Oceanographic Data of the 42nd Japanese Antarctic Research Expedition from November 2000 to March 2001

Wataru Takahashi, Tetsuya Kojima and Noritsune Seo

Hydrographic and Oceanographic Department, Japan Coast Guard,
3-1, Tsukiji 5-chome, Chuo-ku, Tokyo 104-0045

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 42nd Japanese Antarctic Research Expedition (JARE-42) during the austral summer of 2000/2001. The tidal observations were carried out by the winter party of JARE-41 from February 2000 to January 2001.

1. Oceanographic observations

The tracks 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) observations and serial observations were made in the Southern Ocean. Two of surface drifting buoys were deployed and XCP (Expendable Current Profiler) observations were made at three sites in the Antarctic Circumpolar Current region.

(1) Surface water samplings

Surface water samplings were carried out at 44 stations in the Southern Ocean and at 12 stations on the way from Tokyo to Fremantle. The results are given in Table 1.

(2) Monitoring of marine pollution

Surface water samplings for monitoring of marine pollution were made at 15 stations in the Southern Ocean. Items and methods of analyses are given in the following section of (5).

(3) XCTD observations

XCTD observations were carried out at 98 stations in the Southern Ocean from Fremantle to Antarctica and on the way back to Sydney. The results are listed in Table 2. The vertical profiles of water temperature and salinity are shown in Fig. 2 to Fig. 7.

(4) Serial observations

Serial observations with Rosette sampler, equipped with twenty-three Niskin bottles of 2.5-liter capacity, and CTD (Conductivity, Temperature and Depth profiling system: Falmouth Scientific FSI TRITON ICTD) were carried out at 13 stations. The results of the observations are listed in Table 3. The pressure and temperature listed in the column

of "Water Sampling by Niskin bottles" in Table 3 indicate values observed with CTD in its ascending operation at the time of water sampling. The salinity in the same column indicates results of analysis for the sampled water. On the other hand, The pressure, temperature, and salinity in the column of "Observed by CTD" in Table 3 are values observed with CTD in the descending operations.

(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 were 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 Bergamin *et al.* (1978), Andersson (1979) and Gine *et al.* (1980). 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-P: Molybdenum blue method (BRAN+LUEBBE model Traacs 800 auto analyzer).

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

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

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

(h) Ammonium-N: 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 3. The results of items (i) to (k) are given in Table 4.

(6) Current observation with two surface drifters

Each surface drifter comprises from a spherical buoy of 35 cm in diameter and a drogue of 1 m in diameter, and 8 m in length (C-2340, TOYOCOM Co.). Signals transmitted from the drifter are sent to Data Processing Center in CNES via NOAA satellites, and the

DPC distributes drifter's positions and surface water temperature observed by the drifter to each user. Two drifters were deployed in the expedition One was deployed at 59°16.5' S, 110°01.1' E (CTD station 2) on December 9, 2000. It continued the observation until November 30, 2001. Another buoy was deployed at 60°06.8' S, 150°06.7' E (CTD station 11) on March 14, 2000. It was being in operation until November 9, 2001. The trajectories are shown in Fig. 8.

(7) Vertical current observations with XCP

XCP (Sippican Inc. U.S.A) observations were completed at the following 3 stations.

a) December 9, 2000 0800 (UT) 59°16.2' S, 110°00.6' E (CTD station. 2)

b) March 14, 2000 1220 (UT) 60°07.8' S, 150°05.4' E (CTD station.11)

c) March 16, 2000 1245 (UT) 51°02.8' S, 150°08.4' E (CTD station.13)

The results are given in Fig. 9.

2. Tidal observations

(1) Tidal observations at Syowa Station

Tidal observations have been carried out at Syowa Station since 1965. The tide gauge (QWP -8-303D, Meisei Denki Co) was installed on the sea bottom, about 15 m sea depth, Nisi-no-ura, East Ongul Island by JARE-41 members on February 2, 2000. Results obtained from February 2000 to January 2001 are described in this report. The methodology of tidal observations is described 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 measurement is 0-20 m and its precision is 0.01% to full scale, *i.e.* 0.005 m. The tide height measured every 2 s are averaged for 30 s in recordings. The gauge was maintained by a member of the JARE-41 winter party, through the year. Daily and monthly mean sea levels were calculated by averaging hourly height. The results are given in Table 5. 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 6.

(2) Tidal observations at Kizahasi Hama, Skarvsnes

Tidal observations at Kizahasi Hama, Skarvsnes were continuously carried out during 32 days (from January 8, 2001 to February 8, 2001) with a pressure gauge (WLR-8, AANDERAA INSTRUMENTS). The sensor was placed on the sea bottom about 3 m below the sea surface. In this system pressure was measured with a quartz oscillator. The range of the measurement is 0-3500 m and its precision is 0.02% to full scale. The pressure averaged over 40 s was recorded in an EEPROM memory every 10 min. The data were corrected for atmospheric pressure. Daily mean sea levels were calculated by averaging the hourly height. The results are given in Table 7 and Fig. 10. The least squares method was employed in the harmonic analysis. The harmonic constants for 29 days, characteristic of the tide and other details are given in Table 8.

3. Current observations and CTD observations near Syowa Station

Current observations and CTD observations were carried out under a fast ice (69°00.14' S, 39°37.35' E) in the northward offing of Tatimati Misaki, the northeast extremity of East Ongul Island. For the current observation a mobile type of ADCP equipment (Acoustic Doppler Current Profiler: RD INSTRUMENTS Workhorse Sentinel ADCP self-contained 300 kHz) was moored 5 m below the sea surface using a hole drilled on the fast ice of was approximately 3 m thickness. The observation period was 18 days. Using the same hole, CTD hydro-casts (Conductivity, Temperature and Depth profiling system: SBE-BARD ELECTRONICS SEA-19 Seacat Profiler) down to the depth of 200 m were performed 9 times during the period.

Outline of the observation is shown below.

(1) Current observations

Apparatus name	Workhorse Sentinel ADCP (Acrostic Doppler Current Profiler) Self-Contained 300 kHz
Observation term	18 days
Observation start time	January 5, 2001 23:00 (LMT (UT+3 hours))
Observation end time	January 21, 2001 12:50 (LMT (UT+3 hours))
Transducer depth	5.0 m
Pings per ensemble	60.0 times
Sampling interval	5.0 min
Observation layer interval	2.5 m
Total number of observation layers	79 layers
First bin range	4.22 m
Last bin range	201.72 m
Maximum observed layer	105.79 m
Magnetic variation	-48.0 deg.
The standard deviation of magnitude	0.7 cm/s

The result of the comparison with tide data at Syowa Station and current data are given in Fig. 11. The least squares method was employed in the harmonic analysis. Harmonic analysis of tidal stream for 15 days and other details are given in Table 9.

(2) CTD observations

Apparatus name	SBE-19 SEACAT Profilers
Observation term	10 times
Satiation depth	240.2 m
Observation start time	Maximum observed layers
January 4, 2001 15:50 (LMT (UT+3 hours))	211.0 dbar
January 5, 2001 21:00 (LMT (UT+3 hours))	212.0 dbar
January 6, 2001 14:30 (LMT (UT+3 hours))	211.0 dbar

January 17, 2001 14:05 (LMT (UT+3 hours))	205.0 dbar
January 19, 2001 10:10 (LMT (UT+3 hours))	212.0 dbar
January 20, 2001 9:04 (LMT (UT+3 hours)	207.0 dbar
January 20, 2001 11:50 (LMT (UT+3 hours))	207.0 dbar
January 20, 2001 13:05 (LMT (UT+3 hours))	211.0 dbar
January 20, 2001 15:55 (LMT (UT+3 hours))	209.0 dbar
January 20, 2001 18:05 (LMT (UT+3 hours))	210.0 dbar

The results are given in Table 10.

Acknowledgments

The authors would like to express their sincere thanks to Prof. Y. Motoyoshi, the leader of JARE-42, Prof. M. Ayukawa, the leader of JARE-41, Mr. Y. Kato, the summer party leader of JARE-42, Prof. K. Watanabe, the winter party leader of JARE-41, and to all the members of JARE-41 and JARE-42 for their helpful supports and valuable advices. The authors also express their thanks to Captain Y. Ishikado, the officers and all crew of the icebreaker "Shirase".

References

Andersson, L. (1979): Simultaneous spectrophotometric determination of nitrite and nitrate by flow injection analysis. Anal. Chim. Acta, **110**, 123.

Bergamin, H., Reis, B. F. and Zagatto, E. A. G. (1978): A new device for improving sensitivity and stabilization in flow injection analysis. Anal. Chim. Acta, **97**, 427.

Carpenter, J. H. (1965): The accuracy of the Winkler method for dissolved oxygen. Limnol. Oceanogr., **10**, 135-140

Gine, M. F., Bergamin, H. Zagatto, E. A. G. and Reis, B. F. (1980): Simultaneous determination of nitrate and nitrate by flow injection analysis. Anal. Chim. Acta, **144**, 191.

Hydrographic Department, Japan Coast Guard (1995): Results of surveys in 1993. Rep. Mar. Pollut. Surv., **21**, 70-74 (in Japanese)

Motomizu, S. and Korechika, K. (1988): FIA for trace amounts of silicon based on spectrophotometric determination of molybdosilicic acid. Bunseki Kagaku, **37**, T115-T119.

Odamaki, M., Michida, Y., Noguchi, I., Iwanaga, Y., Ikeda, S. and Iwamoto, K. (1991): Mean sea-level observed at Syowa Station, East Antarctica. Proc. NIPR Symp. Antarct. Geosci, **5**, 20-28.

Strickland, J. D. H. and Parsons, T. R. (1992): Practical handbook of seawater analysis. Bull. Fish. Res. Board Can., 2nd ed., **167**, 311 p.

UNESCO (1981): Tenth Report of the joint Panel on Oceanographic Tables and Standards. UNESCO Technical Papers in Marine Science, 36.

(Received April 1, 2002; Revised manuscript accepted July 22, 2002)

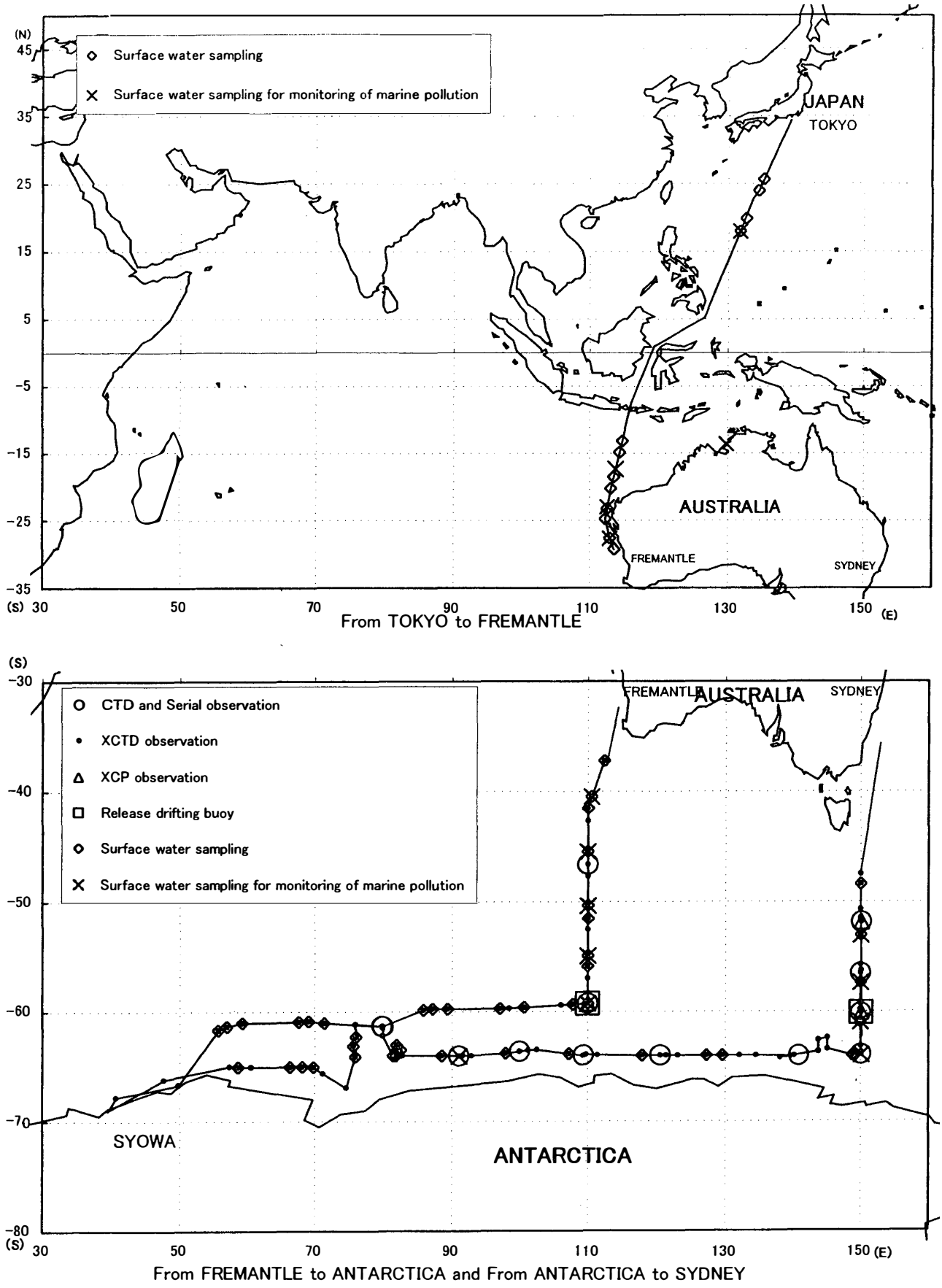

Fig. 1. The track of the icebreaker "Shirase" and the sites of oceanographic stations.

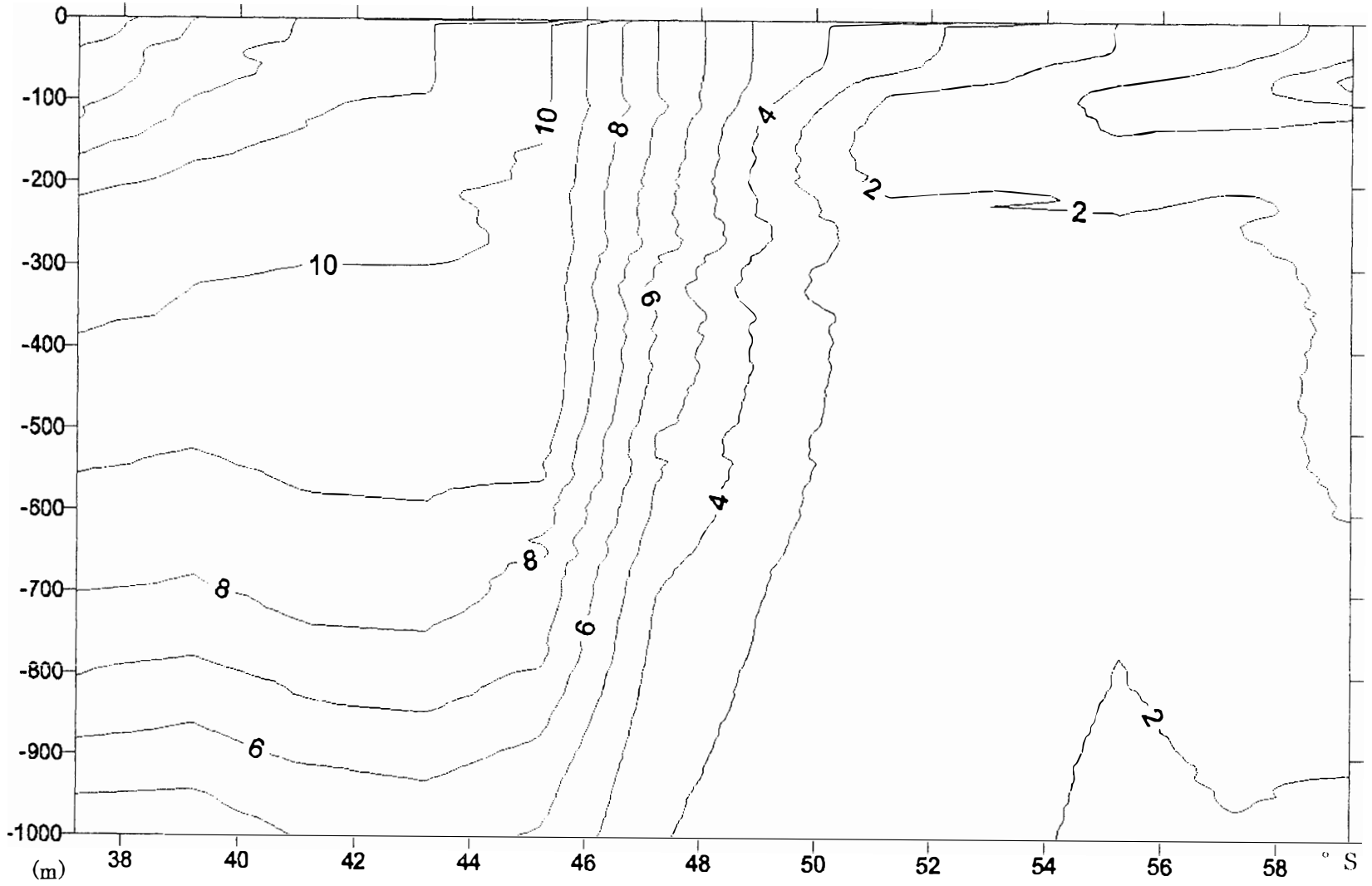

Fig. 2. Vertical profile of water temperature (°C) observed with XCTD along 110°E.
Vertical bars on the top of the profile indicate sites of XCTD observations.

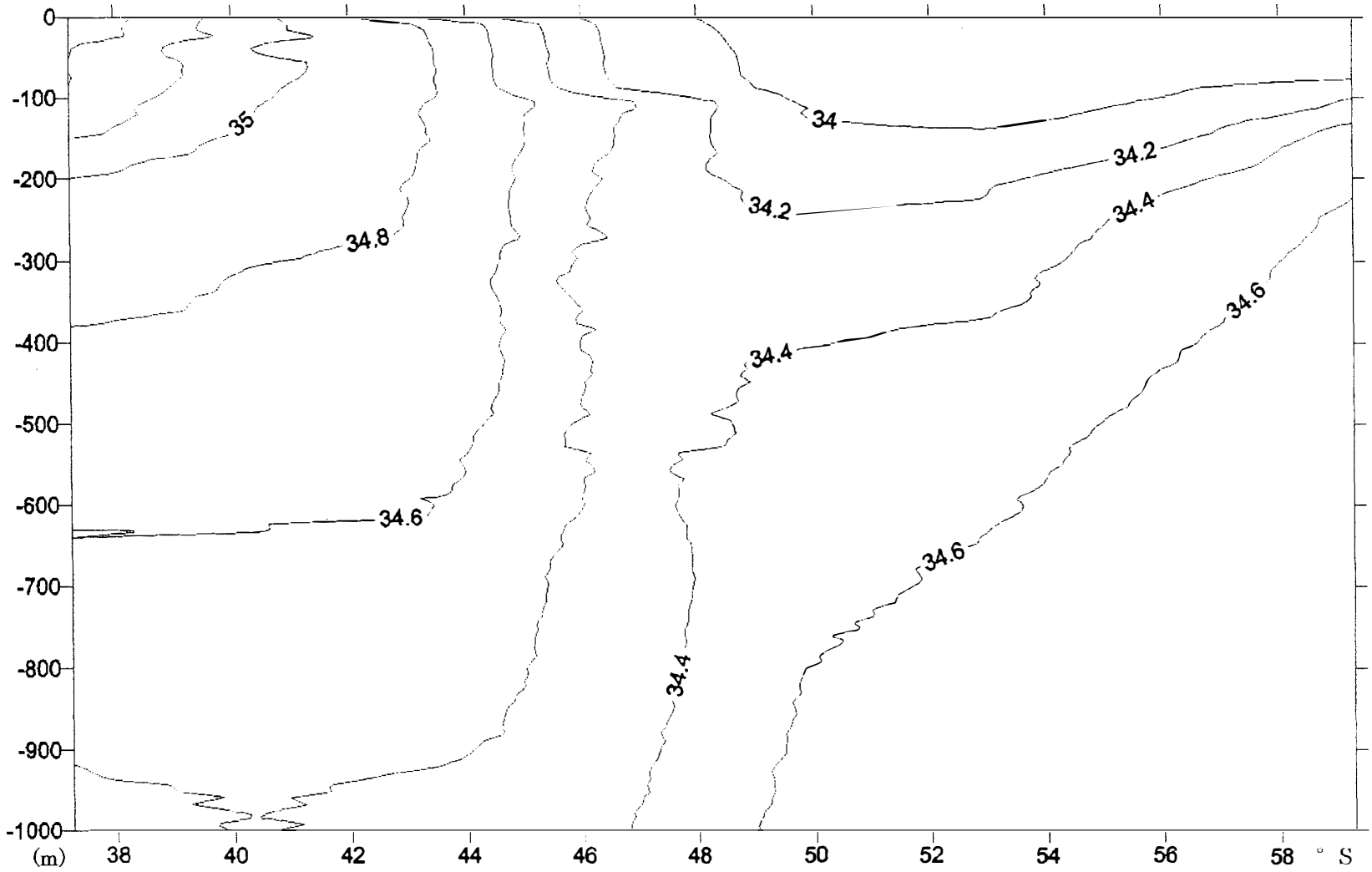

Fig. 3. Vertical profile of water salinity observed with XCTD along 110°E.
Vertical bars on the top of the profile indicate sites of XCTD observations.

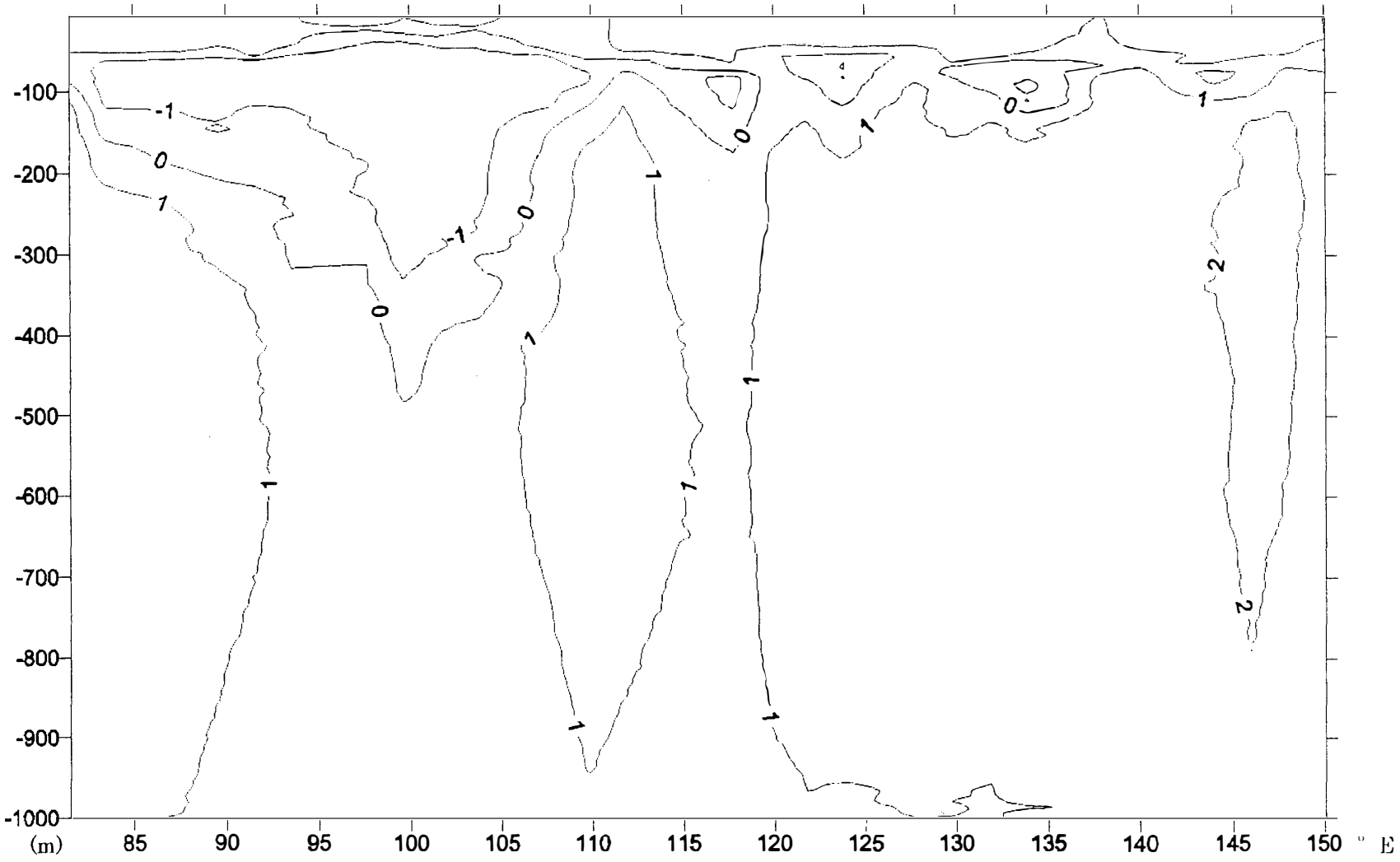

Fig. 4. Vertical profile of water temperature (°C) observed with XCTD along 64°S.
Vertical bars on the top of the profile indicate sites of XCTD observations.

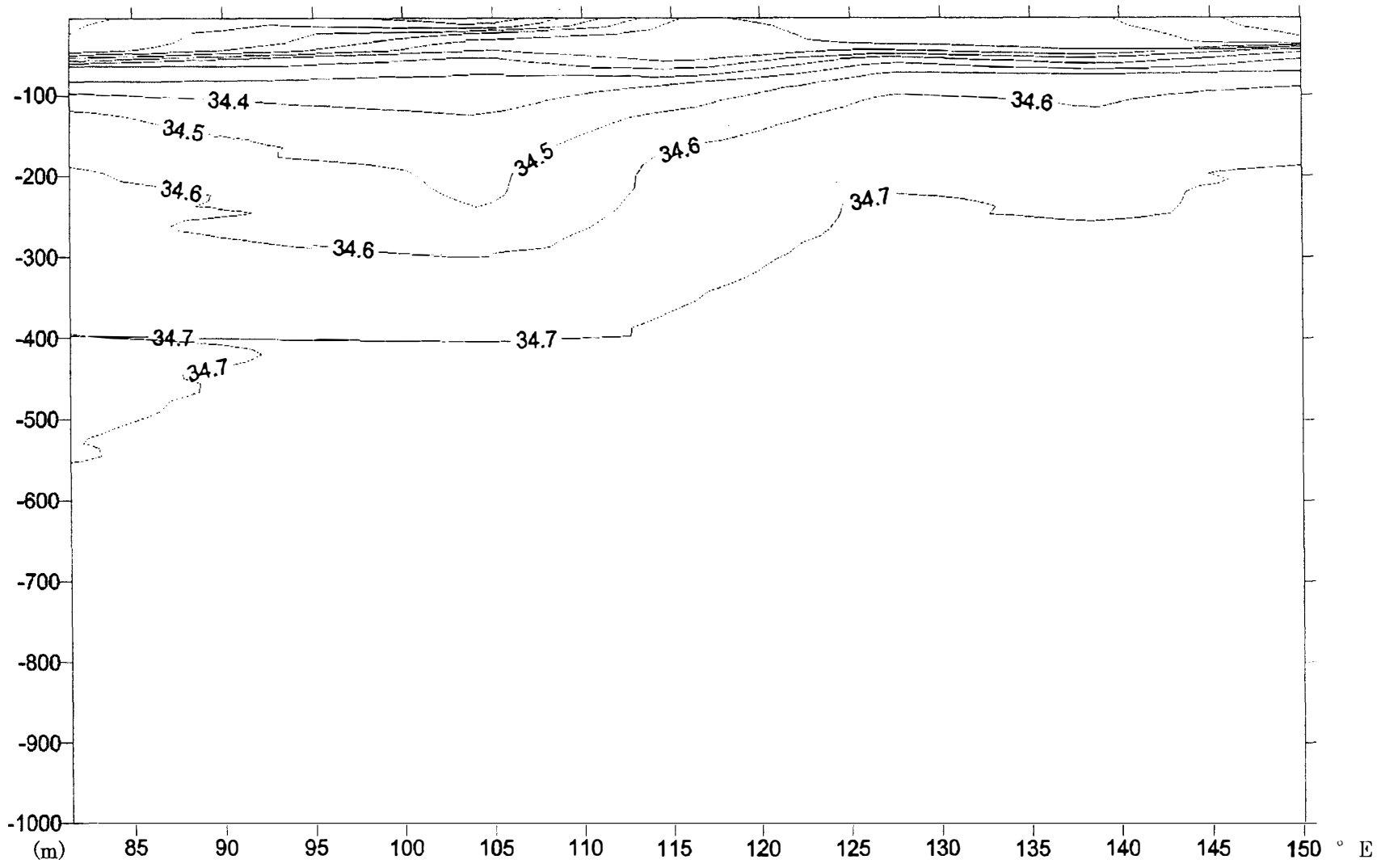

Fig. 5. Vertical profile of water salinity observed with XCTD along 64°S.
Vertical bars on the top of the profile indicate sites of XCTD observations.

