

**Oceanographic Data of the 44th Japanese Antarctic Research Expedition
from December 2002 to March 2003**

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The results of oceanographic observations on board the icebreaker “Shirase” and tidal observations at Syowa Station, Antarctica are presented in this report. The oceanographic observations were carried out by the summer party of the 44th Japanese Antarctic Research Expedition (JARE-44) during the austral summer of 2002/2003. The tidal observations were carried out by the winter party of JARE-43 from February 2002 to January 2003.

1. Oceanographic observations

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

(1) Surface water samplings

Surface water samplings were carried out 62 stations and the results are given in Table 1.

(2) Monitoring of marine pollution

Surface water samplings for monitoring of marine pollution were made at 14 stations. Items and methods of analysis are given in the following section of (5).

(3) XCTD and XBT observations

XCTD and XBT observations were carried out at 135 stations (XCTD: 123 stations, XBT: 12 stations). The results are listed in Table 2 and Table 3. The thickness of the surface mixed layer (S.L.) in Table 3 is the depth at which the water temperature gradient is bigger as a standard than 0.3°C/m. The vertical profiles of water temperature and salinity are shown in Fig. 2 to Fig. 9.

(4) CTD and serial observations

CTD (Falmouth Scientific Inc. TRITON ICTD) and serial observations with Rosette sampler (2.5-ℓ Niskin sampler × 23) were carried out at 18 stations. The results including chemical analysis of sampled water and measured values of temperature and salinity with CTD at each standard depth together with meteorological data are given in Table 4.

(5) Chemical analysis of sampled water

Chemical analysis of seawater sampled with a bucket (10 ℓ) for surface observation or Niskin bottles (2.5 ℓ) for serial observation was made according to the following methods. The item (a) was calculated from conductivity using the 1978 practical salinity scales (UNESCO, 1981). Items (b), (d) and (h) were carried out with the method described by Strickland and Parsons (1972). Item (c) was analyzed by the winkler method as modified by Carpenter (1965) for more precision. Item (e) was analyzed with the method in Motomizu and Korechika (1988). Items (f) and (g) were analyzed with the method in Andersson (1979). Items (i), (j) and (k) were analyzed with the method in Hydrographic Department (1995). The results of items (a) to (h) are given in Table 1 and 4. The results of item (i) to (k) are in Table 5.

- | | |
|-------------------------|---|
| (a) Practical salinity: | Conductive salinometer
(Guildline Autosol salinometer model 8400B). |
| (b) pH: | Glass electrode method (Horiba digital pH meter F-16). |
| (c) Dissolved oxygen: | Carpenter method (Hirama model ART-3 DO-1). |
| (d) Phosphate: | Molybdenum blue method
(BRAN+LUEBBE model Traacs 800 auto analyzer). |
| (e) Silicate: | Molybdenum blue method
(BRAN+LUEBBE model Traacs 800 auto analyzer). |
| (f) Nitrite: | Naphthylethylenediamine method
(BRAN+LUEBBE model Traacs 800 auto analyzer). |
| (g) Nitrate: | Cadmium (Cd)-copper (Cu) reduction column,
Naphthylethylenediamine method
(BRAN+LUEBBE model Traacs 800 auto analyzer). |
| (h) Ammonium: | Indophenol blue method
(Shimadzu Model UV-1600 Spectrophotometer). |
| (i) Petroleum oil: | N-hexane extraction-fluorophotometric analysis. |
| (j) Cadmium (Cd): | Solvent extraction-atomic absorption spectrophotometry. |
| (k) Mercury (Hg): | Cold vapor atomic absorption spectrophotometry. |

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

(6) Current observations with three surface drifters

Each surface drifter comprises from a spherical buoy of 35 cm in diameter with a drogue of 1 m in diameter, 7 m in length and 15 m in depth (TOYOCOM Co. Model 2ANZ-1388). Signals transmitted from the drifter are sent to CLS (Data Processing Center in CNES) via NOAA satellites, and the CLS distributes drifter's positions and surface water temperature observed by the drifter to the drifter's owners. Three drifters were deployed in the expedition. The first buoy (ID No. 2174) was deployed at 44°27.35'S, 110°03.50'E (CTD station 2) on December 6, 2002. It continued transmitting data until December 6, 2003. The second one (ID No. 21563) was deployed at 59°59.80'S, 109°53.55'E (CTD station 5) on December 9, 2002. Data communications were December 30 from December 9 in 2002 and were March 8 from February 24 in 2003. The third one (ID No. 21769) was deployed at 49°06.90'S, 150°07.90'E (CTD station 21) on March 17, 2003. It was being in operation until March 15, 2004. The trajectories are shown in Fig. 10.

(7) Current observations with LADCP and XCP

LADCP observations were carried out at 13 stations. XCP observations were carried out at 3 stations. The vertical profiles of current with LADCP are shown Fig. 11. The vertical profiles of current with XCP are shown Fig. 12.

2. 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 water depth, Nisi-no-ura Cove, East Ongul Island by JARE-36 members on February 2, 1995, and continued operating. The results obtained from February 2002 to January 2003 are described in this report. The methodology of tidal observations is followed by Odamaki *et al.* (1991). In this system, the relative water pressure compensated for atmospheric pressure is measured with a quartz oscillator. The range of the sensor is 0-50 m and its precision is 0.01 m. The data sampled once per 2 s are averaged over 30 s and recorded on hard disk of recording PC. The gauge was maintained by a member of the winter party of JARE-43, through the year. Hourly sea level was recorded on the hour. Daily and monthly mean sea levels were calculated from the hourly data. The results are given in Table 6. The least squares method was employed to the harmonic analysis for one year. The harmonic constants, characteristics of the tide and other details are given in Table 7.

3. Current and water temperature and salinity observations near Syowa Station

(1) Current observations

Ocean current observations were carried out for 17 days (from December 27, 2002 to January 12, 2003) at 69°00'17"S, 39°38'18"E in the coastal fast ice in Ongul Strait near Syowa Station, with an Acoustic Doppler Current Profiler (WH-300, RD Instruments Co.), 10 m below the sea

surface. The results are given in Fig. 13. The least squares method was employed in the harmonic analysis for 15 days. The harmonic constants, characteristics of the tide and other details are given in Table 8.

Outline of the observation is as follows.

Apparatus name	Workhorse Sentinel ADCP Self-Contained 300 kHz
Observation term	17 days
Observation start time	December 27, 2002 (LMT (UT+3 hours))
Observation start time	January 12, 2003 (LMT)
Transducer depth	10.0 m
Pings per ensemble	45 pings
Sampling interval	10.0 min
Observation layer interval	4.0 m
Total number of observation layers	5 layers
First bin range	5.93 m
Last bin range	129.93 m
Maximum observed layer	111.50 m
Magnetic variation	-46.0 deg

(2) Water temperature and salinity observations

Water temperature and salinity observations were carried out for 17 days (from December 27, 2002 to January 12, 2003) at 69°00'17"S, 39°38'18"E in the coastal fast ice in Ongul Strait near Syowa Station, with an Compact-Conductivity Temperature (ACT-HR, ALEC ELECTRONICS Co.), 10 m below the sea surface. The results are given in Fig. 14.

Outline of the observation is as follows.

Apparatus name	Compact-Conductivity Temperature ACT-HR
Observation term	17 days
Observation start time	December 27, 2002 (LMT (UT+3 hours))
Observation start time	January 12, 2003 (LMT)
Sensor type	Conductivity Inductive Cell
	Temperature Thermistor
Range	Conductivity 0 ~ 60 mS/cm
	Temperature -5 ~ 40°C
Accuracy	Conductivity ±0.05 mS/cm
	Temperature ±0.05 °C
Memory type	2 M byte flash memory
Memory capacity	178439 data
Sampling interval	1 s, 1 min, 2 min, 10 min

Acknowledgments

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The authors also express their thanks to Captain Y. Haraguchi, the officers and all crew of the icebreaker “Shirase”.

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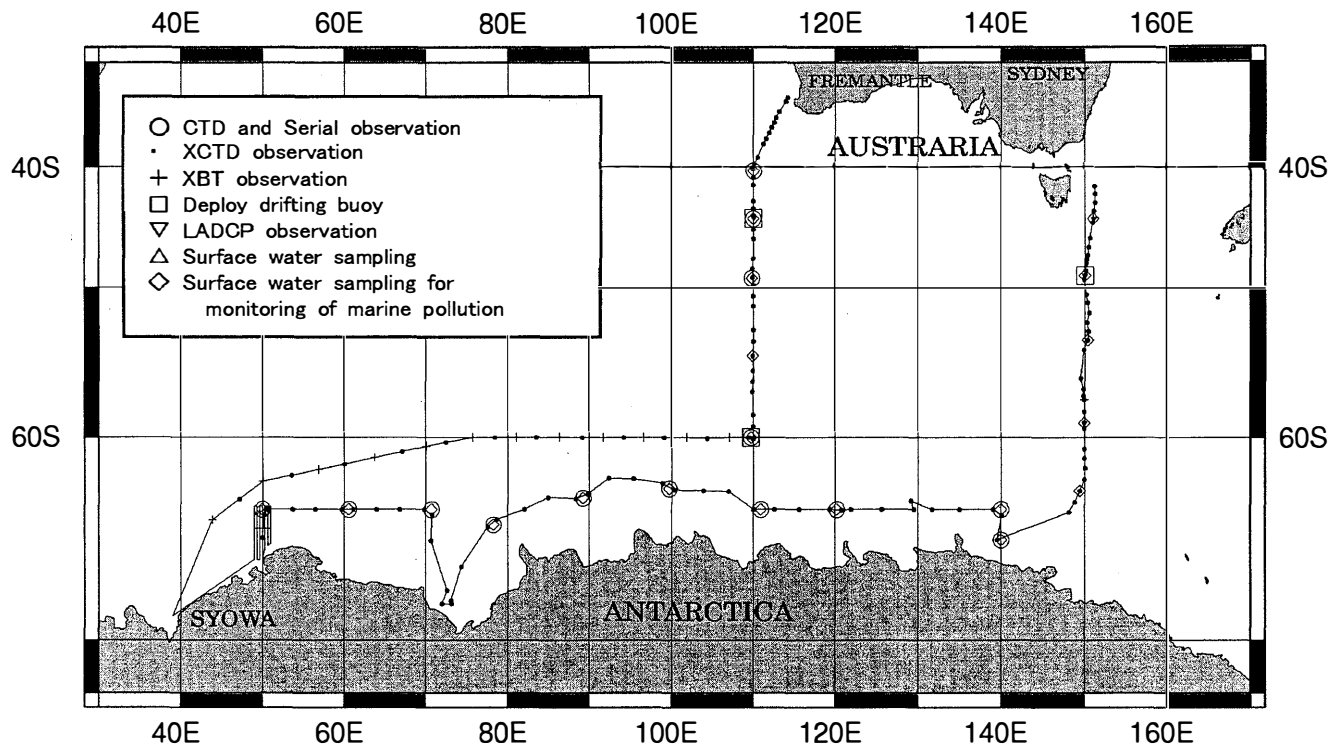


Fig. 1. The track of the icebreaker "Shirase" and the site of oceanographic stations.

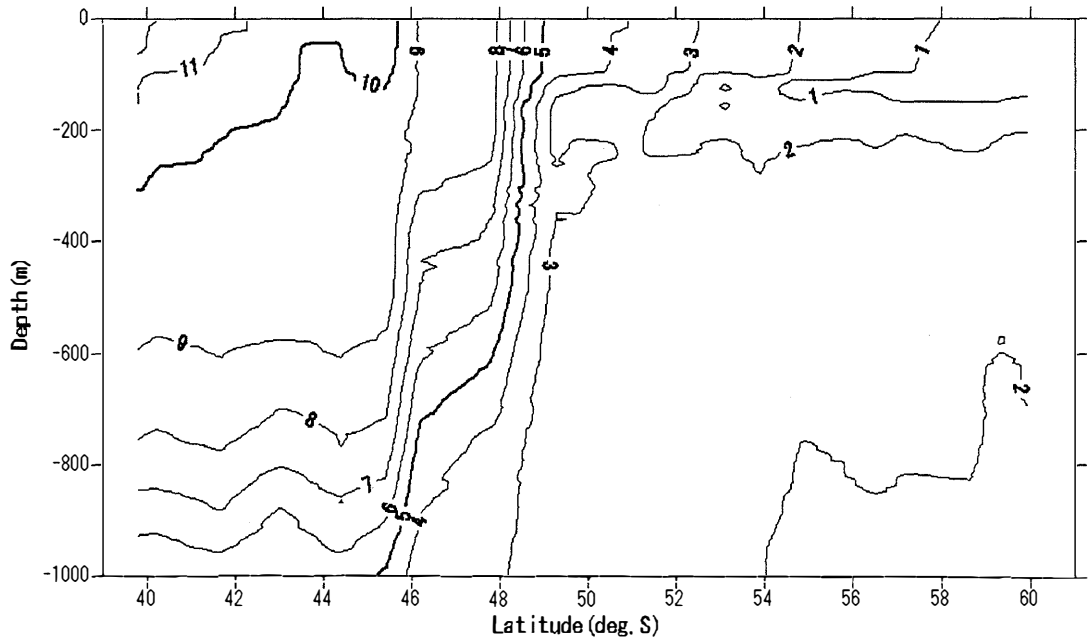


Fig. 2. Vertical profile of water temperature ($^{\circ}\text{C}$) observed with XCTD along 110°E .

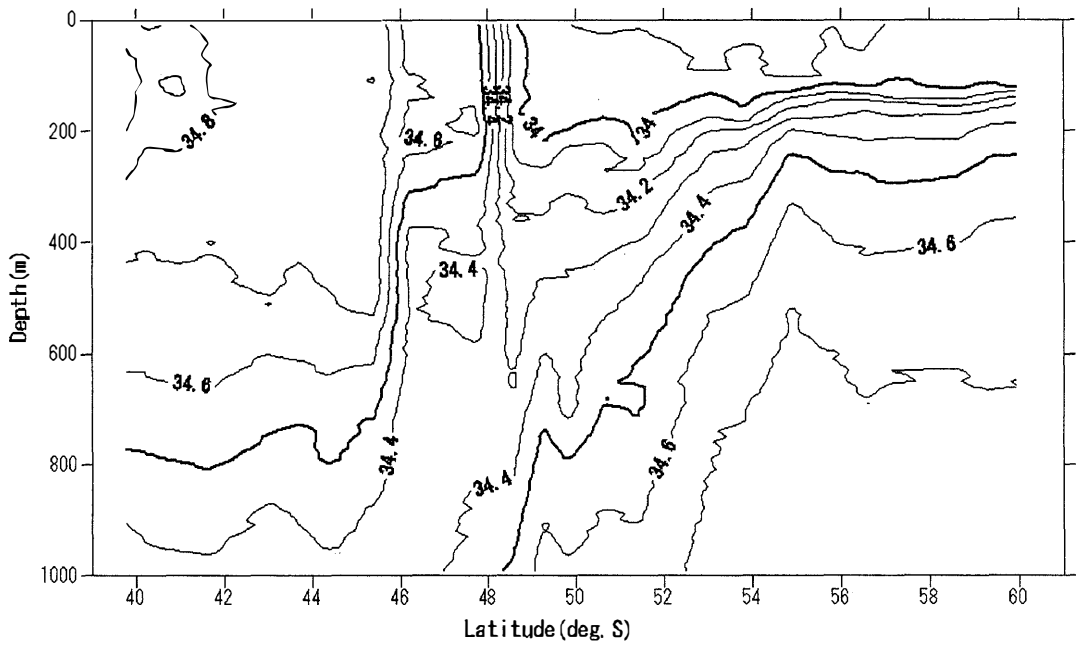


Fig. 3. Vertical profile of water salinity observed with XCTD along 110°E .

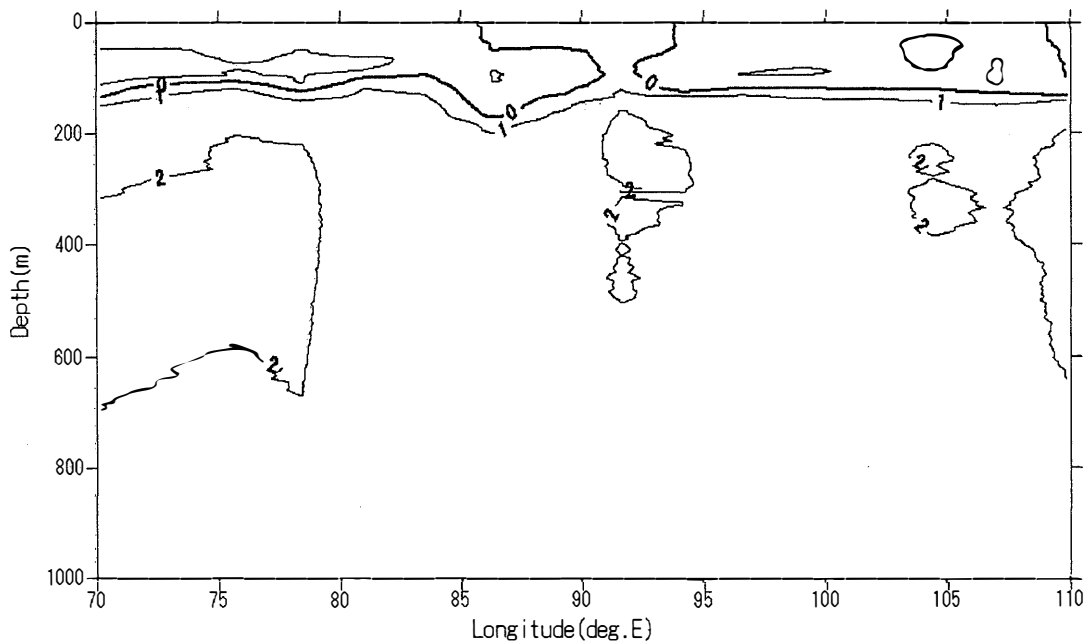


Fig. 4. Vertical profile of water temperature (°C) observed with XCTD and XBT along 60°S.

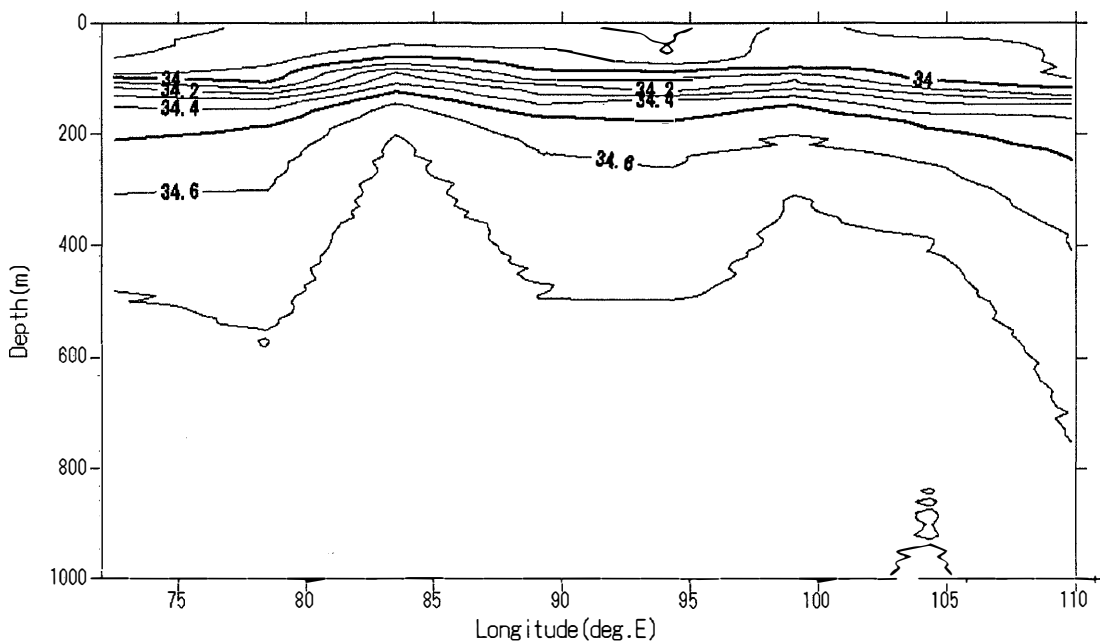


Fig. 5. Vertical profile of water salinity observed with XCTD along 60°S.

