	309	318	319	315	301	281	256	235	217	206	203	209	228	260	295	320	333	341	338	335	329	327	6895	287
2002	1	12	326	326	325	332	343	346	333	315	296	271	249	227	209	210	226	251	285	312	332	340	338	335	325	318	7180	299
2002	1	13	317	319	321	326	332	336	334	318	297	272	241	213	197	197	206	228	255	277	300	318	322	318	313	309	6876	286
2002	1	14	303	294	296	309	325	332	330	318	307	282	248	224	202	195	199	213	237	264	294	316	324	321	313	307	6765	281
2002	1	15	304	302	307	314	321	335	340	333	324	306	280	253	226	208	203	253	292	311	318	321	321	311	309	299	7100	295
2002	1	16	297	302	312	322	329	337	340	333	324	300	279	258	231	218	223	240	274	299	307	307	308	306	303	298	7056	294
2002	1	17	294	291	299	311	318	323	321	318	316	299	276	264	254	237	228	232	256	277	294	292	294	299	287	282	6873	286
2002	1	18	277	282	289	296	306	321	323	323	314	304	288	278	273	270	263	264	279	296	304	306	304	308	298	298	7074	294
2002	1	19	296	298	303	308	315	322	325	315	308	299	282	269	269	274	272	272	274	284	293	303	303	310	302	300	7105	296
2002	1	20	292	294	292	294	297	301	301	304	301	296	291	275	253	244	234	227	227	244	256	273	273	277	280	279	6615	275
2002	1	21	272	272	272	272	276	281	281	276	266	261	252	230	237	240	235	230	233	235	245	253	263	260	263	268	6183	257
2002	1	22	266	249	240	236	239	242	245	241	234	225	213	192	176	174	167	153	156	154	178	197	209	218	230	251	5098	212
2002	1	23	253	245	235	227	227	224	226	238	243	240	235	233	221	233	237	237	239	242	241	241	246	248	246	246	5715	238
2002	1	24	248	248	246	244	241	241	244	247	249	249	250	255	258	258	258	253	244	235	232	230	225	233	233	233	5865	244
2002	1	25	235	238	235	235	231	216	204	197	210	224	225	220	223	220	209	204	205	215	227	227	213	201	196	205	5226	217
2002	1	26	215	224	227	226	226	221	211	190	177	175	150	148	150	150	157	149	159	180	195	209	202	192	177	177	4496	187
2002	1	27	182	191	201	205	208	205	193	169	155	162	152	147	145	148	145	155	143	162	174	194	203	196	182	181	4207	175
2002	1	28	186	190	202	217	224	226	212	186	152	125	127	129	131	143	162	157	149	139	163	194	199	198	184	167	4171	173
2002	1	29	167	175	187	199	214	227	225	208	180	144	128	126	135	136	162	172	175	173	195	224	239	231	224	213	4470	186
2002	1	30	199	190	199	224	250	277	291	288	269	238	197	192	190	190	202	209	217	225	237	256	268	272	263	251	5603	233
2002	1	31	243	246	248	255	272	289	308	310	301	279	243	226	197	178	159	156	187	221	226	245	262	271	259	247	5837	243
2002	2	1	239	232	237	246	258	275	285	290	288	274	252	219	200	188	189	196	213	218	209	226	248	250	248	243	5736	239
2002	2	2	232	220	220	222	239	247	255	262	274	272	262	238	218	218	239	242	253	258	248	250	253	248	244	235	5861	244
2002	2	3	232	225	224	229	240	259	261	256	253	251	——	——	——	——	——	——	——	——	——	——	——	——	——	——	2435	243

Table 9. Harmonic constants at Yukidori Zawa, Langhovde for 32 days.