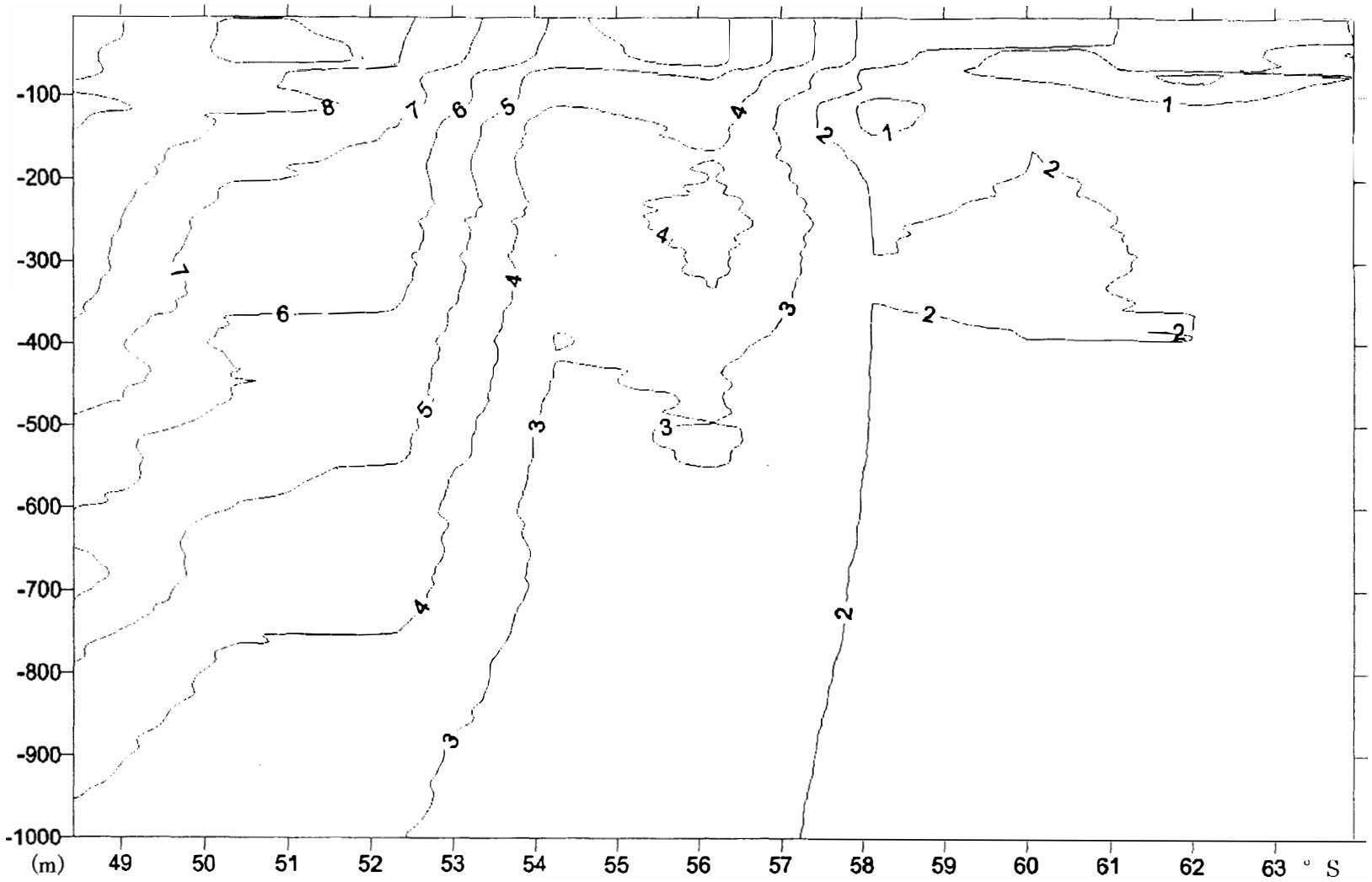

Fig. 6. Vertical profile of water temperature (°C) observed with XCTD along 150°E. Vertical bars on the top of the profile indicate sites of XCTD observations.

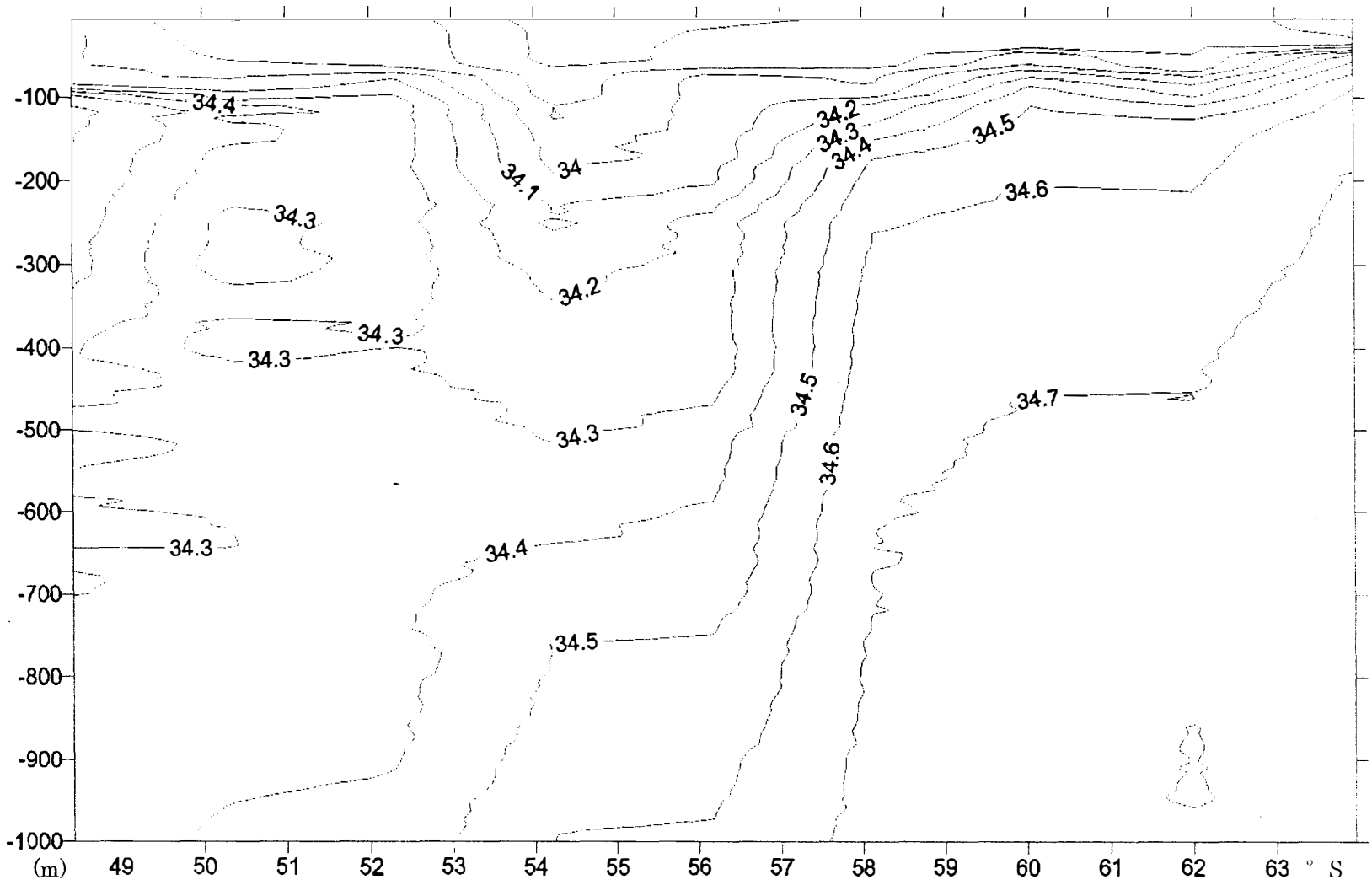

Fig. 7. Vertical profile of water salinity observed with XCTD along 150°E.
Vertical bars on the top of the profile indicate sites of XCTD observations.

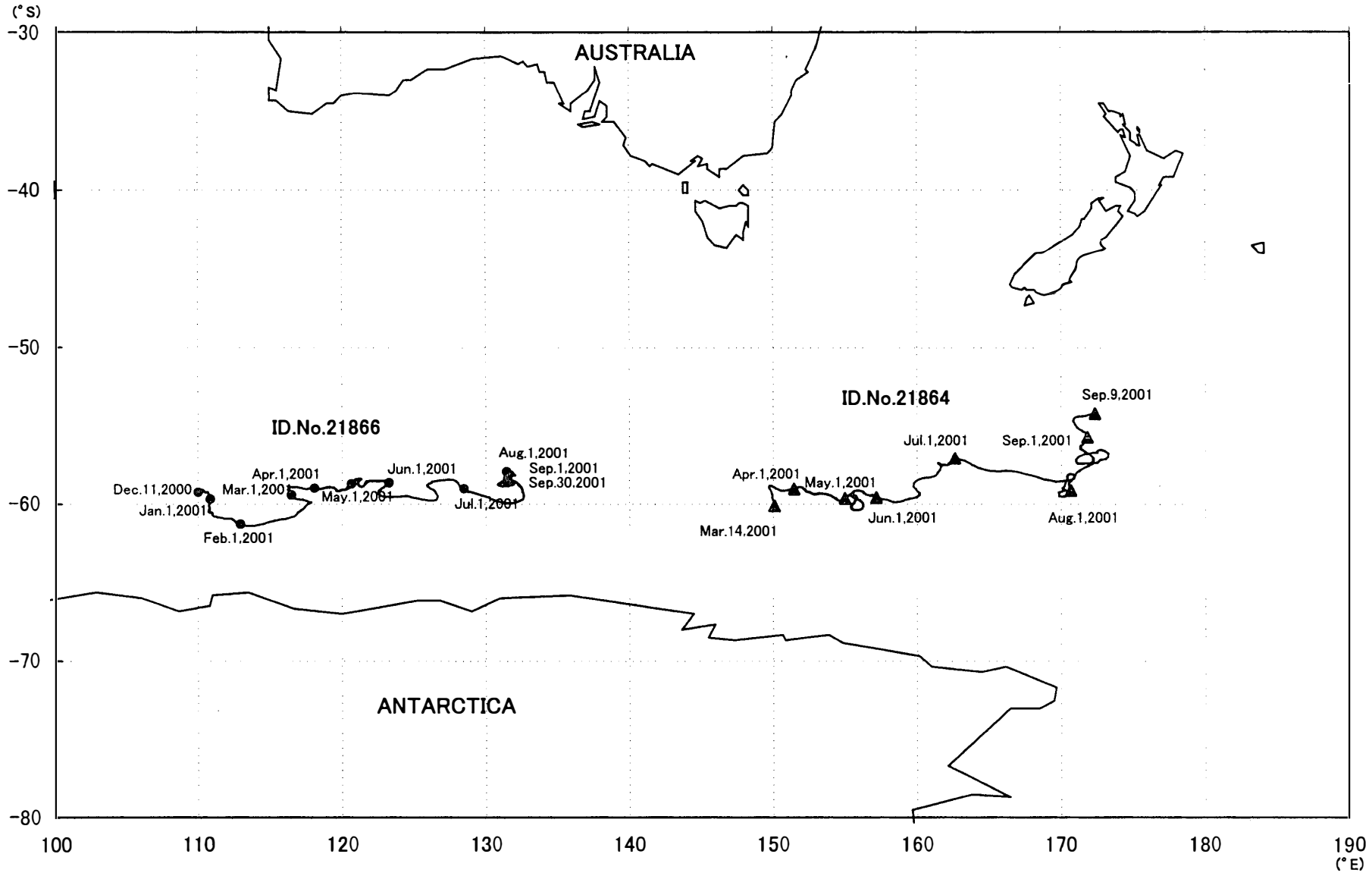

Fig. 8. Trajectory of two surface drifting buoys. Solid circles denote the deployment location and the location on the first day of every month for the first buoy (ID.No.21866). Solid triangles denote the second buoy (ID.No.21864).

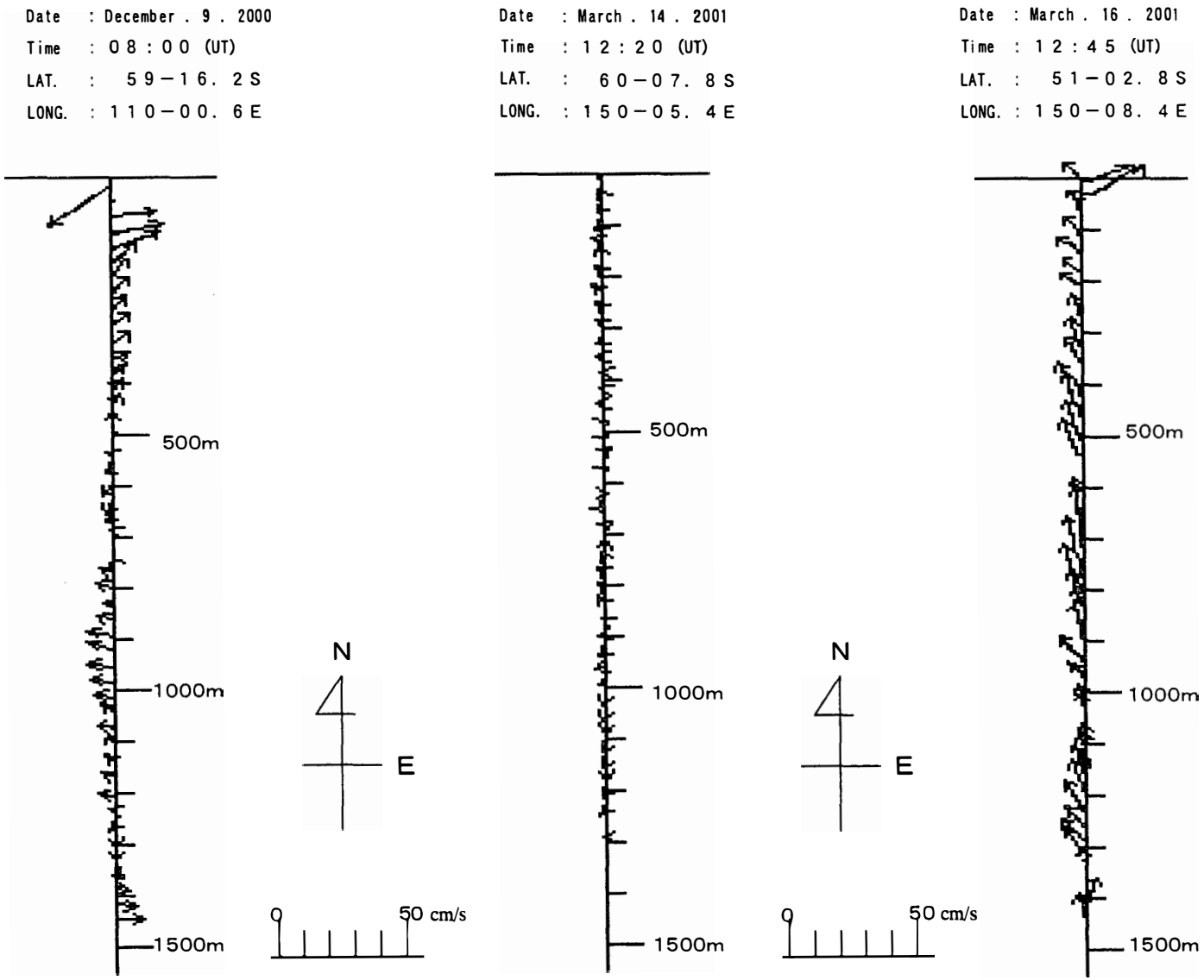

Fig. 9. Vertical profiles of current relative to the deepest layer measured with XCP. Length of arrows indicates speed and direction of arrows indicates horizontal direction (see legends).

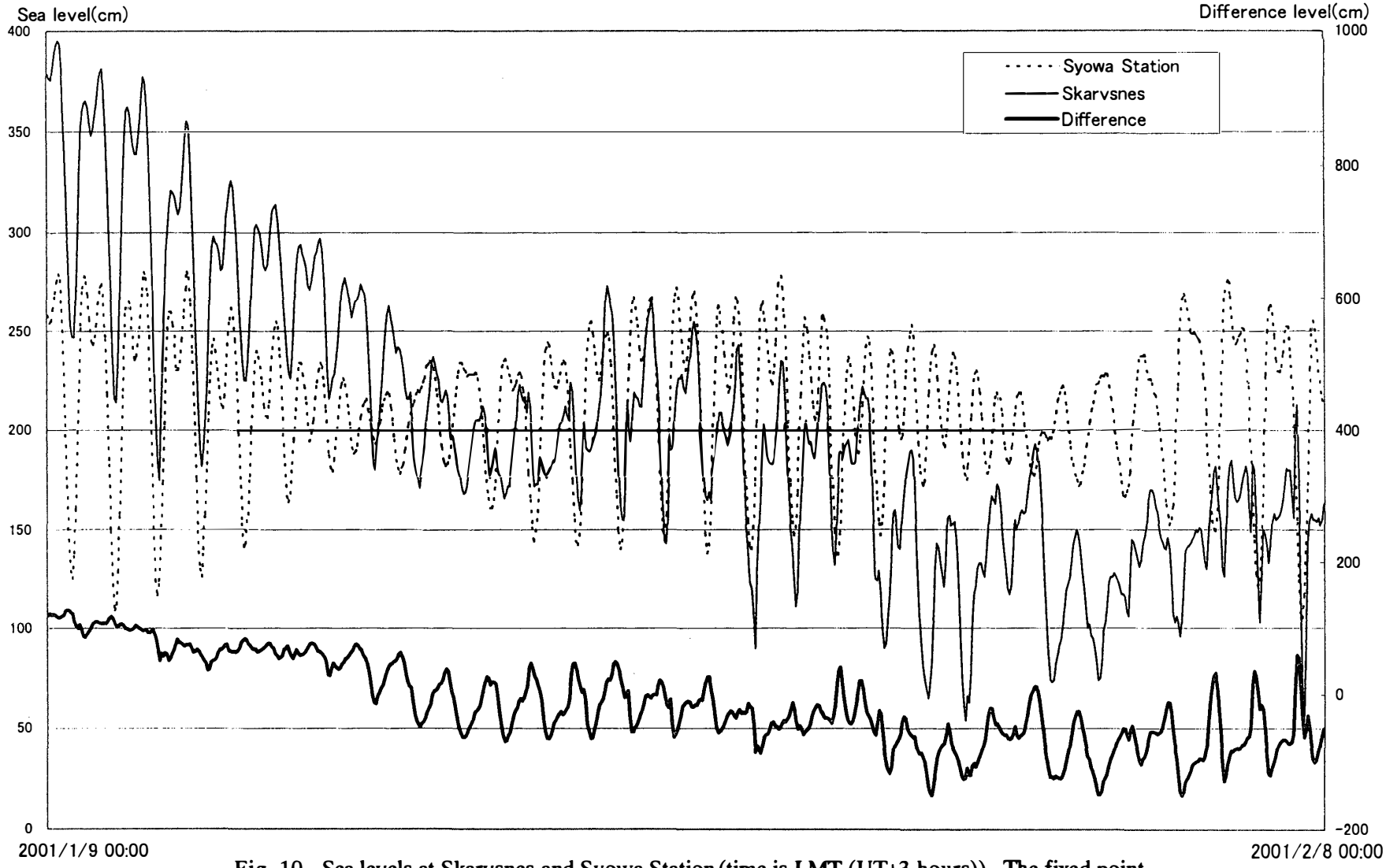

Fig. 10. Sea levels at Skarvsnes and Syowa Station (time is LMT (UT+3 hours)). The fixed point at Skarvsnes has not been connected to the benchmark at Syowa Station.

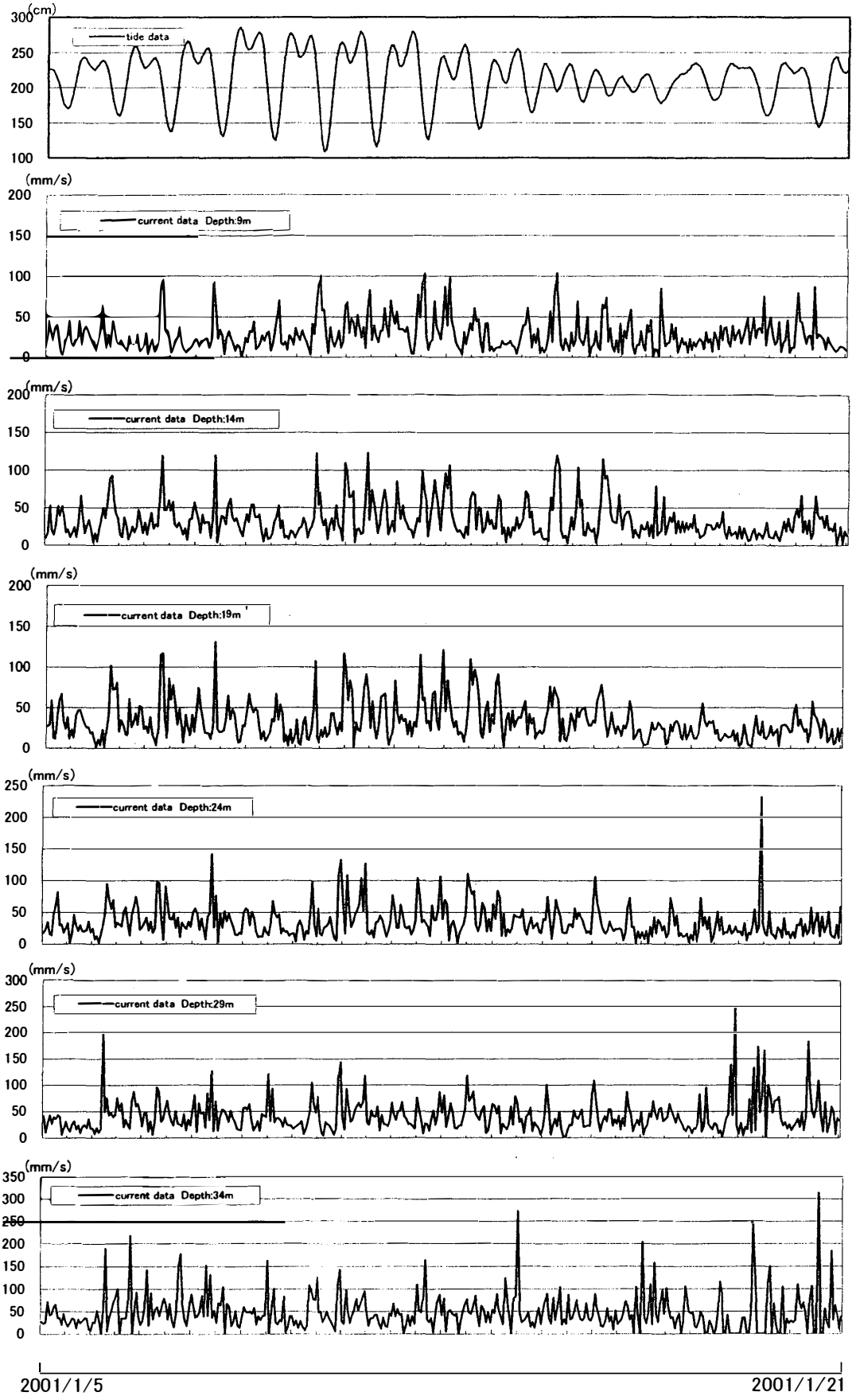

Fig. 11. The result of the comparison with tide data at Syowa Station and current data near Syowa Station.

Table 1. Data of surface water observations on board the icebreaker "Shirase" in 2000-2001.

Date	Time (UT)	Position		Air Temp.	Water Temp.	Salinity	pH	DO2	PO4-P	SiO3-Si	NO2-N	NO3-N	NH4-N
		Lat.	Long.	°C				(μmol/l)					
2000													
Nov. 14		Left Tokyo											
15	2300*	25-38.5 N	135-09.5 E	27.6	28.5	34.461	8.32	210	0.0	0	0.1	0	0.0
16	0700	23-56.6	134-23.5	28.0	28.7	34.526	8.30	207	0.1	0	0.2	0	0.0
16	2300*	19-52.0	132-34.8	28.6	28.6	34.385	8.36	204	0.0	0	0.1	0	0.0
17	0700	17-58.0	131-42.9	28.4	28.9	34.219	8.38	201	0.0	0	0.1	0	0.0
22	2300*	13-10.5 S	114-42.9	27.8	28.8	34.258	8.25	206	0.0	1	0.0	0	0.1
23	0700	14-51.7	114-19.8	28.8	30.2	34.305	8.27	204	0.1	1	0.0	0	0.2
23	2300*	18-32.1	113-29.5	24.8	26.8	34.540	8.25	211	0.2	2	0.0	0	0.1
24	0700	20-14.8	113-05.0	25.0	26.0	34.660	8.24	214	0.2	2	0.0	0	0.8
24	2300*	23-15.9	112-31.8	22.0	23.5	33.053	8.22	224	0.2	2	0.1	0	0.0
25	0700	24-46.3	112-17.1	22.5	23.4	35.022	8.24	225	0.3	2	0.1	0	0.0
25	2300*	27-40.2	112-58.5	19.8	22.2	35.158	8.26	224	0.2	2	0.1	0	0.7
26	0700	29-14.0	113-34.0	20.6	22.2	35.241	8.27	232	0.1	1	0.0	0	0.8
28		Arrived in Fremantle											
Dec. 3		Left Fremantle											
4	0800	37-14.0 S	112-22.8 E	12.1	14.4	35.110	8.36	232	-	-	-	-	-
5	0045	40-29.5	110-31.9	11.7	13.3	35.150	8.28	261	0.6	0	0.1	4	0.0
5	0610	41-33.2	110-02.1	13.3	12.3	34.920	8.17	278	0.6	0	0.2	7	0.1
6	0045	45-28.9	109-58.0	9.7	8.0	34.742	8.07	327	1.0	2	0.3	11	0.2
7	0045	50-21.3	110-00.8	6.1	3.4	33.896	8.10	337	1.6	13	0.3	25	0.1
7	0600	51-33.4	110-04.9	5.7	3.7	33.851	8.05	344	1.6	14	0.2	25	0.2
8	0045	54-54.4	109-59.1	2.7	2.3	33.884	8.03	348	1.8	23	0.3	27	---
8	0600	55-53.0	109-58.2	2.3	1.3	33.925	8.04	351	1.8	25	0.1	28	0.3
9	0100	59-16.4	110-00.3	2.4	0.6	33.913	7.73	362	1.7	35	0.2	29	0.5
9	0900	59-21.1	107-49.2	2.2	1.6	33.954	7.96	352	1.8	30	0.3	29	0.7
10	0100	59-37.6	100-37.1	0.0	-0.1	33.867	7.91	360	1.8	34	0.3	27	0.1
10	0845	59-43.7	97-03.2	-0.6	0.1	33.778	7.94	362	1.7	28	0.3	27	0.3

* The time of the date of the preceding day.

Date	Time (UT)	Position		Air Temp.	Water Temp.	Salinity	pH	DO2	PO4-P	SiO3-Si	NO2-N	NO3-N	NH4-N
		Lat.	Long.	°C				(μmol/l)					
11	0200	59-44.9 S	89-25.2 E	-1.8	1.0	33.866	8.04	360	1.6	23	0.2	26	0.0
11	0655	59-45.5	87-13.4	1.7	0.8	33.861	7.76	366	1.6	32	0.2	26	0.6
11	1000	59-51.5	85-55.2	2.4	0.0	33.663	7.93	363	1.7	39	0.2	30	0.4
13	0300	61-00.9	71-24.6	-1.1	-0.9	33.077	7.90	373	1.6	33	0.3	25	0.4
13	0800	60-51.6	69-06.1	0.3	0.2	33.508	7.96	376	1.8	31	0.1	25	0.1
13	1100	60-55.5	67-39.0	0.4	-0.3	33.477	7.95	371	1.9	31	0.2	25	0.4
14	0400	61-00.3	59-18.6	1.1	0.7	33.596	7.70	375	1.8	33	0.3	26	0.2
14	0900	61-19.5	56-59.8	1.3	1.3	33.592	7.92	364	2.0	38	0.3	28	0.3
14	1200	61-39.9	55-41.7	1.8	0.9	33.698	7.90	366	2.0	39	0.3	28	0.2
		Arrived at the ice edge of Amunzen Bay											
		Left at the ice edge of Amunzen Bay											
2001													
Feb. 28	1145	64-59.8 S	58-38.4 E	-2.0	0.4	33.857	8.26	354	2.0	52	0.2	27	1.2
Mar. 1	0350	65-00.6	66-20.6	-2.8	-0.3	33.986	8.48	343	1.9	51	0.2	27	0.3
1	0750	64-59.4	68-08.3	-2.7	-0.1	33.874	8.35	339	1.9	49	0.2	28	0.8
1	1147	65-00.7	69-47.9	-4.3	0.0	33.772	8.36	355	1.9	46	0.2	30	0.6
3	0248	64-05.3	75-57.5	-1.5	0.6	33.650	8.30	343	1.7	30	0.3	27	---
3	0653	63-06.6	75-40.2	-1.0	0.8	33.623	7.65	357	1.7	31	0.3	25	1.1
3	1052	62-16.8	76-03.7	0.3	1.3	33.597	8.29	358	1.7	24	0.3	25	1.3
5	0250	63-59.7	81-29.9	0.8	0.7	33.652	8.26	344	1.7	32	0.3	27	1.2
5	0347	63-59.6	81-56.3	0.8	0.6	33.577	8.22	349	1.7	32	0.2	27	0.6
5	0613	63-30.5	82-00.1	0.9	1.2	33.585	8.09	354	2.5	33	0.3	36	0.5
5	0837	63-01.4	81-59.9	0.9	1.3	33.526	8.06	344	1.6	22	0.3	25	0.8
5	1202	63-27.7	82-33.3	0.9	1.2	33.553	7.94	348	1.7	23	0.3	26	0.8
6	0152	63-59.5	88-32.3	---	0.6	33.836	7.72	336	1.7	33	0.2	27	---
7	0148	63-47.1	97-54.1	-1.4	-1.2	32.892	8.20	352	2.0	49	0.3	28	0.3
8	0047	63-50.2	107-12.8	-2.4	-0.2	33.764	7.80	357	1.5	33	0.1	23	0.9
9	0049	63-59.7	117-55.8	-0.2	0.7	34.034	7.62	348	1.9	44	0.3	29	0.7
10	2350*	63-59.9	127-13.7	0.3	1.3	33.972	7.71	349	1.9	30	0.3	28	0.4
10	0347	64-00.0	129-35.6	0.2	1.3	33.953	8.23	356	1.8	30	0.3	28	0.6

* The time of the date of the preceding day.