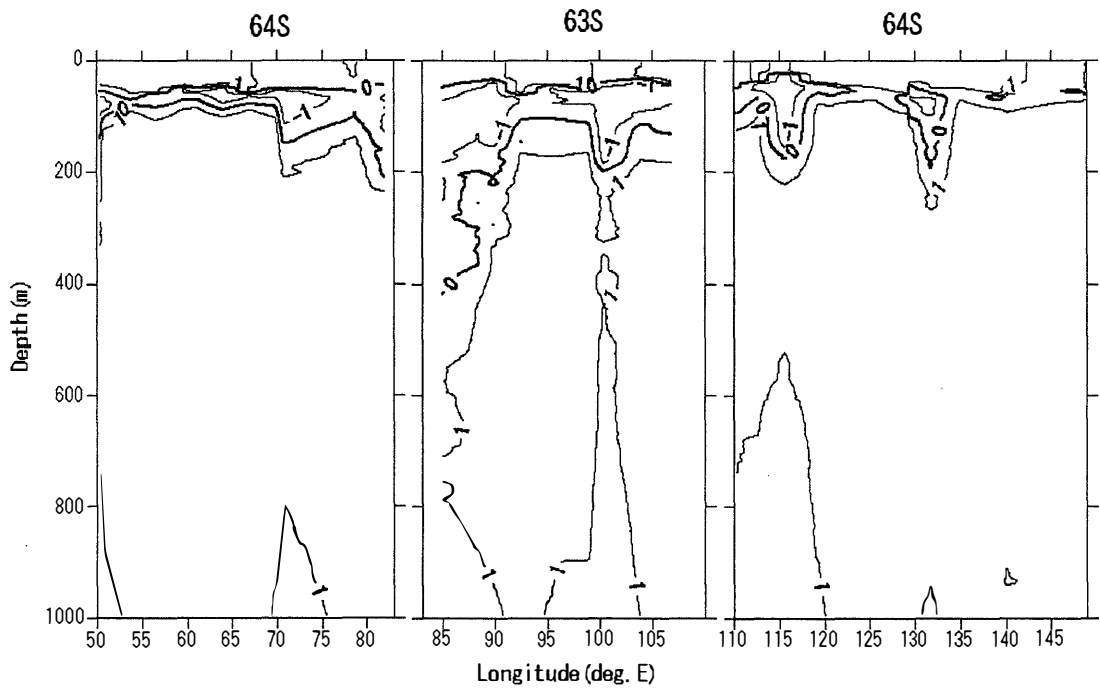


Fig. 6. Vertical profile of water temperature ($^{\circ}\text{C}$) observed with XCTD along 63°S and 64°S .

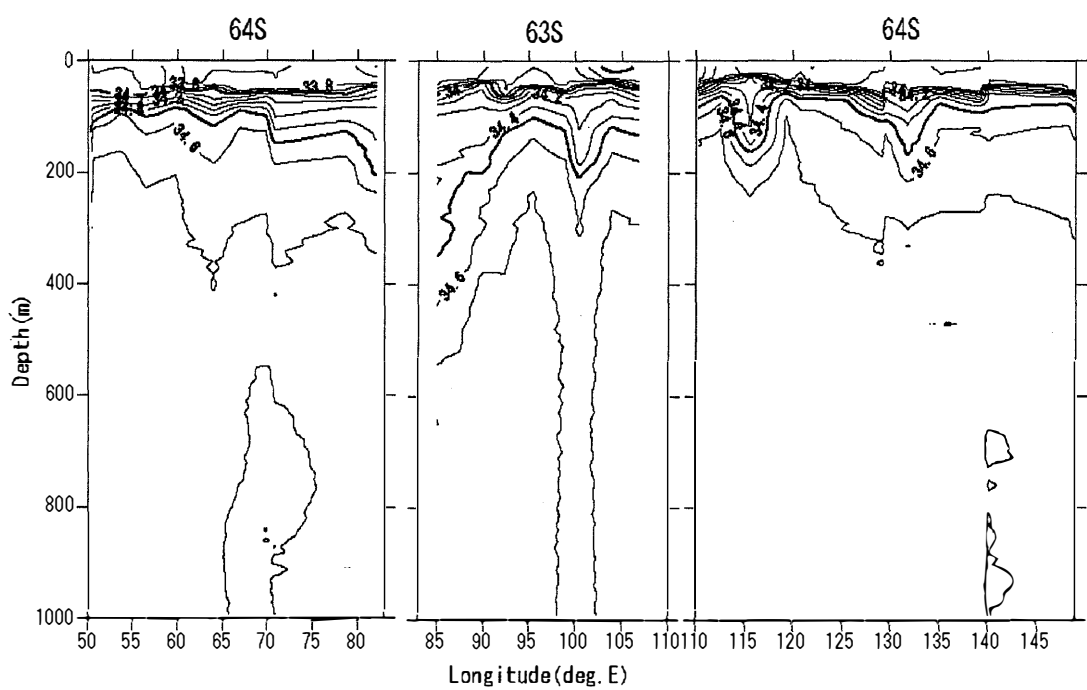


Fig. 7. Vertical profile of water salinity observed with XCTD along 63°S and 64°S .

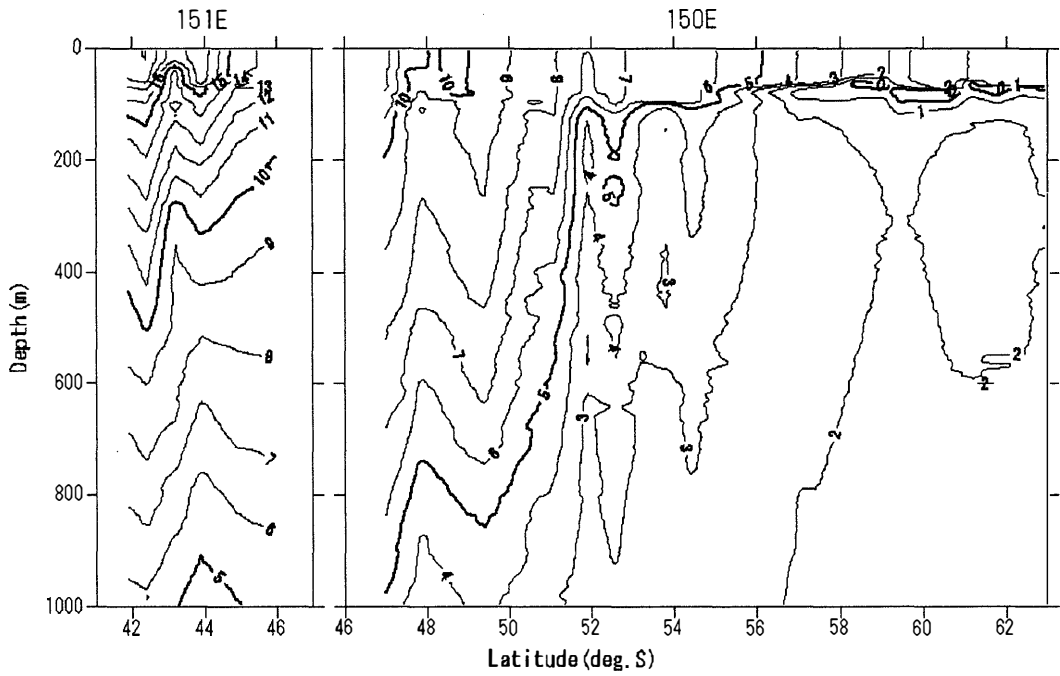


Fig. 8. Vertical profile of water temperature ($^{\circ}\text{C}$) observed with XCTD along 151°E and 150°E .

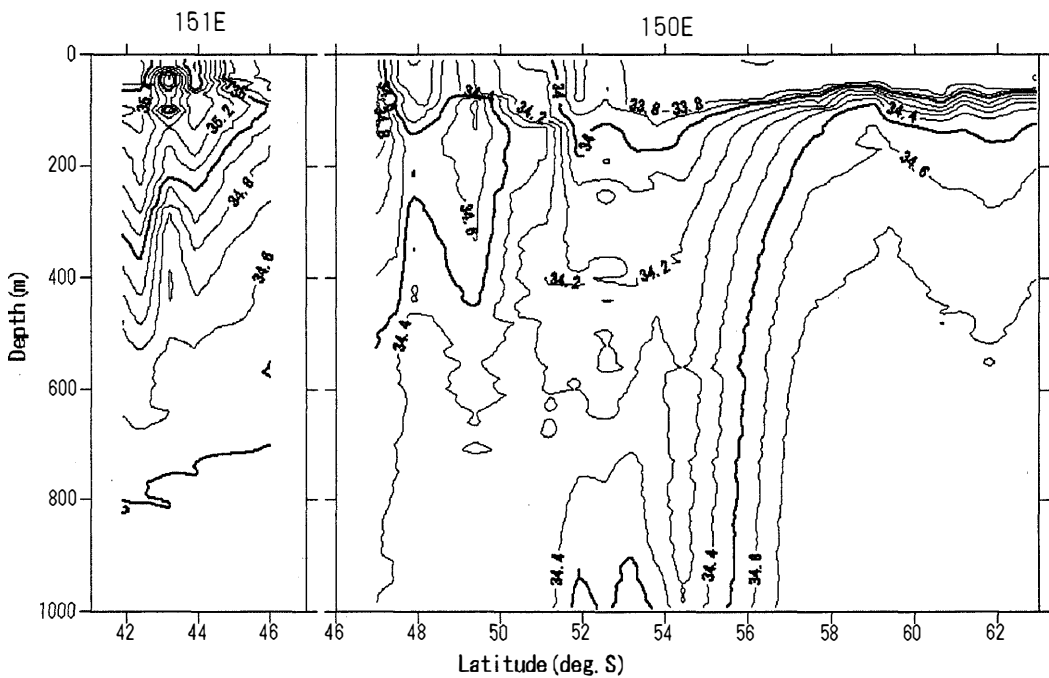


Fig. 9. Vertical profile of water salinity observed with XCTD along 151°E and 150°E .

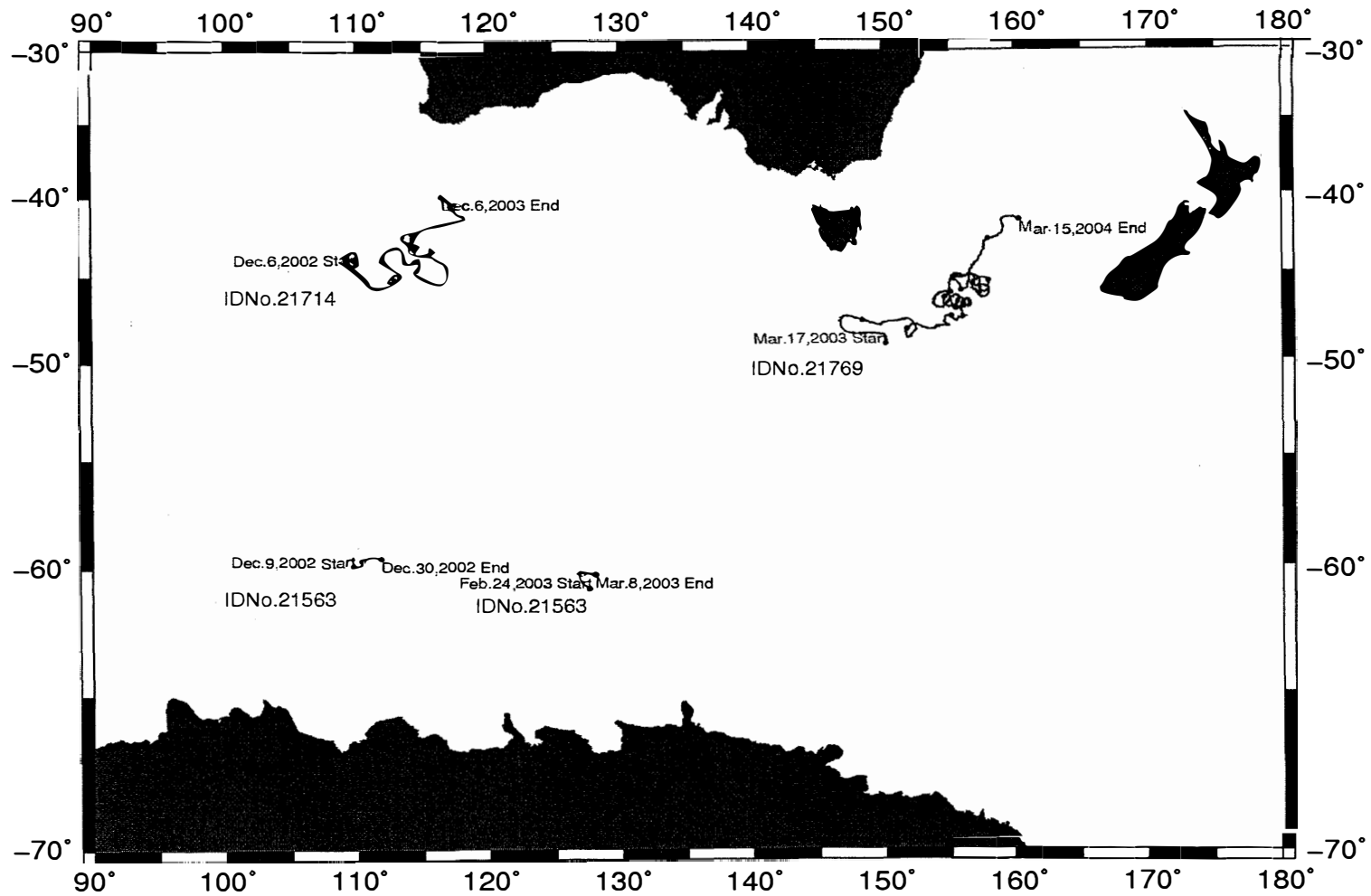


Fig. 10. Trajectories of three surface drifting buoys. Solid circles denote the deployment location and the location on the day of start and end.

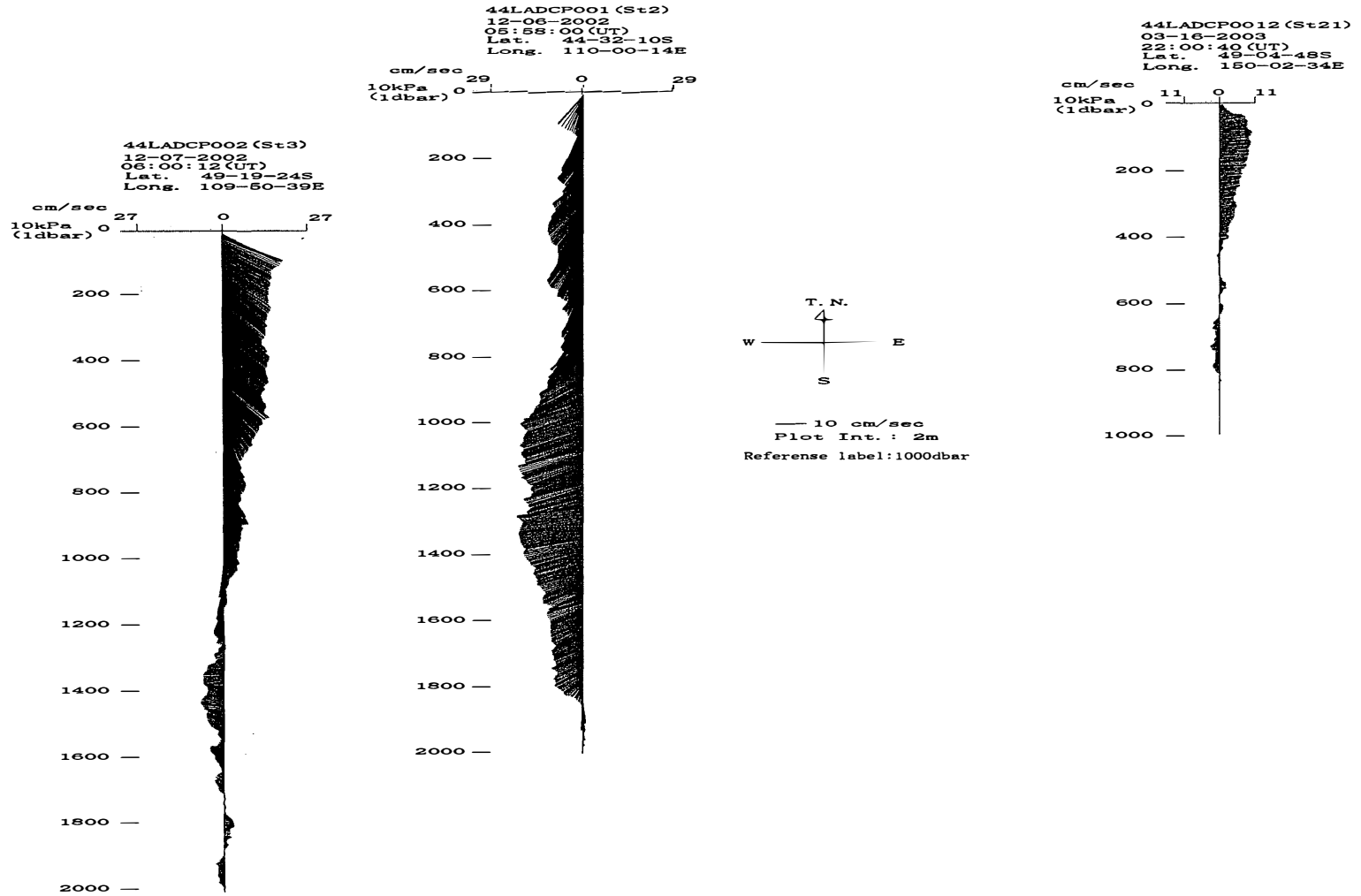


Fig. 11. Vertical profile of current observed with LADCP.