STATION: Langhovde Yukidori Zawa

(1) POSITION
LATITUDE 69 14 38 S
LONGITUDE 39 42 50 E
TIME ZONE S = -3.0

(2) TIME AND DURATION OF ANALYSIS
EPOCH (LT) 2001 12 29 00:00
CENTRAL DATE AND TIME (LT) 2002 1 14 00:00
DURATION 32 DAYS

(3) MEAN SEA LEVEL
SO 285.0 CM

HARMONIC CONSTANTS

SYMBOLS	H (cm)	K (deg.)
MM	40.7	54.1
MSF	49.2	87.3
Q1	10.3	307.7
O1	15.6	349.2
M1	3.7	250.0
K1	20.7	16.4
J1	4.9	43.6
001	4.0	265.5
MU2	1.8	149.5
N2	7.9	148.9
M2	16.5	170.2
L2	6.4	110.0
2SM2	5.1	212.3
S2	16.1	187.9
M03	2.2	244.7
M3	2.3	193.8
MK3	0.6	334.4
MN4	0.6	268.9
M4	0.6	126.5
SN4	0.4	310.9
MS4	0.6	247.1
2MN6	0.3	212.2
M6	0.3	134.9
MSN6	0.3	99.7
2MS6	0.5	174.3
2SM6	0.2	233.8
K2	4.4	187.9
NU2	1.5	148.7
P1	6.8	16.4

Table 10. Harmonic analyses of tidal stream for 15 days near Syowa Station.

Depth = 16m

		M2	S2	K2	N2	K1	O1	P1	Q1	M4	MS4	CONSTANT
North	V (cm/s)	0.64	0.62	0.17	0.58	0.21	0.56	0.07	0.50	0.20	0.12	0.95
Comp.	K (deg.)	111.9	193.2	193.2	255.8	119.2	73.4	119.2	327.3	258.7	314.4	
East	V (cm/s)	0.36	0.66	0.18	0.15	0.31	0.60	0.10	0.37	0.14	0.44	0.54
Comp.	K (deg.)	108.3	190.5	190.5	154.9	241.5	100.7	241.5	351.1	359.3	59.3	
Main Dir.	V (cm/s)	0.67	0.90	0.24	0.35	0.21	0.80	0.07	0.58	0.15	0.34	1.01
52.6°	K (deg.)	110.4	191.6	191.6	236.6	210.4	89.4	210.4	339.0	306.5	47.4	

Depth = 20m

		M2	S2	K2	N2	K1	O1	P1	Q1	M4	MS4	CONSTANT
North	V (cm/s)	0.05	1.21	0.33	0.79	0.25	0.15	0.08	0.37	0.23	0.18	0.77
Comp.	K (deg.)	51.0	174.1	174.1	230.9	85.5	76.8	85.5	251.8	5.5	78.4	
East	V (cm/s)	0.24	0.22	0.06	0.14	0.36	0.36	0.12	0.43	0.12	0.21	0.11
Comp.	K (deg.)	150.3	171.5	171.5	193.6	278.2	82.0	278.2	352.5	179.2	345.4	
Main Dir.	V (cm/s)	0.06	1.23	0.33	0.80	0.17	0.22	0.06	0.36	0.20	0.18	0.77
11.5°	K (deg.)	100.4	174.0	174.0	229.7	80.2	78.5	80.2	265.5	6.3	64.9	

Depth = 24m

		M2	S2	K2	N2	K1	O1	P1	Q1	M4	MS4	CONSTANT
North	V (cm/s)	0.28	0.93	0.25	0.69	0.13	0.15	0.04	0.19	0.22	0.45	0.35
Comp.	K (deg.)	230.0	161.5	161.5	210.6	94.4	121.5	94.4	293.4	345.9	74.7	
East	V (cm/s)	0.23	0.21	0.06	0.12	0.49	0.26	0.16	0.31	0.04	0.26	0.00
Comp.	K (deg.)	142.5	125.7	125.7	236.5	236.2	31.0	236.2	335.4	191.0	5.0	
Main Dir.	V (cm/s)	0.27	0.91	0.25	0.67	0.17	0.15	0.06	0.16	0.22	0.44	0.35
354.2°	K (deg.)	234.9	162.3	162.3	210.2	83.9	131.7	83.9	286.1	346.4	77.9	