Date	Time (UT)	Position		Air Temp.	Water Temp.	Salinity	pH	DO2	PO4-P	SiO3-Si	NO2-N	NO3-N	NH4-N
		Lat.	Long.	°C				(μmol/l)					
12	2146*	63-59.8 S	148-44.7 E	1.0	1.3	33.952	7.93	341	1.8	27	0.2	28	0.3
13	2146*	60-58.1	150-00.0	2.7	2.3	33.880	8.31	339	1.6	6	0.3	27	0.3
14	2145*	57-22.4	150-00.4	4.1	2.7	33.834	8.13	338	1.7	5	0.3	27	0.5
15	2145*	53-04.1	149-59.2	8.2	6.4	33.795	8.27	315	1.6	0	0.2	23	0.7
16	2143*	48-25.8	149-59.6	12.0	9.8	34.127	8.15	303	1.1	0	0.2	15	0.4

* The time of the date of the preceding day.

Table 2. XCTD observation data.

station	JA420001		JA420002		JA420003		JA420004		JA420005		JA420006		JA420007		JA420008	
date	2000/12/4		2000/12/5		2000/12/5		2000/12/5		2000/12/6		2000/12/6		2000/12/6		2000/12/7	
time(UT)	07:48		0:48		6:24		12:48		00:48		6:06		12:54		0:48	
latitude	37-14S		40-30S		41-33S		42-41S		45-29S		46-39S		47-44S		50-21S	
longitude	112-23E		110-31E		110-01E		110-02E		109-58E		109-59E		110-01E		110-01E	
depth	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity
0	14.8	35.55	11.8	35.04	11.9	34.83	11.3	34.78	10.1	34.67	7.7	34.11	-	-	3.2	33.86
10	14.7	35.54	11.7	35.03	11.8	34.86	11.3	34.80	10.1	34.68	7.7	34.12	-	-	3.2	33.85
20	14.6	35.54	11.6	35.04	11.9	34.87	11.3	34.82	10.1	34.71	7.7	34.13	7.7	34.10	3.2	33.86
30	14.2	35.45	11.5	35.01	11.8	34.89	11.3	34.83	10.1	34.71	7.7	34.14	7.7	34.14	3.2	33.87
50	13.9	35.40	11.3	35.02	11.8	34.90	11.3	34.83	10.1	34.72	7.7	34.15	7.7	34.16	3.2	33.88
75	13.7	35.41	11.3	35.05	11.7	34.92	11.3	34.83	10.1	34.72	7.7	34.15	7.7	34.16	3.1	33.89
100	13.3	35.35	11.1	35.01	11.3	34.95	10.8	34.83	10.1	34.72	8.2	34.41	7.8	34.23	2.4	33.91
125	13.0	35.33	10.9	34.97	11.0	34.93	10.3	34.79	10.1	34.75	7.9	34.41	-	-	1.8	33.94
150	12.4	35.20	10.7	34.94	10.8	34.91	10.3	34.81	10.0	34.76	7.8	34.38	-	-	1.6	33.95
200	11.3	35.00	10.5	34.90	10.4	34.85	10.2	34.80	9.9	34.73	7.5	34.36	-	-	1.5	34.03
250	10.6	34.89	10.3	34.88	10.2	34.80	10.2	34.80	9.8	34.74	7.2	34.33	-	-	2.6	34.23
300	10.7	34.91	9.8	34.81	10.1	34.78	10.0	34.77	9.9	34.75	6.6	34.25	-	-	1.9	34.22
400	9.9	34.78	9.4	34.74	9.8	34.75	9.9	34.75	9.8	34.73	6.4	34.30	-	-	2.4	34.41
500	9.3	34.69	9.0	34.69	9.5	34.69	9.5	34.71	9.5	34.68	5.5	34.27	-	-	2.4	34.51
600	8.8	34.62	8.5	34.63	9.1	34.63	9.1	34.65	8.3	34.48	5.3	34.35	-	-	2.4	34.56
700	8.0	34.54	7.8	34.56	8.6	34.56	8.7	34.59	7.5	34.44	4.4	34.29	-	-	2.3	34.61
800	7.1	34.47	6.5	34.49	7.7	34.47	7.7	34.51	6.7	34.42	3.9	34.31	-	-	2.3	34.65
900	5.7	34.41	5.4	34.44	6.6	34.38	6.6	34.43	5.7	34.37	3.5	34.35	-	-	2.3	34.68
1000	4.6	34.37	4.6	34.41	5.3	34.32	5.5	34.37	4.8	34.33	3.2	34.39	-	-	2.2	34.72

station	JA420009		JA420010		JA420011		JA420012		JA420013		JA420014		JA420015		JA420016	
date	2000/12/7		2000/12/7		2000/12/8		2000/12/8		2000/12/8		2000/12/9		2000/12/9		2000/12/9	
time(UT)	06:00		13:00		01:00		06:00		13:00		1:00		9:00		13:00	
latitude	51-32S		52-33S		54-54S		55-53S		56-58S		59-16S		59-21S		59-25S	
longitude	110-02E		109-59E		109-59E		109-58E		109-59E		110-00E		107-49E		106-05E	
depth	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity
0	3.5	33.82	2.8	33.85	2.0	33.88	1.9	33.91	1.9	33.96	0.6	33.95	1.1	33.98	0.7	33.97
10	3.5	33.84	2.8	33.86	2.0	33.89	1.9	33.92	1.9	33.96	0.6	33.95	1.0	33.98	0.7	33.98
20	3.4	33.84	2.8	33.88	2.0	33.89	1.9	33.93	1.7	33.96	0.6	33.95	1.0	33.99	0.6	33.98
30	3.4	33.85	2.8	33.88	2.0	33.88	1.9	33.93	1.6	33.97	0.5	33.95	1.0	33.99	0.6	33.99
50	3.4	33.86	2.7	33.89	1.4	33.91	1.8	33.94	1.2	33.99	-0.3	33.97	0.0	34.00	0.5	34.00
75	2.3	33.89	2.5	33.90	0.8	33.94	1.5	33.94	0.8	34.01	-1.3	34.11	-0.2	34.00	-0.1	34.01
100	1.7	33.91	2.0	33.91	0.5	34.00	1.0	33.98	0.6	34.08	0.0	34.30	-0.5	34.02	-0.5	34.06
125	1.5	33.95	1.7	33.92	1.0	34.14	0.6	34.03	0.8	34.15	1.2	34.46	-0.9	34.10	-0.3	34.13
150	1.2	33.95	1.6	33.98	1.7	34.32	0.8	34.12	1.4	34.24	1.6	34.52	-0.2	34.22	1.0	34.34
200	1.8	34.08	2.0	34.10	1.9	34.42	1.7	34.30	1.9	34.37	1.8	34.61	1.8	34.49	1.9	34.57
250	2.2	34.21	2.2	34.21	2.1	34.50	2.0	34.43	2.0	34.44	1.9	34.65	1.9	34.56	1.9	34.61
300	2.5	34.33	2.3	34.27	2.1	34.55	2.0	34.49	2.1	34.51	1.9	34.68	1.9	34.61	2.0	34.66
400	2.5	34.41	2.3	34.39	2.1	34.63	2.1	34.57	2.2	34.60	1.9	34.72	2.1	34.68	2.0	34.70
500	2.3	34.50	2.4	34.49	2.1	34.67	2.1	34.64	2.2	34.67	1.9	34.76	2.0	34.72	1.9	34.73
600	2.3	34.57	2.4	34.56	2.1	34.68	2.1	34.68	2.2	34.71	2.0	34.60	2.0	34.75	2.0	34.59
700	2.2	34.61	2.3	34.61	2.0	34.69	2.0	34.72	2.2	34.74	2.1	34.40	2.0	34.77	2.1	34.51
800	2.2	34.65	2.3	34.67	2.0	34.70	2.0	34.74	2.1	34.77	2.2	34.26	1.9	34.77	1.8	34.68
900	2.2	34.69	2.3	34.71	1.9	34.70	2.0	34.76	2.1	34.78	2.1	34.33	1.8	34.78	1.7	34.74
1000	2.1	34.72	2.2	34.71	1.9	34.70	1.9	34.77	2.0	34.79	1.9	34.43	1.8	34.78	1.7	34.75

station	JA420017		JA420018		JA420019		JA420020		JA420021		JA420022		JA420023		JA420024	
date	2000/12/10		2000/12/10		2000/12/10		2000/12/11		2000/12/11		2000/12/11		2000/12/12		2000/12/13	
time(UT)	01:00		6:00		9:00		2:00		7:00		10:00		4:30		3:00	
latitude	59-38S		59-42S		59-44S		59-45S		59-46S		59-52S		61-20S		61-01S	
longitude	100-37E		98-25E		97-03E		89-25E		87-13E		85-55E		80-02E		71-25E	
depth	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity
0	-0.1	33.84	0.1	33.73	0.1	33.73	0.9	33.83	0.8	33.84	-0.1	33.59	-0.5	33.71	-1.0	33.02
10	-0.1	33.85	0.1	33.75	0.1	33.79	0.9	33.83	0.7	33.87	-0.1	33.70	-0.5	33.71	-1.0	33.05
20	-0.1	33.86	0.1	33.75	0.1	33.79	0.7	33.85	0.5	33.88	-0.8	33.80	-0.5	33.72	-1.3	33.58
30	-0.1	33.86	-0.2	33.78	0.1	33.80	0.6	33.86	0.4	33.89	-1.2	33.84	-0.9	33.77	-1.5	33.69
50	-0.4	33.88	-1.1	33.84	-1.0	33.87	0.2	33.89	0.3	33.96	-1.4	34.03	-1.6	33.94	-1.7	33.83
75	-1.2	34.03	-1.1	33.96	-1.4	34.00	0.3	33.93	0.1	34.01	-0.6	34.22	-1.6	34.02	-1.7	33.94
100	-0.8	34.10	-0.5	34.09	-1.3	34.05	0.0	33.96	-0.5	34.09	0.9	34.41	-0.8	34.15	-1.3	34.02
125	-0.4	34.19	0.4	34.22	-0.5	34.17	0.0	33.96	-0.8	34.16	1.7	34.53	1.2	34.40	-0.4	34.14
150	0.4	34.34	1.0	34.32	0.3	34.30	0.5	34.08	0.0	34.26	1.7	34.56	1.7	34.49	1.4	34.38
200	1.8	34.56	1.7	34.47	1.6	34.49	1.7	34.30	0.6	34.44	1.8	34.61	1.9	34.56	1.9	34.49
250	1.9	34.63	1.8	34.54	1.8	34.55	2.1	34.43	0.7	34.51	1.7	34.63	2.0	34.60	2.0	34.54
300	1.9	34.66	1.8	34.59	1.8	34.61	2.1	34.48	1.6	34.65	1.7	34.66	2.0	34.64	2.0	34.58
400	1.9	34.70	1.9	34.66	1.8	34.67	2.1	34.59	1.8	34.71	1.8	34.70	2.0	34.69	2.0	34.63
500	1.9	34.72	1.9	34.71	1.8	34.70	2.1	34.63	1.8	34.73	1.7	34.71	2.0	34.72	2.0	34.68
600	1.8	34.75	1.9	34.73	1.8	34.74	2.0	34.66	1.8	34.76	1.7	34.73	2.0	34.75	2.0	34.71
700	1.8	34.76	1.8	34.75	1.8	34.75	1.9	34.69	1.8	34.77	1.6	34.73	1.9	34.77	2.0	34.73
800	1.7	34.76	1.7	34.75	1.7	34.76	1.9	34.71	1.6	34.77	1.5	34.74	1.9	34.77	1.9	34.74
900	1.6	34.77	1.7	34.77	1.6	34.77	1.9	34.72	1.6	34.77	1.4	34.74	1.8	34.77	1.8	34.75
1000	1.6	34.77	-	-	6.9	35.08	1.8	34.73	-	-	1.3	34.73	1.7	34.77	1.8	34.76

station	JA420025		JA420026		JA420027		JA420028		JA420029		JA420030		JA420031		JA420032	
date	2000/12/13		2000/12/13		2000/12/14		2000/12/14		2000/12/14		2000/12/22		2001/2/17		2001/2/25	
time(UT)	08:00		11:00		4:00		9:00		12:00		06:24		09:48		14:42	
latitude	60-52S		60-56S		61-00S		61-20S		61-40S		66-38S		67-48S		66-09S	
longitude	69-06E		67-39E		59-19E		57-00E		55-42E		49-49E		40-39E		47-40E	
depth	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity
0	0.0	33.48	-0.3	33.46	-0.2	33.61	0.4	33.54	0.9	33.67	-1.7	34.10	-0.3	33.78	0.1	34.00
10	-0.1	33.49	-0.6	33.50	-0.3	33.66	0.0	33.55	0.1	33.54	-1.7	34.11	-0.3	33.79	0.1	34.00
20	-0.1	33.52	-0.9	33.56	-0.5	33.73	-0.4	33.58	-0.6	33.45	-1.7	34.19	-0.3	33.79	0.1	34.00
30	-0.7	33.59	-1.4	33.75	-0.6	33.75	-0.7	33.60	-1.1	33.50	-1.8	34.23	-0.3	33.79	0.1	34.01
50	-1.5	33.66	-1.6	33.86	-1.3	33.85	-1.2	33.70	-1.6	33.60	-1.8	34.24	-1.6	34.12	0.1	34.01
75	-1.3	33.82	-1.6	33.99	-1.6	33.92	-1.6	33.83	-1.7	33.71	-1.7	34.26	-1.7	34.26	0.1	34.01
100	-0.8	33.91	-1.1	34.08	-1.6	33.97	-1.5	33.90	-0.8	33.85	-1.8	34.26	-1.7	34.29	-1.1	34.08
125	-1.0	33.97	0.5	34.30	-1.0	34.09	-0.7	34.06	0.8	34.11	-1.8	34.28	-1.5	34.35	-1.7	34.28
150	-0.1	34.13	1.6	34.47	1.2	34.38	1.3	34.37	1.5	34.22	-1.8	34.29	-1.2	34.40	-1.8	34.32
200	1.9	34.43	1.9	34.53	1.8	34.52	1.8	34.51	1.8	34.30	-1.8	34.32	-0.5	34.49	-1.7	34.35
250	2.0	34.50	2.0	34.59	2.0	34.59	1.9	34.55	1.9	34.35	-1.8	34.35	0.3	34.63	-1.5	34.38
300	2.1	34.56	2.0	34.62	2.0	34.62	2.0	34.58	1.9	34.38	-1.8	34.39	0.8	34.70	-0.3	34.52
400	2.1	34.63	2.0	34.67	2.0	34.69	2.0	34.64	1.9	34.43	-1.8	34.41	1.0	34.74	0.2	34.62
500	2.1	34.66	2.0	34.71	2.0	34.72	2.0	34.68	1.9	34.46	-1.8	34.42	1.0	34.75	0.4	34.66
600	2.1	34.71	2.0	34.73	1.9	34.74	2.0	34.69	1.9	34.48	-1.8	34.39	0.9	34.76	0.4	34.66
700	2.0	34.71	1.9	34.74	1.9	34.76	1.9	34.70	1.8	34.49	-1.7	34.36	0.8	34.74	0.4	34.66
800	1.9	34.73	1.8	34.75	1.8	34.77	1.8	34.71	1.7	34.48	-1.6	34.39	0.7	34.74	0.4	34.65
900	1.9	34.74	1.8	34.75	1.7	34.77	1.7	34.71	1.6	34.47	-	-	0.5	34.74	0.4	34.64
1000	1.8	34.75	1.7	34.76	1.6	34.77	1.7	34.71	1.5	34.48	-	-	0.5	34.74	0.3	34.60

station	JA420033		JA420034		JA420035		JA420036		JA420037		JA420038		JA420039		JA420040	
date	2001/2/28		2001/2/28		2001/2/28		2001/3/1		2001/3/1		2001/3/1		2001/3/1		2001/3/2	
time(UT)	8:48		11:48		15:54		3:48		7:48		11:48		15:54		05:06	
latitude	64-57S		65-00S		65-00S		65-01S		64-59S		65-01S		65-35S		66-53S	
longitude	57-21E		58-38E		60-34E		66-21E		68-08E		69-47E		71-09E		74-38E	
depth	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity
0	0.1	33.84	0.1	33.79	0.1	33.84	-0.3	33.92	-0.3	33.84	0.1	33.75	-0.2	33.87	-0.1	33.78
10	0.1	33.85	0.1	33.81	0.1	33.85	-0.3	33.94	-0.4	33.85	0.1	33.77	-0.2	33.88	-0.1	33.79
20	0.1	33.85	0.1	33.82	0.1	33.87	-0.3	33.95	-0.4	33.87	0.1	33.77	-0.2	33.88	-0.1	33.81
30	0.1	33.84	0.1	33.83	0.1	33.88	-0.3	33.96	-0.4	33.88	0.1	33.78	-0.2	33.89	-0.2	33.82
50	0.1	33.85	0.1	33.83	0.1	33.89	-0.3	33.97	-0.7	33.99	-1.6	34.26	-1.3	34.21	-1.0	34.16
75	-0.1	34.24	-0.2	34.16	-0.9	34.23	-1.1	34.27	-1.7	34.31	-1.6	34.30	-1.6	34.34	-1.6	34.35
100	-1.4	34.38	0.6	34.43	0.5	34.40	-0.7	34.40	-1.6	34.33	-1.6	34.33	-1.6	34.36	-1.6	34.40
125	-1.4	34.39	0.8	34.49	1.2	34.51	-0.4	34.47	-1.5	34.37	-1.5	34.35	-1.5	34.37	-1.5	34.43
150	-0.4	34.50	1.3	34.57	1.4	34.56	0.5	34.57	-0.7	34.44	-1.2	34.39	-1.2	34.41	-1.6	34.43
200	1.5	34.64	1.6	34.63	1.7	34.62	1.3	34.65	0.2	34.57	-0.5	34.48	-0.7	34.48	-1.5	34.44
250	1.6	34.68	1.7	34.66	1.7	34.65	1.6	34.69	0.4	34.62	0.1	34.55	-0.1	34.54	-1.3	34.47
300	1.6	34.70	1.7	34.68	1.8	34.67	1.6	34.71	0.4	34.63	0.1	34.58	0.0	34.58	-0.6	34.53
400	1.5	34.71	1.6	34.69	1.7	34.70	1.4	34.71	0.4	34.65	0.3	34.63	0.3	34.63	-0.4	34.57
500	1.4	34.72	1.4	34.69	1.7	34.71	1.4	34.73	0.6	34.69	0.5	34.66	0.5	34.66	-0.2	34.60
600	1.3	34.68	1.4	34.71	1.6	34.70	1.3	34.71	0.6	34.69	0.6	34.68	0.6	34.68	-0.1	34.63
700	1.3	34.61	1.3	34.70	1.5	34.67	1.2	34.68	0.6	34.68	0.7	34.65	0.6	34.70	0.1	34.66
800	1.3	34.48	1.2	34.70	1.4	34.71	1.1	34.66	0.6	34.68	0.6	34.69	0.5	34.69	0.3	34.68
900	1.3	34.37	1.1	34.70	1.3	34.72	1.1	34.65	0.5	34.70	0.6	34.69	0.5	34.70	0.5	34.71
1000	1.3	34.28	1.0	34.70	1.2	34.72	1.0	34.63	0.5	34.69	0.4	34.68	0.4	34.68	0.5	34.71

station	JA420041		JA420042		JA420043		JA420044		JA420045		JA420046		JA420047		JA420048	
date	2001/3/3		2001/3/3		2001/3/3		2001/3/3		2001/3/4		2001/3/4		2001/3/4		2001/3/5	
time(UT)	2:48		7:00		10:54		10:54		6:18		10:48		14:48		02:48	
latitude	64-05S		63-06S		62-17S		61-08S		61-19S		61-30S		62-10S		64-00S	
longitude	75-58E		75-40E		76-04E		76-00E		79-58E		80-00E		79-59E		81-30E	
depth	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity
0	0.8	33.57	0.8	33.60	1.1	33.59	1.3	33.59	1.5	33.48	1.6	33.49	1.7	33.44	0.8	33.58
10	0.8	33.58	0.8	33.60	1.1	33.59	1.3	33.60	1.5	33.50	1.6	33.49	1.7	33.45	0.8	33.58
20	0.8	33.61	0.8	33.60	1.1	33.60	1.3	33.62	1.5	33.55	1.6	33.51	1.7	33.47	0.8	33.60
30	0.8	33.63	0.8	33.60	1.1	33.60	-0.2	33.74	1.4	33.59	1.5	33.52	1.7	33.48	0.8	33.60
50	-1.0	34.12	-0.7	33.90	1.1	33.60	-1.4	33.92	0.0	33.76	-1.2	33.93	-1.2	33.96	0.0	33.80
75	-0.7	34.27	-0.5	34.20	-1.4	33.99	-1.0	34.03	-1.1	33.97	-1.0	34.08	-1.1	34.10	-0.5	34.24
100	0.3	34.42	0.4	34.30	-0.9	34.11	0.5	34.24	0.1	34.16	0.1	34.25	-0.3	34.26	0.6	34.42
125	1.3	34.55	1.0	34.50	0.4	34.29	1.5	34.40	1.4	34.37	0.9	34.38	1.2	34.43	1.4	34.52
150	1.6	34.60	1.6	34.50	1.5	34.47	1.8	34.47	1.8	34.44	1.7	34.51	1.7	34.51	1.5	34.56
200	1.7	34.64	1.8	34.60	1.9	34.55	2.0	34.54	2.0	34.50	1.9	34.57	1.9	34.59	1.8	34.61
250	1.8	34.69	1.8	34.60	1.9	34.59	2.0	34.58	2.0	34.55	1.9	34.62	2.0	34.64	1.8	34.64
300	1.5	34.66	1.9	34.70	2.0	34.63	2.0	34.62	2.1	34.58	2.0	34.66	2.0	34.66	1.8	34.68
400	1.7	34.74	1.9	34.70	2.0	34.67	2.1	34.68	2.1	34.63	2.0	34.70	2.0	34.71	1.7	34.69
500	1.8	34.76	1.8	34.70	2.0	34.71	2.1	34.71	2.1	34.66	2.0	34.73	2.0	34.74	1.3	34.68
600	1.6	34.75	1.8	34.70	2.0	34.74	2.0	34.74	2.0	34.69	1.9	34.73	1.9	34.76	1.5	34.72
700	1.5	34.76	1.8	34.73	1.9	34.74	2.0	34.76	2.0	34.70	1.9	34.75	1.9	34.77	1.5	34.73
800	1.4	34.76	1.7	34.70	1.9	34.75	1.9	34.77	1.9	34.70	1.8	34.76	1.8	34.78	1.4	34.73
900	1.3	34.76	1.6	34.70	1.8	34.76	1.9	34.79	1.9	34.71	1.7	34.76	1.7	34.79	1.3	34.72
1000	1.2	34.75	1.4	34.70	1.7	34.76	1.8	34.79	-	-	1.7	34.77	1.7	34.79	1.1	34.71

station	JA420049		JA420050		JA420051		JA420052		JA420053		JA420054		JA420055		JA420056	
date	2001/3/5		2001/3/5		2001/3/5		2001/3/5		2001/3/5		2001/3/6		2001/3/6		2001/3/6	
time(UT)	03:48		06:12		08:36		10:48		14:54		01:54		7:00		10:48	
latitude	64-00S		63-31S		63-01S		63-12S		64-00S		64-00S		64-01S		63-59S	
longitude	81-56E		82-00E		82-00E		82-33E		82-51E		88-32E		91-02E		91-34E	
depth	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity
0	0.7	33.57	1.2	33.56	1.4	33.51	1.4	33.51	0.8	33.55	0.5	33.84	0.3	33.73	0.3	33.54
10	0.7	33.59	1.2	33.58	1.4	33.52	1.4	33.52	0.8	33.58	0.5	33.85	0.3	33.74	0.3	33.70
20	0.6	33.59	1.2	33.58	1.4	33.52	1.4	33.54	0.8	33.60	0.5	33.86	0.3	33.75	0.3	33.72
30	-1.0	34.05	1.2	33.59	1.4	33.52	1.3	33.55	0.8	33.62	0.5	33.87	-0.1	33.74	0.3	33.74
50	-1.1	34.27	1.1	33.59	-1.3	33.91	-1.1	33.93	0.3	33.71	-0.2	34.04	-1.5	34.26	0.3	33.76
75	-0.5	34.36	-1.0	34.09	-1.3	34.01	-1.2	34.05	-1.4	34.22	-1.3	34.35	-1.4	34.37	-1.4	34.28
100	0.4	34.50	0.3	34.31	-0.2	34.17	-0.2	34.22	-1.4	34.28	-1.2	34.39	-1.5	34.41	-1.2	34.41
125	1.5	34.60	1.3	34.45	1.0	34.35	0.8	34.37	-0.9	34.36	-1.0	34.43	-1.2	34.45	-0.9	34.47
150	1.7	34.64	1.6	34.52	1.5	34.43	1.5	34.49	-0.3	34.43	-0.8	34.46	-1.3	34.46	-0.6	34.50
200	1.7	34.67	1.9	34.58	1.9	34.53	1.8	34.56	0.7	34.58	0.1	34.58	-0.6	34.55	-0.2	34.57
250	1.7	34.70	1.7	34.59	1.9	34.58	1.9	34.62	1.4	34.67	0.9	34.67	-0.1	34.60	0.6	34.65
300	1.7	34.71	1.7	34.62	2.0	34.62	2.0	34.65	1.6	34.70	1.0	34.70	0.8	34.71	0.7	34.68
400	1.7	34.73	1.8	34.67	2.0	34.66	2.0	34.69	1.6	34.73	1.3	34.75	1.2	34.76	1.0	34.73
500	1.7	34.76	1.9	34.71	2.0	34.70	2.0	34.72	1.5	34.74	1.2	34.75	1.2	34.76	1.0	34.75
600	1.6	34.76	1.8	34.72	1.9	34.73	1.9	34.75	1.4	34.74	1.2	34.72	1.1	34.76	1.1	34.76
700	1.5	34.76	1.7	34.73	1.9	34.74	1.9	34.76	1.3	34.73	1.2	34.68	1.0	34.76	1.0	34.76
800	1.4	34.77	1.7	34.74	1.8	34.75	1.8	34.77	1.2	34.74	1.1	34.64	1.0	34.76	0.9	34.75
900	1.2	34.75	1.6	34.73	-	-	1.7	34.77	1.1	34.73	1.0	34.61	0.9	34.76	0.8	34.75
1000	1.2	34.75	1.5	34.73	-	-	1.7	34.77	1.0	34.74	1.0	34.60	0.7	34.74	0.8	34.75