44LADCP003 (St6)
02-27-2003
05:15:11 (UT)
Lat. 63-59-13S
Long. 49-59-09E

44LADCP004 (St7)
02-28-2003
03:49:54 (UT)
Lat. 63-59-41S
Long. 60-34-26E

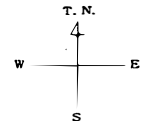
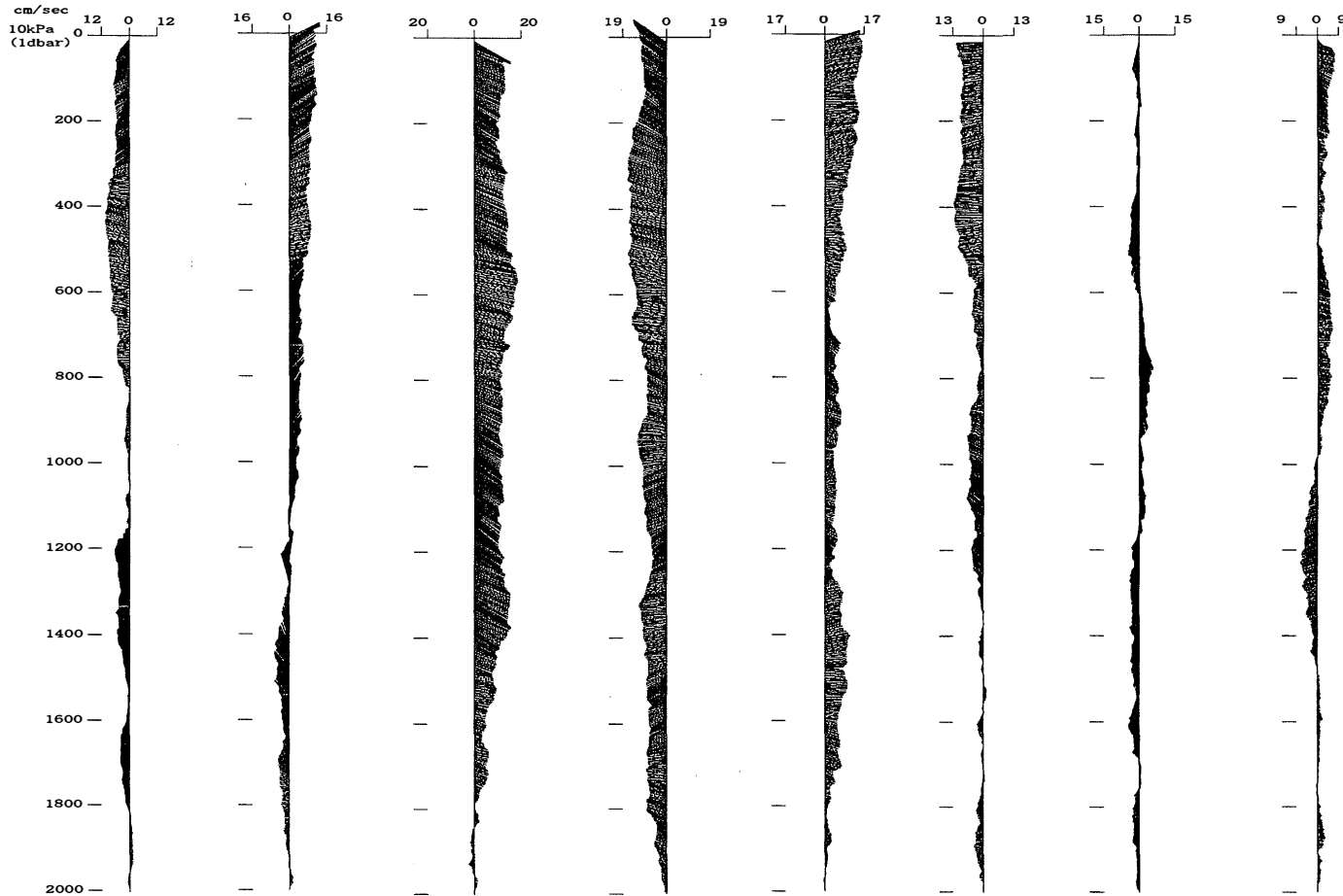
44LADCP005 (St8)
03-01-2003
03:55:25 (UT)
Lat. 64-00-50S
Long. 70-41-09E

44LADCP006 (St9)
03-04-2003
02:51:45 (UT)
Lat. 64-46-31S
Long. 78-14-45E

44LADCP007 (St10)
03-05-2003
02:48:02 (UT)
Lat. 63-25-13S
Long. 89-13-23E

44LADCP008 (St11) 44LADCP009 (St12)
03-06-2003 03-07-2003
01:50:00 (UT) 00:47:51 (UT)
Lat. 62-55-02S Lat. 64-00-30S
Long. 99-40-09E Long. 110-55-35E

44LADCP009 (St13)
03-07-2003
23:43:10 (UT)
Lat. 64-00-34S
Long. 120-08-53E



— 10 cm/sec
Plot Int. : 2m
Reference label:2000dbar

Fig. 11 (continued).

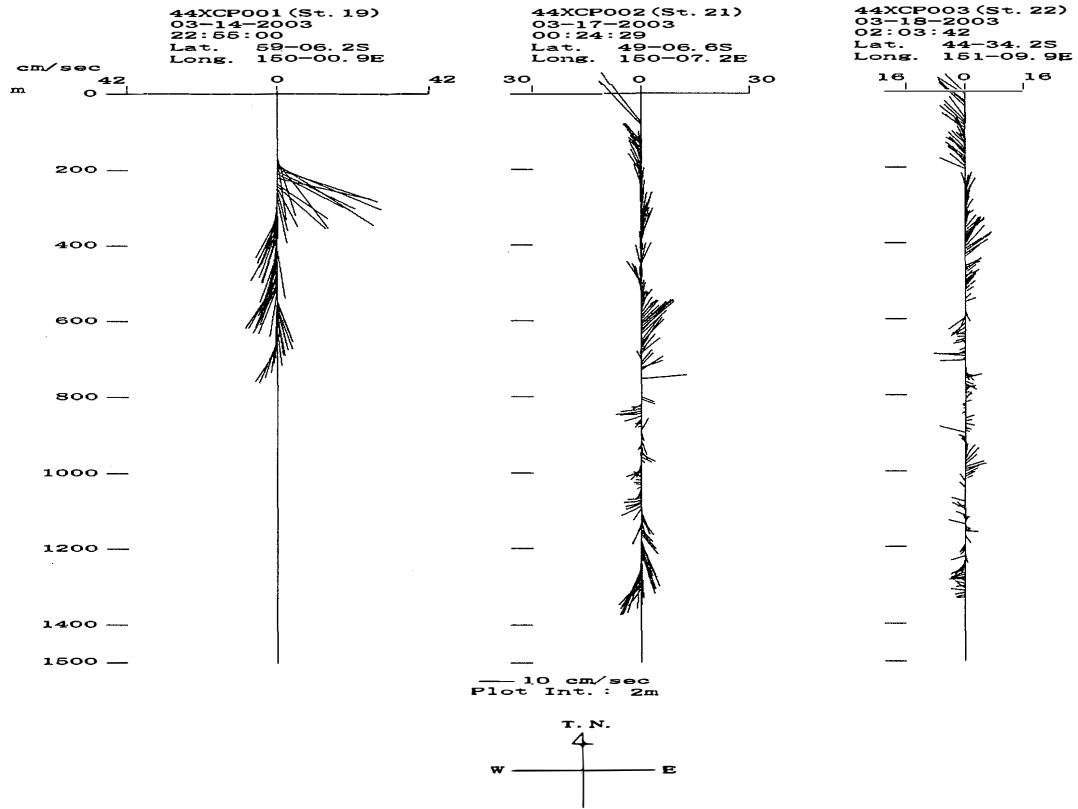


Fig. 12. Vertical profile of current observed with XCP.

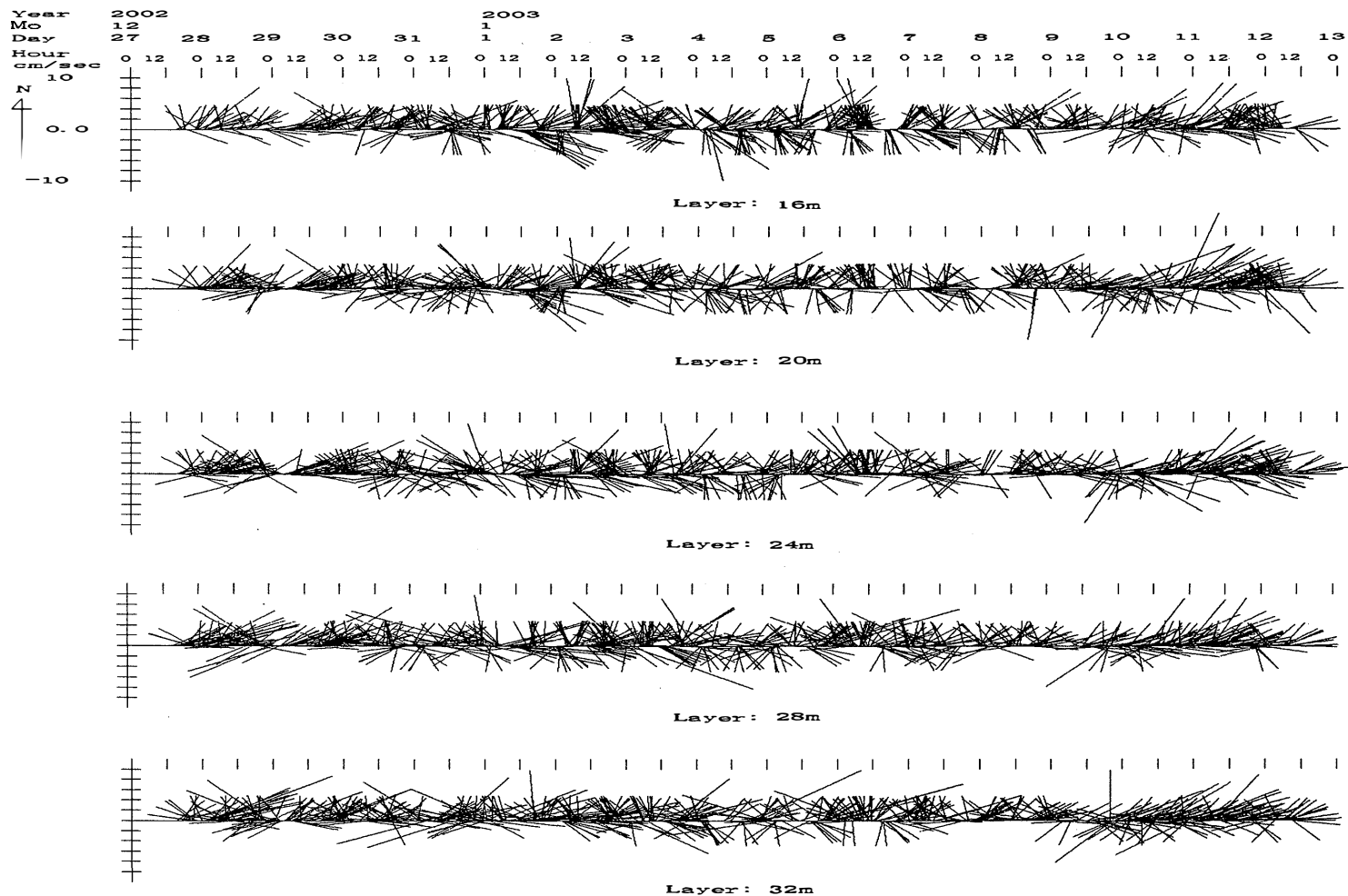


Fig. 13. The result of the current observation near Syowa Station.

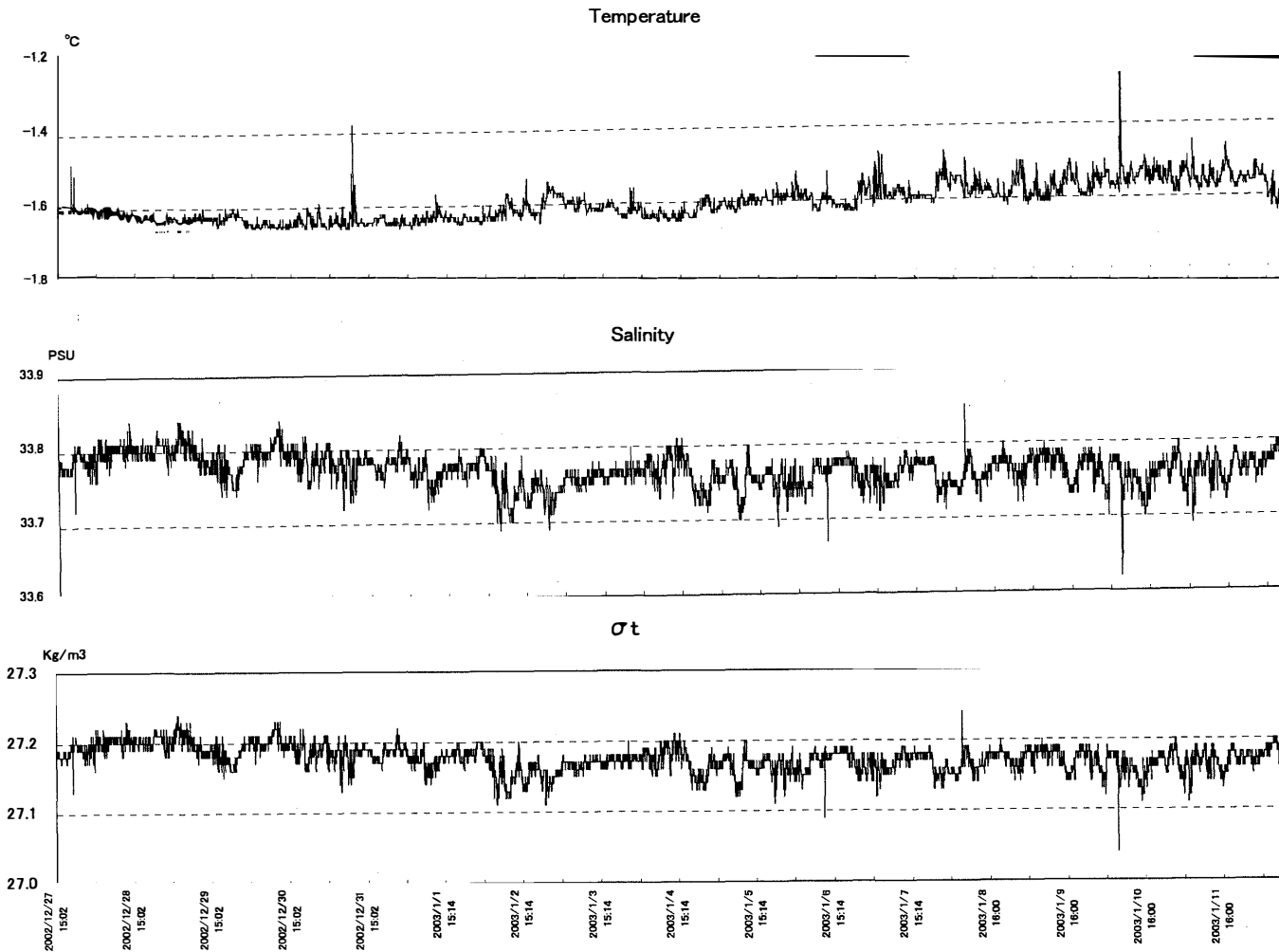


Fig. 14. The result of the water temperature, salinity and σ_t observation near Syowa Station.

Table 1. Data of surface water observations and on board the icebreaker "Shirase" in 2002-2003.

DATE	TIME	Position		Air Temp.	Water Temp.*	Salinity	pH	DO2	PO4-P	SiO3-Si	NO2-N	NO3-N	NH4-N
(UT)		Lat.	Long.	°C	°C	(PSS78)					(μmol/L)		
2002													
Dec.		Left Fremantle											
4	0126	35-25.25 S	112-45.38 E	13.4	17.3	35.715	8.03	—	—	—	—	—	—
4	0357	35-52.58	112-29.10	13.3	—	—	—	—	—	—	—	—	—
4	0430	35-57.75	112-26.31	13.3	—	—	—	—	—	—	—	—	—
4	0657	36-20.70	112-12.66	13.2	15.9	35.425	8.02	—	—	—	—	—	—
4	1000	36-52.77	111-53.78	12.4	—	—	—	—	—	—	—	—	—
4	1301	37-25.20	111-35.22	11.9	—	—	—	—	—	—	—	—	—
4	1602	37-56.72	111-14.73	12.2	—	—	—	—	—	—	—	—	—
4	2301	39-10.63	110-30.41	11.8	—	—	—	—	—	—	—	—	—
5	0208	39-43.10	110-10.50	12.2	12.8	34.923	8.01	—	0.56	—	0.18	7	0.04
5	0615	40-23.09	110-00.69	14.3	12.7	34.838	8.03	—	0.52	—	0.18	8	0.03
6	0157	43-42.42	110-00.07	10.2	9.8	34.746	—	—	—	—	—	—	0.01
6	0557	44-32.16	110-00.24	9.4	10.9	34.771	7.91	—	0.83	—	0.20	11	0.02
7	0155	48-34.34	109-54.32	5.0	6.1	34.091	8.01	—	—	—	—	—	0.02
7	0600	49-19.40	109-50.65	5.3	4.7	33.949	8.07	—	1.36	—	0.31	22	0.02
8	0205	53-51.37	109-56.47	3.8	2.6	33.897	7.93	—	—	—	—	—	0.03
8	0600	54-51.29	109-54.60	3.2	2.0	33.870	7.98	—	—	—	—	—	0.03
9	0200	59-19.28	109-58.23	1.3	0.8	33.936	7.96	—	1.94	—	0.31	27	0.03
9	0619	60-00.13	109-42.06	0.3	—	33.932	7.99	—	1.94	—	0.28	27	0.03
9	1104	59-58.45	109-29.30	0.8	0.8	33.914	7.98	—	2.14	—	0.33	30	0.03
9	2302	60-00.93	104-22.85	0.0	0.5	33.891	8.06	—	1.84	—	0.25	27	0.03
10	1110	59-59.01	99-05.37	0.2	0.7	33.923	8.06	—	1.80	—	0.29	28	0.03
11	2305	59-59.20	94-08.12	0.1	0.9	33.850	8.04	—	1.72	—	0.29	27	0.05
12	1057	59-59.84	89-07.45	0.2	-0.8	33.841	8.07	—	1.65	—	0.25	27	0.03
12	0001	60-00.25	83-30.45	-0.2	-0.3	33.831	8.05	—	1.70	—	0.28	28	0.03
12	1200	60-00.33	78-24.62	0.0	0.1	33.870	8.04	—	1.73	—	0.33	28	0.03
13	0126	60-15.93	72-26.04	-0.7	—	33.704	8.07	—	1.84	—	0.24	27	0.03
13	1303	60-49.17	67-03.94	-0.3	-1.1	33.794	8.12	—	1.83	—	0.19	27	0.04
14	0204	61-31.34	60-01.15	-1.9	-0.4	33.824	8.09	—	1.73	—	0.19	27	0.03
14	1400	62-09.42	53-33.26	-0.9	-1.0	33.856	8.12	—	1.77	—	0.22	28	0.03
14	0205	63-29.14	47-09.61	-2.6	-0.5	33.976	8.07	—	—	—	—	—	0.03
Arrived at the ice edge of SYOWA station.													