Depth = 28m

		M2	S2	K2	N2	K1	O1	P1	Q1	M4	MS4	CONSTANT
North	V (cm/s)	0.48	0.66	0.18	0.47	0.21	0.19	0.07	0.15	0.10	0.21	0.15
Comp.	K (deg.)	188.2	170.5	170.5	199.6	119.0	198.3	119.0	6.9	237.5	70.4	
East	V (cm/s)	0.42	0.07	0.02	0.05	0.34	0.32	0.11	0.13	0.02	0.13	-0.03
Comp.	K (deg.)	152.3	144.2	144.2	64.9	230.3	354.2	230.3	41.8	52.9	326.2	
Main Dir.	V (cm/s)	0.41	0.63	0.17	0.46	0.24	0.25	0.08	0.13	0.10	0.21	0.15
348.3°	K (deg.)	195.3	171.0	171.0	200.5	103.4	192.1	103.4	0.1	237.4	77.2	

Depth = 32m

		M2	S2	K2	N2	K1	O1	P1	Q1	M4	MS4	CONSTANT
North	V (cm/s)	0.64	0.53	0.14	0.16	0.30	0.22	0.10	0.28	0.24	0.12	0.12
Comp.	K (deg.)	173.6	186.9	186.9	197.6	145.3	128.4	145.3	297.3	215.2	105.6	
East	V (cm/s)	0.50	0.19	0.05	0.08	0.21	0.16	0.07	0.43	0.16	0.11	0.03
Comp.	K (deg.)	150.3	56.1	56.1	8.8	203.8	300.5	203.8	50.4	66.7	118.3	
Main Dir.	V (cm/s)	0.72	0.50	0.14	0.14	0.32	0.18	0.11	0.26	0.21	0.14	0.13
10.2°	K (deg.)	170.7	184.1	184.1	198.5	151.0	129.6	151.0	313.1	211.1	107.3	

Depth = 36m

		M2	S2	K2	N2	K1	O1	P1	Q1	M4	MS4	CONSTANT
North	V (cm/s)	0.87	0.40	0.11	0.07	0.38	0.44	0.13	0.29	0.22	0.10	0.05
Comp.	K (deg.)	167.0	162.6	162.6	142.3	150.7	121.5	150.7	308.4	202.2	30.0	
East	V (cm/s)	0.54	0.24	0.06	0.26	0.22	0.14	0.07	0.49	0.14	0.08	0.05
Comp.	K (deg.)	122.2	333.6	333.6	326.4	172.6	247.5	172.6	47.9	354.2	139.7	
Main Dir.	V (cm/s)	0.92	0.36	0.10	0.03	0.40	0.42	0.13	0.28	0.20	0.10	0.06
8.0°	K (deg.)	163.6	163.4	163.4	137.1	152.3	123.7	152.3	322.2	204.7	35.9	

* CONSTANT : NON-Cycle Current

Depth = 40m

		M2	S2	K2	N2	K1	O1	P1	Q1	M4	MS4	CONSTANT
North	V (cm/s)	0.80	0.59	0.16	0.37	0.37	0.37	0.12	0.26	0.13	0.32	0.07
Comp.	K (deg.)	166.9	174.5	174.5	146.4	169.1	134.1	169.1	288.6	198.5	40.6	
East	V (cm/s)	0.30	0.23	0.06	0.26	0.21	0.10	0.07	0.48	0.25	0.10	0.00
Comp.	K (deg.)	77.4	0.5	0.5	281.2	110.1	16.9	110.1	18.2	0.6	151	
Main Dir.	V (cm/s)	0.80	0.60	0.16	0.38	0.36	0.37	0.12	0.26	0.14	0.32	0.07
356.1°	K (deg.)	168.3	174.6	174.6	144.5	171	135.1	171	281.5	196.5	39.5	

Depth = 44m

		M2	S2	K2	N2	K1	O1	P1	Q1	M4	MS4	CONSTANT
North	V (cm/s)	0.56	0.88	0.24	0.51	0.43	0.20	0.14	0.25	0.23	0.45	0.14
Comp.	K (deg.)	162	187.9	187.9	145.1	174.7	130.8	174.7	243.6	265.9	41.6	
East	V (cm/s)	0.18	0.15	0.04	0.24	0.27	0.14	0.09	0.46	0.21	0.10	0.07
Comp.	K (deg.)	355.9	42	42	223.6	98.5	209.5	98.5	40.9	23.8	181	
Main Dir.	V (cm/s)	0.57	0.89	0.24	0.51	0.42	0.20	0.14	0.28	0.23	0.45	0.13
356.6°	K (deg.)	162.2	188.3	188.3	143.5	176.8	128.5	176.8	241.4	263.2	41.1	