station	JA420057		JA420058		JA420059		JA420060		JA420061		JA420062		JA420063		JA420064	
date	2001/3/6		2001/3/7		2001/3/7		2001/3/7		2001/3/7		2001/3/8		2001/3/8		2001/3/8	
time(UT)	13:48		01:48		06:54		10:54		13:48		0:48		5:54		9:48	
latitude	64-00S		63-47S		63-37S		63-31S		63-28S		63-50S		63-58S		63-55S	
longitude	92-55E		97-54E		99-57E		101-12E		102-29E		107-13E		109-21E		109-44E	
depth	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity
0	0.3	33.69	-1.0	32.99	0.1	33.92	-0.7	33.29	-0.6	33.32	-0.1	33.77	0.9	33.94	0.8	33.88
10	0.3	33.70	-1.0	33.23	0.2	33.95	-0.1	33.61	-0.5	33.40	-0.1	33.78	0.9	33.95	0.8	33.90
20	0.3	33.78	0.2	33.76	0.2	34.00	0.3	33.79	-0.1	33.78	-0.1	33.80	0.9	33.95	0.8	33.92
30	0.3	33.79	-0.7	33.92	0.0	34.05	0.5	33.88	-0.5	33.98	0.3	33.95	0.9	33.96	0.8	33.93
50	-0.4	33.97	-1.6	34.21	-1.7	34.31	-1.3	34.19	-1.5	34.22	-1.3	34.17	-0.3	34.05	0.8	33.94
75	-1.4	34.26	-1.6	34.32	-1.8	34.35	-1.7	34.29	-1.8	34.31	-1.2	34.37	-1.5	34.28	-1.1	34.28
100	-1.1	34.39	-1.6	34.38	-1.8	34.38	-1.8	34.34	-1.8	34.33	-0.9	34.47	-1.0	34.41	-0.5	34.44
125	-0.9	34.43	-1.7	34.42	-1.8	34.39	-1.7	34.37	-1.8	34.36	-0.5	34.54	-0.4	34.50	0.3	34.55
150	-0.7	34.50	-1.4	34.44	-1.8	34.40	-1.7	34.40	-1.8	34.38	0.2	34.62	0.6	34.60	0.9	34.61
200	0.0	34.56	-1.1	34.49	-1.8	34.43	-1.3	34.45	-1.8	34.40	0.8	34.69	1.1	34.67	1.3	34.68
250	0.2	34.60	-0.8	34.55	-1.8	34.44	-1.3	34.49	-1.5	34.44	1.1	34.73	1.2	34.69	1.4	34.70
300	-0.2	34.60	-0.1	34.62	-1.7	34.46	-1.0	34.54	-0.3	34.56	1.2	34.75	1.3	34.72	1.4	34.72
400	0.7	34.70	0.6	34.71	-0.8	34.58	-0.1	34.65	0.3	34.67	1.2	34.76	1.4	34.75	1.4	34.73
500	0.9	34.74	0.6	34.72	0.1	34.67	0.2	34.69	0.6	34.72	1.0	34.75	1.4	34.76	1.4	34.74
600	0.9	34.74	0.7	34.74	0.2	34.70	0.2	34.70	0.6	34.72	0.9	34.75	1.3	34.76	1.3	34.73
700	0.8	34.74	0.6	34.74	0.5	34.72	0.1	34.69	0.5	34.72	0.8	34.75	1.2	34.76	1.2	34.74
800	0.7	34.73	0.5	34.73	0.2	34.71	0.1	34.70	0.4	34.72	-	-	1.1	34.76	1.1	34.74
900	0.6	34.73	0.4	34.73	0.2	34.71	0.0	34.70	0.3	34.71	-	-	1.0	34.75	1.1	34.73
1000	-	-	0.3	34.73	0.0	34.69	-0.1	34.71	0.2	34.71	-	-	1.0	34.75	1.0	34.72

station	JA420065		JA420066		JA420067		JA420068		JA420069		JA420070		JA420071		JA420072	
date	2001/3/8		2001/3/9		2001/3/9		2001/3/9		2001/3/9		2001/3/9		2001/3/10		2001/3/10	
time(UT)	12:48		00:48		6:06		9:48		12:48		23:48		3:48		7:48	
latitude	63-57S		64-00S		64-00S		64-00S		64-00S		64-00S		64-00S		64-00S	
longitude	111-23E		117-56E		120-35E		121-23E		123-09E		127-14E		129-36E		132-02E	
depth	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity
0	1.1	33.99	1.1	34.02	1.4	34.00	1.2	34.01	1.3	34.01	1.3	33.96	1.3	33.90	1.4	33.91
10	1.1	34.01	1.1	34.03	1.4	34.01	1.2	34.02	1.3	34.01	1.3	33.96	1.3	33.92	1.4	33.94
20	1.1	34.02	1.1	34.04	1.4	34.00	1.2	34.03	1.3	34.01	1.3	33.97	1.3	33.94	1.4	33.95
30	1.1	34.02	1.1	34.05	1.4	34.01	1.1	34.03	1.3	34.01	1.3	33.97	1.3	33.93	1.4	33.96
50	1.0	34.05	1.1	34.04	-0.5	34.33	0.6	34.08	0.7	34.09	0.1	34.20	1.3	33.96	1.3	33.99
75	0.1	34.53	-0.5	34.12	0.9	34.62	0.0	34.56	-1.3	34.40	1.0	34.52	-0.4	34.29	-0.6	34.37
100	0.9	34.64	-1.4	34.37	1.2	34.66	0.9	34.62	-0.9	34.49	1.5	34.61	0.3	34.41	0.0	34.53
125	1.2	34.69	-0.9	34.45	1.4	34.68	1.3	34.66	-0.1	34.57	1.6	34.64	0.3	34.49	0.7	34.61
150	1.3	34.71	-0.5	34.51	1.4	34.70	1.3	34.69	0.5	34.63	1.7	34.67	0.9	34.57	1.1	34.65
200	1.4	34.73	0.2	34.60	1.4	34.72	1.5	34.71	0.9	34.69	1.6	34.69	1.2	34.62	1.3	34.69
250	1.4	34.74	0.1	34.61	1.4	34.73	1.4	34.72	1.4	34.75	1.7	34.72	1.3	34.65	1.5	34.73
300	1.4	34.75	0.3	34.65	1.5	34.75	1.4	34.73	1.4	34.76	1.7	34.73	1.3	34.68	1.2	34.72
400	1.4	34.75	0.6	34.69	1.5	34.75	1.5	34.75	1.5	34.77	1.6	34.74	1.3	34.70	1.4	34.75
500	1.3	34.75	0.9	34.72	1.4	34.76	1.4	34.75	1.4	34.78	1.6	34.75	1.3	34.71	1.3	34.76
600	1.2	34.75	0.8	34.72	1.3	34.76	1.4	34.75	1.3	34.72	1.5	34.76	1.3	34.72	1.3	34.76
700	1.1	34.74	0.8	34.72	1.2	34.76	1.3	34.75	1.3	34.63	1.4	34.75	1.2	34.72	1.3	34.78
800	1.1	34.73	0.8	34.73	1.2	34.77	1.2	34.76	1.2	34.72	1.2	34.74	1.2	34.73	1.1	34.77
900	1.0	34.72	0.8	34.72	1.1	34.75	1.1	34.75	1.1	34.73	1.1	34.73	1.1	34.72	1.1	34.77
1000	0.9	34.73	0.6	34.71	1.0	34.76	1.0	34.75	0.9	34.75	1.0	34.72	1.0	34.73	1.0	34.76

station	JA420073		JA420074		JA420075		JA420076		JA420077		JA420078		JA420079		JA420080	
date	2001/3/10		2001/3/11		2001/3/11		2001/3/11		2001/3/11		2001/3/12		2001/3/12		2001/3/12	
time(UT)	11:54		05:24		7:48		10:48		22:48		02:48		06:54		10:48	
latitude	64-00S		64-02S		64-07S		64-12S		63-40S		62-39S		62-25S		63-26S	
longitude	134-28E		140-05E		139-34E		138-02E		143-40E		143-40E		145-00E		145-00E	
depth	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity
0	1.2	33.94	1.3	33.95	1.4	33.93	1.0	33.91	1.5	33.92	1.7	33.93	1.8	33.89	1.6	33.88
10	1.2	33.96	1.3	33.95	1.4	33.94	1.0	33.92	1.5	33.93	1.7	33.93	1.7	33.90	1.6	33.89
20	1.2	33.97	1.3	33.95	1.4	33.94	0.9	33.94	1.5	33.93	1.7	33.93	1.7	33.91	1.6	33.90
30	1.1	33.99	1.3	33.96	1.3	33.96	0.9	33.97	1.5	33.94	1.7	33.94	1.7	33.91	1.6	33.91
50	0.9	34.02	0.6	34.08	0.1	34.21	0.6	34.04	1.4	33.95	1.3	33.94	1.7	33.92	1.1	33.94
75	-0.6	34.31	1.2	34.53	1.4	34.57	0.9	34.46	-0.3	34.14	-0.2	34.19	-0.4	34.06	1.7	34.42
100	-1.2	34.38	1.7	34.60	1.7	34.63	1.5	34.55	0.5	34.36	0.5	34.37	0.4	34.18	2.0	34.50
125	-0.1	34.50	1.8	34.64	1.8	34.66	1.6	34.61	1.6	34.55	1.2	34.48	1.9	34.41	2.1	34.54
150	0.7	34.58	1.8	34.65	1.8	34.68	1.8	34.65	1.7	34.59	1.5	34.53	2.1	34.46	2.1	34.57
200	1.4	34.68	1.9	34.69	1.9	34.71	1.8	34.67	1.8	34.64	1.8	34.59	2.0	34.52	2.1	34.63
250	1.5	34.70	1.9	34.71	1.8	34.74	1.5	34.66	2.0	34.69	1.8	34.63	2.2	34.56	2.1	34.66
300	1.6	34.72	1.8	34.72	1.8	34.76	1.5	34.68	1.9	34.71	1.9	34.66	2.2	34.60	2.0	34.69
400	1.5	34.73	1.8	34.75	1.8	34.78	1.5	34.70	1.9	34.74	2.0	34.70	2.2	34.66	2.0	34.73
500	1.4	34.74	1.8	34.76	1.6	34.77	1.6	34.72	1.8	34.75	2.0	34.74	2.2	34.62	2.0	34.77
600	1.4	34.72	1.7	34.77	1.6	34.78	1.4	34.72	1.8	34.78	1.9	34.74	2.3	34.51	1.9	34.78
700	1.2	34.71	1.6	34.78	1.4	34.78	1.3	34.70	1.8	34.78	1.8	34.76	2.1	34.59	1.8	34.80
800	1.3	34.69	1.5	34.78	1.3	34.78	1.1	34.70	1.7	34.78	1.8	34.76	2.1	34.62	1.8	34.81
900	1.1	34.67	1.4	34.78	1.3	34.79	1.2	34.71	1.5	34.77	1.7	34.77	2.0	34.65	1.7	34.81
1000	1.1	34.66	1.3	34.77	1.2	34.79	1.0	34.70	1.4	34.77	1.6	34.77	1.9	34.65	1.6	34.81

station	JA420081		JA420082		JA420083		JA420084		JA420085		JA420086		JA420087		JA420088	
date	2001/3/12		2001/3/13		2001/3/13		2001/3/13		2001/3/13		2001/3/14		2001/3/14		2001/3/14	
time(UT)	21:48		3:24		6:48		9:48		21:48		4:06		6:48		9:48	
latitude	64-00S		63-57S		63-44S		63-11S		60-58S		60-08S		59-50S		59-20S	
longitude	148-45E		150-03E		150-05E		150-00E		150-00E		150-06E		149-56E		150-00E	
depth	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity
0	1.2	33.95	1.0	33.73	1.2	33.88	1.5	33.90	2.0	33.84	2.3	33.84	2.3	33.89	2.1	33.83
10	1.2	33.97	1.0	33.73	1.2	33.90	1.5	33.92	2.0	33.84	2.3	33.85	2.3	33.89	2.1	33.84
20	1.2	33.98	1.0	33.75	1.2	33.91	1.5	33.93	2.0	33.85	2.3	33.86	2.3	33.90	2.1	33.86
30	1.2	33.98	1.0	33.81	1.2	33.92	1.5	33.93	2.0	33.86	2.2	33.88	2.3	33.90	2.1	33.86
50	1.2	33.98	-0.1	34.28	1.2	33.92	1.4	33.94	2.0	33.86	-0.1	34.10	2.3	33.91	2.0	33.87
75	0.2	34.14	1.0	34.52	0.0	34.25	-0.2	34.23	-0.3	33.99	0.9	34.34	-0.1	34.15	-0.3	34.25
100	1.1	34.52	1.6	34.63	1.2	34.47	0.9	34.45	0.1	34.18	1.8	34.49	1.1	34.40	0.8	34.46
125	1.7	34.63	1.7	34.66	1.7	34.58	1.6	34.57	1.6	34.42	2.0	34.53	1.9	34.52	1.6	34.57
150	1.8	34.66	1.8	34.68	1.9	34.61	1.8	34.62	1.9	34.50	2.0	34.55	1.9	34.56	1.8	34.62
200	1.9	34.70	1.8	34.71	1.9	34.64	1.9	34.65	2.0	34.54	2.0	34.60	2.0	34.61	1.9	34.64
250	1.9	34.72	1.8	34.72	1.9	34.67	1.9	34.67	2.0	34.58	2.1	34.62	2.0	34.64	1.9	34.67
300	1.9	34.73	1.8	34.74	1.9	34.68	1.9	34.69	2.0	34.62	2.0	34.65	2.0	34.67	1.9	34.68
400	1.9	34.75	1.8	34.76	1.9	34.71	1.9	34.72	2.1	34.67	2.0	34.69	2.0	34.72	1.8	34.70
500	1.8	34.77	1.8	34.76	1.8	34.72	1.9	34.73	2.0	34.68	2.0	34.70	2.0	34.73	1.8	34.72
600	1.8	34.78	1.7	34.77	1.8	34.71	1.8	34.73	2.0	34.69	1.9	34.72	1.9	34.76	1.7	34.71
700	1.7	34.79	1.6	34.78	1.8	34.65	1.8	34.73	1.9	34.69	1.9	34.72	1.9	34.77	1.7	34.70
800	1.6	34.79	1.5	34.78	-	-	1.7	34.73	1.9	34.69	1.8	34.73	1.8	34.77	1.6	34.71
900	-	-	1.4	34.77	-	-	1.7	34.73	1.8	34.68	1.8	34.74	1.7	34.78	1.5	34.73
1000	-	-	1.4	34.78	-	-	1.6	34.72	1.7	34.72	1.7	34.74	1.6	34.78	1.4	34.72

station	JA420089		JA420090		JA420091		JA420092		JA420093		JA420094		JA420095		JA420096	
date	2001/3/14		2001/3/15		2001/3/15		2001/3/15		2001/3/15		2001/3/16		2001/3/16		2001/3/16	
time(UT)	21:48		3:06		6:48		9:48		22:00		5:24		6:54		9:54	
latitude	57-22S		56-33S		56-16S		55-46S		53-02S		51-53S		51-31S		50-43S	
longitude	150-00E		149-59E		150-07E		150-00E		150-00E		150-08E		150-00E		150-00E	
depth	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity	temp.	salinity
0	3.0	33.80	6.0	33.77	6.6	33.79	5.4	33.70	6.4	33.77	9.4	34.05	9.3	34.02	7.8	33.86
10	3.0	33.80	5.9	33.77	6.6	33.81	5.4	33.72	6.3	33.78	9.4	34.06	9.2	34.03	7.5	33.88
20	3.0	33.82	5.9	33.77	6.6	33.82	5.4	33.73	6.3	33.79	9.4	34.07	9.2	34.05	7.5	33.89
30	3.0	33.81	5.7	33.78	6.6	33.83	5.4	33.73	6.2	33.79	9.3	34.08	9.2	34.05	7.5	33.90
50	3.0	33.82	3.8	33.91	6.6	33.84	5.3	33.74	6.0	33.79	9.3	34.09	9.2	34.06	7.5	33.95
75	3.0	33.82	3.5	33.94	5.5	34.05	3.5	33.89	5.2	33.78	9.0	34.43	9.0	34.05	8.0	34.08
100	1.2	33.93	3.4	33.96	5.0	34.06	3.2	33.90	5.1	33.82	9.2	34.61	8.3	34.24	8.1	34.21
125	0.0	34.09	3.7	34.05	4.9	34.06	2.9	33.92	4.0	33.87	9.1	34.62	8.4	34.40	7.5	34.35
150	0.7	34.27	3.5	34.06	4.6	34.06	3.0	33.97	3.4	33.93	9.0	34.60	8.9	34.56	7.5	34.39
200	1.9	34.49	3.4	34.16	4.2	34.08	3.1	34.08	3.3	33.98	8.8	34.57	8.6	34.52	6.8	34.30
250	2.1	34.54	3.7	34.25	4.9	34.27	3.1	34.15	3.0	34.01	8.5	34.53	8.3	34.48	5.9	34.20
300	2.1	34.58	3.5	34.28	4.4	34.26	3.0	34.20	3.2	34.11	8.3	34.50	7.8	34.40	5.6	34.18
400	2.1	34.63	3.0	34.33	3.4	34.23	2.9	34.30	3.0	34.18	7.3	34.39	6.7	34.27	5.3	34.23
500	2.1	34.66	2.8	34.41	3.3	34.35	2.7	34.36	2.6	34.23	7.0	34.44	6.1	34.26	5.5	34.33
600	2.1	34.68	2.6	34.45	3.0	34.41	2.6	34.44	2.5	34.29	5.8	34.34	6.0	34.34	4.8	34.33
700	2.0	34.70	2.5	34.52	2.7	34.44	2.5	34.52	2.8	34.42	5.2	34.36	5.1	34.32	3.9	34.30
800	1.9	34.72	2.5	34.59	2.6	34.51	2.5	34.57	2.6	34.47	4.3	34.32	4.4	34.31	3.6	34.35
900	1.9	34.73	2.4	34.62	2.5	34.57	2.4	34.61	2.5	34.51	3.7	34.33	3.8	34.31	3.4	34.40
1000	1.8	34.74	2.3	34.66	2.4	34.62	2.4	34.65	2.5	34.56	3.4	34.38	3.4	34.34	3.1	34.42

station	JA420097		JA420098	
date	2001/3/16		2001/3/17	
time(UT)	21:24		1:06	
latitude	48-26S		47-31S	
longitude	150-00E		150-00E	
depth	temp.	salinity	temp.	salinity
0	9.5	34.09	10.7	34.22
10	9.5	34.10	10.7	34.23
20	9.5	34.11	10.7	34.23
30	9.5	34.12	10.6	34.24
50	9.2	34.11	10.4	34.24
75	9.2	34.12	10.2	34.32
100	9.1	34.57	9.7	34.54
125	9.1	34.63	9.5	34.63
150	9.0	34.61	9.3	34.66
200	8.9	34.59	9.1	34.64
250	8.7	34.56	9.0	34.62
300	8.5	34.54	8.9	34.62
400	7.6	34.40	8.9	34.61
500	6.7	34.31	8.6	34.57
600	6.0	34.27	7.7	34.46
700	6.2	34.40	6.9	34.41
800	4.8	34.33	6.6	34.45
900	4.3	34.33	-	-
1000	3.9	34.36	-	-

Table 3. Serial observation data.

Station 1

Beginning of cast

Date	:	December 6, 2000
Time(UT)	:	06:00
Latitude	:	46-38.6S
Longitude	:	109-58.5E
Depth	:	3500 m

Meteorological observation

Time(UT)	:	06:00	Wind direction	:	NW
Weather	:	r	Velocity	:	30m/s
Air temperature(dry)	:	9.3℃	Wave	:	NW/4
Humidity	:	93%	Swell	:	W/3
Atmospheric Pressure	:	1000.6hPa	Visibility	:	8km

Water Sampling by Niskin bottles										Observed by CTD			
Pressure (dbar)	Temperature (IPTS68)	Salinity (PSS78)	pH	DO2	PO4-P	SiO3-Si	NO2-N	NO3-N	NH4-N	Pressure (dbar)	Temperature (ITS-90)	Temperature (IPTS68)	Salinity (PSS78)
				(μmol/l)									
0	8.000	34.138	8.06	308	1.21	2	0.29	16.7	0.2	10	7.7214	7.7233	34.1330
46	7.900	34.187	8.09	308	1.28	2	0.30	16.5	0.1	20	7.7218	7.7237	34.1321
73	7.894	34.185	8.05	310	1.39	2	0.30	17.0	0.3	30	7.7192	7.7211	34.1334
98	7.867	34.184	8.05	310	1.26	2	0.30	16.9	0.3	50	7.7082	7.7100	34.1339
121	8.403	34.470	8.05	293	1.31	5	0.27	17.0	0.2	75	7.7036	7.7054	34.1380
144	7.982	34.388	8.02	294	1.35	5	0.32	17.7	0.1	100	7.8154	7.8173	34.2169
201	7.073	34.265	8.01	304	1.45	6	0.38	19.7	0.2	125	7.3992	7.4010	34.2958
253	6.695	34.228	8.00	303	1.52	6	0.19	20.3	0.1	150	7.7976	7.7995	34.3719
299	6.488	34.238	7.99	298	1.55	7	0.06	22.3	0.0	200	7.3456	7.3474	34.3085
403	6.005	34.219	7.96	286	1.72	10	0.04	23.9	0.2	250	7.2926	7.2943	34.3280
499	6.074	34.335	7.90	243	2.28	28	0.07	30.9	0.0	300	7.0576	7.0593	34.3279
601	5.302	34.328	7.88	239	2.09	22	0.03	29.1	0.0	400	6.8820	6.8837	34.3590
700	4.380	34.285	7.86	248	2.24	27	0.04	31.0	0.1	500	5.8644	5.8658	34.2984
800	3.865	34.295	7.84	236	2.34	34	0.03	32.8	0.0	600	5.3456	5.3469	34.3257
901	3.482	34.327	7.82	227	2.45	42	0.04	33.5	0.0	700	4.4118	4.4129	34.2758
998	3.250	34.359	7.81	217	2.51	49	0.05	35.2	0.0	800	3.9004	3.9013	34.2840
1250	2.809	34.485	7.78	195	2.62	67	0.01	36.1	0.0	1000	3.2652	3.2660	34.3583
1493	2.622	34.593	7.80	193	2.51	76	0.03	35.2	0.0	1200	2.8472	2.8479	34.4488
1688	2.515	34.654	7.82	193	2.46	78	0.04	34.4	0.0	1500	2.6180	2.6186	34.5937

IPTS68 : International Practical Temperture Scale of 1968.
ITS-90 : International Temperture Scale of 1990.
PSS78 : Practical Salinity Scale of 1978.

Station 2

Beginning of cast

Date	:	December 9, 2000
Time(UT)	:	01:00
Latitude	:	59-16.4S
Longitude	:	110-00.1E
Depth	:	4450 m

Meteorological observation

Time(UT)	:	01:00	Wind direction	:	NW
Weather	:	c	Velocity	:	7m/s
Air temperature(dry)	:	0.6℃	Wave	:	NW/3
Humidity	:	83%	Swell	:	NW, S/3, 3
Atmospheric Pressure	:	971.4hPa	Visibility	:	20km

Water Sampling by Niskin bottles										Observed by CTD			
Pressure (dbar)	Temperature (IPTS68)	Salinity (PSS78)	pH	DO2	PO4-P	SiO3-Si	NO2-N	NO3-N	NH4-N	Pressure (dbar)	Temperature (ITS-90)	Temperature (IPTS68)	Salinity (PSS78)
				(μmol/l)									
0	0.600	33.913	----	--	--	--	--	--	--	10	0.6042	----	33.8989
----	----	----	----	--	--	--	--	--	--	20	0.5119	----	33.8871
----	----	----	----	--	--	--	--	--	--	30	0.4764	----	33.8879
----	----	----	----	--	--	--	--	--	--	50	-0.3085	----	33.9299
----	----	----	----	--	--	--	--	--	--	75	-1.2729	----	34.0587
----	----	----	----	--	--	--	--	--	--	100	-0.5483	----	34.1579
----	----	----	----	--	--	--	--	--	--	125	0.8270	----	34.3517
----	----	----	----	--	--	--	--	--	--	150	1.4214	----	34.4324
----	----	----	----	--	--	--	--	--	--	200	1.7529	----	34.5179
----	----	----	----	--	--	--	--	--	--	250	1.9203	----	34.5840
----	----	----	----	--	--	--	--	--	--	300	1.9408	----	34.6194
----	----	----	----	--	--	--	--	--	--	400	1.9464	----	34.6677
----	----	----	----	--	--	--	--	--	--	500	1.8930	----	34.7009
----	----	----	----	--	--	--	--	--	--	600	1.8373	----	34.7208
----	----	----	----	--	--	--	--	--	--	700	1.8047	----	34.7303
----	----	----	----	--	--	--	--	--	--	800	1.7485	----	34.7380
----	----	----	----	--	--	--	--	--	--	1000	1.5704	----	34.7397
----	----	----	----	--	--	--	--	--	--	1250	1.3536	----	34.7339
----	----	----	----	--	--	--	--	--	--	1500	1.1537	----	34.7239
----	----	----	----	--	--	--	--	--	--	2000	0.7636	----	34.7054
----	----	----	----	--	--	--	--	--	--	2500	0.4495	----	34.6933
----	----	----	----	--	--	--	--	--	--	3000	0.2050	----	34.6816
----	----	----	----	--	--	--	--	--	--	3500	0.0568	----	34.6778
----	----	----	----	--	--	--	--	--	--	4000	-0.0434	----	34.6739

IPTS68 : International Practical Temperture Scale of 1968.
ITS-90 : International Temperture Scale of 1990.
PSS78 : Practical Salinity Scale of 1978.

Station 3

Beginning of cast

Date	:	December 12, 2000
Time(UT)	:	04:09
Latitude	:	61-20.5S
Longitude	:	79-56.9E
Depth	:	2700 m

Meteorological observation

Time(UT)	:	04:00	Wind direction	:	ESE
Weather	:	s	Velocity	:	30m/s
Air temperature(dry)	:	0.4℃	Wave	:	ESE/4
Humidity	:	91%	Swell	:	ESE/2
Atmospheric Pressure	:	986.2hPa	Visibility	:	4km

Water Sampling by Niskin bottles										Observed by CTD			
Pressure (dbar)	Temperature (IPTS68)	Salinity (PSS78)	pH	DO2	PO4-P	SiO3-Si	NO2-N	NO3-N	NH4-N	Pressure (dbar)	Temperature (ITS-90)	Temperature (IPTS68)	Salinity (PSS78)
				(μmol/l)									
0	-0.500	33.730	8.21	373	1.61	37	0.30	25	0.3	10	-0.4658	-0.4659	33.6985
49	-1.587	33.886	8.16	357	2.06	45	0.24	28	0.2	20	-0.4784	-0.4785	33.6992
74	-1.660	33.951	8.14	341	2.14	48	0.19	29	0.3	30	-0.7264	-0.7266	33.7332
100	-1.646	33.991	8.12	333	2.18	49	0.20	29	0.2	50	-1.6414	-1.6418	33.9299
126	-0.353	34.150	8.04	282	2.37	61	0.10	32	0.3	75	-1.6964	-1.6968	33.9775
151	1.541	34.416	7.97	438	2.64	80	0.00	36	0.4	100	-1.2042	-1.2045	34.0395
200	1.859	34.513	7.96	188	2.66	87	0.01	36	0.1	125	0.7762	0.7764	34.2869
252	1.918	34.562	7.97	185	2.65	90	0.00	36	0.0	150	1.6746	1.6750	34.4405
302	1.983	34.599	7.98	185	2.57	92	0.01	35	0.1	200	1.8452	1.8456	34.5141
403	2.019	34.658	7.99	189	2.50	93	0.00	34	0.0	250	1.9582	1.9587	34.5676
501	2.023	34.693	8.01	195	2.44	93	0.09	33	0.1	300	2.0108	2.0113	34.6054
600	1.987	34.715	8.02	198	2.40	94	0.01	32	0.1	400	2.0452	2.0457	34.6569
702	1.935	34.731	8.02	204	2.34	94	0.08	32	0.2	500	2.0178	2.0183	34.6907
801	1.852	34.738	8.02	206	2.33	95	0.07	32	0.1	600	1.9836	1.9841	34.7143
1000	1.713	34.741	8.02	209	2.28	98	0.06	31	0.0	700	1.9344	1.9349	34.7273
1249	1.489	34.748	8.00	214	2.28	103	0.00	31	0.0	800	1.8684	1.8688	34.7380
1496	1.262	34.741	7.95	220	2.29	110	0.03	31	0.0	1000	1.7188	1.7192	34.7480
2013	0.823	34.713	7.75	222	2.35	124	0.00	32	0.0	1200	1.5482	1.5486	34.7491
										1500	1.2660	1.2663	34.7381
										2000	0.8346	0.8348	34.7139

IPTS68 : International Practical Temperture Scale of 1968.
ITS-90 : International Temperture Scale of 1990.
PSS78 : Practical Salinity Scale of 1978.