DATE	TIME	Position		Air Temp.	Water Temp.*	Salinity	pH	DO2	PO4-P	SiO3-Si	NO2-N	NO3-N	NH4-N	
(UT)		Lat.	Long.	°C	°C	(PSS78)					(μmol/L)			
2003														
Feb.		Left at the ice edge of SYOWA station.												
27	0310	64-17.52	50-14.53	-1.4	1.4	33.896	8.05	—	1.06	—	0.14	17	0.07	
27	0519	63-59.22	49-59.15	-0.3	1.9	33.914	8.05	—	1.86	—	0.25	25	0.05	
27	1456	64-00.04	53-44.34	0.7	2.8	33.881	8.04	—	1.74	—	0.31	27	0.04	
28	0203	63-59.96	59-41.38	0.8	1.0	33.709	8.07	—	1.63	—	0.34	26	0.08	
28	0350	63-59.68	60-34.44	-0.3	1.4	33.725	8.05	—	1.69	—	0.32	26	—	
28	1407	64-00.08	63-57.28	0.8	1.2	33.746	8.07	—	1.55	—	0.28	25	0.13	
Mar.	1	0202	64-00.12	69-48.04	0.2	1.3	33.710	8.09	—	1.61	—	1.76	23	0.07
1	0355	64-00.83	70-41.15	0.2	0.8	33.728	8.10	—	1.60	—	1.76	22	0.07	
1	1356	65-35.62	70-38.61	-0.2	0.6	33.701	8.09	—	1.64	—	1.76	24	0.08	
4	0108	64-56.12	77-36.33	-2.5	0.3	33.744	8.07	—	1.63	—	0.28	27	0.06	
4	0250	64-46.51	78-14.75	-2.4	0.6	33.769	8.10	—	1.62	—	0.30	26	0.06	
4	1255	63-59.13	82-04.70	-2.7	0.3	33.712	8.13	—	1.36	—	0.32	20	0.05	
5	0102	63-26.97	88-18.04	-2.8	—	33.633	8.09	—	1.35	—	0.27	23	0.06	
5	0248	63-25.21	89-13.39	-0.7	0.4	33.759	8.09	—	1.34	—	0.31	23	0.09	
5	1301	62-20.30	92-23.09	-1.9	0.4	33.808	8.08	—	—	—	—	—	—	
6	0003	62-37.83	98-52.19	-1.3	1.0	33.839	8.06	—	1.51	—	0.27	25	—	
6	0150	62-55.03	99-40.15	-1.2	—	33.831	—	—	1.63	—	0.28	26	0.03	
6	1157	62-59.80	103-54.55	0.0	0.7	33.516	8.12	—	1.40	—	0.31	23	—	
7	2307	64-00.08	110-04.73	-0.5	0.4	33.608	8.10	—	1.46	—	0.30	23	0.05	
7	0047	64-00.50	110-55.59	-0.4	0.5	33.742	8.08	—	1.55	—	0.32	24	0.03	
7	1112	64-00.18	112-35.13	0.1	0.8	33.873	8.06	—	1.60	—	0.31	25	0.04	
7	2157	64-00.05	119-15.73	-2.1	1.3	33.700	8.08	—	1.57	—	0.36	24	—	
7	2343	64-00.56	120-08.88	-2.6	1.5	33.631	8.08	—	1.55	—	0.35	24	0.10	
8	0958	64-00.11	121-55.18	-1.6	1.3	33.691	8.07	—	1.62	—	0.34	24	—	
8	2202	64-00.48	129-27.73	-1.0	1.5	33.849	8.04	—	1.78	—	0.36	27	0.04	
9	0956	64-00.01	131-44.07	-1.3	1.1	33.877	8.06	—	1.83	—	0.34	27	0.06	
9	2110	64-00.12	139-04.19	0.0	1.3	33.825	8.05	—	1.84	—	0.37	28	0.05	
9	2248	63-59.71	139-58.65	0.3	1.4	33.809	8.04	—	1.73	—	0.44	28	0.03	
10	0853	65-33.33	139-31.30	-0.9	—	34.007	8.04	—	1.93	—	0.25	29	0.07	
10	2244	65-33.14	140-00.40	-2.1	—	34.575	—	—	1.93	—	0.23	28	0.07	
13	2256	63-36.76	148-52.91	-3.8	0.4	33.890	8.05	—	1.80	—	0.32	28	0.07	
14	0455	62-22.83	150-04.28	-0.9	1.4	33.856	8.05	—	1.83	—	0.29	27	0.10	
14	2219	59-06.50	150-00.14	1.2	1.8	33.813	8.12	—	—	—	—	—	0.03	
15	0457	57-42.83	150-00.05	4.2	3.7	33.860	8.12	—	1.40	—	0.24	23	0.06	
15	2257	53-47.24	150-24.42	6.0	6.3	33.794	8.13	—	1.28	—	0.25	20	0.06	
16	0457	52-34.13	150-20.07	7.2	7.3	33.922	8.13	—	1.24	—	0.23	19	0.06	
16	2200	49-04.80	150-02.56	11.6	10.1	34.462	8.11	—	0.84	—	0.15	12	0.04	
17	0452	48-09.17	150-15.81	12.2	—	34.304	8.11	—	0.92	—	0.19	13	0.04	
17	2155	44-30.01	151-02.72	16.2	—	34.901	—	—	0.23	—	0.13	1	0.03	
18	0501	43-53.44	151-10.59	18.0	17.6	35.637	8.18	—	0.11	—	0.03	—	0.04	

* : The value of the digital thermometer.
PSS78 : Practical Salinity Scale of 1978

Table 2. XCTD observation data.

Station	JA440001		JA440002		JA440003		JA440004		JA440005		JA440006		JA440007		JA440008	
Date	2002/12/3		2002/12/3		2002/12/3		2002/12/4		2002/12/4		2002/12/4		2002/12/4		2002/12/4	
Time(UT)	13:54		16:07		22:11		1:27		4:03		6:56		9:58		12:56	
Latitude	33-30.6S		33-30.6S		34-52.3S		35-25.3S		35-52.6S		36-20.7S		36-52.8S		37-25.2S	
Longitude	114-10.4E		113-54.7E		113-06.1E		112-45.4E		112-29.1E		112-12.7E		111-53.8E		111-35.2E	
Depth(m)	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity
	0	18.36	35.73	18.14	35.74	-	-	17.18	35.63	16.79	35.60	15.31	35.34	21.88	-	14.43
10	18.37	35.74	18.14	35.75	-	-	17.18	35.67	16.76	35.63	15.26	35.38	21.22	-	14.41	35.11
20	18.38	35.76	18.14	35.75	-	-	17.18	35.68	16.73	35.64	15.24	35.39	21.60	-	14.22	35.11
30	18.38	35.76	18.14	35.76	-	-	17.15	35.69	16.73	35.64	15.09	35.36	21.50	-	14.18	35.11
50	18.39	35.76	18.13	35.76	-	-	16.02	35.52	15.47	35.51	13.79	35.23	21.10	-	13.30	35.11
75	17.15	35.72	17.74	35.73	-	-	15.03	35.49	14.41	35.42	13.35	35.27	14.75	35.28	13.13	35.19
100	16.38	35.66	16.71	35.69	18.07	34.21	14.63	35.49	13.93	35.37	12.98	35.23	14.71	35.30	12.80	35.21
125	15.72	35.62	16.13	35.68	18.08	35.70	14.42	35.48	13.43	35.30	12.51	35.16	12.77	34.98	12.00	35.07
150	15.00	35.55	15.62	35.62	16.80	35.58	13.90	35.41	12.92	35.22	12.16	35.10	12.27	34.99	11.95	35.11
200	13.88	35.38	14.46	35.45	14.72	35.45	13.11	35.28	12.19	35.13	11.85	35.08	11.26	34.95	11.58	35.08
250	12.71	35.19	13.27	35.28	13.50	35.26	12.21	35.14	11.47	35.01	11.37	34.99	10.92	34.90	11.28	35.02
300	11.82	35.05	11.88	35.05	12.23	35.05	11.20	34.98	10.79	34.87	10.44	34.83	10.59	34.86	10.67	34.89
400	10.04	34.77	10.07	34.78	10.11	34.72	9.80	34.79	9.73	34.72	9.63	34.71	10.21	34.80	10.18	34.82
500	9.26	34.67	9.32	34.68	9.36	34.61	9.14	34.71	9.29	34.65	9.29	34.67	9.70	34.70	9.71	34.73
600	8.71	34.60	8.72	34.60	8.85	34.55	8.70	34.66	9.01	34.60	8.94	34.63	9.34	34.65	9.32	34.68
700	7.55	34.49	7.74	34.51	7.81	34.46	7.67	34.56	8.44	34.53	8.42	34.57	8.99	34.60	8.73	34.60
800	6.00	34.41	6.07	34.43	6.26	34.37	6.30	34.49	7.36	34.44	7.41	34.48	8.32	34.53	7.93	34.53
900	4.59	34.38	4.75	34.40	4.81	34.32	5.09	34.45	6.04	34.36	6.14	34.42	7.19	34.44	6.57	34.44
1000	4.07	34.43	4.03	34.43	4.07	34.33	4.22	34.45	4.82	34.33	4.89	34.38	5.84	34.37	5.29	34.38

Station	JA440009		JA440010		JA440011		JA440012		JA440013		JA440014		JA440015		JA440016	
Date	2002/12/4		2002/12/4		2002/12/5		2002/12/5		2002/12/5		2002/12/5		2002/12/5		2002/12/6	
Time(UT)	15:58		22:58		1:55		4:54		14:00		17:01		23:01		1:55	
Latitude	37-56.7S		39-10.6S		39-43.1S		40-13.4S		40-58.5S		41-40.4S		43-01.7S		43-42.4S	
Longitude	111-14.7E		110-30.4E		110-10.5E		109-59.9E		110-00.1E		110-00.0E		110-00.4E		110-00.1E	
Depth(m)	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity
	0	14.23	34.99	12.54	34.84	12.57	34.88	12.00	34.75	11.97	34.80	11.34	34.75	10.57	34.71	10.19
10	14.24	35.03	12.42	34.85	12.56	34.90	11.87	34.78	11.97	34.82	11.34	34.77	10.57	34.73	10.19	34.73
20	14.39	35.19	12.39	34.86	12.45	34.91	11.76	34.80	11.96	34.84	11.34	34.79	10.57	34.74	10.18	34.74
30	14.44	35.22	12.34	34.87	12.43	34.91	11.71	34.81	11.78	34.84	11.01	34.79	10.45	34.75	10.16	34.74
50	13.40	35.03	11.95	34.83	12.38	34.91	11.66	34.81	11.67	34.84	10.95	34.80	10.28	34.76	9.91	34.74
75	11.85	34.95	11.44	34.82	11.91	34.94	11.61	34.88	11.14	34.82	10.88	34.80	10.26	34.76	9.87	34.74
100	11.30	34.97	11.31	34.96	11.25	34.96	10.86	34.88	10.83	34.90	10.67	34.79	10.24	34.76	9.87	34.75
125	11.05	34.95	10.97	34.90	11.07	34.95	10.64	34.87	10.82	34.93	10.44	34.79	10.11	34.78	9.86	34.74
150	11.04	34.95	10.73	34.87	11.10	34.97	10.51	34.85	10.66	34.90	10.33	34.82	10.05	34.78	9.84	34.75
200	10.99	34.94	10.70	34.88	10.80	34.91	10.37	34.84	10.38	34.84	10.04	34.76	9.82	34.76	9.76	34.75
250	10.77	34.91	10.44	34.83	10.46	34.84	10.06	34.78	10.09	34.79	9.85	34.74	9.66	34.74	9.67	34.74
300	10.30	34.82	10.17	34.79	10.13	34.78	9.84	34.75	9.82	34.75	9.72	34.73	9.66	34.75	9.56	34.73
400	9.73	34.73	9.54	34.68	9.71	34.71	9.59	34.71	9.61	34.72	9.53	34.70	9.50	34.72	9.41	34.71
500	9.33	34.66	9.28	34.64	9.36	34.66	9.22	34.66	9.27	34.67	9.29	34.66	9.38	34.69	9.19	34.66
600	8.87	34.61	8.92	34.61	8.98	34.62	8.86	34.61	8.95	34.63	9.02	34.63	8.72	34.60	8.95	34.62
700	8.06	34.52	8.43	34.54	8.43	34.55	8.27	34.55	8.52	34.58	8.62	34.58	7.99	34.52	8.13	34.52
800	6.86	34.44	7.39	34.46	7.51	34.47	7.43	34.48	7.59	34.50	7.76	34.51	7.03	34.47	7.35	34.46
900	5.64	34.38	6.10	34.39	6.32	34.40	6.28	34.42	6.54	34.44	6.73	34.45	5.71	34.37	6.20	34.40
1000	4.70	34.36	5.14	34.35	5.23	34.35	5.14	34.38	5.44	34.38	5.54	34.39	4.92	34.36	5.24	34.35

*Adoption for "Depth 0" for a numerical value of 4m.

Station	JA440017	JA440018	JA440019	JA440020	JA440021	JA440022	JA440023	JA440024								
Date	2002/12/6	2002/12/6	2002/12/6	2002/12/6	2002/12/7	2002/12/7	2002/12/7	2002/12/7								
Time(UT)	4:58	14:03	16:58	23:02	1:55	4:52	11:00	14:06								
Latitude	44-22.4S	45-24.7S	46-11.4S	47-46.7S	48-34.3S	49-14.3S	49-47.7S	50-37.4S								
Longitude	109-59.4E	109-58.5E	109-59.8E	109-58.9E	109-54.3E	109-52.2E	109-58.0E	109-59.9E								
Depth(m)	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity
0	10.35	34.70	10.64	34.75	8.88	34.55	8.52	34.51	5.94	33.97	4.54	33.91	4.41	33.88	4.12	33.86
10	10.32	34.73	10.64	34.78	8.88	34.56	8.53	34.51	5.92	34.02	4.53	33.92	4.42	33.90	4.11	33.89
20	10.30	34.74	10.64	34.80	8.88	34.56	8.52	34.52	5.92	34.03	4.46	33.93	4.30	33.91	4.05	33.90
30	10.26	34.75	10.65	34.79	8.89	34.56	8.53	34.52	5.92	34.04	4.44	33.93	4.25	33.91	3.97	33.90
50	9.98	34.75	10.60	34.80	8.89	34.57	8.53	34.54	5.91	34.05	4.43	33.94	4.24	33.92	3.96	33.91
75	9.96	34.75	10.47	34.80	8.88	34.57	8.53	34.54	5.90	34.06	4.43	33.93	4.22	33.92	3.96	33.91
100	9.93	34.75	10.18	34.80	8.92	34.60	8.50	34.56	5.88	34.06	4.26	33.94	3.92	33.93	3.95	33.90
125	9.91	34.75	10.01	34.79	8.92	34.61	8.55	34.58	5.80	34.03	3.34	33.96	3.01	33.96	2.59	33.94
150	9.87	34.74	9.96	34.79	8.85	34.59	8.60	34.60	4.95	34.02	2.92	33.97	2.80	33.96	2.74	33.98
200	9.80	34.75	9.66	34.73	8.59	34.56	8.60	34.62	4.87	34.08	2.71	33.98	2.76	34.00	2.87	34.05
250	9.69	34.73	9.66	34.75	8.56	34.57	8.13	34.55	4.76	34.10	2.93	34.06	3.28	34.15	3.00	34.14
300	9.61	34.73	9.79	34.78	8.21	34.53	7.54	34.46	4.90	34.20	3.12	34.15	3.19	34.20	2.76	34.17
400	9.54	34.73	9.67	34.76	7.19	34.38	6.93	34.42	4.55	34.25	2.74	34.22	2.77	34.23	2.58	34.27
500	9.37	34.69	9.57	34.74	6.87	34.39	6.18	34.43	4.04	34.27	2.65	34.31	2.76	34.34	2.66	34.38
600	9.02	34.63	8.76	34.61	6.18	34.39	5.15	34.38	3.37	34.27	2.65	34.41	2.66	34.36	2.56	34.44
700	8.36	34.55	8.12	34.51	5.19	34.34	4.40	34.38	3.15	34.34	2.57	34.48	2.66	34.37	2.50	34.51
800	7.74	34.50	7.19	34.45	4.38	34.31	3.55	34.34	2.96	34.39	2.54	34.55	2.58	34.51	2.44	34.56
900	6.75	34.44	5.98	34.38	3.92	34.33	3.54	34.43	2.83	34.46	2.49	34.60	2.49	34.56	2.40	34.61
1000	5.57	34.38	4.83	34.34	3.44	34.34	3.18	34.46	2.81	34.52	2.41	34.65	2.42	34.62	2.36	34.64

Station	JA440025	JA440026	JA440027	JA440028	JA440029	JA440030	JA440031	JA440032								
Date	2002/12/7	2002/12/7	2002/12/8	2002/12/8	2002/12/8	2002/12/8	2002/12/8	2002/12/8								
Time(UT)	17:04	23:15	2:04	6:56	10:59	14:11	16:59	23:06								
Latitude	51-23.8S	53-03.5S	53-51.4S	54-51.0S	55-49.0S	56-32.3S	57-11.2S	58-38.1S								
Longitude	109-58.9E	109-56.8E	109-56.5E	109-54.1E	109-53.2E	109-55.4E	109-55.1E	109-56.3E								
Depth(m)	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity
0	3.81	33.87	2.59	33.84	2.50	33.84	1.97	33.85	1.48	33.88	1.58	33.82	1.28	33.90	0.74	33.93
10	3.81	33.89	2.60	33.86	2.49	33.87	1.97	33.86	1.47	33.90	1.58	33.85	1.27	33.92	0.73	33.94
20	3.79	33.90	2.60	33.87	2.49	33.89	1.97	33.88	1.48	33.91	1.55	33.86	1.21	33.94	0.73	33.95
30	3.74	33.91	2.59	33.88	2.49	33.90	1.96	33.88	1.47	33.91	1.40	33.87	1.17	33.95	0.73	33.95
50	3.61	33.92	2.57	33.89	2.48	33.91	1.94	33.88	1.45	33.90	1.24	33.90	1.13	33.96	0.67	33.95
75	3.60	33.92	2.52	33.89	2.48	33.91	1.88	33.88	1.40	33.91	1.01	33.92	1.09	33.96	0.64	33.95
100	3.60	33.92	1.33	33.94	2.21	33.92	1.81	33.88	1.34	33.91	0.89	33.91	0.73	33.96	0.61	33.95
125	3.47	33.92	0.91	33.99	1.32	33.96	0.62	33.98	0.74	34.04	0.81	34.02	0.03	34.02	0.39	34.00
150	2.34	33.96	1.00	34.03	1.20	33.99	1.06	34.15	1.51	34.23	1.56	34.25	1.16	34.21	1.06	34.16
200	1.90	33.99	1.81	34.20	1.80	34.22	1.84	34.41	1.91	34.38	1.87	34.37	1.98	34.38	1.97	34.38
250	2.27	34.08	2.10	34.32	1.93	34.33	2.11	34.52	2.16	34.47	2.11	34.47	2.10	34.44	2.03	34.46
300	2.46	34.17	2.20	34.39	2.13	34.42	2.18	34.57	2.21	34.52	2.19	34.51	2.17	34.51	2.13	34.51
400	2.47	34.31	2.28	34.49	2.30	34.53	2.18	34.66	2.21	34.60	2.19	34.59	2.22	34.58	2.16	34.60
500	2.57	34.41	2.29	34.58	2.22	34.60	2.13	34.69	2.16	34.65	2.16	34.64	2.21	34.65	2.15	34.66
600	2.46	34.49	2.25	34.63	2.22	34.66	2.06	34.72	2.12	34.70	2.11	34.68	2.15	34.69	2.12	34.69
700	2.44	34.50	2.22	34.67	2.21	34.70	2.01	34.74	2.05	34.72	2.08	34.71	2.06	34.72	2.06	34.72
800	2.36	34.56	2.12	34.70	2.14	34.73	1.97	34.75	2.00	34.74	2.04	34.72	2.00	34.73	2.02	34.73
900	2.31	34.59	2.06	34.72	2.09	34.74	1.90	34.77	1.95	34.76	1.97	34.74	1.95	34.76	1.94	34.75
1000	2.33	34.63	2.00	34.74	2.03	34.76	1.84	34.77	1.88	34.76	1.92	34.75	1.90	34.76	1.89	34.75

*Adoption for "Depth 0" for a numerical value of 4m.