Depth = 48m

		M2	S2	K2	N2	K1	O1	P1	Q1	M4	MS4	CONSTANT
North	V (cm/s)	0.42	1.00	0.27	0.37	0.43	0.20	0.14	0.19	0.06	0.30	0.13
Comp.	K (deg.)	147.3	182.2	182.2	166.5	169	212.2	169	199.1	328.4	79.8	
East	V (cm/s)	0.27	0.12	0.03	0.23	0.22	0.22	0.07	0.45	0.18	0.03	0.09
Comp.	K (deg.)	278.6	83.8	83.8	218.1	102.2	216.7	102.2	52.3	12.3	173.5	
Main Dir.	V (cm/s)	0.41	1.00	0.27	0.38	0.43	0.21	0.14	0.17	0.07	0.30	0.13
3.2°	K (deg.)	148.9	181.8	181.8	168	167.5	212.5	167.5	194.3	334.4	80.1	

Depth = 52m

		M2	S2	K2	N2	K1	O1	P1	Q1	M4	MS4	CONSTANT
North	V (cm/s)	0.38	0.93	0.25	0.36	0.36	0.28	0.12	0.30	0.19	0.26	0.23
Comp.	K (deg.)	149.5	186.6	186.6	204.7	169.7	233.2	169.7	177.9	24.2	59.7	
East	V (cm/s)	0.40	0.19	0.05	0.21	0.20	0.14	0.07	0.18	0.23	0.05	0.11
Comp.	K (deg.)	273.1	109.1	109.1	167.9	126.9	179.2	126.9	51.8	27.3	10.1	
Main Dir.	V (cm/s)	0.38	0.93	0.25	0.36	0.36	0.28	0.12	0.30	0.19	0.26	0.23
359.4°	K (deg.)	149	186.7	186.7	204.9	169.9	233.5	169.9	178.1	24.2	59.8	

Depth = 56m

		M2	S2	K2	N2	K1	O1	P1	Q1	M4	MS4	CONSTANT
North	V (cm/s)	0.45	0.80	0.22	0.37	0.32	0.17	0.11	0.43	0.24	0.20	0.29
Comp.	K (deg.)	170.2	187.4	187.4	196.6	161.3	244.7	161.3	187.6	20.2	54.7	
East	V (cm/s)	0.47	0.16	0.04	0.23	0.19	0.14	0.06	0.01	0.24	0.13	0.06
Comp.	K (deg.)	258.7	123.9	123.9	120.8	136.5	80.4	136.5	138.3	351.8	357.5	
Main Dir.	V (cm/s)	0.45	0.78	0.21	0.38	0.36	0.11	0.12	0.40	0.30	0.22	0.29
20.9°	K (deg.)	191.7	183.6	183.6	184.2	156.9	238	156.9	187.3	12.5	44.4	

Depth = 60m

		M2	S2	K2	N2	K1	O1	P1	Q1	M4	MS4	CONSTANT
North	V (cm/s)	0.52	0.76	0.21	0.29	0.12	0.10	0.04	0.35	0.37	0.19	0.31
Comp.	K (deg.)	182.9	189.1	189.1	191.4	220.7	223.7	220.7	198.2	19.1	42.2	
East	V (cm/s)	0.23	0.35	0.09	0.26	0.18	0.17	0.06	0.05	0.22	0.13	0.07
Comp.	K (deg.)	248	109.1	109.1	123.5	142.9	79.8	142.9	198.7	268.1	28.6	
Main Dir.	V (cm/s)	0.53	0.76	0.21	0.31	0.13	0.08	0.04	0.35	0.36	0.21	0.31
9.4°	K (deg.)	186.6	184.9	184.9	184	208.2	212	208.2	198.3	13.7	40.8	

* CONSTANT : NON-Cycle Current