Station 4

Beginning of cast

Date	:	March 4, 2001
Time(UT)	:	05:41
Latitude	:	61-19.2S
Longitude	:	79-55.8E
Depth	:	2750 m

Meteorological observation

Time(UT)	:	06:00	Wind direction	:	W
Weather	:	b	Velocity	:	16m/s
Air temperature(dry)	:	0.6℃	Wave	:	W/3
Humidity	:	83%	Swell	:	WNW/1
Atmospheric Pressure	:	1001.6hPa	Visibility	:	30km

Water Sampling by Niskin bottles										Observed by CTD			
Pressure (dbar)	Temperature (IPTS68)	Salinity (PSS78)	pH	DO2	PO4-P	SiO3-Si	NO2-N	NO3-N	NH4-N	Pressure (dbar)	Temperature (ITS-90)	Temperature (IPTS68)	Salinity (PSS78)
				(μmol/l)									
0	1.400	33.563	8.16	348	1.66	22	0.35	25	0.3	10	1.4042	1.4045	33.5235
48	1.327	33.631	8.18	349	1.75	25	0.34	26	0.3	20	1.4098	1.4101	33.5262
98	-0.065	34.160	8.03	270	2.41	59	0.17	34	0.4	30	1.4072	1.4075	33.5243
125	1.228	34.330	7.98	221	2.61	70	0.01	36	0.3	50	0.3562	0.3563	33.6892
151	1.837	34.450	7.97	289	2.66	78	0.01	37	0.5	75	-1.1550	-1.1553	33.9543
200	1.957	34.500	7.98	187	2.66	82	0.00	37	0.2	100	0.0256	0.0256	34.1627
251	2.026	34.567	7.98	183	2.61	85	0.00	37	0.4	125	1.3246	1.3249	34.3590
301	2.041	34.595	7.98	182	2.57	86	0.00	36	0.3	150	1.8076	1.8080	34.4417
401	2.048	34.650	7.99	190	2.51	89	0.01	35	0.5	200	1.9796	1.9801	34.5166
502	2.036	34.685	7.98	191	2.51	89	0.01	34	0.4	250	2.0230	2.0235	34.5637
602	2.009	34.713	7.98	195	2.39	90	0.03	34	0.5	300	2.0338	2.0343	34.5947
699	1.968	34.729	7.98	198	2.35	90	0.00	33	0.5	400	2.0476	2.0481	34.6465
800	1.908	34.736	7.96	203	2.30	91	0.00	32	0.6	500	2.0376	2.0381	34.6814
900	1.840	34.748	7.93	207	2.26	92	0.00	32	0.5	600	2.0076	2.0081	34.7061
1001	1.769	34.758	7.89	212	2.26	94	0.00	32	0.6	700	1.9596	1.9601	34.7243
1250	1.562	34.754	7.83	216	2.24	99	0.00	32	0.4	800	1.9016	1.9021	34.7371
1498	1.313	34.750	7.61	216	2.29	107	0.00	32	0.2	1000	1.7496	1.7500	34.7485
1998	0.863	34.728	7.64	219	2.35	121	0.00	33	0.2	1200	1.5736	1.5740	34.7485
2099	0.785	34.715	7.44	220	2.37	124	0.00	33	0.3	1500	1.2934	1.2937	34.7367
										2000	0.8606	0.8608	34.7127

IPTS68 : International Practical Temperture Scale of 1968.
ITS-90 : International Temperture Scale of 1990.
PSS78 : Practical Salinity Scale of 1978.

Station 5

Beginning of cast

Date	: March 6, 2001
Time(UT)	: 06:55
Latitude	: 64-00.4S
Longitude	: 91-01.8E
Depth	: 3532 m

Meteorological observation

Time(UT)	: 07:00	Wind direction	: ENE
Weather	: s	Velocity	: 16m/s
Air temperature(dry)	: 0.7℃	Wave	: ENE/3
Humidity	: 96%	Swell	: WNW/1
Atmospheric Pressure	: 983.9hPa	Visibility	: 7km

Water Sampling by Niskin bottles										Observed by CTD			
Pressure (dbar)	Temperature (IPTS68)	Salinity (PSS78)	pH	DO2	PO4-P	SiO3-Si	NO2-N	NO3-N	NH4-N	Pressure (dbar)	Temperature (ITS-90)	Temperature (IPTS68)	Salinity (PSS78)
				(μmol/l)									
0	1.400	33.729	8.16	354	1.94	46	0.31	29	0.3	10	0.4978	0.4979	33.7334
48	-1.411	----	8.15	328	2.23	66	0.13	31	0.3	20	0.4050	0.4051	33.7332
74	-1.458	----	8.12	311	2.30	72	0.13	33	0.5	30	0.0850	0.0850	33.7198
101	-1.606	34.267	8.12	317	2.28	71	0.04	33	0.4	50	-1.4138	-1.4141	34.1986
122	-1.577	----	8.11	219	2.25	71	0.01	32	0.2	75	-1.4074	-1.4077	34.3049
199	-0.617	----	8.09	280	2.35	82	0.01	34	0.3	100	-1.4906	-1.4910	34.3683
250	-0.161	34.535	8.09	263	2.36	86	0.01	34	0.2	125	-1.1164	-1.1167	34.4060
300	0.625	----	8.06	235	2.40	93	0.00	34	0.3	150	-1.3060	-1.3063	34.4215
400	1.173	34.695	8.05	217	2.38	100	0.00	34	0.3	200	-0.3280	-0.3281	34.5045
501	1.167	34.687	8.05	218	2.38	105	0.02	34	0.2	250	-0.0118	-0.0118	34.5666
600	1.124	34.693	8.04	223	2.38	108	0.03	34	0.4	300	0.8214	0.8216	34.6595
700	1.064	34.684	8.03	216	2.39	112	0.01	34	0.2	400	1.2022	1.2025	34.7101
801	0.967	34.714	8.02	214	2.41	114	0.01	34	0.2	500	1.1928	1.1931	34.7213
902	0.895	34.713	8.02	217	2.41	118	0.00	34	0.2	600	1.1074	1.1077	34.7193
999	0.809	34.702	8.00	221	2.43	120	0.00	34	0.2	700	1.0742	1.0745	34.7223
1251	0.582	34.694	7.97	227	2.46	127	0.01	34	0.2	800	0.9832	0.9834	34.7194
1501	0.392	34.689	7.95	227	2.47	129	0.00	35	0.2	1000	0.7882	0.7884	34.7093
2000	0.120	34.676	7.92	238	2.48	133	0.00	35	0.2	1200	0.6188	0.6189	34.7009
2499	-0.047	34.674	7.83	240	2.45	130	0.00	34	0.2	1500	0.4026	0.4027	34.6929
3062	-0.117	34.649	7.74	252	2.42	130	0.00	34	0.1	2000	0.1180	0.1180	34.6814
										2500	-0.0468	-0.0468	34.6763
										3000	-0.1176	-0.1176	34.6725

IPTS68 : International Practical Temperture Scale of 1968.
ITS-90 : International Temperture Scale of 1990.
PSS78 : Practical Salinity Scale of 1978.

Station 6

Beginning of cast

Date	:	March 7, 2001
Time(UT)	:	06:45
Latitude	:	63-36.5S
Longitude	:	99-57.5E
Depth	:	1687 m

Meteorological observation

Time(UT)	:	07:00	Wind direction	:	SE
Weather	:	s	Velocity	:	11m/s
Air temperature(dry)	:	0.7℃	Wave	:	SE/1
Humidity	:	95%	Swell	:	NW/1
Atmospheric Pressure	:	981.7hPa	Visibility	:	8km

Water Sampling by Niskin bottles										Observed by CTD			
Pressure (dbar)	Temperature (IPTS68)	Salinity (PSS78)	pH	DO2	PO4-P	SiO3-Si	NO2-N	NO3-N	NH4-N	Pressure (dbar)	Temperature (ITS-90)	Temperature (IPTS68)	Salinity (PSS78)
				(μmol/l)									
0	0.000	33.857	7.63	345	2.11	56	0.31	29	0.5	10	0.0852	0.0852	33.8646
49	-1.221	----	--	--	--	--	--	--	--	20	0.0908	0.0908	33.8788
73	-1.769	34.292	8.17	314	2.29	69	0.15	32	0.5	30	0.2586	0.2587	33.9477
99	-1.804	34.316	8.15	310	2.32	69	0.12	32	0.5	50	-0.2136	-0.2136	34.0340
122	-1.804	34.330	8.15	311	2.31	68	0.07	32	0.3	75	-1.7212	-1.7216	34.2779
147	-1.797	34.343	8.16	309	2.31	68	0.09	33	0.4	100	-1.7822	-1.7826	34.3087
198	-1.799	34.368	8.16	317	2.30	68	0.04	32	0.3	125	-1.7512	-1.7516	34.3352
249	-1.818	34.377	8.14	321	2.28	68	0.06	32	0.3	150	-1.7656	-1.7660	34.3526
298	-1.813	34.399	8.14	323	2.27	68	0.05	32	0.2	200	-1.7766	-1.7770	34.3756
497	-0.339	34.582	8.11	264	2.37	91	0.03	33	0.2	250	-1.7744	-1.7748	34.3906
698	0.383	34.669	8.09	238	2.44	114	0.03	34	0.3	300	-1.7710	-1.7714	34.4077
797	0.410	34.681	8.09	232	2.47	122	0.02	34	0.2	400	-0.7942	-0.7944	34.5187
897	0.086	34.655	8.08	234	2.46	117	0.02	34	0.3	500	-0.1178	-0.1178	34.6116
996	0.187	34.676	8.09	232	2.47	126	0.01	34	0.2	600	0.2328	0.2329	34.6516
1246	0.014	34.666	8.08	239	2.48	126	0.02	35	0.2	700	0.3230	0.3231	34.6673
1500	-0.202	34.650	8.10	247	2.44	120	0.02	35	0.2	800	0.2948	0.2949	34.6732
1588	-0.212	34.652	8.09	246	2.42	120	0.03	34	0.2	1000	0.1354	0.1354	34.6717
										1200	0.0324	0.0324	34.6698
										1500	-0.2026	-0.2026	34.6532

IPTS68 : International Practical Temperture Scale of 1968.
ITS-90 : International Temperture Scale of 1990.
PSS78 : Practical Salinity Scale of 1978.

Station 7

Beginning of cast

Date	:	March 8, 2001
Time(UT)	:	05:47
Latitude	:	63-58.2S
Longitude	:	109-21.1E
Depth	:	3510 m

Meteorological observation

Time(UT)	:	06:00	Wind direction	:	S
Weather	:	s	Velocity	:	19m/s
Air temperature(dry)	:	-2.0℃	Wave	:	S/4
Humidity	:	81%	Swell	:	SE/3
Atmospheric Pressure	:	982.6hPa	Visibility	:	15km

Water Sampling by Niskin bottles										Observed by CTD			
Pressure (dbar)	Temperature (IPTS68)	Salinity (PSS78)	pH	DO2	PO4-P	SiO3-Si	NO2-N	NO3-N	NH4-N	Pressure (dbar)	Temperature (ITS-90)	Temperature (IPTS68)	Salinity (PSS78)
				(μmol/l)									
0	0.700	33.933	8.19	349	1.88	46	0.27	29	0.4	10	0.9102	0.9104	33.9272
49	0.883	33.932	8.16	375	1.91	45	0.26	29	0.3	20	0.9066	0.9068	33.9265
75	-1.247	34.139	8.13	337	2.28	66	0.14	32	0.4	30	0.9044	0.9046	33.9271
96	-1.010	34.319	8.09	300	2.35	73	0.18	34	0.3	50	-0.0794	-0.0794	33.9900
123	-0.466	34.436	8.07	273	2.38	81	0.01	34	0.3	75	-1.4758	-1.4762	34.2666
147	0.441	34.535	8.04	241	2.41	87	0.00	35	0.3	100	-1.0804	-1.0807	34.3574
198	1.083	34.632	8.04	220	2.42	93	0.00	35	0.2	125	-0.4748	-0.4749	34.4433
249	1.186	34.663	8.04	215	2.39	96	0.00	35	0.2	150	0.5488	0.5489	34.5582
300	1.362	34.698	8.04	212	2.40	99	0.00	34	0.3	200	1.1306	1.1309	34.6291
398	1.175	34.690	8.03	213	2.39	103	0.00	35	0.3	250	1.1810	1.1813	34.6564
498	1.373	34.713	8.03	211	2.35	104	0.00	34	0.2	300	1.3350	1.3353	34.6849
600	1.322	34.716	8.02	215	2.36	108	0.00	34	0.4	400	1.4042	1.4045	34.7174
699	1.230	34.728	8.02	212	2.35	118	0.01	34	0.3	500	1.3666	1.3669	34.7272
800	1.149	34.706	8.00	257	2.36	114	0.00	34	0.2	600	1.2990	1.2993	34.7284
898	1.071	34.726	7.99	220	2.37	118	0.01	34	0.3	700	1.2302	1.2305	34.7313
1001	0.970	34.718	7.94	217	2.38	120	0.00	34	0.4	800	1.1430	1.1433	34.7290
1250	0.780	34.707	7.90	221	2.41	126	0.00	35	0.3	1000	0.9668	0.9670	34.7201
1500	0.575	34.697	7.86	224	2.43	131	0.00	35	0.2	1200	0.8000	0.8002	34.7129
1999	0.223	34.681	7.79	233	2.44	135	0.00	35	0.2	1500	0.5728	0.5729	34.7009
2499	0.032	34.677	7.69	239	2.42	139	0.00	35	0.3	2000	0.2348	0.2349	34.6874
3056	-0.124	34.668	7.54	250	2.40	135	0.00	35	0.2	2500	0.0312	0.0312	34.6808
										3000	-0.1102	-0.1102	34.6750

IPTS68 : International Practical Temperture Scale of 1968.
ITS-90 : International Temperture Scale of 1990.
PSS78 : Practical Salinity Scale of 1978.

Station 8

Beginning of cast

Date	: March 9, 2001	Meteorological observation				Wind direction	: WSW
Time(UT)	: 05:47	Time(UT)	: 06:00			Velocity	: 17m/s
Latitude	: 63-59.8S	Weather	: c			Wave	: WSW/4
Longitude	: 120-34.3E	Air temperature(dry)	: -0.5℃			Swell	: W/3
Depth	: 3791 m	Humidity	: 76%			Visibility	: 20km
		Atmospheric Pressure	: 982.5hPa				

Water Sampling by Niskin bottles										Observed by CTD			
Pressure (dbar)	Temperature (IPTS68)	Salinity (PSS78)	pH	DO2	PO4-P	SiO3-Si	NO2-N	NO3-N	NH4-N	Pressure (dbar)	Temperature (ITS-90)	Temperature (IPTS68)	Salinity (PSS78)
				(μmol/l)									
0	1.200	33.978	8.18	349	2.52	69	0.21	33	0.5	10	1.4260	1.4263	33.9832
48	1.409	33.994	8.17	374	2.68	90	0.30	36	0.2	20	1.4282	1.4285	33.9831
74	-0.439	----	8.15	375	2.67	90	0.30	36	0.2	30	1.4286	1.4289	33.9833
99	1.109	34.602	8.05	337	2.69	91	0.30	36	0.4	50	1.4292	1.4295	33.9842
125	1.304	34.628	7.99	300	2.63	92	0.05	36	0.2	75	-0.4278	-0.4279	34.3429
151	1.406	34.648	7.99	273	2.65	94	0.05	36	0.2	100	1.0802	1.0805	34.6038
199	1.514	34.643	8.00	241	2.59	96	0.04	36	0.3	125	1.2862	1.2865	34.6370
250	1.496	34.688	8.01	220	2.57	97	0.04	35	0.2	150	1.3794	1.3797	34.6560
301	1.535	34.709	8.02	215	2.56	98	0.04	35	0.1	200	1.4386	1.4389	34.6802
401	1.460	34.716	8.02	212	2.52	101	0.02	35	0.1	250	1.4128	1.4131	34.6927
500	1.415	34.724	8.02	213	2.52	103	0.04	34	0.2	300	1.5190	1.5194	34.7124
600	1.338	34.726	8.03	211	2.51	106	0.02	34	0.3	400	1.5166	1.5170	34.7259
700	1.263	34.725	8.04	215	2.51	109	0.03	34	0.2	500	1.3954	1.3957	34.7262
799	1.212	34.728	8.04	212	2.53	113	0.02	34	0.2	600	1.3392	1.3395	34.7291
902	1.125	34.678	8.04	257	2.51	115	0.02	34	0.2	700	1.2294	1.2297	34.7270
1001	1.051	34.680	8.03	220	2.54	118	0.03	34	0.2	800	1.1982	1.1985	34.7303
1249	0.847	34.707	8.03	217	2.54	124	0.03	35	0.3	1000	1.0412	1.0415	34.7241
1499	0.632	34.696	8.03	221	2.59	129	0.03	35	0.2	1200	0.8738	0.8740	34.7168
1999	0.250	34.674	8.03	224	2.61	133	0.01	35	0.3	1500	0.6234	0.6235	34.7037
2496	0.085	34.665	8.02	233	2.60	139	0.02	36	0.3	2000	0.2178	0.2179	34.6809
2996	-0.044	34.660	8.03	239	2.61	140	0.02	35	0.2	2500	0.0816	0.0816	34.6812
3327	-0.121	34.663	8.08	250	2.57	133	0.02	35	0.2	3000	-0.0460	-0.0460	34.6798

IPTS68 : International Practical Temperture Scale of 1968.
ITS-90 : International Temperture Scale of 1990.
PSS78 : Practical Salinity Scale of 1978.

Station 9

Beginning of cast

Date : March 11, 2001
Time(UT) : 05:08
Latitude : 64-01.5S
Longitude : 140-04.6E
Depth : 3646 m

Meteorological observation

Time(UT) : 05:00
Weather : s
Air temperature(dry) : 1.1℃
Humidity : 95%
Atmospheric Pressure : 985.7hPa

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

Water Sampling by Niskin bottles										Observed by CTD			
Pressure (dbar)	Temperature (IPTS68)	Salinity (PSS78)	pH	DO2	PO4-P	SiO3-Si	NO2-N	NO3-N	NH4-N	Pressure (dbar)	Temperature (ITS-90)	Temperature (IPTS68)	Salinity (PSS78)
				(μmol/l)									
0	0.900	33.943	8.16	347	2.44	56	0.24	32	0.2	20	1.3318	1.3321	33.9250
47	1.045	33.951	8.14	348	2.27	57	0.23	33	---	30	1.3340	1.3343	33.9255
73	0.000	34.220	8.04	298	2.28	57	0.24	33	0.3	50	1.2468	1.2471	33.9431
98	1.477	----	7.98	206	2.44	78	0.09	37	0.3	75	1.5300	1.5304	34.4728
124	1.742	34.579	7.98	192	2.42	82	0.02	36	0.2	100	1.9256	1.9261	34.5754
146	1.778	34.600	7.98	190	2.41	84	0.02	36	0.2	125	1.9458	1.9463	34.6005
198	1.781	34.640	8.00	197	2.35	86	0.01	35	0.1	150	1.9508	1.9513	34.6234
246	1.857	34.676	8.00	196	2.31	88	0.01	34	0.3	200	1.9674	1.9679	34.6561
298	1.837	34.694	8.00	196	2.31	88	0.02	34	0.3	250	1.9838	1.9843	34.6824
399	1.620	34.698	8.00	202	2.25	90	0.00	34	0.2	300	1.9484	1.9489	34.6992
498	1.635	34.715	7.99	206	2.24	91	0.01	33	0.3	400	1.8982	1.8987	34.7207
598	1.687	34.740	7.99	207	2.21	93	0.00	33	0.3	500	1.8446	1.8450	34.7366
698	1.623	34.740	7.98	212	2.20	95	0.01	32	0.2	600	1.7316	1.7320	34.7406
797	1.521	34.741	7.97	213	2.23	97	0.00	33	0.4	700	1.6438	1.6442	34.7435
897	1.435	34.740	7.95	213	2.23	99	0.01	32	0.4	800	1.5712	1.5716	34.7469
998	1.354	34.739	7.91	215	2.23	102	0.01	32	0.2	1000	1.3614	1.3617	34.7408
1245	1.160	34.735	7.88	217	2.26	104	0.02	33	0.3	1200	1.1978	1.1981	34.7359
1494	0.908	34.716	7.83	217	2.31	111	0.02	32	0.1	1500	0.9358	0.9360	34.7215
1953	0.534	34.695	7.76	219	2.34	118	0.01	34	0.1				

IPTS68 : International Practical Temperture Scale of 1968.
ITS-90 : International Temperture Scale of 1990.
PSS78 : Practical Salinity Scale of 1978.

Station 10

Beginning of cast

Date	:	March 12, 2001
Time(UT)	:	02:45
Latitude	:	63-55.6S
Longitude	:	150-01.4E
Depth	:	3679 m

Meteorological observation

Time(UT)	:	03:00	Wind direction	:	N
Weather	:	s	Velocity	:	19m/s
Air temperature(dry)	:	1.1℃	Wave	:	N/4
Humidity	:	95%	Swell	:	NE/3
Atmospheric Pressure	:	985.1hPa	Visibility	:	10km

Water Sampling by Niskin bottles										Observed by CTD			
Pressure (dbar)	Temperature (IPTS68)	Salinity (PSS78)	pH	DO2	PO4-P	SiO3-Si	NO2-N	NO3-N	NH4-N	Pressure (dbar)	Temperature (ITS-90)	Temperature (IPTS68)	Salinity (PSS78)
				(μmol/l)									
0	0.900	33.755	8.16	347	1.72	28	0.23	26	0.4	10	1.0314	1.0316	33.7863
47	1.024	33.800	8.12	340	1.73	28	0.23	26	0.3	20	1.0272	1.0274	33.7853
73	0.438	34.363	7.98	248	2.51	71	0.27	34	---	30	1.0294	1.0296	33.7832
99	1.351	34.539	7.97	198	2.53	81	0.26	35	0.3	50	1.0174	1.0176	33.7908
121	1.682	34.599	7.96	189	2.50	82	0.06	35	0.2	75	0.0864	0.0864	34.2850
149	1.792	34.628	7.98	190	2.48	83	0.04	35	0.4	100	1.1540	1.1543	34.4999
199	1.841	34.644	7.98	187	2.44	85	0.02	34	0.2	125	1.6024	1.6028	34.5860
248	1.850	34.678	7.99	192	2.41	86	0.03	34	---	150	1.7646	1.7650	34.6238
299	1.827	34.691	8.00	193	2.41	87	0.02	33	0.2	200	1.8354	1.8358	34.6551
401	1.518	34.678	8.01	208	2.36	87	0.04	33	0.3	250	1.8520	1.8524	34.6774
499	1.750	34.723	8.01	203	2.29	90	0.02	33	0.2	300	1.8026	1.8030	34.6907
602	1.716	34.734	8.03	202	2.29	92	0.04	32	0.4	400	1.8216	1.8220	34.7144
701	1.635	34.734	8.04	204	2.27	94	0.02	32	0.2	500	1.7316	1.7320	34.7215
801	1.552	34.738	8.02	210	2.27	96	0.03	32	0.2	600	1.6852	1.6856	34.7318
900	1.464	34.736	8.03	212	2.26	99	0.03	32	0.3	700	1.6400	1.6404	34.7396
1000	1.394	34.737	8.02	215	2.28	101	0.02	32	0.4	800	1.5614	1.5618	34.7410
1250	1.217	34.731	8.02	214	2.30	107	0.02	32	0.2	1000	1.4082	1.4085	34.7416
1497	1.024	34.722	8.03	215	2.30	114	0.03	33	0.2	1200	1.2494	1.2497	34.7364
1994	0.639	34.702	8.04	221	2.36	125	0.04	33	0.2	1500	1.0184	1.0186	34.7270
2279	0.445	34.692	8.06	223	2.39	128	0.04	33	0.2	2000	0.6298	0.6300	34.7063

IPTS68 : International Practical Temperture Scale of 1968.
ITS-90 : International Temperture Scale of 1990.
PSS78 : Practical Salinity Scale of 1978.

Station 11

Beginning of cast

Date : Maech 14, 2001
Time(UT) : 02:20
Latitude : 60-09.9S
Longitude : 150-00.9E
Depth : 3016 m

Meteorological observation

Time(UT) : 03:00
Weather : c
Air temperature(dry) : 2.9℃
Humidity : 89%
Atmospheric Pressure : 992.1hPa

Wind direction : W
Velocity : 23m/s
Wave : W/4
Swell : WNW/3
Visibility : 15km

Water Sampling by Niskin bottles										Observed by CTD			
Pressure (dbar)	Temperature (IPTS68)	Salinity (PSS78)	pH	DO2	PO4-P	SiO3-Si	NO2-N	NO3-N	NH4-N	Pressure (dbar)	Temperature (ITS-90)	Temperature (IPTS68)	Salinity (PSS78)
				(μmol/l)									
0	2.300	33.877	8.17	342	1.83	14	0.29	28	1.4	10	2.2622	2.2627	33.8693
49	2.258	33.890	8.11	342	1.86	20	0.29	28	0.4	20	2.2656	2.2661	33.8697
75	-0.097	34.134	8.03	331	2.44	53	0.20	32	0.3	30	2.2688	2.2693	33.8701
100	1.008	34.342	7.97	246	2.60	68	0.27	36	0.2	50	1.6502	1.6506	33.9233
124	1.819	34.498	7.95	194	2.69	77	0.02	37	0.4	75	0.1218	0.1218	34.1997
152	1.939	34.529	7.95	189	2.66	80	0.00	37	0.3	100	1.1848	1.1851	34.3747
202	2.013	34.588	7.96	187	2.65	83	0.01	36	0.2	125	1.8886	1.8891	34.5110
250	2.033	34.624	7.96	189	2.63	85	0.01	35	0.3	150	1.9826	1.9831	34.5497
302	2.043	34.654	7.97	186	2.55	86	0.00	35	0.2	200	2.0692	2.0697	34.5951
400	2.001	34.682	7.97	193	2.51	88	0.01	34	0.4	250	2.0528	2.0533	34.6198
498	1.964	34.706	7.97	195	2.46	89	0.01	33	0.2	300	2.0506	2.0511	34.6457
599	1.916	34.721	7.98	201	2.43	90	0.01	33	0.2	400	2.0194	2.0199	34.6828
696	1.879	34.732	7.98	204	2.51	92	0.02	33	0.1	500	1.9762	1.9767	34.7065
799	1.826	34.743	7.97	212	2.37	93	0.02	32	0.1	600	1.9296	1.9301	34.7234
898	1.739	34.745	7.95	207	2.35	96	0.00	32	0.4	700	1.8676	1.8680	34.7351
997	1.642	34.745	7.91	213	2.33	99	0.00	32	0.2	800	1.7930	1.7934	34.7414
1247	1.435	34.741	7.89	215	2.37	105	0.00	32	0.3	1000	1.6326	1.6330	34.7468
1489	1.232	34.732	7.84	217	2.46	111	0.02	33	0.4	1200	1.4816	1.4820	34.7459
1995	0.838	34.712	7.76	219	2.45	124	0.00	33	0.2	1500	1.2270	1.2273	34.7366
2234	0.637	34.702	7.59	224	2.48	128	0.02	33	0.1	2000	0.8346	0.8348	34.7165

IPTS68 : International Practical Temperture Scale of 1968.
ITS-90 : International Temperture Scale of 1990.
PSS78 : Practical Salinity Scale of 1978.

Station 12

Beginning of cast

Date	:	March 15, 2001
Time(UT)	:	02:51
Latitude	:	56-32.3S
Longitude	:	149-59.8E
Depth	:	3448 m

Meteorological observation

Time(UT)	:	03:00	Wind direction	:	NW
Weather	:	c	Velocity	:	23m/s
Air temperature(dry)	:	6.5℃	Wave	:	NW/3
Humidity	:	95%	Swell	:	NW/3
Atmospheric Pressure	:	1008.2hPa	Visibility	:	6km

Water Sampling by Niskin bottles										Observed by CTD			
Pressure (dbar)	Temperature (IPTS68)	Salinity (PSS78)	pH	DO2	PO4-P	SiO3-Si	NO2-N	NO3-N	NH4-N	Pressure (dbar)	Temperature (ITS-90)	Temperature (IPTS68)	Salinity (PSS78)
				(μmol/l)									
0	6.100	33.802	8.20	315	1.63	0	0.20	23	0.4	10	5.8592	5.8606	33.7912
49	5.798	33.787	8.18	316	1.62	0	0.21	23	0.4	20	5.8614	5.8628	33.7918
74	3.628	33.918	8.13	320	1.84	9	0.27	26	0.4	30	5.8598	5.8612	33.7922
101	3.376	33.927	8.11	323	1.85	11	0.00	26	0.2	50	5.4182	5.4195	33.8076
125	3.382	33.960	8.10	308	1.86	12	0.00	27	0.3	75	3.6458	3.6467	33.9378
158	3.712	34.055	8.07	287	1.94	16	0.00	28	0.2	100	3.4536	3.4544	33.9586
200	3.587	34.141	8.03	264	2.05	22	0.00	29	0.2	125	3.5250	3.5258	34.0052
250	3.345	34.208	8.01	250	2.20	29	0.00	31	0.2	150	3.5406	3.5414	34.0645
302	3.668	34.268	7.98	235	2.22	32	0.00	31	0.2	200	3.5514	3.5523	34.1421
401	3.142	34.311	7.96	220	2.37	43	0.00	33	0.2	250	3.2922	3.2930	34.1909
500	2.835	34.406	7.94	202	2.47	57	0.00	35	0.2	300	3.6024	3.6033	34.2794
600	2.731	34.453	7.92	195	2.50	63	0.00	35	0.3	400	3.1200	3.1207	34.3317
700	2.473	34.515	7.90	190	2.49	70	0.00	35	0.1	500	2.8842	2.8849	34.4025
800	2.477	34.577	7.85	189	2.45	75	0.00	34	0.1	600	2.6598	2.6604	34.4743
902	2.397	34.612	7.83	192	2.50	77	0.00	34	0.2	700	2.5270	2.5276	34.5225
1009	2.344	34.653	7.79	187	2.36	80	0.00	33	0.2	800	2.4680	2.4686	34.5837
1254	2.166	34.707	7.74	194	2.29	84	0.00	32	0.3	1000	2.3200	2.3206	34.6696
1504	1.973	34.739	7.64	201	2.21	91	0.00	31	0.1	1200	2.1682	2.1687	34.7173
										1500	1.9554	1.9559	34.7479

IPTS68 : International Practical Temperture Scale of 1968.
ITS-90 : International Temperture Scale of 1990.
PSS78 : Practical Salinity Scale of 1978.