Station	JA440033	JA440034	JA440035	JA440036	JA440037	JA440038	JA440039	JA440040								
Date	2002/12/9	2002/12/9	2002/12/9	2002/12/9	2002/12/10	2002/12/10	2002/12/11	2002/12/12								
Time(UT)	2:00	5:07	11:03	23:00	10:57	23:05	10:56	0:01								
Latitude	59-19.2840S	60-00.9490S	59-58.4490S	60-00.9S	59-59.1S	59-59.2S	59-59.8S	60-00.3S								
Longitude	109-58.2330E	109-56.5500E	109-56.5500E	104-22.8E	99-05.4E	94-08.1E	89-07.4E	83-30.4E								
Depth(m)	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity				
0	0.74	33.90	0.57	33.92	0.21	33.85	-0.01	33.81	-0.46	33.92	-0.04	33.75	0.08	33.81	-0.53	33.82
10	0.71	33.92	0.56	33.94	0.21	33.87	-0.01	33.84	-0.46	33.93	-0.04	33.76	0.06	33.83	-0.54	33.83
20	0.69	33.93	0.53	33.94	0.21	33.88	-0.01	33.86	-0.50	33.95	-0.04	33.79	0.05	33.84	-0.52	33.84
30	0.69	33.93	0.50	33.95	0.21	33.88	0.22	33.92	-0.58	33.95	-0.05	33.79	0.05	33.86	-0.52	33.84
50	0.68	33.93	0.49	33.94	0.15	33.88	0.47	33.95	-0.63	33.96	-0.07	33.79	-0.04	33.92	-0.93	33.93
75	0.67	33.94	0.44	33.94	0.09	33.89	0.33	33.96	-0.83	33.97	-0.67	33.93	-0.28	33.97	-0.71	34.11
100	0.48	33.95	0.39	33.94	0.06	33.90	-0.44	33.96	-0.86	34.20	-0.72	34.09	-0.68	34.06	0.13	34.35
125	0.36	34.05	0.32	34.00	-0.58	34.03	0.16	34.16	0.41	34.36	-0.18	34.23	-0.21	34.28	0.89	34.51
150	1.03	34.21	1.56	34.31	1.61	34.32	1.22	34.33	1.35	34.50	1.64	34.43	0.78	34.41	1.49	34.62
200	1.84	34.42	2.00	34.43	2.03	34.44	1.93	34.52	1.45	34.59	1.95	34.54	1.60	34.56	1.81	34.70
250	2.09	34.50	2.11	34.51	2.14	34.50	2.07	34.59	1.65	34.66	2.04	34.59	1.72	34.62	1.86	34.73
300	2.15	34.55	2.18	34.55	2.11	34.54	2.08	34.65	1.76	34.69	2.02	34.62	1.63	34.64	1.86	34.74
400	2.16	34.62	2.16	34.63	2.13	34.60	1.98	34.70	1.73	34.72	1.75	34.66	1.71	34.68	1.80	34.75
500	2.10	34.67	2.10	34.66	2.05	34.64	1.98	34.74	1.74	34.74	1.92	34.71	1.76	34.70	1.74	34.75
600	1.99	34.69	2.06	34.70	2.03	34.67	1.91	34.76	1.68	34.75	1.77	34.71	1.63	34.72	1.66	34.77
700	1.93	34.71	1.99	34.71	1.97	34.70	1.85	34.79	1.64	34.76	1.77	34.74	1.65	34.72	1.57	34.76
800	1.88	34.73	1.94	34.72	1.90	34.70	1.82	34.80	1.55	34.76	1.65	34.74	1.58	34.74	1.46	34.77
900	1.88	34.74	1.88	34.73	1.84	34.72	1.72	34.80	1.43	34.76	1.62	34.75	1.51	34.73	1.35	34.75
1000	1.82	34.74	1.81	34.73	1.77	34.71	1.66	34.80	1.36	34.75	1.52	34.75	1.43	34.73	1.25	34.75

Station	JA440041	JA440042	JA440043	JA440044	JA440045	JA440046	JA440047	JA440048								
Date	2002/12/12	2002/12/13	2002/12/13	2002/12/14	2002/12/14	2002/12/15	2002/12/15	2003/2/24								
Time(UT)	12:00	1:27	13:02	2:02	14:00	2:06	13:58	13:27								
Latitude	60-00.3S	60-15.9S	60-49.2S	61-31.3S	62-09.4S	63-29.1S	65-41.0S	65-26.4S								
Longitude	78-24.6E	72-26.0E	67-03.9E	60-01.2E	53-33.3E	47-09.6E	41-43.7E	49-59.9E								
Depth(m)	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity				
0	-0.57	33.83	-0.50	33.70	-0.19	33.75	-0.64	33.77	-0.81	33.76	-0.92	33.99	-0.56	34.17	-0.11	33.93
10	-0.57	33.83	-0.51	33.72	-0.20	33.77	-0.65	33.80	-0.84	33.79	-0.90	34.00	-0.58	34.18	-0.20	33.93
20	-0.61	33.83	-0.64	33.76	-0.28	33.78	-0.65	33.81	-0.92	33.80	-1.03	34.02	-0.82	34.17	-0.25	33.95
30	-0.68	33.84	-0.68	33.77	-0.43	33.78	-0.71	33.82	-0.99	33.81	-1.06	34.02	-1.05	34.19	-0.25	33.95
50	-1.03	33.85	-1.24	33.78	-0.54	33.82	-0.95	33.84	-1.09	33.82	-1.17	34.03	-1.12	34.19	-0.30	33.95
75	-1.10	33.89	-1.42	33.82	-0.01	33.93	-1.40	33.96	-1.17	33.91	-1.42	34.06	0.17	34.56	-0.32	33.96
100	-1.05	33.95	-0.90	34.02	-0.09	33.96	-0.12	34.20	0.68	34.36	-0.82	34.33	1.37	34.70	-1.77	34.29
125	-0.02	34.19	0.67	34.25	-0.11	33.99	1.40	34.43	1.51	34.49	1.19	34.65	1.49	34.73	-1.60	34.36
150	1.25	34.37	1.51	34.40	-0.30	34.10	1.72	34.49	1.67	34.53	1.51	34.70	1.48	34.74	-1.41	34.41
200	1.92	34.51	1.80	34.48	1.53	34.45	1.76	34.54	1.79	34.59	1.57	34.73	1.48	34.75	-1.56	34.46
250	2.03	34.57	1.94	34.55	1.81	34.52	1.85	34.59	1.85	34.62	1.61	34.75	1.46	34.76	-1.53	34.49
300	2.06	34.60	2.03	34.60	1.94	34.58	1.94	34.64	1.86	34.65	1.57	34.75	1.42	34.76	-0.66	34.57
400	2.07	34.65	2.09	34.67	2.07	34.65	1.98	34.68	1.84	34.68	1.46	34.77	1.33	34.77	0.13	34.66
500	2.07	34.69	2.08	34.70	2.06	34.68	1.96	34.72	1.80	34.70	1.38	34.78	1.22	34.78	0.32	34.70
600	2.03	34.71	2.02	34.75	2.09	34.72	1.92	34.74	1.72	34.71	1.27	34.79	1.13	34.75	0.29	34.71
700	1.99	34.72	1.96	34.75	2.04	34.73	1.86	34.76	1.63	34.72	1.15	34.78	1.01	34.75	0.30	34.72
800	1.93	34.74	1.91	34.77	1.98	34.74	1.78	34.77	1.52	34.72	1.04	34.78	0.92	34.75	0.30	34.71
900	1.87	34.74	1.85	34.78	1.93	34.75	1.70	34.77	1.37	34.72	0.94	34.77	0.82	34.75	0.23	34.72
1000	1.78	34.75	1.77	34.78	1.84	34.76	1.60	34.76	1.32	34.72	0.86	34.77	0.72	34.74	0.20	34.72

*Adoption for "Depth 0" for a numerical value of 4m.

Station	JA440049		JA440050		JA440051		JA440052		JA440053		JA440054		JA440055		JA440056	
Date	2003/2/27		2003/2/27		2003/2/27		2003/2/27		2003/2/28		2003/2/28		2003/2/28		2003/2/28	
Time(UT)	3:08		9:08		14:56		20:02		2:03		8:00		14:06		19:57	
Latitude	64-17.5S		64-00.0S		64-00.0S		64-00.0S		64-00.0S		63-59.9E		64-00.1S		63-59.4S	
Longitude	50-14.5E		50-38.0E		53-44.3E		56-27.3E		59-41.4E		61-06.5E		63-57.3E		66-50.4E	
Depth(m)	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity
0	0.88	33.89	1.73	33.87	1.34	33.87	1.34	33.84	1.28	33.74	1.29	33.64	1.12	33.66	1.01	33.67
10	0.88	33.91	1.69	33.89	1.34	33.89	1.34	33.86	1.27	33.75	1.26	33.65	1.12	33.89	1.01	33.69
20	0.88	33.93	1.69	33.89	1.32	33.92	1.34	33.87	1.28	33.76	1.22	33.66	1.10	33.71	1.01	33.70
30	0.88	33.94	1.59	33.92	1.29	33.93	1.35	33.87	1.28	33.76	1.22	33.67	1.06	33.71	1.02	33.71
50	0.68	33.94	0.56	33.97	1.20	33.94	1.36	33.89	-1.10	34.05	-0.27	33.87	-1.42	34.02	1.04	33.72
75	-1.60	34.22	-1.30	34.24	-0.22	34.31	-0.67	34.25	0.30	34.40	0.29	34.34	-1.03	34.15	-0.13	34.30
100	-1.40	34.33	-0.13	34.44	1.41	34.63	1.35	34.49	1.35	34.56	1.48	34.53	1.03	34.42	1.48	34.55
125	-1.08	34.40	1.06	34.62	1.60	34.67	1.27	34.58	1.58	34.62	1.63	34.58	1.57	34.52	1.70	34.60
150	-0.61	34.51	1.41	34.68	1.63	34.69	1.56	34.63	1.67	34.66	1.75	34.61	1.73	34.55	1.77	34.63
200	0.28	34.62	1.57	34.72	1.63	34.73	1.65	34.68	1.76	34.70	1.79	34.64	1.89	34.62	1.82	34.67
250	0.45	34.66	1.59	34.73	1.68	34.75	1.72	34.72	1.76	34.72	1.81	34.68	1.93	34.65	1.82	34.68
300	0.38	34.66	1.54	34.75	1.67	34.75	1.75	34.73	1.76	34.74	1.81	34.69	1.95	34.67	1.80	34.71
400	1.34	34.77	1.49	34.77	1.61	34.78	1.72	34.77	1.71	34.77	1.78	34.73	1.88	34.70	1.76	34.72
500	1.22	34.78	1.41	34.77	1.53	34.79	1.67	34.78	1.66	34.78	1.73	34.73	1.85	34.72	1.68	34.74
600	1.07	34.77	1.31	34.79	1.44	34.77	1.56	34.79	1.56	34.79	1.64	34.74	1.79	34.74	1.57	34.75
700	0.96	34.78	1.17	34.78	1.36	34.79	1.48	34.78	1.47	34.79	1.56	34.75	1.67	34.74	1.49	34.71
800	0.86	34.78	1.11	34.78	1.27	34.80	1.35	34.79	1.38	34.79	1.46	34.76	1.58	34.75	1.45	34.68
900	0.76	34.77	0.98	34.77	1.15	34.79	1.25	34.78	1.28	34.79	1.37	34.75	1.49	34.76	1.40	34.62
1000	0.65	34.77	0.90	34.76	1.06	34.79	1.15	34.78	1.21	34.78	1.27	34.74	1.39	34.75	1.22	34.68

Station	JA440057		JA440058		JA440059		JA440060		JA440061		JA440062		JA440063		JA440064	
Date	2003/3/1		2003/3/1		2003/3/1		2003/3/2		2003/3/2		2003/3/2		2003/3/3		2003/3/3	
Time(UT)	2:00		8:00		13:54		1:14		6:55		13:00		6:54		12:59	
Latitude	64-00.1S		64-17.4S		65-35.6S		67-53.3S		68-29.5S		68-29.3S		68-19.4S		66-50.4S	
Longitude	69-48.0E		70-47.7E		70-38.6E		72-37.3E		71-58.8E		73-08.3E		73-02.2E		74-18.9E	
Depth(m)	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity
0	0.92	33.68	0.84	33.68	0.65	33.66	-0.79	34.17	-0.54	33.54	0.15	33.87	0.11	33.88	-0.08	33.37
10	0.92	33.69	0.83	33.69	0.55	33.67	-0.79	34.18	-0.47	33.58	0.09	33.90	0.11	33.93	0.15	33.54
20	0.92	33.70	0.82	33.70	0.51	33.69	-0.80	34.20	-0.32	33.63	0.08	33.91	0.11	33.93	0.16	33.64
30	0.92	33.71	0.81	33.70	0.50	33.69	-0.82	34.20	-0.11	33.72	0.07	33.93	0.23	33.98	-1.46	34.11
50	0.20	33.78	0.49	33.73	-1.32	34.15	-0.85	34.21	0.25	33.88	-0.12	34.02	-1.07	34.31	-1.71	34.23
75	-0.47	34.30	-1.53	34.20	-1.36	34.30	-1.72	34.41	0.70	34.01	-1.51	34.42	-1.57	34.40	-1.66	34.28
100	0.92	34.51	-1.25	34.30	-1.11	34.38	-1.92	34.45	0.10	34.03	-1.73	34.47	-1.69	34.45	-1.66	34.29
125	1.45	34.59	-0.58	34.41	-0.84	34.44	-2.03	34.47	0.08	34.16	-1.79	34.50	-1.82	34.49	-1.65	34.31
150	1.69	34.64	0.06	34.51	-0.35	34.51	-2.02	34.47	-0.95	34.23	-1.80	34.50	-1.85	34.50	-1.66	34.32
200	1.70	34.67	0.74	34.60	0.22	34.59	-2.03	34.48	-1.49	34.40	-1.82	34.51	-1.90	34.50	-1.66	34.34
250	1.63	34.69	1.09	34.66	0.51	34.63	-1.97	34.49	-2.01	34.47	-1.86	34.52	-1.86	34.52	-1.63	34.36
300	1.63	34.70	1.16	34.68	0.94	34.68	-1.88	34.52	-1.99	34.49	-1.86	34.53	-1.85	34.53	-1.43	34.40
400	1.51	34.71	1.18	34.70	0.97	34.70	-1.89	34.54	-1.93	34.53	-1.86	34.55	-1.87	34.55	-0.96	34.47
500	1.46	34.73	1.16	34.72	0.87	34.70	-	-	-	-	-1.87	34.55	-1.87	34.54	-0.34	34.55
600	1.52	34.62	1.10	34.72	0.85	34.71	-	-	-	-	-1.89	34.58	-1.89	34.57	0.12	34.61
700	1.35	34.67	1.06	34.66	0.79	34.71	-	-	-	-	-1.89	34.67	-	-	0.44	34.67
800	1.25	34.70	1.00	34.67	0.69	34.70	-	-	-	-	-	-	-	-	0.57	34.69
900	1.13	34.69	0.88	34.70	0.62	34.70	-	-	-	-	-	-	-	-	0.55	34.69
1000	0.95	34.69	0.81	34.69	0.55	34.70	-	-	-	-	-	-	-	-	0.48	34.69

*Adoption for "Depth 0" for a numerical value of 4m.

Station	JA440065	JA440066	JA440067	JA440068	JA440069	JA440070	JA440071	JA440072								
Date	2003/3/4	2003/3/4	2003/3/4	2003/3/4	2003/3/5	2003/3/5	2003/3/5	2003/3/5								
Time(UT)	1:00	6:54	12:56	18:56	10:11	7:06	13:01	17:57								
Latitude	64-56.1S	64-30.4S	63-59.1E	63-21.3S	63-27.0S	63-09.3S	62-20.3S	62-20.5S								
Longitude	77-36.3E	78-40.2E	82-04.7E	84-55.2E	88-18.0E	89-47.8E	92-23.1E	95-22.9E								
Depth(m)	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity
0	0.73	33.71	1.03	33.73	0.48	33.57	0.56	33.63	0.39	33.63	0.64	33.65	1.41	33.73	1.40	33.77
10	0.73	33.73	1.02	33.75	0.49	33.59	0.55	33.65	0.38	33.64	0.64	33.68	1.41	33.76	1.40	33.80
20	0.74	33.73	1.01	33.75	0.58	33.65	0.55	33.65	0.42	33.66	0.66	33.70	1.41	33.77	1.40	33.81
30	0.63	33.76	1.00	33.76	0.60	33.70	0.52	33.67	0.45	33.67	0.61	33.71	1.41	33.79	1.40	33.81
50	-0.07	33.91	0.35	33.88	-0.84	34.08	-0.12	33.82	-1.07	34.11	-1.49	34.21	1.39	33.79	-1.19	34.23
75	-0.91	34.24	-0.62	34.25	-0.94	34.27	-1.22	34.20	-1.42	34.27	-1.55	34.30	-0.97	34.19	-1.00	34.37
100	-0.77	34.31	0.01	34.36	-1.15	34.33	-1.24	34.31	-1.10	34.34	-1.60	34.33	-0.34	34.35	-0.07	34.50
125	-0.12	34.41	0.72	34.51	-1.17	34.38	-1.38	34.34	-1.07	34.36	-1.51	34.34	0.53	34.49	0.59	34.58
150	0.62	34.50	1.13	34.55	-0.67	34.43	-1.44	34.35	-0.82	34.39	-1.26	34.41	0.96	34.55	0.88	34.62
200	1.39	34.62	1.74	34.66	-0.26	34.48	-0.28	34.44	0.09	34.51	-0.25	34.50	1.27	34.62	1.37	34.69
250	1.53	34.66	1.76	34.68	1.63	34.66	-1.05	34.42	0.92	34.59	0.25	34.56	1.62	34.68	1.40	34.70
300	1.56	34.69	1.69	34.70	1.63	34.68	-0.89	34.45	-0.03	34.54	0.21	34.59	1.52	34.68	1.41	34.72
400	1.53	34.72	1.74	34.73	1.75	34.73	-0.26	34.55	0.77	34.66	1.24	34.72	1.49	34.71	1.40	34.75
500	1.48	34.73	1.65	34.75	1.73	34.75	0.63	34.66	1.09	34.71	1.27	34.73	1.48	34.72	1.34	34.75
600	1.34	34.73	1.54	34.75	1.67	34.76	0.91	34.70	1.17	34.73	1.24	34.75	1.39	34.73	1.26	34.76
700	1.29	34.71	1.43	34.75	1.54	34.76	0.95	34.72	1.11	34.73	1.17	34.76	1.32	34.72	1.20	34.76
800	1.25	34.69	1.32	34.74	1.47	34.76	0.99	34.73	1.07	34.73	1.12	34.75	1.22	34.74	1.14	34.76
900	1.17	34.66	1.24	34.74	1.35	34.76	0.89	34.72	0.98	34.73	1.04	34.75	1.14	34.73	1.07	34.76
1000	1.03	34.65	1.13	34.73	1.25	34.76	0.80	34.73	0.92	34.74	0.96	34.74	1.05	34.73	0.98	34.75