Station 13

Beginning of cast

Date : March 16, 2001
Time(UT) : 02:45
Latitude : 51-52.0S
Longitude : 150-02.0E
Depth : 3679 m

Meteorological observation

Time(UT) : 03:00
Weather : c
Air temperature(dry) : 10.1℃
Humidity : 100%
Atmospheric Pressure : 1014.1hPa

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

Water Sampling by Niskin bottles										Observed by CTD			
Pressure (dbar)	Temperature (IPTS68)	Salinity (PSS78)	pH	DO2	PO4-P	SiO3-Si	NO2-N	NO3-N	NH4-N	Pressure (dbar)	Temperature (ITS-90)	Temperature (IPTS68)	Salinity (PSS78)
				(μmol/l)									
0	9.000	34.110	8.23	294	1.16	0.0	0.27	15	0.4	10	9.5164	9.5187	34.1116
48	9.319	----	8.21	292	1.20	0.0	0.35	15	0.2	20	9.4840	9.4863	34.1116
74	9.299	34.145	8.18	275	1.20	3.1	0.09	16	0.1	30	9.4552	9.4575	34.1113
99	9.051	34.552	8.18	275	1.13	4.0	0.09	15	0.2	50	9.3864	9.3887	34.1085
126	9.179	34.631	8.18	276	1.14	3.6	0.06	15	0.2	75	9.3912	9.3935	34.1785
149	8.992	34.602	8.17	278	1.18	3.8	0.07	16	0.1	100	9.0342	9.0364	34.5559
199	8.751	34.564	8.17	278	1.22	3.8	0.07	16	0.1	125	9.1384	9.1406	34.6260
251	8.505	34.522	8.16	273	1.26	3.9	0.03	17	0.2	150	8.9768	8.9790	34.6042
301	8.301	34.493	8.13	269	1.48	6.2	0.05	20	0.2	200	8.7452	8.7473	34.5690
400	7.330	34.360	8.08	233	1.69	11.0	0.05	24	0.3	250	8.5352	8.5372	34.5360
502	7.258	34.446	8.06	241	1.87	15.1	0.04	26	0.3	300	8.5406	8.5426	34.5357
600	5.890	34.330	8.05	225	2.05	23.8	0.06	29	0.3	400	7.5200	7.5218	34.3893
700	5.230	34.336	8.03	230	2.18	27.2	0.05	30	0.3	500	6.9004	6.9021	34.3568
801	4.437	34.299	8.02	226	2.30	35.0	0.07	32	0.2	600	6.4934	6.4950	34.4053
902	3.782	34.303	8.01	214	2.41	44.7	0.07	33	0.1	700	5.4090	5.4103	34.3467
1001	3.504	34.336	7.99	195	2.50	61.6	0.03	35	0.2	800	4.6276	4.6287	34.3262
1251	2.871	34.449	8.00	187	2.49	72.9	0.07	35	0.2	1000	3.5750	3.5759	34.3520
1498	2.598	34.544	8.02	193	2.35	83.9	0.05	33	0.3	1200	3.0462	3.0469	34.4288
1998	2.284	34.703	8.05	207	2.28	93.1	0.06	32	0.2	1500	2.6028	2.6034	34.5591
2497	1.960	34.741	8.05	211	2.31	107.4	0.07	32	0.2	2000	2.2814	2.2819	34.7084
2997	1.531	34.739	8.10	212	2.31	118.1	0.05	32	0.2	2500	1.9556	1.9561	34.7479
3412	1.217	34.724								3000	1.5474	1.5478	34.7428

IPTS68 : International Practical Temperture Scale of 1968.
ITS-90 : International Temperture Scale of 1990.
PSS78 : Practical Salinity Scale of 1978.

Table 4. 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)		
	2000									
1	11 17	0650	1550	17 - 58.0 N	131 - 42.9 E	29.0	28.9	0.11	0.007	0.0017
2	18	0100	1000	13 - 34.9 S	129 - 45.0 E	28.3	28.7	0.03	0.005	0.0022
3	23	1720*	0220	17 - 18.5 S	113 - 46.1 E	27.6	27.9	0.03	0.017	0.0007
4	24	2110*	0610	22 - 56.6 S	112 - 34.4 E	22.2	24.3	0.09	0.007	0.0006
5	25	2245*	0745	27 - 40.2 S	112 - 58.5 E	20.3	22.2	0.06	0.014	0.0011
6	12 5	0045	0745	40 - 29.5 S	110 - 31.1 E	11.2	13.3	0.02	0.007	0.0028
7	6	0050	0750	45 - 28.9 S	109 - 58.0 E	9.5	8.0	0.04	0.037	0.0021
8	7	0050	0750	50 - 21.3 S	110 - 00.8 E	3.5	3.4	0.04	0.028	0.0016
9	8	0050	0750	54 - 54.4 S	109 - 59.1 E	2.0	1.3	0.02	0.072	0.0013
10	9	0100	0800	59 - 16.4 S	110 - 00.3 E	3.0	1.5	0.07	0.116	0.0011
	2001									
11	3 6	0700	1300	64 - 00.3 S	91 - 01.8 E	1.0	1.2	0.03	0.150	0.0016
12	13	0310	1310	63 - 56.7 S	150 - 03.1 E	3.2	0.9	0.03	0.122	0.0078
13	13	2150*	0750	60 - 58.1 S	150 - 00.0 E	4.0	2.3	0.03	0.030	0.0124
14	14	2150*	0750	57 - 22.4 S	150 - 00.4 E	10.0	2.7	0.10	0.169	0.0010
15	15	2150*	0750	53 - 04.1 S	149 - 59.2 E	11.0	6.4	0.13	0.047	0.0023

* The time of the date of the preceding day.

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

Table 5. Hourly tidal observation at Syowa Station from February 2000 to January 2001 (time is LMT (UT+3 hours)).

STATION SYOWA STATION
LATITUDE 69°00'28"S
LONGITUDE : 39°34'13"E
DURATION FEB . 1, - FEB . 29 , 2000
UNIT : CENTIMETER

The zero level of the tide gauge
relative to the bench mark No. 1040
−4.686m Jan. 26 1999
−4.718m Jan. 27 2001

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	225	226	227	229	223	218	206	187	173	161	153	154	161	176	196	218	235	243	247	243	237	229	221	216	5004	209	5225	209
2	221	225	228	232	233	229	216	196	177	160	147	144	151	167	189	214	236	251	259	257	250	239	231	226	5078	212	5306	212
3	228	233	240	248	253	251	239	221	196	173	156	145	146	161	185	213	236	254	263	264	258	246	233	225	5267	219	5493	220
4	226	230	241	251	260	261	252	233	208	184	160	142	137	149	170	196	222	246	261	265	259	248	234	222	5257	219	5478	219
5	221	225	237	250	264	270	267	252	231	203	176	155	145	149	168	194	224	250	269	276	274	262	246	234	5442	227	5672	227
6	230	229	240	257	274	282	285	277	256	229	201	175	157	154	166	189	214	241	261	271	271	260	243	228	5590	233	5804	232
7	214	210	218	234	252	266	273	269	254	230	199	172	151	143	147	166	193	217	239	252	256	248	231	217	5251	219	5457	218
8	206	197	200	214	233	252	263	268	260	243	218	191	167	154	153	166	189	212	232	249	256	251	236	219	5229	218	5433	217
9	204	194	191	198	215	236	248	257	258	247	227	203	183	167	161	168	183	204	226	239	249	247	237	222	5164	215	5369	215
10	205	194	187	189	203	223	238	249	256	251	240	222	204	190	180	184	192	205	222	235	243	242	234	218	5206	217	5408	216
11	202	189	177	173	181	194	208	219	230	231	227	216	205	195	189	188	194	203	215	227	233	235	231	220	4982	208	5188	208
12	206	195	181	173	171	181	190	202	213	219	225	223	219	217	218	217	221	227	234	241	249	249	245	238	5154	215	5381	215
13	227	214	204	191	186	185	188	194	201	208	215	223	226	230	234	240	242	244	249	251	254	253	250	244	5353	223	5592	224
14	239	227	220	211	200	191	186	183	184	189	193	203	212	223	232	246	251	253	254	253	250	247	244	238	5329	222	5564	223
15	235	232	226	216	205	194	182	169	161	159	160	169	184	199	217	237	250	256	257	255	249	241	236	234	5123	213	5356	214
16	233	232	234	229	222	211	193	171	156	144	138	143	155	177	202	228	246	264	270	265	262	253	248	243	5119	213	5365	215
17	246	255	259	265	265	259	241	218	194	172	156	154	156	177	204	232	259	278	285	284	273	260	252	242	5586	233	5830	233
18	244	250	258	267	273	270	258	235	206	175	152	138	137	150	176	202	233	258	271	275	266	253	240	226	5413	226	5637	225
19	224	234	245	260	275	280	276	258	230	198	168	146	135	140	161	193	221	247	264	271	268	252	235	220	5401	225	5616	225
20	215	219	234	253	272	287	290	281	259	229	196	167	147	146	160	185	213	239	258	266	265	252	233	217	5483	228	5688	228
21	205	205	214	233	257	276	287	286	273	248	217	185	160	153	156	176	201	225	243	254	253	242	223	203	5375	224	5563	223
22	188	180	184	198	220	244	260	263	259	245	219	192	168	152	152	163	185	208	226	239	243	234	216	195	5033	210	5211	208
23	178	166	164	175	193	217	236	247	253	247	231	211	190	177	176	182	200	220	241	252	257	253	240	222	5128	214	5332	213
24	204	189	181	184	196	215	235	247	255	252	244	229	212	200	192	194	203	217	232	244	247	245	233	216	5266	219	5465	219
25	199	184	175	170	178	192	205	219	231	235	232	224	216	211	208	209	216	225	238	247	251	247	241	230	5183	216	5395	216
26	212	199	189	180	178	187	197	205	214	220	221	221	217	214	217	216	221	227	236	244	245	243	238	228	5169	215	5386	215
27	217	207	198	191	189	191	197	198	205	211	216	222	225	230	239	247	252	257	265	269	272	273	269	263	5503	229	5760	230
28	257	249	243	237	230	226	224	220	223	222	224	228	234	238	247	257	263	264	266	266	260	259	254	247	5838	243	6080	243
29	242	240	233	228	224	217	209	199	195	192	189	194	205	214	228	243	252	258	256	255	247	243	238	233	5434	226	5666	227
1	232																											

220.3 cm

STATION : SYOWA STATION
LATITUDE : 69°00'28"S
LONGITUDE : 39°34'13"E
DURATION : MAR. 1, - MAR. 31, 2000
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) SUM	(24H) MEAN	(25H) SUM	(25H) MEAN
1	232	234	231	228	227	220	208	195	186	177	172	176	186	200	220	239	254	260	264	260	251	244	236	232	5332	222	5564	223
2	232	235	239	243	241	234	222	204	186	172	163	161	168	187	207	231	249	260	263	262	252	238	229	224	5302	221	5528	221
3	226	234	241	248	254	251	240	225	201	180	163	158	162	177	198	223	244	262	265	262	250	233	220	212	5329	222	5540	222
4	211	220	232	244	252	254	246	227	202	176	153	140	142	152	174	201	226	243	253	251	238	219	202	192	5050	210	5238	210
5	188	195	210	227	243	250	246	230	208	181	154	136	130	137	156	185	213	234	246	249	237	219	200	185	4859	202	5037	201
6	178	184	200	221	240	253	257	249	228	201	173	148	136	139	156	182	210	233	252	256	248	230	210	195	4979	207	5163	207
7	184	185	202	224	249	269	279	279	266	243	214	188	169	164	176	196	221	246	263	269	264	246	222	202	5420	226	5605	224
8	185	179	189	211	236	261	277	281	275	257	233	207	186	176	178	193	217	239	255	264	262	247	225	200	5433	226	5614	225
9	181	170	173	188	212	238	258	268	269	261	240	217	200	185	183	194	212	231	248	258	255	244	223	200	5308	221	5486	219
10	178	163	159	167	188	211	232	249	256	254	243	226	210	199	193	199	211	227	242	252	252	244	226	206	5187	216	5371	215
11	184	167	159	158	173	190	210	228	239	244	241	233	225	217	212	214	222	231	241	252	252	242	231	213	5178	216	5370	215
12	192	175	162	156	159	172	185	199	210	220	224	223	220	222	223	225	230	239	247	253	254	251	242	228	5111	213	5322	213
13	211	197	184	172	168	169	174	183	189	197	204	210	214	221	229	234	239	244	250	253	252	246	239	233	5112	213	5332	213
14	220	210	201	188	182	175	171	171	173	177	186	194	205	215	228	241	248	253	252	251	247	242	236	230	5096	212	5319	213
15	223	219	214	206	199	189	177	167	158	157	161	168	181	197	216	234	248	254	253	249	243	233	228	225	4999	208	5220	209
16	221	224	226	223	218	207	193	175	157	149	144	148	160	181	204	228	246	259	261	254	246	236	228	224	5012	209	5241	210
17	229	236	245	251	252	248	233	211	188	169	155	154	161	177	203	230	251	263	269	262	252	234	221	216	5310	221	5528	221
18	218	229	243	256	266	265	255	234	205	178	157	146	147	160	185	212	233	251	261	255	240	221	202	193	5212	217	5404	216
19	192	204	221	240	257	267	266	250	226	197	170	152	148	157	180	208	231	252	262	261	247	225	205	189	5207	217	5389	216
20	182	194	212	236	262	279	285	279	257	230	204	178	166	170	188	212	237	256	269	269	256	236	211	191	5459	227	5643	226
21	184	186	201	230	253	276	290	292	278	254	226	200	181	177	187	206	230	250	262	263	253	230	207	183	5499	229	5665	227
22	166	161	172	195	222	248	264	273	268	252	231	206	187	179	188	204	225	244	258	261	256	238	212	188	5298	221	5468	219
23	170	161	164	182	209	235	254	269	272	263	247	227	212	202	202	216	233	252	267	272	269	254	230	205	5467	228	5653	226
24	186	172	167	178	199	221	242	257	262	263	254	238	227	214	211	219	232	248	259	265	264	251	230	208	5467	228	5655	226
25	188	174	165	168	181	202	220	234	242	246	243	234	226	220	219	221	231	243	255	260	261	251	238	219	5341	223	5542	222
26	201	186	179	179	184	196	211	225	233	241	246	242	238	239	240	243	247	255	267	272	271	263	251	239	5548	231	5771	231
27	223	211	202	198	200	203	211	220	227	232	239	238	241	245	247	253	259	263	267	271	270	262	254	244	5680	237	5911	236
28	231	223	215	208	204	205	205	207	210	216	222	225	231	242	248	255	261	267	266	266	264	255	250	243	5619	234	5854	234
29	235	230	225	218	213	211	207	203	200	201	206	211	221	231	243	255	262	266	267	262	255	249	242	237	5550	231	5783	231
30	233	233	231	230	227	220	211	201	192	187	188	194	205	219	236	252	260	262	262	256	246	236	230	226	5437	227	5664	227
31	227	230	235	240	239	233	221	206	190	180	175	181	190	208	227	246	261	268	266	257	244	231	221	218	5394	225	5614	225
1	220																											

MONTHLY MEAN 220.7 cm

STATION : SYOWA STATION
LATITUDE : 69°00'28"S
LONGITUDE : 39°34'13"E
DURATION : APR. 1. - APR. 30, 2000
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) SUM	(24H) MEAN	(25H) SUM	(25H) MEAN
1	220	229	240	248	251	249	239	219	200	182	172	169	180	197	218	239	256	264	265	253	238	221	208	201	5358	223	5561	222
2	203	215	232	246	255	254	245	228	204	182	164	156	159	177	197	222	242	252	255	245	229	207	190	184	5143	214	5333	213
3	190	202	223	245	262	270	271	256	233	208	186	174	175	189	210	237	260	275	281	271	252	230	211	198	5509	230	5707	228
4	198	211	234	263	287	301	306	296	271	246	224	202	195	201	219	243	264	280	287	279	258	231	206	187	5889	245	6068	243
5	179	186	207	232	259	280	288	286	271	246	222	199	186	188	201	221	243	261	270	268	252	227	197	176	5545	231	5707	228
6	162	166	184	210	242	270	288	296	291	273	252	233	215	209	217	235	253	271	280	279	265	237	207	181	5716	238	5876	235
7	160	154	161	184	213	240	264	279	282	273	257	240	224	215	217	231	249	264	275	274	266	245	216	189	5572	232	5737	229
8	165	153	153	166	191	218	244	263	273	272	266	256	245	236	237	245	258	273	285	287	279	266	241	213	5685	237	5876	235
9	191	173	167	170	185	207	226	245	259	264	265	259	254	249	246	251	261	272	281	282	278	267	248	225	5725	239	5930	237
10	205	188	172	170	176	186	201	217	230	240	248	248	250	252	253	257	261	270	278	277	275	268	253	239	5614	234	5834	233
11	220	208	192	180	178	182	186	195	204	213	221	232	237	245	254	260	263	270	271	270	268	261	252	245	5507	229	5740	230
12	233	220	212	201	193	188	186	184	186	190	201	211	220	233	247	256	260	264	263	256	252	247	239	235	5377	224	5609	224
13	232	226	223	219	210	199	187	178	173	170	175	188	199	215	233	247	255	258	256	248	238	232	226	225	5212	217	5443	218
14	231	232	235	242	235	225	214	196	183	174	173	179	193	212	231	247	260	264	258	249	236	222	215	216	5322	222	5545	222
15	223	233	244	255	258	253	242	222	200	184	176	175	184	203	224	245	259	264	260	248	231	213	202	200	5398	225	5607	224
16	209	223	242	258	268	272	264	246	222	200	183	180	182	199	221	241	258	267	266	252	230	211	193	185	5472	228	5662	226
17	190	206	227	250	269	281	278	262	240	215	193	184	183	195	215	236	252	265	265	252	231	207	184	170	5450	227	5620	225
18	170	181	206	233	257	273	279	271	250	227	203	189	182	187	205	226	244	253	255	247	225	197	173	152	5285	220	5431	217
19	146	156	175	205	233	255	269	269	255	236	215	195	187	189	201	221	241	254	258	252	234	204	178	155	5183	216	5324	213
20	141	145	161	188	217	242	259	267	261	245	227	211	199	195	204	221	239	251	259	255	239	213	184	159	5182	216	5324	213
21	142	137	148	169	197	223	243	256	258	248	234	222	211	204	209	224	239	252	263	262	250	227	200	175	5193	216	5348	214
22	155	144	147	163	185	211	231	246	254	249	238	230	219	213	216	226	238	253	263	261	255	238	215	192	5242	218	5415	217
23	173	162	162	171	190	215	238	254	268	272	272	270	263	261	263	269	281	290	299	301	292	278	259	234	5937	247	6153	246
24	216	202	192	193	203	217	232	246	258	261	261	259	254	253	252	253	260	267	271	272	267	257	240	223	5809	242	6017	241
25	208	196	188	184	187	199	207	221	233	242	246	250	252	256	258	261	264	271	275	278	273	267	256	243	5715	238	5945	238
26	230	218	212	207	206	206	210	217	224	232	238	243	247	252	257	258	261	261	259	260	256	250	243	232	5679	237	5903	236
27	224	219	215	209	207	204	203	203	206	208	216	226	234	243	252	258	260	261	258	256	250	245	241	238	5536	231	5769	231
28	233	228	228	229	226	218	210	205	201	202	206	214	225	239	252	257	263	261	260	251	243	237	235	229	5552	231	5789	232
29	237	244	245	249	249	245	235	229	216	213	219	229	237	254	272	281	289	287	279	265	254	242	234	234	5938	247	6177	247
30	239	247	256	261	261	254	245	226	210	197	193	196	209	223	239	254	265	264	254	239	224	207	197	200	5560	232	5767	231
1	207																											
																										229.6	cm	

STATION SYOWA STATION
LATITUDE 69°00'28"S
LONGITUDE : 39°34'13"E
DURATION MAY . 1. - MAY . 31 . 2000
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) SUM	(24H) MEAN	(25H) SUM	(25H) MEAN
1	207	221	238	252	261	260	250	234	215	200	189	189	197	214	233	250	262	265	257	239	219	197	186	181	5416	226	5607	224
2	191	209	229	252	270	276	270	257	236	216	201	195	195	210	229	244	256	261	254	237	211	184	164	154	5401	225	5560	222
3	159	177	200	228	250	266	268	259	239	216	196	186	183	190	209	226	238	249	244	227	202	172	148	135	5067	211	5201	208
4	134	147	174	207	236	261	274	273	260	240	222	208	198	203	219	234	249	260	259	247	222	188	158	135	5208	217	5335	213
5	127	134	157	187	220	249	272	280	275	266	249	233	226	224	236	252	268	278	279	273	251	220	189	160	5505	229	5649	226
6	144	144	154	180	210	240	268	283	288	284	270	261	252	245	253	266	280	291	296	291	274	247	214	186	5821	243	5983	239
7	162	148	152	165	187	218	241	259	272	274	269	263	255	250	250	257	270	279	284	284	271	250	223	196	5679	237	5849	234
8	170	151	146	150	168	192	214	233	249	259	262	264	264	264	265	270	283	292	301	303	298	288	270	246	5802	242	6030	241
9	228	210	195	195	201	211	228	241	252	263	271	272	274	276	275	276	280	286	290	292	289	278	268	252	6103	254	6338	254
10	235	218	205	196	190	192	197	206	216	225	238	248	254	259	263	265	266	269	271	269	270	266	259	254	5731	239	5977	239
11	246	238	226	220	210	203	200	199	205	212	221	232	244	254	262	265	266	265	264	260	257	254	252	252	5707	238	5961	238
12	254	252	249	248	240	230	222	216	211	215	220	231	243	257	264	272	273	268	259	253	243	236	236	241	5833	243	6081	243
13	248	251	258	261	254	247	235	222	212	208	208	216	227	243	253	265	267	265	254	243	229	218	214	219	5717	238	5946	238
14	229	242	256	267	269	263	255	236	220	209	205	207	219	234	249	258	263	263	250	234	218	202	192	198	5638	235	5845	234
15	207	221	241	258	270	274	266	253	235	219	207	211	221	232	247	262	266	267	255	237	217	196	181	177	5620	234	5806	232
16	186	206	228	251	269	277	278	266	250	233	221	214	218	231	250	261	270	270	262	246	219	195	178	168	5647	235	5820	233
17	173	190	213	241	263	278	285	280	266	250	235	226	227	237	252	267	278	286	281	265	242	218	196	181	5830	243	6012	240
18	182	194	218	245	271	292	303	299	286	269	254	236	232	236	247	261	272	276	272	257	236	209	181	163	5891	245	6046	242
19	155	160	180	206	237	262	279	287	284	272	259	251	245	246	256	271	284	291	290	283	259	231	203	180	5871	245	6037	241
20	166	163	176	197	222	249	268	280	280	271	261	248	243	239	245	257	272	281	282	280	262	237	209	186	5774	241	5941	238
21	167	159	165	180	201	225	244	258	265	261	253	245	236	232	235	249	262	272	280	277	268	249	224	204	5611	234	5797	232
22	186	177	178	186	205	228	248	267	273	273	269	261	255	247	244	252	258	268	273	270	261	248	222	196	5745	239	5925	237
23	180	165	160	163	177	196	214	230	245	252	253	254	253	253	252	256	266	274	284	284	280	271	254	237	5653	236	5871	235
24	218	204	196	194	199	210	224	235	245	254	261	261	260	260	260	258	259	266	270	269	267	261	249	235	5815	242	6037	241
25	222	211	203	198	197	202	210	221	230	237	243	253	250	249	251	249	245	246	246	248	240	240	232	223	5546	231	5757	230
26	211	203	197	191	186	186	187	194	197	203	213	223	228	232	237	237	233	231	229	226	225	219	217	215	5120	213	5331	213
27	211	208	202	200	196	188	185	183	184	190	197	207	218	222	229	234	229	222	218	212	206	206	204	204	4955	206	5167	207
28	212	215	215	217	214	207	197	189	187	186	194	201	213	222	228	234	232	223	215	204	193	188	188	194	4968	207	5170	207
29	202	212	224	232	232	229	221	211	202	195	194	201	214	225	234	239	242	232	216	201	186	174	172	177	5067	211	5257	210
30	190	208	223	241	246	250	241	230	219	206	207	211	222	241	252	260	267	256	245	225	203	186	180	181	5390	225	5586	223
31	196	214	237	257	270	275	274	260	244	229	220	220	228	239	253	263	263	260	246	222	197	174	162	155	5558	232	5729	229
1	171																											

MONTHLY MEAN 232.1 cm

STATION SYOWA STATION
LATITUDE 69°00'28"S
LONGITUDE 39°34'13"E
DURATION JUNE. 1. - JUNE. 30, 2000
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) SUM	(24H) MEAN	(25H) SUM	(25H) MEAN
1	171	193	220	251	271	288	296	285	272	257	243	236	237	246	257	267	275	272	258	235	203	174	150	137	5694	237	5834	233
2	140	156	182	212	242	266	277	275	270	254	240	232	230	233	244	259	265	265	259	240	207	177	149	128	5402	225	5522	221
3	120	130	152	183	216	244	265	275	273	268	255	246	238	241	248	260	272	274	271	258	233	199	163	136	5420	226	5540	222
4	120	117	131	154	186	217	242	259	271	262	259	252	242	242	247	257	271	279	279	271	249	224	193	163	5387	224	5529	221
5	142	126	130	146	171	196	221	244	253	258	256	250	243	237	235	245	256	263	269	271	259	239	212	181	5303	221	5460	218
6	157	140	132	137	152	175	199	219	237	249	251	256	249	249	253	254	264	277	287	287	283	273	258	235	5473	228	5688	228
7	215	195	183	180	183	193	207	226	241	255	261	262	260	258	257	254	258	263	272	275	271	265	259	247	5740	239	5971	239
8	231	215	201	194	189	190	199	213	223	232	242	250	252	250	249	243	239	238	239	244	244	241	241	234	5493	229	5721	229
9	228	219	208	199	189	188	183	189	199	205	216	227	231	235	235	232	227	221	217	219	216	217	221	221	5142	214	5365	215
10	223	223	219	217	211	203	200	197	202	206	213	226	234	239	243	244	236	229	223	216	211	213	214	220	5262	219	5492	220
11	230	237	242	246	242	235	230	221	218	219	221	226	238	244	253	254	247	241	232	223	211	208	215	220	5553	231	5794	232
12	241	252	263	273	278	274	265	252	244	239	237	241	248	256	262	261	262	251	237	220	205	194	192	195	5842	243	6053	242
13	211	228	250	270	279	280	280	270	261	248	247	249	255	266	272	273	276	268	252	231	211	192	181	180	5930	247	6122	245
14	192	208	228	249	263	274	270	263	253	238	230	231	235	243	254	260	262	258	244	223	200	177	159	154	5568	232	5729	229
15	161	178	200	223	243	260	262	260	253	238	226	221	221	230	240	251	255	252	245	224	198	174	155	142	5312	221	5457	218
16	145	156	180	208	231	252	265	265	262	249	239	235	232	237	249	263	271	273	267	252	230	204	176	161	5502	229	5660	226
17	158	163	184	217	241	264	278	286	284	274	266	261	255	257	268	278	288	292	288	276	254	225	198	178	5933	247	6098	244
18	165	166	181	204	229	250	270	281	280	273	263	255	247	245	250	262	270	276	276	270	252	225	199	176	5765	240	5925	237
19	160	156	164	181	205	230	253	265	277	271	263	259	253	250	250	262	272	282	286	281	269	247	219	193	5748	240	5924	237
20	176	167	166	176	196	218	240	258	265	268	266	260	254	248	250	254	267	276	280	281	272	253	233	209	5733	239	5924	237
21	191	178	173	181	192	211	231	246	262	269	266	263	255	251	248	250	256	263	270	275	269	260	243	220	5723	238	5926	237
22	203	187	182	180	188	202	220	234	246	254	256	252	247	243	238	233	243	246	255	257	256	254	241	227	5544	231	5753	230
23	209	197	185	186	185	194	206	220	234	241	250	249	246	245	236	234	235	237	244	247	248	247	239	231	5445	227	5666	227
24	221	209	200	192	193	195	202	213	223	229	240	246	244	242	240	232	229	227	228	234	236	236	236	234	5381	224	5610	224
25	229	227	222	214	209	209	207	209	216	222	228	235	236	237	232	225	218	210	208	204	204	209	209	213	5232	218	5450	218
26	218	220	222	218	217	210	208	207	210	214	219	226	233	236	236	228	220	210	202	197	189	189	193	203	5125	214	5340	214
27	215	222	232	233	234	233	226	219	215	215	220	226	231	238	240	235	228	214	200	190	181	177	182	191	5197	217	5406	216
28	209	225	243	258	266	270	265	259	254	247	250	255	262	268	274	275	267	255	239	221	203	191	190	199	5845	244	6052	242
29	207	231	249	271	283	291	289	278	268	252	251	248	251	254	258	256	254	240	223	197	171	154	137	134	5647	235	5796	232
30	149	172	192	222	245	258	266	265	255	245	235	236	236	240	250	258	256	249	236	209	180	158	133	128	5273	220	5405	216
1	132																											