Station	JA440073	JA440074	JA440075	JA440076	JA440077	JA440078	JA440079	JA440080								
Date	2003/3/6	2003/3/6	2003/3/6	2003/3/6	2003/3/6	2003/3/7	2003/3/7	2003/3/7								
Time(UT)	0:03	6:04	11:57	17:01	23:06	11:04	15:59	21:58								
Latitude	62-37.8S	62-57.5S	62-59.8S	63-01.9S	64-00.1S	64-00.2S	64-00.2S	64-00.0S								
Longitude	98-52.2E	100-20.5E	103-54.5E	106-57.4E	110-04.7E	112-35.1E	115-32.6E	119-15.7E								
Depth(m)	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity
0	1.18	33.76	0.47	33.62	0.99	33.39	1.30	33.51	0.78	33.61	1.11	33.85	0.86	33.74	1.74	33.70
10	1.18	33.77	0.46	33.67	0.99	33.41	1.30	33.53	0.77	33.63	1.11	33.86	0.86	33.74	1.74	33.71
20	1.18	33.78	0.46	33.70	1.06	33.50	1.30	33.54	0.77	33.63	1.11	33.87	0.81	33.74	1.74	33.72
30	1.17	33.79	0.57	33.75	0.95	33.55	1.30	33.55	0.76	33.65	1.11	33.88	-1.74	34.22	1.74	33.72
50	0.38	33.87	-1.45	34.12	-1.35	34.14	-1.24	33.98	-0.07	33.98	-1.28	34.37	-1.80	34.25	-0.44	34.37
75	-1.26	34.29	-1.71	34.24	-1.08	34.32	-1.05	34.23	-0.69	34.45	0.39	34.60	-1.80	34.27	0.96	34.65
100	-0.37	34.41	-1.79	34.27	-0.79	34.41	-0.59	34.38	0.19	34.58	1.05	34.69	-1.75	34.29	1.35	34.70
125	0.37	34.51	-1.70	34.30	0.43	34.51	-0.64	34.45	1.02	34.68	1.18	34.70	-1.69	34.31	1.40	34.72
150	0.74	34.55	-1.62	34.32	0.74	34.58	0.30	34.53	1.24	34.70	1.26	34.72	-1.20	34.40	1.43	34.73
200	1.32	34.63	0.08	34.47	1.37	34.67	1.26	34.64	1.34	34.73	1.31	34.74	0.62	34.63	1.48	34.74
250	1.31	34.64	0.91	34.58	1.48	34.70	1.44	34.68	1.36	34.74	1.38	34.74	1.16	34.70	1.48	34.75
300	1.34	34.65	0.69	34.58	1.44	34.71	1.56	34.72	1.34	34.73	1.37	34.75	1.22	34.72	1.46	34.76
400	1.36	34.67	0.70	34.62	1.53	34.74	1.42	34.72	1.31	34.73	1.29	34.76	1.12	34.73	1.41	34.76
500	1.35	34.69	0.85	34.65	1.45	34.74	1.42	34.74	1.21	34.74	1.17	34.76	1.02	34.73	1.35	34.76
600	1.27	34.69	0.84	34.66	1.37	34.76	1.38	34.73	1.12	34.73	1.07	34.75	0.87	34.73	1.25	34.76
700	1.19	34.69	0.77	34.66	1.30	34.76	1.25	34.74	1.03	34.73	0.95	34.74	0.62	34.71	1.16	34.77
800	1.12	34.68	0.66	34.65	1.21	34.75	1.13	34.74	0.96	34.72	0.86	34.74	0.62	34.72	1.08	34.77
900	-	-	0.53	34.66	1.12	34.75	1.12	34.74	0.86	34.73	0.75	34.73	0.55	34.72	0.99	34.76
1000	-	-	0.45	34.65	1.02	34.74	1.05	34.73	0.77	34.72	0.65	34.72	0.39	34.70	0.92	34.75

*Adoption for "Depth 0" for a numerical value of 4m.

Station	JA440081	JA440082	JA440083	JA440084	JA440085	JA440086	JA440087	JA440088								
Date	2003/3/8	2003/3/8	2003/3/8	2003/3/8	2003/3/9	2003/3/9	2003/3/9	2003/3/9								
Time(UT)	3:59	9:59	15:56	22:02	3:54	9:57	14:59	21:09								
Latitude	64-02.3S	64-00.1S	64-00.6S	64-00.5S	63-31.8S	64-00.0S	64-00.4S	64-00.1S								
Longitude	120-42.8E	121-55.2E	125-37.4E	129-27.7E	129-06.5E	131-44.1E	135-01.3E	139-04.2E								
Depth(m)	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity		
0	1.73	33.79	1.66	33.68	1.58	33.77	1.37	33.79	1.93	33.76	1.14	33.82	1.68	33.74	1.54	33.75
10	1.72	33.80	1.66	33.70	1.58	33.78	1.36	33.81	1.91	33.78	1.15	33.85	1.68	33.78	1.54	33.80
20	1.73	33.80	1.66	33.71	1.58	33.78	1.37	33.82	1.89	33.81	1.12	33.87	1.68	33.80	1.55	33.81
30	1.77	33.86	1.66	33.70	1.58	33.79	1.36	33.84	1.89	33.81	1.10	33.87	1.69	33.80	1.55	33.82
50	-0.52	34.29	-0.24	34.30	0.77	34.01	-0.58	34.18	1.86	33.82	0.99	33.89	0.83	33.99	1.51	33.83
75	0.88	34.55	1.01	34.55	1.16	34.51	-0.84	34.36	-0.38	34.12	-1.35	34.24	1.20	34.51	0.32	34.35
100	1.28	34.62	1.35	34.62	1.57	34.58	-0.15	34.45	1.37	34.46	-0.87	34.37	1.49	34.56	1.41	34.54
125	1.35	34.65	1.39	34.65	1.56	34.61	1.29	34.60	1.74	34.54	-0.95	34.39	1.69	34.61	1.89	34.61
150	1.44	34.68	1.46	34.67	1.65	34.63	1.59	34.65	1.82	34.58	-0.38	34.48	1.71	34.62	1.88	34.63
200	1.51	34.70	1.52	34.69	1.61	34.66	1.68	34.67	1.87	34.63	0.05	34.56	1.75	34.66	1.91	34.67
250	1.49	34.72	1.56	34.70	1.59	34.68	1.67	34.69	1.96	34.67	0.80	34.65	1.75	34.69	1.92	34.69
300	1.54	34.72	1.57	34.72	1.64	34.69	1.64	34.71	1.96	34.69	1.22	34.70	1.77	34.71	1.89	34.71
400	1.53	34.75	1.57	34.74	1.65	34.73	1.65	34.73	1.88	34.71	1.29	34.72	1.74	34.73	1.81	34.73
500	1.48	34.75	1.52	34.74	1.57	34.73	1.57	34.75	1.83	34.73	1.25	34.74	1.66	34.74	1.79	34.75
600	1.42	34.76	1.47	34.74	1.53	34.74	1.51	34.74	1.80	34.75	1.19	34.74	1.63	34.75	1.75	34.76
700	1.33	34.76	1.37	34.74	1.33	34.72	1.44	34.75	1.73	34.75	1.17	34.74	1.53	34.76	1.68	34.76
800	1.24	34.75	1.30	34.74	1.33	34.74	1.33	34.75	1.68	34.76	1.13	34.74	1.45	34.76	1.60	34.77
900	1.15	34.74	1.22	34.74	1.28	34.74	1.19	34.74	1.59	34.76	1.02	34.73	1.37	34.76	1.51	34.78
1000	1.06	34.74	1.15	34.74	1.18	34.74	1.11	34.74	1.50	34.76	0.92	34.72	1.30	34.75	1.42	34.77

Station	JA440089	JA440090	JA440091	JA440092	JA440093	JA440094	JA440095	JA440096								
Date	2003/3/10	2003/3/10	2003/3/13	2003/3/13	2003/3/14	2003/3/14	2003/3/14	2003/3/14								
Time(UT)	3:04	8:53	19:58	22:56	1:55	4:55	7:56	10:59								
Latitude	64-18.9S	65-33.3S	64-09.2S	63-36.8S	63-00.0S	62-22.8S	61-46.9S	61-11.4S								
Longitude	140-05.6E	139-31.3E	148-12.7E	148-52.9E	149-29.0E	150-04.3E	150-06.0E	150-03.4E								
Depth(m)	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity		
0	1.20	33.89	-0.72	33.99	0.47	33.86	1.13	33.78	1.49	33.76	1.71	33.73	1.75	33.75	1.83	33.73
10	1.20	33.88	-0.73	34.01	0.47	33.88	1.13	33.81	1.49	33.78	1.71	33.76	1.75	33.76	1.83	33.75
20	1.20	33.90	-0.74	34.02	0.48	33.88	1.13	33.82	1.49	33.80	1.71	33.78	1.75	33.76	1.83	33.77
30	1.20	33.90	-0.82	34.03	0.48	33.88	1.13	33.81	1.49	33.80	1.71	33.78	1.75	33.77	1.83	33.77
50	0.50	34.32	-0.81	34.05	0.48	33.90	1.11	33.83	1.49	33.80	1.71	33.78	1.75	33.77	1.82	33.78
75	0.61	34.48	-0.76	34.12	1.18	34.49	1.25	34.43	-0.17	34.15	0.39	34.16	-0.40	33.98	0.07	34.13
100	1.00	34.53	-1.19	34.31	1.65	34.58	1.76	34.53	1.32	34.43	1.70	34.39	1.02	34.25	1.60	34.39
125	1.33	34.58	-1.45	34.41	1.82	34.62	1.79	34.57	1.65	34.51	1.99	34.47	1.97	34.45	1.86	34.47
150	1.59	34.64	-1.48	34.43	1.87	34.64	1.87	34.61	1.89	34.56	2.01	34.50	2.06	34.49	2.01	34.52
200	1.76	34.67	-1.21	34.49	1.91	34.67	1.83	34.63	1.87	34.60	2.05	34.55	2.18	34.54	2.12	34.58
250	1.81	34.71	-0.93	34.54	1.90	34.69	1.95	34.67	1.96	34.65	2.05	34.59	2.12	34.58	2.10	34.61
300	1.73	34.71	-0.72	34.57	1.89	34.70	1.95	34.69	2.02	34.68	2.09	34.62	2.12	34.61	2.07	34.64
400	1.62	34.73	-	-	1.84	34.73	1.89	34.72	1.95	34.70	2.06	34.68	2.04	34.65	2.10	34.69
500	1.45	34.73	-	-	1.84	34.75	1.86	34.74	1.94	34.73	2.03	34.71	2.06	34.69	2.03	34.70
600	1.48	34.71	-	-	1.77	34.76	1.83	34.75	1.88	34.74	1.94	34.73	2.00	34.72	2.00	34.73
700	1.23	34.68	-	-	1.66	34.75	1.76	34.76	1.84	34.76	1.90	34.73	1.96	34.72	1.95	34.75
800	1.35	34.71	-	-	1.63	34.76	1.69	34.76	1.76	34.77	1.87	34.75	1.86	34.73	1.90	34.75
900	1.22	34.70	-	-	1.54	34.76	1.61	34.76	1.71	34.77	1.81	34.75	1.79	34.74	1.82	34.76
1000	1.22	34.71	-	-	1.46	34.76	1.53	34.76	1.62	34.77	1.74	34.76	1.75	34.74	1.76	34.76

*Adoption for "Depth 0" for a numerical value of 4m.

Station	JA440097	JA440098	JA440099	JA440100	JA440101	JA440102	JA440103	JA440104								
Date	2003/3/14	2003/3/14	2003/3/14	2003/3/15	2003/3/15	2003/3/15	2003/3/15	2003/3/15								
Time(UT)	13:52	19:58	23:11	2:10	4:56	6:07	7:56	10:58								
Latitude	60-39.1S	59-25.8S	59-04.1S	58-23.9S	57-42.8S	57-26.7S	56-59.8S	56-20.4S								
Longitude	149-59.9E	150-00.0E	150-02.9E	150-01.0E	150-00.1E	149-59.5E	149-55.3E	149-35.2E								
Depth(m)	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity
0	2.79	33.72	1.77	33.72	2.12	33.70	2.14	33.71	3.90	33.73	3.74	33.69	3.98	33.73	4.84	33.63
10	2.79	33.74	1.78	33.74	2.12	33.72	2.13	33.73	3.89	33.75	3.74	33.71	3.98	33.73	4.84	33.68
20	2.79	33.76	1.78	33.75	2.12	33.74	2.14	33.74	3.89	33.76	3.73	33.73	3.98	33.75	4.83	33.70
30	2.79	33.76	1.78	33.76	2.12	33.73	2.13	33.75	3.89	33.76	3.73	33.73	3.97	33.75	4.82	33.71
50	2.79	33.76	1.80	33.76	1.51	33.82	2.12	33.75	3.82	33.77	3.72	33.74	3.97	33.75	4.79	33.73
75	0.13	33.81	-0.10	34.15	0.12	34.35	0.22	34.35	0.54	33.99	0.70	34.04	0.94	33.92	2.24	33.79
100	0.43	34.18	0.11	34.35	1.38	34.55	1.35	34.51	-	-	1.44	34.32	1.44	34.24	-	-
125	1.80	34.46	1.22	34.50	1.70	34.61	1.79	34.57	-	-	2.01	34.44	1.96	34.37	-	-
150	1.97	34.52	1.66	34.58	1.80	34.63	-	-	-	-	2.13	34.49	2.12	34.42	-	-
200	2.09	34.57	1.88	34.64	-	-	-	-	-	-	2.19	34.56	2.22	34.48	-	-
250	2.10	34.61	1.94	34.67	-	-	-	-	-	-	2.23	34.60	2.19	34.52	-	-
300	2.10	34.65	1.98	34.70	-	-	-	-	-	-	2.21	34.62	2.19	34.57	-	-
400	2.07	34.68	1.92	34.72	-	-	-	-	-	-	2.21	34.68	2.18	34.62	-	-
500	2.03	34.71	1.87	34.74	-	-	-	-	-	-	2.17	34.71	2.16	34.68	-	-
600	1.98	34.73	1.80	34.75	-	-	-	-	-	-	2.13	34.74	2.10	34.70	-	-
700	1.94	34.74	1.75	34.77	-	-	-	-	-	-	2.06	34.75	2.05	34.73	-	-
800	1.89	34.75	1.67	34.76	-	-	-	-	-	-	1.99	34.75	2.00	34.74	-	-
900	1.81	34.76	1.58	34.77	-	-	-	-	-	-	1.91	34.77	1.96	34.76	-	-
1000	1.73	34.76	1.51	34.77	-	-	-	-	-	-	1.86	34.77	1.86	34.75	-	-

Station	JA440105	JA440106	JA440107	JA440108	JA440109	JA440110	JA440111	JA440112								
Date	2003/3/15	2003/3/15	2003/3/16	2003/3/16	2003/3/16	2003/3/16	2003/3/16	2003/3/16								
Time(UT)	20:08	22:57	1:55	4:57	7:55	11:02	13:54	19:56								
Latitude	54-24.9S	53-47.2S	53-11.5S	52-34.1S	51-52.2S	51-07.7S	50-32.2S	49-22.9S								
Longitude	149-56.2E	150-24.4E	150-31.3E	150-22.1E	150-35.8E	150-27.0E	150-18.2E	150-03.4E								
Depth(m)	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity
0	6.56	33.74	6.56	33.77	6.47	33.73	7.41	33.84	7.07	33.76	8.07	34.05	8.53	34.05	9.64	34.27
10	6.57	33.77	6.56	33.79	6.45	33.75	7.40	33.87	6.92	33.77	8.06	34.05	8.53	34.08	9.63	34.28
20	6.57	33.77	6.56	33.79	6.45	33.76	7.40	33.89	6.89	33.77	8.03	34.07	8.50	34.09	9.63	34.29
30	6.57	33.78	6.56	33.80	6.45	33.76	7.39	33.90	6.85	33.77	8.05	34.10	8.51	34.12	9.59	34.29
50	6.57	33.78	6.57	33.80	6.45	33.76	7.39	33.91	6.83	33.77	8.12	34.13	8.46	34.11	9.54	34.30
75	6.57	33.75	6.57	33.80	6.45	33.76	7.38	33.91	6.80	33.77	8.10	34.12	8.41	34.11	9.59	34.58
100	5.89	33.81	4.80	33.79	5.12	33.89	7.13	33.95	5.34	33.84	8.11	34.13	7.99	34.15	9.77	34.73
125	4.61	33.96	3.20	33.89	4.13	33.95	5.71	34.01	4.04	33.95	7.86	34.39	7.75	34.37	9.65	34.72
150	4.31	34.02	2.95	33.91	3.87	33.97	5.60	34.09	3.81	33.96	7.80	34.42	7.85	34.44	9.47	34.69
200	4.26	34.06	3.59	34.09	3.78	34.01	5.05	34.09	3.64	34.00	7.46	34.38	7.63	34.43	9.18	34.65
250	4.27	34.13	3.19	34.11	4.02	34.11	5.58	34.24	3.93	34.11	7.03	34.33	6.90	34.31	9.09	34.63
300	4.18	34.18	3.21	34.16	3.92	34.16	4.65	34.14	3.74	34.15	6.76	34.31	6.83	34.31	8.99	34.62
400	3.78	34.21	2.92	34.22	3.50	34.20	4.29	34.19	3.48	34.21	5.47	34.19	6.07	34.26	8.55	34.56
500	3.35	34.25	3.00	34.31	3.09	34.24	4.31	34.32	3.32	34.27	5.18	34.26	6.07	34.37	7.80	34.45
600	3.17	34.22	2.79	34.32	2.94	34.32	3.06	34.22	3.00	34.30	4.76	34.29	5.28	34.35	7.34	34.44
700	3.09	34.24	2.75	34.35	2.84	34.40	3.46	34.37	2.76	34.36	4.32	34.31	4.97	34.38	6.60	34.40
800	2.96	34.25	2.75	34.35	2.69	34.46	3.22	34.41	2.77	34.43	3.85	34.32	4.20	34.35	5.62	34.35
900	2.90	34.25	2.69	34.38	2.59	34.50	3.06	34.47	2.74	34.49	3.43	34.34	3.90	34.39	4.86	34.32
1000	2.81	34.33	2.54	34.48	2.56	34.55	2.76	34.49	2.65	34.54	2.93	34.34	3.39	34.39	4.26	34.34

*Adoption for "Depth 0" for a numerical value of 4m.