230.0 cm

STATION SYOWA STATION
LATITUDE 69°00'28"S
LONGITUDE : 39°34'13"E
DURATION : JULY . 1. – JULY . 31 , 2000
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) SUM	(24H) MEAN	(25H) SUM	(25H) MEAN
1	132	150	177	206	237	267	278	281	285	273	263	263	266	267	285	295	301	301	297	282	253	214	183	170	5926	247	6087	243
2	161	170	191	218	246	271	294	302	303	292	276	270	262	261	269	282	294	293	292	276	247	215	178	153	6016	251	6149	246
3	133	130	144	164	194	227	248	266	271	272	268	256	251	249	254	267	279	284	289	280	262	239	202	171	5600	233	5753	230
4	153	137	138	157	182	207	232	254	267	268	265	260	251	245	247	254	270	282	286	286	281	260	232	203	5617	234	5793	232
5	176	159	148	152	169	191	213	233	246	254	257	248	239	233	223	232	244	250	262	272	268	263	247	224	5403	225	5604	224
6	201	180	166	162	167	182	199	216	234	241	244	243	236	227	219	217	218	226	240	247	252	250	241	229	5237	218	5450	218
7	213	198	188	176	177	186	199	212	225	236	243	243	237	235	227	218	217	224	231	237	246	249	245	245	5307	221	5544	222
8	237	227	220	211	206	206	210	220	227	234	239	242	239	234	226	216	210	203	204	211	214	219	221	225	5301	221	5529	221
9	228	225	223	221	216	216	216	219	227	232	236	241	241	236	232	223	212	203	197	195	195	197	201	207	5239	218	5456	218
10	217	222	223	227	225	224	220	222	224	228	235	235	241	246	240	238	230	221	212	207	202	200	206	218	5363	223	5591	224
11	228	242	257	266	272	270	270	266	262	263	265	269	272	274	273	272	262	250	240	222	207	201	198	202	6003	250	6215	249
12	212	227	244	261	267	271	269	264	257	250	250	251	253	257	264	265	257	245	232	210	194	180	172	176	5728	239	5913	237
13	185	202	221	239	259	269	265	265	256	247	245	242	246	253	255	260	259	251	236	217	196	176	162	156	5562	232	5728	229
14	166	182	202	220	241	256	259	257	248	239	233	227	228	231	241	248	247	244	230	215	189	162	142	134	5241	218	5378	215
15	137	150	173	197	220	241	248	250	249	237	227	224	222	229	241	252	252	251	247	226	204	180	152	139	5148	215	5284	211
16	136	143	168	191	215	236	252	259	255	244	239	231	229	237	247	258	265	269	268	255	230	203	175	158	5363	223	5513	221
17	150	153	170	193	218	243	256	267	264	254	244	237	225	225	235	250	260	265	265	255	237	208	178	156	5408	225	5549	222
18	141	135	147	167	193	218	237	253	254	245	240	228	219	218	219	233	246	254	259	258	244	220	193	167	5188	216	5337	213
19	149	143	145	158	181	206	222	245	254	249	239	227	220	211	212	226	239	251	257	261	250	233	205	185	5168	215	5329	213
20	161	150	148	155	175	195	216	231	246	248	236	225	223	211	204	210	225	237	251	251	253	237	222	197	5107	213	5286	211
21	179	164	158	160	177	192	216	234	241	245	242	233	223	213	207	207	211	225	237	247	250	247	232	215	5155	215	5356	214
22	201	184	176	176	178	194	207	223	233	240	241	234	224	214	205	203	205	211	225	235	239	235	233	224	5140	214	5352	214
23	212	200	190	187	190	195	208	219	229	237	238	236	228	217	210	199	197	201	207	211	220	226	225	220	5102	213	5320	213
24	218	213	209	203	201	208	214	217	226	230	234	234	228	220	212	205	196	192	196	199	202	209	216	220	5102	213	5330	213
25	228	221	223	223	224	222	224	227	230	232	236	239	233	230	219	210	200	188	185	184	184	188	194	202	5146	214	5363	215
26	217	223	231	240	243	244	244	242	243	247	249	255	253	256	253	246	237	222	213	207	200	200	202	213	5580	233	5807	232
27	227	242	260	270	276	282	279	275	274	265	264	265	265	266	262	255	247	233	213	195	184	171	174	182	5826	243	6020	241
28	194	213	238	255	276	285	285	279	271	265	256	259	255	264	263	264	259	241	227	198	180	165	153	152	5697	237	5859	234
29	162	180	210	240	264	281	285	284	281	273	263	261	254	262	269	273	270	263	248	225	196	164	148	135	5691	237	5830	233
30	139	157	182	211	240	264	280	282	277	265	254	247	247	251	262	268	271	273	263	242	216	179	149	131	5550	231	5675	227
31	125	134	157	185	215	241	262	271	267	261	249	238	235	234	249	265	269	277	278	260	239	211	170	142	5434	226	5567	223
1	133																											

MONTHLY MEAN 226.3 cm

STATION SYOWA STATION
LATITUDE 69°00'28"S
LONGITUDE : 39°34'13"E
DURATION AUG. 1. - AUG. 31, 2000
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) SUM	(24H) MEAN	(25H) SUM	(25H) MEAN
1	133	124	143	165	201	223	247	263	266	257	247	233	223	220	231	251	261	273	280	278	257	228	197	162	5363	223	5503	220
2	140	130	136	153	175	204	228	245	251	243	234	221	207	199	202	216	230	249	260	265	256	241	212	183	5080	212	5235	209
3	155	140	138	146	168	189	208	230	236	238	233	218	199	190	191	195	213	231	246	258	261	252	233	210	4978	207	5167	207
4	189	169	161	166	177	198	216	232	244	245	241	231	213	205	195	194	205	218	237	251	261	259	252	238	5197	217	5426	217
5	229	210	199	197	201	220	230	243	256	258	258	247	235	221	211	200	205	213	224	237	242	252	247	241	5476	228	5711	228
6	235	227	216	215	216	223	231	244	252	254	255	250	236	228	216	208	201	201	205	214	223	229	230	235	5444	227	5678	227
7	234	230	229	229	227	234	239	245	252	256	260	256	250	240	230	225	215	211	209	214	216	223	227	230	5581	233	5818	233
8	237	240	243	246	248	246	246	247	250	246	248	246	238	233	226	217	206	195	191	184	181	181	183	187	5365	224	5562	222
9	197	208	216	224	232	236	232	235	233	234	234	233	229	231	227	220	214	203	192	181	177	171	170	176	5105	213	5294	212
10	189	199	215	231	240	247	245	242	240	232	232	230	231	233	231	229	224	216	204	192	178	169	164	166	5179	216	5359	214
11	180	195	214	233	246	260	260	256	252	246	239	238	241	243	249	249	249	240	228	213	191	177	167	165	5431	226	5603	224
12	172	187	212	233	252	266	273	271	265	253	250	244	248	258	266	271	276	275	263	245	223	203	188	179	5773	241	5959	238
13	186	200	223	247	268	283	292	287	284	271	259	253	253	256	267	275	281	280	269	250	225	200	170	158	5937	247	6095	244
14	158	167	187	213	238	259	270	271	265	252	240	230	228	234	247	260	271	272	268	256	229	201	176	156	5548	231	5694	228
15	146	154	175	200	223	249	263	267	258	247	235	221	211	216	227	246	259	266	268	260	239	211	183	157	5381	224	5528	221
16	147	148	161	183	208	235	252	257	253	245	230	213	206	205	215	234	250	263	269	269	252	225	198	173	5291	220	5451	218
17	160	153	159	179	202	229	247	255	257	247	233	219	207	201	210	223	242	264	277	278	271	256	228	201	5398	225	5584	223
18	186	175	175	192	209	236	253	266	267	260	246	230	217	206	208	220	237	257	270	279	274	262	241	216	5582	233	5782	231
19	200	186	179	187	204	224	240	252	255	252	238	222	205	192	188	191	205	227	244	256	260	254	240	220	5321	222	5526	221
20	205	192	185	190	200	217	236	243	248	247	239	218	201	191	179	176	187	201	216	230	237	240	236	223	5137	214	5348	214
21	211	204	198	197	204	214	229	239	244	243	235	222	207	191	182	177	177	187	200	210	219	229	228	223	5070	211	5288	212
22	218	211	213	209	213	220	227	235	240	241	237	228	217	203	191	188	183	183	193	203	209	217	223	226	5128	214	5358	214
23	230	232	233	235	239	244	248	250	252	251	250	243	231	220	209	194	185	177	179	179	181	185	191	201	5239	218	5447	218
24	208	216	226	233	239	241	241	243	242	236	233	229	222	211	206	195	187	171	164	157	153	154	158	168	4933	206	5116	205
25	183	197	217	234	244	254	254	254	248	245	243	244	238	238	238	234	224	209	192	179	165	154	153	162	5203	217	5381	215
26	178	198	215	239	257	266	268	265	258	249	242	242	241	243	251	252	245	236	217	197	175	155	149	148	5386	224	5550	222
27	164	186	212	243	265	281	289	287	279	271	262	256	259	264	274	281	281	272	260	234	203	175	152	143	5793	241	5942	238
28	149	162	189	219	244	266	280	278	269	254	244	237	237	245	260	271	281	282	279	252	224	191	163	140	5616	234	5754	230
29	138	147	169	196	229	251	265	268	259	245	231	216	213	222	235	253	273	283	283	273	248	217	184	159	5457	227	5602	224
30	145	148	166	192	220	244	263	267	260	245	227	210	199	202	215	237	258	276	288	287	269	242	211	180	5451	227	5610	224
31	159	154	166	186	207	233	254	259	257	245	224	204	189	183	190	211	231	255	269	278	268	248	222	193	5285	220	5457	218
1	172																											

MONTHLY MEAN 223.3 cm

STATION SYOWA STATION
LATITUDE 69°00'28"S
LONGITUDE : 39°34'13"E
DURATION SEP. 1, - SEP. 30, 2000
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) SUM	(24H) MEAN	(25H) SUM	(25H) MEAN
1	172	158	158	173	195	214	231	240	239	226	207	187	169	157	159	175	195	217	238	252	252	243	228	206	4891	204	5079	203
2	188	171	168	175	195	215	230	236	242	234	214	195	179	168	164	166	181	202	222	239	250	247	236	225	4942	206	5152	206
3	210	199	192	197	207	221	239	244	248	243	232	213	198	183	168	167	177	191	209	220	232	236	234	227	5087	212	5302	212
4	215	212	207	206	210	224	237	246	245	242	235	218	202	185	175	169	169	178	185	196	209	213	215	214	5007	209	5218	209
5	211	208	212	211	216	222	230	237	239	236	229	218	204	193	182	177	171	172	176	184	187	192	194	195	4896	204	5099	204
6	203	206	210	214	221	225	229	231	231	228	223	217	209	200	191	185	179	173	172	173	174	172	180	186	4832	201	5023	201
7	191	202	215	223	227	233	236	236	235	231	227	222	219	213	210	205	199	194	188	181	179	176	175	183	5000	208	5194	208
8	194	210	224	237	249	253	252	249	245	240	236	233	232	229	233	230	224	216	206	193	181	173	168	172	5279	220	5462	218
9	183	197	218	233	248	255	252	247	239	231	223	219	222	223	226	230	228	222	212	191	174	160	151	151	5135	214	5296	212
10	161	178	198	220	234	248	249	240	228	222	212	203	208	216	224	235	236	229	221	202	182	159	146	143	4994	208	5142	206
11	148	166	191	211	235	249	249	245	233	220	209	204	202	213	228	241	249	253	239	223	197	173	153	145	5076	212	5226	209
12	150	161	183	213	233	248	255	247	234	218	204	197	193	205	223	241	253	259	256	239	217	187	166	147	5129	214	5274	211
13	145	154	174	202	227	245	254	249	235	218	202	187	181	194	210	229	248	260	261	253	234	206	178	155	5101	213	5250	210
14	149	153	170	199	223	238	254	254	237	220	202	186	175	181	197	220	243	257	261	261	244	218	192	171	5105	213	5262	210
15	157	156	169	189	213	234	248	253	242	222	201	182	172	168	181	206	230	252	268	272	265	245	220	197	5142	214	5328	213
16	186	179	185	205	229	245	259	263	255	236	214	189	175	165	174	197	217	245	259	269	268	254	233	214	5315	221	5511	220
17	196	184	186	197	214	235	245	252	245	231	210	183	165	152	153	168	185	207	232	246	252	247	231	215	5031	210	5235	209
18	204	194	191	201	215	229	242	247	246	235	217	192	171	158	155	158	174	196	215	234	246	243	236	231	5030	210	5253	210
19	223	217	215	220	230	244	250	258	256	249	237	213	195	178	171	166	177	191	206	221	235	242	244	243	5281	220	5525	221
20	244	242	245	248	257	266	273	278	277	268	259	242	224	210	198	189	185	192	200	209	218	226	232	234	5616	234	5855	234
21	239	243	248	251	256	259	264	262	262	255	246	235	222	210	200	185	178	171	171	174	178	183	188	200	5280	220	5487	219
22	207	219	234	242	247	249	248	245	242	238	229	225	219	210	203	197	186	172	164	160	154	152	159	172	4973	207	5159	206
23	186	200	222	234	244	250	250	248	240	233	232	224	223	226	224	223	212	199	184	167	156	148	146	155	5026	209	5197	208
24	171	194	215	234	250	259	258	252	240	232	228	224	226	234	243	244	244	232	215	192	173	152	141	142	5195	216	5349	214
25	154	175	198	220	240	248	248	239	223	208	200	196	200	207	222	236	240	237	225	201	175	152	132	126	4902	204	5038	202
26	136	154	179	205	231	247	249	242	227	209	195	191	195	211	229	248	264	270	264	247	219	183	162	151	5108	213	5258	210
27	150	164	190	214	240	257	258	253	237	215	198	186	184	197	221	246	267	283	286	273	247	217	190	171	5344	223	5506	220
28	162	172	192	218	238	257	265	259	242	221	194	175	168	176	199	227	252	270	282	279	264	234	209	188	5343	223	5513	221
29	170	173	188	209	230	249	258	256	239	217	191	167	154	154	171	197	222	248	265	272	264	246	221	202	5163	215	5350	214
30	187	183	190	208	230	247	257	259	245	223	198	171	154	147	157	176	201	228	248	262	262	250	229	214	5126	214	5326	213
1	200																											

213.0 cm

STATION SYOWA STATION
LATITUDE 69°00'28"S
LONGITUDE : 39°34'13"E
DURATION OCT. 1. - OCT. 31, 2000
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) SUM	(24H) MEAN	(25H) SUM	(25H) MEAN
1	200	192	196	212	228	244	256	257	247	229	205	182	164	151	152	164	187	212	232	247	256	251	240	229	5133	214	5351	214
2	218	210	215	223	238	254	261	265	259	244	225	202	181	166	162	167	180	198	219	232	244	249	243	238	5293	221	5527	221
3	234	228	228	232	244	257	266	268	263	254	238	218	201	185	179	176	181	193	207	220	227	234	234	233	5400	225	5627	225
4	227	231	230	232	240	246	252	254	249	246	232	216	202	187	181	177	178	181	191	199	209	213	220	222	5215	217	5438	218
5	223	230	235	237	245	251	254	253	251	248	238	227	218	210	202	198	196	191	195	196	203	205	211	220	5337	222	5564	223
6	227	238	246	256	257	258	263	260	258	254	245	238	233	226	224	220	212	206	203	200	198	200	206	212	5540	231	5760	230
7	220	232	246	255	259	263	259	257	249	241	237	230	231	227	229	225	222	215	205	195	188	184	183	188	5440	227	5640	226
8	200	215	229	244	252	252	250	243	233	225	220	215	218	223	228	231	230	225	213	200	185	177	174	180	5262	219	5454	218
9	192	208	228	245	257	258	255	248	235	224	217	215	219	231	238	249	248	245	234	217	199	183	172	175	5392	225	5576	223
10	184	201	221	244	256	262	258	247	229	215	206	205	207	220	239	254	261	261	251	232	211	191	177	171	5403	225	5583	223
11	180	195	216	239	258	263	260	244	228	211	196	189	197	212	234	251	267	275	270	251	230	205	185	178	5434	226	5611	224
12	177	190	216	239	256	268	267	252	231	211	190	179	182	196	221	246	266	278	280	265	242	220	195	179	5446	227	5619	225
13	173	184	204	224	244	257	260	245	222	201	177	159	155	170	194	222	248	264	277	270	252	230	204	187	5223	218	5400	216
14	177	179	197	217	236	247	253	244	222	196	169	149	138	143	169	195	225	251	266	268	258	241	219	202	5061	211	5250	210
15	189	187	200	217	234	248	252	244	226	200	173	146	129	131	146	171	203	230	251	260	261	250	231	217	4996	208	5201	208
16	205	200	208	224	238	254	259	254	240	217	187	162	142	129	136	158	180	205	228	245	250	246	237	223	5027	209	5239	210
17	212	206	208	217	231	244	250	249	234	217	191	166	143	130	126	138	162	183	206	227	238	243	243	240	4904	204	5140	206
18	236	234	236	244	259	270	276	276	267	255	231	206	187	170	160	161	167	180	199	213	223	233	233	235	5351	223	5588	224
19	237	238	239	243	253	260	264	264	259	249	235	215	195	180	167	161	161	165	174	186	195	207	213	222	5182	216	5409	216
20	227	235	240	244	250	254	260	258	254	248	240	226	213	203	195	184	180	174	175	180	185	189	200	212	5226	218	5449	218
21	223	236	247	255	259	264	263	258	255	251	246	242	238	233	230	223	213	203	195	189	186	186	194	208	5497	229	5717	229
22	220	235	251	261	265	265	260	252	244	238	232	230	232	238	237	238	231	217	203	190	178	169	171	179	5436	227	5632	225
23	196	215	231	247	255	255	246	236	224	212	204	205	210	222	236	242	242	235	219	202	182	168	160	165	5209	217	5389	216
24	180	197	217	235	247	248	240	223	206	193	184	184	193	210	230	245	253	250	239	219	196	176	163	160	5088	212	5257	210
25	169	186	207	226	240	246	239	220	199	182	168	163	171	194	219	240	257	264	258	244	218	195	179	172	5056	211	5231	209
26	175	192	214	233	248	256	249	228	206	180	161	149	154	172	198	229	251	264	267	256	237	210	192	177	5098	212	5274	211
27	176	188	209	228	245	253	249	233	208	182	157	143	142	154	181	213	240	258	272	270	253	234	214	199	5101	213	5293	212
28	192	197	215	235	253	264	263	247	226	199	171	150	140	146	167	200	227	252	270	276	267	253	234	217	5261	219	5470	219
29	209	208	221	240	256	269	271	259	241	213	183	161	144	142	155	183	211	233	254	264	262	251	238	221	5289	220	5504	220
30	215	207	218	233	250	262	268	262	251	226	200	176	158	154	162	180	205	228	248	266	267	261	253	242	5392	225	5625	225
31	233	225	228	238	252	263	266	264	254	232	205	181	161	148	146	156	175	196	214	232	238	237	233	223	5200	217	5420	217
1	220																											

MONTHLY MEAN 218.9 cm

STATION SYOWA STAION
LATITUDE 69°00'28"S
LONGITUDE 39°34'13"E
DURATION Nov. 1. - Nov. 30. 2000
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	220	217	216	224	233	244	249	248	240	225	203	181	164	151	146	153	164	177	194	211	220	226	227	224	4957	207	5182	207
2	225	224	227	230	238	248	251	248	246	236	219	201	185	173	167	165	171	179	190	203	211	220	226	227	5110	213	5342	214
3	232	234	237	239	245	249	254	253	250	244	233	221	209	201	194	193	193	192	199	208	212	220	228	233	5373	224	5611	224
4	238	243	248	249	252	255	253	249	244	237	230	221	213	206	200	197	194	189	189	191	191	196	204	211	5300	221	5520	221
5	220	230	237	241	242	244	237	231	227	221	216	213	209	210	209	209	204	198	194	190	187	188	194	204	5155	215	5370	215
6	215	229	242	247	252	249	242	237	229	221	219	220	223	228	232	234	232	222	214	204	194	190	191	198	5364	224	5575	223
7	211	224	237	247	251	247	234	223	211	199	196	197	205	216	228	234	237	230	217	204	191	182	177	183	5181	216	5377	215
8	196	210	225	238	243	242	229	212	198	186	178	180	192	206	223	239	245	243	235	217	196	182	174	174	5063	211	5247	210
9	184	202	217	231	239	239	225	206	186	168	160	159	168	189	214	235	251	253	249	234	215	197	184	181	4986	208	5176	207
10	190	207	225	240	252	253	238	220	198	171	157	152	159	181	208	235	259	271	269	257	239	220	202	193	5196	217	5392	216
11	196	207	224	239	250	253	243	223	195	167	144	134	136	153	184	214	242	261	271	266	249	232	213	199	5095	212	5293	212
12	198	205	220	236	247	253	247	227	197	166	139	120	114	126	153	186	215	240	257	264	255	241	225	211	4942	206	5146	206
13	204	208	222	237	249	257	254	240	213	181	152	127	114	117	139	166	198	227	250	263	266	259	248	237	5028	210	5257	210
14	229	227	237	251	263	271	270	258	239	208	174	145	126	117	124	146	171	197	220	237	245	245	236	228	5064	211	5287	211
15	223	218	225	236	249	260	261	256	244	218	191	162	139	124	125	135	154	179	201	219	236	241	240	236	4972	207	5208	208
16	236	233	235	241	252	261	262	260	250	234	211	184	161	141	131	131	139	153	171	187	201	212	217	216	4919	205	5138	206
17	219	218	216	221	226	232	236	234	229	218	202	182	164	146	133	128	126	132	143	157	171	182	191	201	4507	188	4716	189
18	209	214	219	224	227	235	235	237	236	229	222	215	204	194	184	175	171	167	167	172	180	189	198	208	4911	205	5128	205
19	217	225	232	234	233	234	228	225	225	219	217	215	212	211	207	199	190	183	176	173	174	176	184	195	4984	208	5191	208
20	207	218	227	230	231	226	215	210	204	200	200	202	210	217	219	220	216	203	193	181	174	173	173	184	4933	206	5133	205
21	200	211	222	229	229	223	211	197	186	179	177	182	194	207	222	233	233	225	216	203	189	184	181	188	4921	205	5125	205
22	204	218	231	240	244	238	223	206	190	177	174	177	191	212	231	249	254	256	246	228	212	198	193	194	5186	216	5388	216
23	202	216	228	237	245	240	223	202	183	165	155	157	169	190	215	238	256	261	255	245	228	211	198	195	5114	213	5317	213
24	203	216	230	244	249	245	234	211	185	161	144	140	148	169	195	224	247	261	265	258	241	224	209	201	5104	213	5310	212
25	206	217	232	245	255	259	247	224	199	172	149	136	138	154	180	212	239	260	271	268	256	242	226	216	5203	217	5418	217
26	215	224	238	251	263	267	258	240	212	185	157	137	134	142	166	195	223	243	260	265	257	245	233	221	5231	218	5446	218
27	215	218	228	244	258	264	260	245	221	191	163	140	128	131	147	174	205	227	247	257	257	248	237	227	5132	214	5350	214
28	218	219	227	241	255	261	259	249	231	205	175	151	154	156	159	161	185	210	231	246	248	245	237	233	5156	215	5381	215
29	225	221	228	238	250	260	262	255	240	218	191	165	147	138	139	152	173	197	215	231	241	241	237	231	5095	212	5321	213
30	226	222	224	231	244	255	256	254	247	226	204	180	162	149	147	152	167	185	204	218	231	235	233	232	5084	212	5312	212
1	228																											

MONTHLY MEAN 211.5 cm

STATION SYOWA STATION
LATITUDE 69°00'28"S
LONGITUDE : 39°34'13"E
DURATION DEC. 1. - DEC. 31, 2000
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	228	200	187	181	178	180	184	192	199	208	219	226	228	235	246	253	258	263	267	269	264	257	246	237	5405	225	5633	225
2	228	223	222	226	234	241	245	246	243	235	223	207	193	182	175	173	174	181	191	201	210	220	227	230	5130	214	5361	214
3	231	232	232	233	233	233	235	236	233	229	222	211	203	195	187	183	181	184	186	191	198	207	215	220	5110	213	5334	213
4	224	228	229	228	226	226	223	220	219	215	211	208	205	200	199	196	191	188	186	187	188	194	203	210	5004	209	5223	209
5	219	223	227	226	223	218	211	208	203	201	199	201	203	208	210	209	207	201	195	190	188	190	194	203	4957	207	5170	207
6	213	218	224	225	219	213	201	194	188	182	181	185	196	205	215	220	220	216	207	198	192	192	192	198	4894	204	5103	204
7	209	218	226	230	229	219	204	190	178	172	169	175	189	205	220	236	241	240	233	222	212	204	203	207	5031	210	5244	210
8	213	225	235	239	236	228	211	189	172	158	150	155	170	191	212	232	247	249	244	236	223	207	198	200	5020	209	5227	209
9	207	217	227	236	233	227	210	185	161	142	130	128	144	167	192	222	244	256	257	252	239	222	211	208	4917	205	5129	205
10	212	222	232	243	246	239	224	198	172	143	123	116	125	144	174	206	234	255	264	262	252	238	227	218	4969	207	5184	207
11	215	224	234	246	253	251	237	213	184	153	123	104	104	119	144	176	208	234	252	258	254	244	233	223	4886	204	5103	204
12	217	222	232	244	254	255	246	229	201	166	133	108	96	101	122	150	181	213	237	250	254	252	244	235	4842	202	5072	203
13	230	231	240	251	263	270	265	254	232	198	164	134	111	103	115	133	161	190	215	235	246	246	243	238	4968	207	5198	208
14	230	225	230	242	253	261	261	258	245	220	185	157	132	117	114	123	143	166	189	210	229	234	235	235	4894	204	4894	196
15	228	222	223	229	241	252	256	257	249	234	211	187	161	142	132	133	141	158	177	197	212	222	226	227	4917	205	5143	206
16	226	220	219	220	227	235	241	247	246	240	226	208	188	170	157	152	151	158	171	185	199	210	220	223	4939	206	5162	206
17	223	222	218	215	217	219	224	229	230	230	226	217	207	197	186	178	173	172	177	186	193	203	213	220	4975	207	5198	208
18	223	221	218	215	210	208	207	209	212	212	212	214	209	209	207	201	193	191	187	191	197	200	206	218	4970	207	5193	208
19	223	225	226	224	218	211	205	200	198	199	204	209	226	225	229	231	230	224	217	215	214	214	218	227	5212	217	5448	218
20	236	239	243	243	238	228	215	204	195	191	192	199	208	222	235	243	247	244	237	229	222	219	218	224	5371	224	5604	224
21	233	236	241	242	238	229	213	196	180	174	172	181	193	210	232	245	255	256	250	241	232	225	220	227	5321	222	5553	222
22	232	239	243	247	242	235	218	197	180	165	158	161	171	190	214	234	253	259	256	249	240	226	222	222	5253	219	5476	219
23	226	235	242	248	248	240	224	202	178	156	142	140	150	173	194	220	240	254	256	252	243	232	221	219	5135	214	5358	214
24	223	231	240	250	252	247	235	211	187	160	140	128	130	145	169	195	222	238	249	250	243	233	220	212	5010	209	5223	209
25	213	220	229	240	247	246	238	217	193	162	137	121	115	126	150	177	205	228	242	248	244	234	223	213	4868	203	5078	203
26	210	215	225	235	245	249	244	228	205	177	149	127	117	121	137	164	191	219	237	246	248	241	230	220	4880	203	5094	204
27	214	213	224	236	247	256	255	244	224	196	170	142	126	126	134	154	183	208	229	245	249	245	237	229	4986	208	5206	208
28	220	219	225	237	250	262	266	257	245	221	193	168	148	140	142	157	180	204	225	241	250	250	242	235	5177	216	5406	216
29	229	225	227	237	249	262	264	263	255	235	210	187	167	154	150	163	181	202	223	240	249	253	246	240	5311	221	5544	222
30	233	226	224	228	240	252	256	257	254	240	218	198	179	163	155	160	173	188	207	221	234	243	239	233	5221	218	5451	218
31	230	223	217	219	227	237	245	249	248	241	228	211	192	180	171	171	176	187	200	214	226	233	236	233	5194	216	5421	217
1	227																											

MONTHLY MEAN 210.7 cm

STATION . SYOWA STATION
LATITUDE 69°00'28"S
LONGITUDE : 39°34'13"E
DURATION JAN . 1 , - JAN . 31 , 2001
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	227	222	216	213	215	223	230	232	235	234	225	215	203	194	185	181	184	189	196	207	218	222	227	228	5121	213	5344	214
2	223	218	213	207	204	207	213	214	216	218	217	213	208	198	197	194	190	191	196	205	208	214	219	224	5007	209	5231	209
3	224	220	216	210	204	202	199	202	203	207	206	209	209	211	209	208	209	205	206	208	211	214	216	222	5030	210	5254	210
4	224	223	218	213	205	198	191	188	186	188	191	196	202	211	217	221	222	221	218	216	214	215	217	221	5016	209	5242	210
5	226	226	225	219	212	203	189	177	173	170	173	183	196	209	224	237	242	243	241	235	231	228	225	229	5116	213	5349	214
6	233	237	239	237	230	219	201	183	171	162	160	167	182	201	220	240	253	260	258	251	242	235	228	229	5238	218	5471	219
7	233	237	241	243	237	228	207	185	161	146	138	138	153	175	197	226	251	261	266	264	253	244	238	234	5156	215	5393	216
8	237	245	252	256	256	247	228	204	177	152	135	131	139	159	184	217	249	270	282	286	281	269	258	254	5368	224	5623	225
9	255	261	269	275	279	276	261	234	203	172	145	129	125	138	161	193	224	253	272	278	275	268	256	244	5446	227	5689	228
10	243	247	253	264	272	274	264	246	218	183	149	122	109	112	129	158	190	220	247	261	265	262	252	242	5182	216	5417	217
11	235	237	246	257	271	280	277	269	247	215	178	146	124	116	124	146	174	203	230	251	260	260	253	243	5242	218	5472	219
12	230	230	234	246	260	272	280	277	264	240	209	175	149	130	126	140	158	183	208	228	242	246	240	231	5198	217	5420	217
13	222	213	211	217	232	248	256	262	257	245	226	198	172	153	141	143	158	177	201	218	234	240	237	232	5093	212	5317	213
14	224	212	207	206	214	231	241	251	255	252	238	222	198	183	167	164	168	183	195	210	225	234	234	228	5142	214	5364	215
15	222	214	200	194	198	205	216	224	230	234	232	223	210	200	187	181	179	185	195	206	216	223	226	223	5023	209	5241	210
16	218	209	201	191	188	189	192	200	207	212	214	216	210	205	202	196	193	194	198	204	212	215	218	219	4903	204	5121	205
17	218	211	203	195	185	181	178	181	183	190	196	203	208	212	214	218	220	219	221	224	226	232	233	235	4986	208	5219	209
18	233	231	226	218	209	198	191	184	182	183	186	191	202	212	221	229	234	234	231	230	227	228	228	228	5136	214	5364	215
19	228	229	226	221	212	203	190	175	166	161	161	165	174	188	204	221	232	235	236	232	228	225	220	222	4954	206	5178	207
20	224	228	229	227	220	212	196	178	165	151	144	149	159	175	195	217	234	241	244	243	234	227	222	221	4935	206	5159	206
21	224	228	233	235	234	225	211	192	174	155	144	142	147	164	187	209	235	245	254	255	248	239	229	225	5034	210	5262	210
22	228	235	242	247	249	246	233	212	191	167	149	140	144	160	183	209	232	249	264	267	262	253	241	235	5238	218	5474	219
23	236	240	250	260	266	267	258	239	216	190	166	149	146	158	178	205	233	254	268	272	267	256	245	235	5454	227	5684	227
24	230	236	245	256	268	270	264	250	226	197	170	148	138	142	158	186	213	236	256	263	260	250	238	228	5328	222	5547	222
25	219	221	232	243	256	267	265	254	234	206	177	154	141	140	151	175	204	230	250	263	265	256	245	235	5283	220	5508	220
26	225	223	232	245	262	274	278	272	258	231	202	173	154	147	151	169	195	218	237	252	257	250	237	225	5367	224	5579	223
27	212	205	208	220	236	251	258	256	247	228	198	172	149	137	137	148	169	192	214	229	237	233	222	211	4969	207	5167	207
28	198	189	188	196	213	231	242	247	244	232	210	185	166	153	147	156	173	195	216	232	240	239	235	222	4949	206	5156	206
29	207	199	195	197	210	229	241	249	253	247	231	210	193	179	172	174	185	201	219	233	240	243	238	226	5171	215	5383	215
30	212	202	193	191	199	213	224	233	239	237	229	213	199	187	178	175	182	194	207	219	228	230	226	219	5029	210	5029	201
31	206	194	184	178	181	188	199	207	216	219	216	208	199	191	185	183	185	192	202	211	217	219	219	214	4813	201	5016	201
1	203																											

MONTHLY MEAN 213.6 cm

Table 6. Harmonic constants at Syowa Station.