Station	JA440113		JA440114		JA440115		JA440116		JA440117		JA440118		JA440119		JA440120	
Date	2003/3/17		2003/3/17		2003/3/17		2003/3/17		2003/3/17		2003/3/17		2003/3/17		2003/3/18	
Time(UT)	2:01		4:52		6:32		8:02		10:57		13:56		19:53		5:00	
Latitude	48-43.9S		48-09.2S		47-50.6S		47-30.7S		46-50.7S		46-09.3S		44-52.6S		43-53.4S	
Longitude	150-10.3E		150-15.8E		150-21.0E		150-24.9E		150-29.8E		150-38.4E		151-00.4E		151-10.6E	
Depth(m)	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity
0	10.36	34.43	9.82	34.21	10.50	34.14	10.32	34.27	13.10	34.71	13.41	34.68	14.52	34.88	17.81	35.57
10	10.36	34.45	9.83	34.22	10.51	34.17	10.32	34.29	13.10	34.73	13.42	34.71	14.51	34.90	17.81	35.61
20	10.36	34.46	9.82	34.22	10.49	34.19	10.32	34.30	13.10	34.74	13.42	34.72	14.50	34.91	17.79	35.62
30	10.36	34.46	9.81	34.23	10.41	34.19	10.32	34.30	13.07	34.75	13.41	34.73	14.50	34.92	17.74	35.62
50	10.33	34.48	9.76	34.23	9.48	34.26	9.94	34.28	12.89	34.80	13.22	34.76	14.46	35.03	17.69	35.62
75	10.29	34.49	9.50	34.25	9.00	34.25	10.28	34.49	12.55	34.78	12.83	34.78	12.85	35.16	15.43	35.34
100	-	-	-	-	8.05	34.29	9.53	34.47	12.29	35.13	11.31	34.95	12.38	35.18	14.50	35.37
125	-	-	-	-	8.12	34.42	8.88	34.60	11.56	35.03	10.81	34.88	11.85	35.11	13.89	35.33
150	-	-	-	-	8.46	34.52	9.00	34.65	11.19	34.97	10.18	34.77	11.37	35.02	13.38	35.28
200	-	-	-	-	8.25	34.51	8.97	34.65	10.18	34.79	9.85	34.73	10.56	34.89	12.26	35.13
250	-	-	-	-	8.09	34.50	8.89	34.65	9.97	34.77	9.63	34.71	10.22	34.84	11.17	34.99
300	-	-	-	-	7.73	34.44	8.81	34.63	9.51	34.69	9.21	34.64	9.72	34.76	10.53	34.91
400	-	-	-	-	7.30	34.40	8.22	34.55	8.93	34.61	8.72	34.56	8.98	34.66	9.20	34.73
500	-	-	-	-	6.45	34.35	7.23	34.41	8.31	34.53	8.35	34.53	8.32	34.58	8.09	34.62
600	-	-	-	-	5.85	34.36	6.80	34.43	7.83	34.49	7.85	34.50	7.80	34.56	7.28	34.55
700	-	-	-	-	5.35	34.37	6.02	34.39	7.13	34.44	7.40	34.50	7.13	34.52	6.38	34.51
800	-	-	-	-	4.43	34.34	5.20	34.38	6.54	34.45	6.61	34.46	6.27	34.48	5.52	34.48
900	-	-	-	-	3.88	34.36	4.43	34.36	5.97	34.44	5.81	34.43	5.56	34.47	5.02	34.48
1000	-	-	-	-	3.41	34.37	3.84	34.38	5.06	34.40	5.22	34.42	4.94	34.47	4.36	34.48

Station	JA440121		JA440122		JA440123	
Date	2003/3/18		2003/3/18		2003/3/18	
Time(UT)	8:00		11:15		13:56	
Latitude	43-10.4S		42-23.5S		41-45.3S	
Longitude	151-15.9E		151-17.0E		151-13.2E	
Depth(m)	Temp.	Salinity	Temp.	Salinity	Temp.	Salinity
0	16.20	35.30	19.07	35.56	18.59	35.60
10	16.19	35.32	19.07	35.61	18.59	35.64
20	16.09	35.30	19.05	35.64	18.58	35.65
30	14.95	35.01	18.94	35.66	18.56	35.66
50	13.46	34.75	18.74	35.64	18.07	35.61
75	13.41	35.01	16.94	35.43	16.61	35.48
100	12.42	34.87	15.98	35.43	15.27	35.31
125	12.98	35.18	15.24	35.42	14.85	35.37
150	12.46	35.14	14.77	35.38	14.14	35.32
200	11.64	35.03	13.95	35.34	13.15	35.23
250	10.54	34.87	13.33	35.28	12.32	35.13
300	9.41	34.67	12.51	35.16	11.55	35.03
400	8.81	34.59	11.19	34.96	10.33	34.84
500	8.83	34.61	10.13	34.78	9.17	34.65
600	8.23	34.55	9.03	34.63	8.70	34.64
700	7.50	34.53	8.30	34.57	7.79	34.56
800	6.67	34.50	7.41	34.51	7.05	34.50
900	5.74	34.45	6.56	34.46	6.36	34.48
1000	5.11	34.48	5.81	34.44	5.58	34.46

*Adoption for "Depth 0" for a numerical value of 4m.

Table 3. XBT observation data.

Station	JA440001B	JA440002B	JA440003B	JA440004B	JA440005B	JA440006B	JA440007B	JA440008B
Date	2002/12/9	2002/12/10	2002/12/10	2002/12/11	2002/12/11	2002/12/12	2002/12/12	2002/12/13
Time(UT)	16:54	4:58	16:56	5:01	17:05	5:55	17:58	6:55
Latitude	59-59.8S	60-00.9S	59-59.5S	60-00.1S	59-57.1S	59-59.9S	59-59.7S	60-30.5S
Longitude	107-00.1E	101-51.0E	96-36.6E	91-37.7E	86-20.2E	81-00.1E	75-45.3E	70-02.4E
Depth(m)	Temp.(°C)	Temp.(°C)	Temp.(°C)	Temp.(°C)	Temp.(°C)	Temp.(°C)	Temp.(°C)	Temp.(°C)
0	-0.5	-0.4	-0.1	0.4	0.1	-0.7	-0.6	-0.3
10	-0.5	-0.4	-0.1	0.3	0.1	-0.7	-0.7	-0.5
20	-0.5	-0.4	-0.1	0.3	0.1	-0.7	-0.6	-0.5
30	-0.5	-0.5	-0.2	0.3	0.1	-0.7	-0.6	-0.6
50	-0.8	-0.5	-0.3	0.3	0.0	-0.8	-0.7	-1.2
75	-1.1	-0.7	-0.7	0.2	-0.9	-1.2	-1.0	-1.5
100	-1.1	-0.8	-0.9	0.4	-1.0	-0.1	-0.6	-1.4
125	-0.5	0.2	0.5	1.0	-1.0	1.1	1.3	-0.5
150	1.0	1.5	1.3	1.9	-0.7	1.6	1.8	1.0
200	1.8	1.8	1.6	2.1	1.0	1.8	2.0	1.6
250	1.8	1.8	1.7	2.1	1.4	1.9	2.0	1.9
300	1.9	1.9	1.7	2.0	1.6	1.9	2.1	2.0
350	2.0	1.9	1.7	2.1	1.7	1.8	2.1	2.0
400	1.9	1.9	1.7	2.0	1.7	1.8	2.0	2.0
450	1.9	1.9	1.7	2.0	1.5	1.8	2.1	2.1
500	1.9	1.9	1.7	2.0	1.7	1.7	2.0	2.1
550	1.9	1.9	1.7	2.0	1.7	1.7	2.0	2.1
600	1.9	1.9	1.7	1.9	1.6	1.7	2.0	2.0
650	1.8	1.8	1.7	1.9	1.6	1.6	2.0	2.0
700	1.8	1.8	1.6	1.7	1.6	1.6	1.9	2.0
750	1.8	1.8	1.6	1.8	1.6	1.5	1.9	2.0
S.L.	128	122	119	93	50	55	107	106
AIR Temp.(°C)	0.1	0.0	0.1	0.2	-0.2	-0.5	-0.2	0.1

Station	JA440009B	JA440010B	JA440011B	JA440012B
Date	2002/12/13	2002/12/14	2002/12/14	2002/12/15
Time(UT)	19:06	7:53	20:01	8:28
Latitude	61-08.7S	61-50.0S	62-29.9S	64-33.0S
Longitude	63-46.1E	56-53.6E	50-05.0E	43-53.8E
Depth(m)	Temp.(°C)	Temp.(°C)	Temp.(°C)	Temp.(°C)
0	-0.6	-0.7	-0.9	-0.7
10	-0.6	-0.7	-0.9	-0.9
20	-0.6	-0.8	-0.9	-1.0
30	-0.6	-0.8	-1.0	-1.0
50	-0.7	-0.9	-1.1	-1.1
75	-1.3	-1.1	-1.4	-1.4
100	-1.7	-0.3	1.1	-0.4
125	-1.4	1.1	1.7	1.5
150	0.0	1.5	1.7	1.6
200	1.6	1.7	1.9	1.6
250	1.8	1.7	2.0	1.6
300	1.9	1.7	2.0	1.5
350	2.0	1.7	2.0	1.5
400	2.0	1.7	2.0	1.5
450	2.0	1.7	1.9	1.4
500	2.0	1.7	1.8	1.3
550	2.0	1.7	1.7	1.3
600	2.0	1.7	1.7	1.2
650	1.9	1.6	1.7	1.2
700	1.9	1.6	1.6	1.1
750	1.9	1.5	1.6	1.0
S.L.	125	96	74	83
AIR Temp.(°C)	-1.0	-0.7	-1.3	-1.0

Table 4. Serial and CTD observation data.

Station 440001

Beginning of cast

Meteorological observation

Date : December 5, 2002
 Time(UT) : 06:15
 Latitude : 42-23.1S
 Longitude : 110-00.7E
 Depth : 4570m

Time(UT) : 06:00
 Weather : c
 Air temperature(dry) : 14.3°C
 Humidity : 74%
 Atmospheric Pressure : 1021.2hPa

Wind direction : WNW
 Velocity : 4m/s
 Wave : WNW/2
 Swell : SSW/3
 Visibility : 20km

Water Sampling by Niskin bottles										Observed by CTD		
Pressure* (dber)	Temperature* (ITS-90)	Salinity (PSS78)	pH	DO2	PO4-P	SiO3-Si	NO2-N	NO3-N	NH4-N	Pressure (dber)	Temperature (ITS-90)	Salinity (PSS78)
				(µmol/l)								
0	12.7	34.838	8.04	---	0.59	---	0.20	8	0.03	10	12.292	34.814
51	11.637	34.809	8.06	---	0.61	---	0.18	8	0.02	20	11.864	34.816
75	11.502	---	8.06	---	0.55	---	0.23	8	0.04	30	11.815	34.819
102	11.019	---	8.05	---	0.64	---	0.61	9	0.03	50	11.639	34.808
126	10.838	---	8.05	---	0.61	---	0.42	9	0.02	75	11.242	34.791
152	10.652	34.851	8.05	---	0.66	---	0.07	10	0.01	100	10.827	34.827
200	10.153	34.808	8.05	---	0.79	---	0.05	11	0.01	125	10.860	34.919
251	9.952	34.799	8.04	---	0.78	---	0.04	11	0.02	150	10.660	34.890
304	9.702	34.758	8.04	---	0.89	---	0.03	13	0.02	200	10.152	34.800
402	9.511	34.704	8.03	---	0.93	---	0.03	15	0.02	250	9.952	34.768
503	9.254	34.666	8.01	---	1.01	---	0.02	16	0.01	300	9.712	34.732
604	8.884	34.619	7.99	---	1.19	---	0.02	18	0.02	400	9.516	34.702
802	7.489	34.484	7.93	---	1.54	---	0.02	25	0.02	500	9.260	34.669
905	6.337	34.419	7.91	---	1.80	---	0.02	28	0.04	600	8.907	34.626
1004	5.121	34.368	7.89	---	2.06	---	0.02	30	0.06	700	8.380	34.563
1252	3.617	34.391	7.85	---	2.22	---	0.02	34	0.05	800	7.504	34.488
1502	3.017	34.495	7.81	---	2.42	---	0.01	35	0.01	1000	5.204	34.372
2001	2.522	34.670	7.82	---	2.28	---	0.02	34	0.02	1200	3.827	34.376
3000	1.659	34.744	7.84	---	2.12	---	0.02	32	0.01	1500	3.021	34.502
3499	1.219	34.730	7.82	---	2.09	---	0.03	33	0.02	2000	2.522	34.677
3999	0.908	34.709	7.81	---	2.11	---	0.09	33	0.11	2500	2.133	34.744
										3000	1.678	34.748
										3500	1.218	34.732
										4000	0.908	34.718

ITS-90 : International Temperature Scale of 1990.

PSS78 : Practical Salinity Scale of 1978.

* : The value of the CTD observation. ("0"dber temperature is the value of the digital thermometer.)

Station 440002

Beginning of cast

Meteorological observation

Date : December 6, 2002
 Time(UT) : 05:57
 Latitude : 44-32.2S
 Longitude : 110-00.2E
 Depth : 3950m

Time(UT) : 13:00
 Weather : bc
 Air temperature(dry) : 9.4°C
 Humidity : 61%
 Atmospheric Pressure : 1015.2hPa

Wind direction : WSW
 Velocity : 9m/s
 Wave : WSW/4
 Swell : WSW/3
 Visibility : 25km

Water Sampling by Niskin bottles										Observed by CTD		
Pressure* (dber)	Temperature* (ITS-90)	Salinity (PSS78)	pH	DO2	PO4-P	SiO3-Si	NO2-N	NO3-N	NH4-N	Pressure (dber)	Temperature (ITS-90)	Salinity (PSS78)
				(umol/l)								
0	---	34.771	7.83	---	---	---	---	---	0.02	10	10.350	34.765
74	9.960	34.760	8.05	---	---	---	---	---	0.01	20	10.353	34.766
98	9.928	34.753	8.05	---	---	---	---	---	0.02	30	10.323	34.767
123	9.898	34.748	8.05	---	---	---	---	---	0.02	50	10.275	34.766
153	9.855	34.758	8.05	---	0.01	---	---	---	0.01	75	10.041	34.763
206	9.764	34.755	8.04	---	---	---	---	---	0.01	100	10.048	34.766
252	9.666	34.740	8.02	---	0.05	---	---	---	---	125	10.051	34.767
302	9.593	34.733	8.02	---	0.10	---	---	---	0.01	150	9.948	34.759
408	9.537	34.729	8.01	---	0.14	---	---	---	0.02	200	9.777	34.751
504	9.462	34.711	8.01	---	0.14	---	---	---	0.02	250	9.723	34.759
603	9.292	34.687	7.99	---	---	---	---	---	0.02	300	9.583	34.737
701	8.658	34.585	7.95	---	0.63	---	---	---	---	400	9.464	34.716
805	7.875	34.515	7.91	---	0.83	---	---	---	0.01	500	9.302	34.690
908	6.800	34.446	7.90	---	1.06	---	---	---	0.01	600	9.199	34.670
1004	5.549	34.372	7.90	---	---	---	---	---	0.01	700	8.705	34.586
1256	3.763	---	8.02	---	1.51	---	---	---	0.04	800	7.915	34.508
1503	3.122	34.442	7.79	---	1.39	---	---	---	0.01	1000	5.744	34.387
2000	2.530	34.655	7.78	---	1.24	---	---	---	0.01	1200	4.084	34.339
										1500	3.126	34.445
										2000	2.542	34.653
										2500	2.211	34.751
										3000	1.663	34.755
										3500	1.236	34.736

ITS-90 : International Temperature Scale of 1990.

PSS78 : Practical Salinity Scale of 1978.

* : The value of the CTD observation. ("0"dber temperature is the value of the digital thermometer.)

Station 440003

Beginning of cast

Meteorological observation

Date : December 7, 2002
 Time(UT) : 06:00
 Latitude : 49-19.4S
 Longitude : 109-50.7E
 Depth : 3300m

Time(UT) : 06:00
 Weather : bc
 Air temperature(dry) : 5.3°C
 Humidity : 76%
 Atmospheric Pressure : 1016.4hPa

Wind direction : W
 Velocity : 7m/s
 Wave : W/4
 Swell : W/3
 Visibility : 20km

Water Sampling by Niskin bottles										Observed by CTD		
Pressure* (dber)	Temperature* (ITS-90)	Salinity (PSS78)	pH	DO2	PO4-P	SiO3-Si	NO2-N	NO3-N	NH4-N	Pressure (dber)	Temperature (ITS-90)	Salinity (PSS78)
				(umol/l)								
0	4.7	33.949	8.08	---	1.52	---	0.33	22	0.02	10	4.537	33.942
52	4.465	33.929	8.10	---	1.54	---	0.30	22	0.02	20	4.499	33.942
76	4.456	33.929	8.11	---	1.52	---	0.30	22	0.02	30	4.484	33.943
149	3.134	33.965	8.05	---	1.87	---	0.14	26	0.01	50	4.465	33.943
201	2.937	33.983	8.05	---	1.91	---	0.04	27	0.01	75	4.456	33.943
251	3.250	34.089	8.00	---	1.65	---	0.02	29	0.01	100	4.448	33.943
302	3.238	34.163	7.97	---	2.16	---	0.02	31	0.01	125	4.128	33.939
404	2.914	34.235	7.94	---	2.05	---	0.01	33	0.01	150	3.449	33.956
502	2.509	34.289	7.92	---	2.40	---	0.01	34	0.01	200	2.693	33.969
603	2.638	34.391	7.90	---	2.43	---	0.02	35	0.01	250	3.048	34.059
803	2.482	34.527	7.88	---	2.53	---	0.02	35	0.03	300	3.210	34.165
901	2.478	34.571	7.89	---	2.22	---	0.01	35	0.01	400	2.935	34.249
1003	2.428	34.618	7.89	---	2.42	---	0.00	34	0.01	500	2.608	34.311
1252	2.286	34.693	7.89	---	2.06	---	0.02	31	0.01	600	2.650	34.408
1501	2.144	34.735	7.91	---	2.25	---	0.00	32	0.01	700	2.517	34.463
1999	1.723	34.753	7.93	---	2.21	---	0.00	31	0.01	800	2.519	34.527
2499	1.238	34.732	7.91	---	2.25	---	0.01	32	0.01	1000	2.426	34.630
2990	0.863	34.712	7.89	---	2.31	---	0.06	33	0.02	1200	2.309	34.688
										1500	2.147	34.745
										2000	1.719	34.761
										2500	1.235	34.741
										3000	0.861	34.722

ITS-90 : International Temperature Scale of 1990.

PSS78 : Practical Salinity Scale of 1978.

* : The value of the CTD observation. ("0"dber temperature is the value of the digital thermometer.)

Station 440004

Beginning of cast

Meteorological observation

Date : December 8, 2002
 Time(UT) : 06:00
 Latitude : 54-51.29S
 Longitude : 109-54.6E
 Depth :

Time(UT) : 06:00
 Weather : c
 Air temperature(dry) : 3.2°C
 Humidity : 93%
 Atmospheric Pressure : 998.7hPa

Wind direction : NW
 Velocity : 20m/s
 Wave : NW/4
 Swell : W/3
 Visibility : 0.5km

Water Sampling by Bandon bottles										Observed by CTD		
Pressure* (dber)	Temperature* (ITS-90)	Salinity (PSS78)	pH	DO2	PO4-P	SiO3-Si (umol/l)				Pressure (dber)	Temperature (ITS-90)	Salinity (PSS78)
						NO2-N	NO3-N	NH4-N				
0	---	33.870	7.87	---	4.86	---	1.80	25	0.03			
10	---	33.863	7.87	---	2.52	---	1.80	25	0.03			
25	---	33.862	7.88	---	-0.09	---	1.80	25	0.02			
50	---	33.863	7.88	---	0.24	---	1.81	25	0.01			

ITS-90 : International Temperature Scale of 1990.

PSS78 : Practical Salinity Scale of 1978.

* : The value of the CTD observation. ("0"dber temperature is the value of the digital thermometer.)