SYOWA STATION

(1) POSITION

LAT 69 00 28S

LONG 39 34 13E

(2) EPOCH & DURATION OF ANALYSIS

EPOCH 2000 1 29

CENTRAL DATE 2000 7 31

DURATION IN DAYS 369 DAYS

MISSING HOUR 0 HOURS

ERROR 0

(3) MEAN SEA LEVEL

S0 220.8 CM

(4) SPECIAL REMARKS

0-P MAX 88.2 CM

0-P S.D. 9.6 CM

	H (cm)	κ (deg.)		H(cm)	κ (deg.)
SA	9.81	67.04	M2	24.67	160.57
SSA	1.99	85.09	MKS2	0.19	127.78
MM	1.47	147.60	LAM2	0.25	132.92
MSF	0.63	334.38	L2	1.27	160.92
MF	3.35	194.02	T2	1.20	161.48
2Q1	0.68	336.82	S2	19.92	175.44
SIG1	1.19	342.54	R2	0.12	199.04
Q1	5.84	342.11	K2	5.90	175.28
RHO1	1.00	327.90	MSN2	0.08	39.28
O1	24.46	350.14	KJ2	0.22	21.20
M1	1.50	319.57	MO3	0.07	248.89
CHI1	0.46	292.29	M3	0.23	272.03
PI1	0.54	341.93	SO3	0.02	191.96
P1	7.42	355.48	MK3	0.04	183.99
S1	0.35	65.30	SK3	0.38	332.26
K1	21.93	356.85	MN4	0.21	54.18
PSI1	0.15	296.09	M4	0.41	105.14
PHI1	0.50	345.01	SN4	0.06	107.57
THE1	0.17	28.99	MS4	0.16	171.89
J1	1.04	359.94	MK4	0.03	141.07
SO1	0.45	340.72	S4	0.07	135.03
OO1	0.40	356.88	SK4	0.07	156.00
OO1	0.40	356.88	SK4	0.07	156.00
OQ2	0.09	65.60	2MN6	0.03	29.66
MNS2	0.10	344.20	M6	0.12	107.27
2N2	0.29	126.71	MSN6	0.05	165.54
MU2	0.58	106.69	2MS6	0.34	185.77
N2	3.84	149.43	2MK6	0.07	154.26
NU2	0.68	159.36	2SM6	0.13	246.52
OP2	0.22	307.04	MSK6	0.10	225.69

Table 7. Hourly tidal observation at Kizahasi Hama, Skarvsnes from January 8, 2001 to February 8, 2001 (time is LMT (UT+3 hours)).

STATION SKARVSNES KIZAHASI HAMA
LATITUDE 69°28'26"S
LONGITUDE 39°36'56"E
DURATION JAN 8, - FEB 8, 2001
UNIT : CENTIMETER

Time is LMT (UT +3hours)

The zero level of the tide gauge
relative to the bench mark No. 39-02
-12.335m Jan. 8 2001

Year	Month	Day	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	SUM	MEAN
2001	1	8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	369	396	404	401	390	378	376	2714	388
2001	1	9	375	382	389	393	395	393	380	354	330	300	272	253	247	247	264	293	329	351	360	364	365	362	354	348	8100	338
2001	1	10	351	357	363	372	379	381	372	353	328	299	267	237	216	214	232	264	296	324	346	360	362	359	350	343	7725	322
2001	1	11	339	339	346	355	367	377	374	362	340	310	276	237	208	185	175	208	232	266	291	302	314	321	320	318	7162	298
2001	1	12	313	309	312	321	333	347	355	353	334	304	274	243	215	191	182	191	206	220	246	277	293	298	295	294	6706	279
2001	1	13	290	281	282	292	307	314	322	326	322	309	292	268	251	235	225	225	234	251	270	286	302	304	302	299	6789	283
2001	1	14	293	283	281	283	291	303	311	313	314	306	294	280	266	253	240	229	226	237	255	277	288	293	294	289	6699	279
2001	1	15	286	282	273	271	275	281	288	290	295	297	292	279	259	230	216	220	226	228	235	244	256	269	274	277	6343	264
2001	1	16	273	268	264	257	261	265	266	269	274	271	269	263	245	224	200	184	180	193	202	215	226	239	251	259	5818	242
2001	1	17	263	257	252	245	239	242	241	237	230	221	216	216	219	201	186	180	176	171	179	184	192	206	213	221	5187	216
2001	1	18	234	237	233	228	225	215	214	217	220	217	205	195	197	192	186	180	177	171	168	169	173	180	185	191	4809	200
2001	1	19	201	205	205	205	208	212	209	202	191	176	181	184	191	186	178	177	171	166	168	172	172	182	189	198	4529	189
2001	1	20	204	218	223	218	215	217	209	219	212	190	172	173	173	180	186	181	180	176	179	181	181	185	184	189	4645	194
2001	1	21	196	203	204	208	212	207	205	224	220	202	181	166	160	168	195	202	191	190	189	191	196	197	202	210	4719	197
2001	1	22	217	228	247	266	273	268	263	258	240	213	186	162	155	156	181	215	200	194	209	219	217	216	212	212	5207	217
2001	1	23	224	238	250	257	261	267	258	239	229	212	186	161	144	143	159	198	190	191	210	220	226	226	228	221	5138	214
2001	1	24	219	226	234	238	250	255	249	241	219	189	178	167	165	169	165	179	185	187	200	209	209	204	199	197	4933	206
2001	1	25	192	197	206	212	222	241	243	227	208	179	152	141	123	120	108	90	128	149	164	189	203	197	187	184	4262	178
2001	1	26	183	183	186	198	211	225	235	234	218	195	171	151	142	125	111	118	149	167	178	196	205	200	193	194	4368	182
2001	1	27	188	186	193	204	212	223	224	222	212	190	156	140	132	150	173	189	189	187	191	193	195	190	183	183	4505	188
2001	1	28	183	194	209	217	222	219	216	216	208	187	154	125	124	129	118	99	90	92	104	115	131	158	160	151	3821	159
2001	1	29	141	140	155	165	175	178	184	189	190	185	154	128	106	93	80	74	69	65	73	83	104	131	143	141	3146	131
2001	1	30	134	128	121	132	156	157	152	153	154	147	131	104	78	62	54	66	63	75	102	117	121	130	133	133	2803	117
2001	1	31	129	126	136	149	161	167	165	163	173	171	162	150	139	131	120	117	121	135	155	150	153	158	160	158	3549	148
2001	2	1	159	166	174	179	183	189	193	189	181	165	145	122	102	85	74	73	74	82	86	91	94	101	110	119	3136	131
2001	2	2	122	125	133	142	146	150	147	140	130	121	111	100	102	96	95	90	83	74	75	83	99	103	111	123	2701	113
2001	2	3	126	126	128	126	124	121	117	117	116	109	106	127	145	143	139	135	131	134	142	146	151	165	170	170	3214	134
2001	2	4	168	162	159	152	146	144	141	140	146	141	129	107	103	106	102	96	105	121	139	141	142	143	145	147	3225	134
2001	2	5	150	149	151	150	142	134	130	146	161	168	179	182	169	158	152	130	126	150	174	183	185	174	166	164	3773	157
2001	2	6	165	168	174	178	182	178	160	149	183	180	154	126	103	125	150	148	143	133	143	154	158	155	156	157	3722	155
2001	2	7	160	165	173	181	180	180	168	156	197	213	179	119	72	54	91	142	155	158	155	155	154	156	152	155	3670	153
2001	2	8	163	170	182	190	196	197	196	177	152	171	163	130	---	---	---	---	---	---	---	---	---	---	---	---	2087	174

Table 8. Harmonic constants at Kizahasi Hama, Skarvsnes for 29 days.

STATION: Skarvsnes Kizahasi Hama

(1) POSITION
LAT. 69 28 26S
LONG. 39 06 05E
TIME ZONE S= -3.0

(2) TIME AND DURATION OF OBSERVATION
EPOCH (L.S.T.) 2001/1/ 9 00:00
CENTRAL DAY AND TIME(L.S.T.) 2001/1/23 12:00
DURATION IN DAYS 29 DAYS

(3) MEAN SEA LEVEL
S0= 202.2 cm

(4) SPECIAL REMARKS
MEAN = -0.1 cm
S.D. = 65.1 cm

HARMONIC CONSTANTS

FIVE MAJOR CONSTITUENTS

SYMBOLS	H (cm)	K (deg.)
M2	14.9	13.5
N2	5.2	356.6
S2	13.3	34.5
O1	11.8	269.1
K1	39.3	337.9

SECONDARY CONSTITUENTS (SEMIDIURNAL)

SYMBOLS	H (cm)	K (deg.)
K2	3.6	34.5
L2	0.4	30.5
2N2	0.7	339.6
R2	0.1	34.5
T2	0.8	34.5
LAM2	0.1	23.3
MU2	0.4	352.5
NU2	1.0	310.6

SECONDARY CONSTITUENTS (DIURNAL)

SYMBOLS	H (cm)	K (deg.)
J1	0.9	12.2
M1	0.8	303.5
OO1	0.5	46.6
P1	13.0	337.9
Q1	2.3	234.7
2Q1	0.3	200.3
RHO1	0.5	239.5

OVERTIDES

SYMBOLS	H (cm)	K (deg.)
M4	1.9	15.1
M6	0.7	360.0
M8	0.6	242.1
S4	1.5	139.4
S6	0.7	242.0

Table 9. Harmonic analysis of tidal stream for 15 days near Syowa Station.

Depth: 9m

*** HARMONIC CONSTANTS ***

N-Comp	M2	S2	K2	N2	K1	O1	P1	Q1	M4	MS4	CONSTANT
V(cm/s)	1.54	1.27	0.35	0.65	0.48	0.11	0.16	0.30	0.52	0.33	0.68
K(deg.)	287.7	321.7	321.7	258.9	127.3	40.6	127.3	171.5	221.5	16.0	

E-Comp	M2	S2	K2	N2	K1	O1	P1	Q1	M4	MS4	CONSTANT
V(cm/s)	0.38	0.61	0.17	0.36	0.06	0.39	0.02	0.12	0.55	0.15	0.65
K(deg.)	115.8	52.0	52.0	328.0	41.6	153.4	41.6	322.4	228.6	284.0	

MAIN DIR. = 347.2

	M2	S2	K2	N2	K1	O1	P1	Q1	M4	MS4	CONSTANT
V(cm/s)	1.58	1.25	0.34	0.61	0.47	0.16	0.16	0.32	0.39	0.32	0.52
K(deg.)	288.1	315.4	315.4	251.9	128.9	11.2	128.9	169.2	219.2	21.8	

Depth: 14m

*** HARMONIC CONSTANTS ***

N-Comp	M2	S2	K2	N2	K1	O1	P1	Q1	M4	MS4	CONSTANT
V(cm/s)	2.12	1.35	0.37	0.70	0.78	0.15	0.26	0.13	0.42	0.18	1.33
K(deg.)	294.7	327.6	327.6	261.0	108.7	205.4	108.7	194.6	233.3	90.5	

E-Comp	M2	S2	K2	N2	K1	O1	P1	Q1	M4	MS4	CONSTANT
V(cm/s)	0.32	0.37	0.10	0.30	0.22	0.05	0.07	0.21	0.41	0.24	1.32
K(deg.)	187.9	103.9	103.9	352.6	298.7	95.9	298.7	167.5	226.2	319.1	

MAIN DIR. = 351.4

	M2	S2	K2	N2	K1	O1	P1	Q1	M4	MS4	CONSTANT
V(cm/s)	2.11	1.38	0.37	0.69	0.80	0.15	0.27	0.10	0.36	0.21	1.11
K(deg.)	296.0	326.0	326.0	257.3	109.1	208.2	109.1	203.3	234.5	98.1	

Depth: 19m

*** HARMONIC CONSTANTS ***

N-Comp	M2	S2	K2	N2	K1	O1	P1	Q1	M4	MS4	CONSTANT
V(cm/s)	1.89	1.37	0.37	1.06	0.71	0.41	0.24	0.17	0.30	0.31	1.34
K(deg.)	286.4	329.9	329.9	274.4	94.3	133.0	94.3	299.4	226.9	139.5	

E-Comp	M2	S2	K2	N2	K1	O1	P1	Q1	M4	MS4	CONSTANT
V(cm/s)	0.28	0.35	0.09	0.36	0.35	0.04	0.12	0.21	0.31	0.07	1.47
K(deg.)	183.2	87.6	87.6	347.8	298.6	234.1	298.6	118.9	230.2	191.2	

MAIN DIR. = 351.6

	M2	S2	K2	N2	K1	O1	P1	Q1	M4	MS4	CONSTANT
V(cm/s)	1.88	1.38	0.37	1.03	0.75	0.41	0.25	0.20	0.26	0.30	1.11
K(deg.)	287.6	328.0	328.0	271.6	96.0	132.2	96.0	299.3	226.4	138.0	

※CONSTANT : NON-Cycle Current

Depth: 24m

*** HARMONIC CONSTANTS ***

N-Comp	M2	S2	K2	N2	K1	O1	P1	Q1	M4	MS4	CONSTANT CURRENT
V(cm/s)	1.73	1.49	0.41	0.93	0.60	0.24	0.20	0.42	0.31	0.31	1.25
K(deg.)	285.0	312.3	312.3	278.0	114.2	159.7	114.2	73.5	189.1	173.2	

E-Comp	M2	S2	K2	N2	K1	O1	P1	Q1	M4	MS4	CONSTANT CURRENT
V(cm/s)	0.26	0.39	0.11	0.22	0.35	0.28	0.12	0.26	0.32	0.27	1.41
K(deg.)	271.6	131.5	131.5	101.3	295.3	47.8	295.3	161.0	216.3	149.5	

MAIN DIR. = 348.0

	M2	S2	K2	N2	K1	O1	P1	Q1	M4	MS4	CONSTANT
V(cm/s)	1.64	1.54	0.42	0.95	0.66	0.27	0.22	0.41	0.24	0.25	0.93
K(deg.)	285.4	312.2	312.2	278.1	114.4	171.5	114.4	66.0	182.1	178.3	

Depth: 29m

*** HARMONIC CONSTANTS ***

N-Comp	M2	S2	K2	N2	K1	O1	P1	Q1	M4	MS4	CONSTANT
V(cm/s)	1.68	1.54	0.42	0.74	0.36	0.14	0.12	0.43	0.47	0.27	1.36
K(deg.)	287.6	318.2	318.2	268.4	144.1	165.4	144.1	101.9	205.7	151.4	

E-Comp	M2	S2	K2	N2	K1	O1	P1	Q1	M4	MS4	CONSTANT
V(cm/s)	0.05	0.31	0.08	0.20	0.13	0.63	0.04	0.89	0.26	0.28	1.36
K(deg.)	91.9	73.1	73.1	39.7	225.9	281.7	225.9	102.1	220.1	149.4	

MAIN DIR. = 346.5

	M2	S2	K2	N2	K1	O1	P1	Q1	M4	MS4	CONSTANT
V(cm/s)	1.65	1.53	0.42	0.75	0.35	0.24	0.12	0.21	0.39	0.19	1.01
K(deg.)	287.5	315.8	315.8	265.7	139.3	132.5	139.3	101.7	203.5	152.1	

Depth: 34m

*** HARMONIC CONSTANTS ***

N-Comp	M2	S2	K2	N2	K1	O1	P1	Q1	M4	MS4	CONSTANT
V(cm/s)	1.31	1.41	0.38	0.87	0.36	0.34	0.12	0.60	0.34	0.21	1.41
K(deg.)	302.7	328.4	328.4	265.9	130.9	205.2	130.9	111.9	238.4	160.4	

E-Comp	M2	S2	K2	N2	K1	O1	P1	Q1	M4	MS4	CONSTANT
V(cm/s)	0.19	0.52	0.14	0.15	0.21	0.48	0.07	0.64	0.28	0.32	1.55
K(deg.)	79.8	152.8	152.8	39.0	272.6	301.8	272.6	109.1	203.2	154.1	

MAIN DIR. = 336.2 deg.

	M2	S2	K2	N2	K1	O1	P1	Q1	M4	MS4	CONSTANT
V(cm/s)	1.26	1.50	0.41	0.84	0.40	0.38	0.13	0.29	0.23	0.06	0.66
K(deg.)	300.3	329.0	329.0	262.8	123.3	174.9	123.3	114.4	254.3	173.4	

※CONSTANT : NON-Cycle Current

Table 10. CTD observations near Syowa Station.

Station	hyoujouctd1	
Date	2001/1/4	
Time	15:50	LMT(UT +3hours)
Latitude	69-00.14S	
Longitude	39-37.35E	
Depth(m)	211.0 m	

Pressure (dbar)	Temperature ITS-90 [deg C]	Conductivity [S/m]	Salinity PSS-78 [PSU]	Sigma-t [kg/m^3]
1	-1.6993	2.702171	34.2102	27.5362
10	-1.7524	2.698727	34.2177	27.5437
20	-1.7548	2.692203	34.123	27.4667
30	-1.7565	2.679375	33.9396	27.3177
50	-1.7357	2.617711	33.0454	26.5903
75	-1.6898	2.703889	34.1757	27.5079
100	-1.6838	2.705822	34.1798	27.511
125	-1.6642	2.709304	34.1897	27.5185
150	-1.6535	2.711876	34.1973	27.5244
200	-1.6072	2.721155	34.2411	27.5587
211	-1.6053	2.72193	34.2428	27.56

Station	hyoujouctd2	
Date	2001/1/5	
Time	21:00	LMT(UT +3hours)
Latitude	69-00.14S	
Longitude	39-37.35E	
Depth(m)	212.0 m	

Pressure (dbar)	Temperature ITS-90 [deg C]	Conductivity [S/m]	Salinity PSS-78 [PSU]	Sigma-t [kg/m^3]
1	-1.6618	2.551133	32.0725	25.7981
10	-1.7264	2.688638	34.0469	27.4042
20	-1.7407	2.690012	34.0761	27.4283
30	-1.739	2.691981	34.0952	27.4438
50	-1.7255	2.695528	34.1163	27.4605
75	-1.6856	2.703119	34.1602	27.4951
100	-1.6752	2.706514	34.1795	27.5105
125	-1.6763	2.708813	34.1969	27.5247
150	-1.6477	2.712958	34.2057	27.531
200	-1.6304	2.718505	34.2311	27.5512
212	-1.6239	2.719734	34.2331	27.5527

Station	hyoujouctd3	
Date	2001/1/6	
Time	14:30	LMT(UT +3hours)
Latitude	69-00.14S	
Longitude	39-37.35E	
Depth(m)	211.0 m	

Pressure (dbar)	Temperature ITS-90 [deg C]	Conductivity [S/m]	Salinity PSS-78 [PSU]	Sigma-t [kg/m^3]
1	-1.4927	2.697795	33.9124	27.2883
10	-1.695	2.689022	34.0163	27.3784
20	-1.7312	2.689257	34.0547	27.4106
30	-1.7419	2.690357	34.0759	27.4281
50	-1.7273	2.693996	34.0971	27.445
75	-1.6721	2.703523	34.1502	27.4866
100	-1.6785	2.705227	34.1654	27.4992
125	-1.6409	2.711506	34.1935	27.5209
150	-1.607	2.716587	34.2092	27.5327
200	-1.6116	2.72035	34.2351	27.5539
211	-1.6148	2.720719	34.2369	27.5555

Station	hyoujouctd4	
Date	2001/1/17	
Time	14:05	LMT(UT +3hours)
Latitude	69-00.14S	
Longitude	39-37.35E	
Depth(m)	240.2m	

Pressure (dbar)	Temperature ITS-90 [deg C]	Conductivity [S/m]	Salinity PSS-78 [PSU]	Sigma-t [kg/m^3]
1	-0.6411	1.344142	15.4273	12.32
10	-1.6678	2.689487	33.9915	27.3575
20	-1.7103	2.689433	34.0331	27.3925
30	-1.7138	2.690543	34.0462	27.4032
50	-1.7015	2.697225	34.1124	27.4567
75	-1.6885	2.702305	34.1522	27.4887
100	-1.6707	2.706358	34.1722	27.5045
125	-1.652	2.710037	34.1859	27.5151
150	-1.665	2.71197	34.2118	27.5365
200	-1.6225	2.71958	34.2369	27.5557
205	-1.6196	2.720048	34.2369	27.5556

Station	hyoujouctd5	
Date	2001/1/19	
Time	10:10	LMT(UT +3hours)
Latitude	69-00.14S	
Longitude	39-37.35E	
Depth(m)	212.0 m	

Pressure (dbar)	Temperature ITS-90 [deg C]	Conductivity [S/m]	Salinity PSS-78 [PSU]	Sigma-t [kg/m^3]
1	-0.7946	1.458921	16.9445	13.543
10	-1.6519	2.691936	34.0074	27.37
20	-1.7082	2.691702	34.0623	27.4162
30	-1.7197	2.692502	34.0803	27.4311
50	-1.7154	2.695701	34.1072	27.4528
75	-1.695	2.70142	34.1474	27.4849
100	-1.6719	2.706428	34.1745	27.5064
125	-1.657	2.710169	34.1934	27.5213
150	-1.6578	2.713368	34.223	27.5454
200	-1.611	2.720679	34.2389	27.557
212	-1.6143	2.721123	34.2413	27.559

Station	hyoujouctd6	
Date	2001/1/20	
Time	9:04	LMT(UT +3hours)
Latitude	69-00.14S	
Longitude	39-37.35E	
Depth(m)	207.0 m	

Pressure (dbar)	Temperature ITS-90 [deg C]	Conductivity [S/m]	Salinity PSS-78 [PSU]	Sigma-t [kg/m^3]
1	-0.5304	0.995157	11.1116	8.8354
10	-1.6881	2.691483	34.0427	27.3996
20	-1.6979	2.692235	34.0579	27.4123
30	-1.7103	2.692485	34.0692	27.4218
50	-1.7214	2.694752	34.1009	27.4479
75	-1.6962	2.701569	34.1509	27.4878
100	-1.6827	2.70493	34.1661	27.4999
125	-1.6635	2.708935	34.1838	27.5137
150	-1.6461	2.713165	34.2067	27.5318
200	-1.6217	2.72031	34.2462	27.5632
207	-1.6155	2.721246	34.2476	27.5642

Station	hyoujouctd7	
Date	2001/1/20	
Time	11:50	LMT(UT +3hours)
Latitude	69-00.14S	
Longitude	39-37.35E	
Depth(m)	207.0 m	

Pressure (dbar)	Temperature ITS-90 [deg C]	Conductivity [S/m]	Salinity PSS-78 [PSU]	Sigma-t [kg/m^3]
1	0.1293	1.083994	11.9217	9.5079
10	-1.6427	2.689519	33.9632	27.3338
20	-1.6945	2.692003	34.0508	27.4064
30	-1.7037	2.69285	34.0668	27.4197
50	-1.7162	2.694933	34.0974	27.4449
75	-1.6932	2.701169	34.1418	27.4804
100	-1.686	2.70412	34.1586	27.4938
125	-1.6666	2.707732	34.1707	27.5031
150	-1.6451	2.712858	34.2013	27.5274
200	-1.6246	2.71929	34.2353	27.5545
207	-1.6198	2.720135	34.2372	27.5558

Station	hyoujouctd8	
Date	2001/1/20	
Time	13:05	LMT(UT +3hours)
Latitude	69-00.14S	
Longitude	39-37.35E	
Depth(m)	211.0 m	

Pressure (dbar)	Temperature ITS-90 [deg C]	Conductivity [S/m]	Salinity PSS-78 [PSU]	Sigma-t [kg/m^3]
1	-0.1211	1.135424	12.6367	10.0788
10	-1.6061	2.689972	33.9277	27.3039
20	-1.7025	2.690315	34.0364	27.395
30	-1.7085	2.691241	34.0498	27.406
50	-1.7191	2.694595	34.096	27.4439
75	-1.6976	2.700528	34.1379	27.4773
100	-1.6844	2.704436	34.1612	27.4959
125	-1.6663	2.70802	34.1743	27.5061
150	-1.6445	2.712846	34.2004	27.5267
200	-1.6256	2.71889	34.231	27.551
211	-1.6293	2.719414	34.2355	27.5547

Station	hyoujouctd9
Date	2001/1/20
Time	15:55 LMT(UT +3hours)
Latitude	69-00.14S
Longitude	39-37.35E
Depth(m)	209.0 m

Pressure (dbar)	Temperature ITS-90 [deg C]	Conductivity [S/m]	Salinity PSS-78 [PSU]	Sigma-t [kg/m^3]
1	-0.47	1.567363	18.1175	14.4949
10	-1.6232	2.69508	34.0182	27.378
20	-1.7058	2.691208	34.0527	27.4083
30	-1.7113	2.692242	34.067	27.4201
50	-1.7152	2.694936	34.0963	27.444
75	-1.6889	2.702108	34.1499	27.4868
100	-1.6799	2.704871	34.1621	27.4965
125	-1.6633	2.70887	34.1827	27.5128
150	-1.6413	2.713303	34.2031	27.5287
200	-1.6185	2.719728	34.2344	27.5535
209	-1.6058	2.721721	34.2417	27.5591

Station	hyoujouctd10
Date	2001/1/20
Time	18:05 LMT(UT +3hours)
Latitude	69-00.14S
Longitude	39-37.35E
Depth(m)	210.0m

Depth(m) (dbar)	Temp(℃) ITS-90 [deg C]	Conductivity [S/m]	Salinity PSS-78 [PSU]	Sigma-t [kg/m^3]
1	-0.2819	0.933752	10.29	8.1799
10	-1.6326	2.693659	34.0092	27.3709
20	-1.7047	2.691106	34.0501	27.4061
30	-1.7128	2.692315	34.0698	27.4223
50	-1.7179	2.694329	34.0909	27.4397
75	-1.6896	2.701895	34.1477	27.4851
100	-1.678	2.704949	34.161	27.4956
125	-1.6655	2.70837	34.1782	27.5092
150	-1.6427	2.712913	34.1993	27.5257
200	-1.6177	2.719804	34.2346	27.5536
210	-1.6069	2.721752	34.2428	27.56