Station 440005

Beginning of cast

Meteorological observation

Date : December 9, 2002
 Time(UT) : 06:19
 Latitude : 60-00.1S
 Longitude : 109-42.1E
 Depth : 4400m

Time(UT) : 06:00
 Weather : s
 Air temperature(dry) : 0.3°C
 Humidity : 97%
 Atmospheric Pressure : 987.7hPa

Wind direction : WSW
 Velocity : 11m/s
 Wave : WNW/3
 Swell : NW/1
 Visibility : 2km

Water Sampling by Niskin bottles										Observed by CTD		
Pressure* (dbar)	Temperature* (ITS-90)	Salinity (PSS78)	pH	DO2	PO4-P	SiO3-Si (umol/l)	NO2-N	NO3-N	NH4-N	Pressure (dbar)	Temperature (ITS-90)	Salinity (PSS78)
0	---	33.932	7.88	---	1.84	---	0.27	27	0.03	10	0.484	33.930
51	0.500	33.937	8.00	---	---	---	---	---	---	20	0.473	33.932
75	0.457	33.937	8.00	---	1.84	---	0.26	27	0.28	30	0.434	33.931
101	0.373	33.945	7.98	---	1.82	---	0.26	28	0.02	50	0.412	33.933
124	0.469	34.063	7.94	---	2.09	---	0.17	31	0.02	75	0.363	33.931
151	1.656	34.315	7.85	---	2.38	---	0.03	35	0.01	100	0.290	33.936
201	2.006	34.441	7.81	---	2.43	---	0.01	35	0.01	125	0.089	34.055
253	2.105	34.501	7.82	---	2.42	---	0.01	36	0.01	150	1.383	34.287
303	2.156	34.557	7.81	---	2.38	---	0.02	35	0.02	200	1.974	34.443
402	2.152	34.625	7.83	---	2.32	---	0.00	34	0.01	250	2.036	34.501
503	2.104	34.662	7.85	---	2.23	---	0.01	34	0.03	300	2.114	34.557
603	2.049	34.686	7.86	---	2.20	---	0.00	33	0.01	400	2.098	34.622
703	1.976	34.712	7.86	---	2.15	---	0.01	32	0.02	500	2.072	34.671
802	1.924	34.723	7.86	---	2.11	---	0.01	31	0.01	600	2.025	34.693
903	1.860	34.734	7.86	---	2.09	---	0.00	32	0.01	700	1.983	34.717
1003	1.770	34.740	7.86	---	2.09	---	0.01	31	0.02	800	1.953	34.732
1251	1.563	34.743	7.85	---	2.06	---	---	---	0.01	1000	1.789	34.745
1502	1.341	34.737	7.85	---	2.07	---	0.01	31	0.01	1200	1.618	34.750
2001	0.906	34.714	7.81	---	2.13	---	0.01	32	0.02	1500	1.342	34.740
2499	0.536	34.694	7.80	---	2.17	---	0.00	33	0.02	2000	0.925	34.721
2998	0.269	34.685	7.81	---	2.16	---	0.02	33	0.02	2500	0.539	34.701
3498	0.096	34.678	7.79	---	2.16	---	0.01	33	0.01	3000	0.274	34.688
3997	-0.017	34.673	7.78	---	2.11	---	0.08	33	0.02	3500	0.092	34.681
										4000	-0.018	34.675

ITS-90 : International Temperature Scale of 1990.

PSS78 : Practical Salinity Scale of 1978.

* : The value of the CTD observation. ("0"dbar temperature is the value of the digital thermometer.)

Station 440006

Beginning of cast

Meteorological observation

Date : February 27, 2003
 Time(UT) : 05:19
 Latitude : 63-59.2S
 Longitude : 49-59.2E
 Depth : 4473m

Time(UT) : 05:00
 Weather : bc
 Air temperature(dry) : -0.3°C
 Humidity : 72%
 Atmospheric Pressure : 987.4hPa

Wind direction : W
 Velocity : 7m/s
 Wave : W/3
 Swell : E/1
 Visibility : 30km

Water Sampling by Niskin bottles										Observed by CTD		
Pressure* (dber)	Temperature* (ITS-90)	Salinity (PSS78)	pH	DO2	PO4-P	SiO3-Si	NO2-N	NO3-N	NH4-N	Pressure (dber)	Temperature (ITS-90)	Salinity (PSS78)
				(umol/l)								
0	1.9	33.914	8.07	---	1.93	---	0.28	25	0.05	10	1.224	33.903
51	0.855	33.923	8.05	---	1.92	---	0.25	28	0.05	20	1.220	33.902
101	-1.285	34.279	7.98	---	2.29	---	0.10	33	0.02	30	1.218	33.903
125	0.922	34.514	7.93	---	2.50	---	0.14	35	0.04	50	0.818	33.906
151	1.506	34.607	7.93	---	---	---	---	---	---	75	-1.623	34.172
201	1.640	34.662	7.94	---	2.44	---	0.01	34	0.04	100	-1.338	34.275
251	1.640	34.681	7.94	---	2.42	---	0.05	33	0.03	125	1.323	34.561
302	1.551	34.695	7.94	---	2.39	---	0.03	34	0.01	150	1.486	34.607
402	1.548	34.719	7.95	---	2.33	---	0.03	33	0.04	200	1.592	34.651
502	1.452	34.722	7.95	---	2.30	---	0.04	33	0.03	250	1.639	34.687
602	1.274	34.716	7.95	---	2.32	---	0.04	33	0.04	300	1.578	34.700
701	1.213	34.722	7.96	---	2.27	---	0.03	32	0.03	400	1.559	34.718
802	1.150	34.723	7.95	---	2.34	---	0.03	33	0.04	500	1.424	34.722
903	1.036	---	7.95	---	2.33	---	0.02	33	0.04	600	1.256	34.716
1002	0.947	---	7.94	---	2.33	---	0.03	33	0.02	700	1.214	34.725
1253	0.722	34.713	7.93	---	2.41	---	0.04	33	0.02	800	1.115	34.725
1501	0.561	34.696	7.94	---	2.40	---	0.02	34	0.02	1000	0.927	34.716
2001	0.289	34.685	7.93	---	2.43	---	0.02	34	0.02	1200	0.758	34.707
2500	0.071	34.671	7.91	---	2.42	---	0.02	34	0.02	1500	0.544	34.697
3002	-0.076	34.666	7.90	---	2.43	---	0.03	34	0.03	2000	0.268	34.681
4002	-0.281	34.654	7.93	---	2.44	---	0.05	33	0.02	2500	0.070	34.673
										3000	-0.077	34.667
										3500	-0.211	34.658
										4000	-0.282	34.654

ITS-90 : International Temperature Scale of 1990.

PSS78 : Practical Salinity Scale of 1978.

* : The value of the CTD observation. ("0"dber temperature is the value of the digital thermometer.)

Station 440007

Beginning of cast

Meteorological observation

Date : February 28, 2003
 Time(UT) : 03:50
 Latitude : 63-59.7S
 Longitude : 60-34.4E
 Depth : 4382m

Time(UT) : 04:00
 Weather : bc
 Air temperature(dry) : -0.3°C
 Humidity : 72%
 Atmospheric Pressure : 988.7hPa

Wind direction : WNW
 Velocity : 4m/s
 Wave : WNW/2
 Swell : E/3
 Visibility : 30km

Water Sampling by Niskin bottles										Observed by CTD		
Pressure* (dber)	Temperature* (ITS-90)	Salinity (PSS78)	pH	DO2	PO4-P	SiO3-Si	NO2-N	NO3-N	NH4-N	Pressure (dber)	Temperature (ITS-90)	Salinity (PSS78)
				(umol/l)								
0	1.4	33.725	8.07	---	1.73	---	0.34	26	0.03	10	1.157	33.709
54	-0.991	---	8.07	---	1.93	---	0.19	28	0.04	20	1.158	33.709
78	0.611	34.364	7.95	---	2.37	---	0.15	34	0.04	30	1.160	33.710
104	1.430	34.518	7.91	---	2.51	---	0.24	36	0.03	50	-0.979	34.073
128	1.650	34.569	7.90	---	2.49	---	0.07	36	0.03	75	1.489	34.486
153	1.737	34.600	7.91	---	2.45	---	0.03	36	0.04	100	1.726	34.546
204	1.740	34.599	7.92	---	2.43	---	0.02	35	0.04	125	1.802	34.579
255	1.779	34.658	7.91	---	2.38	---	0.02	35	0.05	150	1.838	34.600
304	1.793	34.676	7.92	---	2.35	---	0.01	34	0.04	200	1.834	34.634
403	1.771	34.700	7.93	---	2.31	---	0.02	34	0.04	250	1.819	34.656
504	1.713	34.717	7.95	---	2.20	---	0.01	33	0.05	300	1.836	34.680
607	1.651	34.726	7.95	---	2.27	---	0.02	32	0.04	400	1.815	34.708
704	1.594	34.734	7.94	---	2.17	---	0.03	32	0.04	500	1.795	34.729
804	1.511	34.734	7.95	---	2.24	---	0.04	32	0.04	600	1.705	34.736
903	1.419	34.734	7.94	---	2.21	---	0.02	32	0.04	700	1.618	34.743
1005	1.326	34.735	7.94	---	2.24	---	0.03	32	0.04	800	1.546	34.749
1254	1.054	34.721	7.91	---	2.26	---	0.03	33	0.03	1000	1.340	34.741
1503	0.857	34.711	7.92	---	2.30	---	0.02	33	0.02	1200	1.104	34.731
2006	0.508	34.692	7.89	---	2.37	---	0.03	34	0.02	1500	0.848	34.716
2504	0.275	34.681	7.87	---	2.36	---	0.01	34	0.02	2000	0.516	34.697
3003	0.102	34.675	7.86	---	2.37	---	0.02	34	0.03	2500	0.279	34.687
3506	-0.048	---	7.85	---	2.37	---	0.02	33	0.02	3000	0.105	34.679
4005	-0.158	34.662	7.85	---	2.33	---	0.03	34	0.02	3500	-0.046	34.670
										4000	-0.157	34.666

ITS-90 : International Temperature Scale of 1990.

PSS78 : Practical Salinity Scale of 1978.

* : The value of the CTD observation. ("0"dber temperature is the value of the digital thermometer.)

Station 440008

Beginning of cast

Meteorological observation

Date : March 1, 2003
 Time(UT) : 03:55
 Latitude : 64-00.8S
 Longitude : 70-41.2E
 Depth : 3469m

Time(UT) : 04:00
 Weather : bc
 Air temperature(dry) : 0.2°C
 Humidity : 87%
 Atmospheric Pressure : 991.5hPa

Wind direction : N
 Velocity : 9m/s
 Wave : N/4
 Swell : SE/3
 Visibility : 30km

Water Sampling by Niskin bottles										Observed by CTD		
Pressure* (dbar)	Temperature* (ITS-90)	Salinity (PSS78)	pH	DO2	PO4-P	SiO3-Si	NO2-N	NO3-N	NH4-N	Pressure (dbar)	Temperature (ITS-90)	Salinity (PSS78)
				(μmol/l)								
0	0.8	33.728	8.11	---	1.53	---	0.00	24	0.07	10	0.961	33.732
52	0.887	33.729	8.07	---	1.50	---	0.00	24	0.06	20	0.952	33.733
77	-0.480	34.303	7.97	---	2.29	---	0.00	33	0.03	30	0.954	33.733
103	1.183	34.535	7.90	---	2.43	---	0.00	35	0.02	50	0.957	33.734
126	1.637	34.607	7.90	---	2.42	---	0.00	35	0.02	75	-0.788	34.276
152	1.694	34.632	7.90	---	2.41	---	0.00	35	0.04	100	0.428	34.452
202	1.761	34.672	7.92	---	2.33	---	0.00	34	0.02	125	1.416	34.593
254	1.732	34.691	7.92	---	2.29	---	0.00	34	0.02	150	1.608	34.633
304	1.690	34.700	7.91	---	2.28	---	0.00	33	0.03	200	1.736	34.675
405	1.472	34.705	7.93	---	2.24	---	0.00	33	0.02	250	1.744	34.697
503	1.467	34.717	7.92	---	2.21	---	0.00	32	0.02	300	1.698	34.706
602	1.379	34.724	7.95	---	2.21	---	0.00	32	0.03	400	1.595	34.718
702	1.329	34.728	7.94	---	2.20	---	0.00	32	0.02	500	1.470	34.727
802	1.209	34.724	7.94	---	2.21	---	0.00	32	0.03	600	1.425	34.735
904	1.160	34.727	7.95	---	2.22	---	0.00	32	0.01	700	1.302	34.736
1004	1.070	34.724	7.95	---	2.21	---	0.00	32	0.02	800	1.252	34.739
1254	0.774	34.705	7.93	---	2.24	---	0.00	33	0.01	1000	1.038	34.728
1504	0.581	34.699	7.94	---	2.29	---	0.00	33	0.01	1200	0.843	34.719
3283	-0.104	34.671	7.92	---	2.27	---	---	---	0.02	1500	0.585	34.705
										2000	0.296	34.692
										2500	0.084	34.681
										3000	-0.043	34.677

ITS-90 : International Temperature Scale of 1990.

PSS78 : Practical Salinity Scale of 1978.

* : The value of the CTD observation. ("0"dbar temperature is the value of the digital thermometer.)

Station 440009

Beginning of cast

Meteorological observation

Date : March 4, 2003
 Time(UT) : 02:50
 Latitude : 64-46.5S
 Longitude : 78-14.8E
 Depth : 3538m

Time(UT) : 03:00
 Weather : bc
 Air temperature(dry) : -2.4°C
 Humidity : 76%
 Atmospheric Pressure : 998.7hPa

Wind direction : S
 Velocity : 5m/s
 Wave : S/3
 Swell : N/1
 Visibility : 30km

Water Sampling by Niskin bottles										Observed by CTD		
Pressure* (dbar)	Temperature* (ITS-90)	Salinity (PSS78)	pH	DO2	PO4-P	SiO3-Si	NO2-N	NO3-N	NH4-N	Pressure (dbar)	Temperature (ITS-90)	Salinity (PSS78)
				(µmol/l)								
0	0.6	33.769	8.11	---	1.64	---	0.31	26	0.06	10	0.843	33.766
52	0.482	33.813	8.11	---	1.74	---	0.26	22	0.04	20	0.827	33.761
75	-0.903	34.193	8.03	---	2.24	---	0.21	32	0.04	30	0.713	33.771
102	-0.542	34.306	8.01	---	2.29	---	0.17	33	0.04	50	-0.139	33.939
126	-0.636	34.371	8.01	---	2.24	---	0.12	33	0.03	75	-0.908	34.188
149	0.248	34.454	7.97	---	2.33	---	0.13	34	0.03	100	-0.482	34.307
200	1.183	34.585	7.95	---	2.31	---	0.10	34	0.03	125	0.107	34.423
302	1.182	34.641	7.95	---	2.31	---	0.08	34	0.03	150	0.771	34.520
401	1.411	34.692	7.96	---	2.28	---	0.10	33	0.03	200	0.948	34.583
501	1.257	34.695	7.97	---	2.24	---	0.10	33	0.04	250	1.220	34.633
601	1.233	34.710	7.97	---	2.25	---	0.08	32	0.03	300	1.189	34.651
699	1.126	34.710	7.97	---	2.24	---	0.09	---	0.03	400	1.362	34.704
800	1.161	34.723	7.98	---	2.24	---	0.07	32	0.03	500	1.296	34.713
900	1.101	34.724	7.96	---	2.24	---	0.06	32	0.03	600	1.378	34.736
1002	1.020	34.723	7.97	---	2.27	---	0.08	32	0.03	700	1.242	34.737
1251	0.766	34.708	7.95	---	2.32	---	0.08	33	0.03	800	1.238	34.743
1501	0.568	34.699	7.95	---	2.34	---	0.06	---	0.03	1000	0.959	34.725
2001	0.273	34.683	7.94	---	2.36	---	0.05	34	0.03	1200	0.824	34.720
2501	0.094	34.675	7.92	---	2.35	---	0.07	33	0.03	1500	0.565	34.706
3000	-0.020	34.672	7.91	---	2.36	---	0.06	33	0.04	2000	0.274	34.692
3501	-0.160	34.664	7.90	---	2.32	---	0.06	33	0.03	2500	0.094	34.684
										3000	-0.020	34.682
										3500	-0.159	34.675

ITS-90 : International Temperature Scale of 1990.

PSS78 : Practical Salinity Scale of 1978.

* : The value of the CTD observation. ("0"dbar temperature is the value of the digital thermometer.)

Station 440010

Beginning of cast

Meteorological observation

Date : March 5, 2003
 Time(UT) : 02:48
 Latitude : 63-25.2S
 Longitude : 89-13.4E
 Depth : 3828m

Time(UT) : 03:00
 Weather : bc
 Air temperature(dry) : -0.7°C
 Humidity : 56%
 Atmospheric Pressure : 992.6hPa

Wind direction : N
 Velocity : 2m/s
 Wave : N/2
 Swell : SSE/1
 Visibility : 30km

Water Sampling by Niskin bottles										Observed by CTD		
Pressure* (dber)	Temperature* (ITS-90)	Salinity (PSS78)	pH	DO2	PO4-P	SiO3-Si	NO2-N	NO3-N	NH4-N	Pressure (dber)	Temperature (ITS-90)	Salinity (PSS78)
				(umol/l)								
0	0.4	33.759	8.11	---	1.38	---	0.29	22	0.09	10	0.841	33.797
55	-0.284	33.965	8.05	---	1.90	---	0.20	26	0.05	20	0.843	33.798
79	-1.232	34.270	8.01	---	2.21	---	0.17	31	0.04	30	0.838	33.798
104	-0.593	34.427	7.98	---	2.30	---	0.04	33	0.01	50	0.754	33.810
128	-0.361	34.454	7.98	---	2.31	---	0.06	33	0.03	75	-1.410	34.250
153	-0.209	34.488	7.97	---	2.30	---	0.04	33	0.01	100	-1.239	34.356
204	0.136	34.546	7.97	---	2.31	---	0.02	33	0.03	125	-0.607	34.431
254	0.535	34.603	7.96	---	2.29	---	0.04	33	0.02	150	-0.314	34.471
303	0.935	34.660	7.96	---	2.29	---	0.03	33	0.01	200	0.165	34.556
403	1.366	34.717	7.95	---	2.26	---	0.01	32	0.01	250	0.626	34.620
503	1.312	34.723	7.95	---	2.26	---	0.01	32	0.01	300	1.343	34.705
603	1.180	34.719	7.95	---	2.26	---	0.02	32	0.03	400	1.388	34.727
703	1.149	34.725	7.94	---	2.27	---	0.02	32	0.02	500	1.282	34.733
804	1.066	34.721	7.95	---	2.30	---	0.00	32	0.02	600	1.199	34.732
903	0.982	34.719	7.94	---	2.32	---	0.02	32	0.02	700	1.117	34.735
1005	0.907	34.714	7.94	---	2.30	---	0.01	33	0.01	800	1.063	34.732
1254	0.718	34.704	7.93	---	2.35	---	0.01	33	0.01	1000	0.910	34.727
1504	0.536	34.695	7.94	---	2.38	---	0.02	33	0.01	1200	0.738	34.715
2002	0.239	34.682	7.93	---	2.39	---	0.01	33	0.02	1500	0.520	34.704
2504	0.046	34.676	7.91	---	2.39	---	0.02	33	0.01	2000	0.227	34.693
3005	-0.056	34.673	7.90	---	2.38	---	0.01	33	0.01	2500	0.040	34.686
3504	-0.105	34.670	7.90	---	2.36	---	0.01	33	0.02	3000	-0.064	34.681
3704	-0.126	34.670	7.91	---	2.33	---	0.03	33	0.02	3500	-0.107	34.679

ITS-90 : International Temperature Scale of 1990.

PSS78 : Practical Salinity Scale of 1978.

* : The value of the CTD observation. ("0"dber temperature is the value of the digital thermometer.)

Station 440011

Beginning of cast

Meteorological observation

Date : March 6, 2003
 Time(UT) : 01:50
 Latitude : 62-55.0S
 Longitude : 99-40.2E
 Depth : 3138m

Time(UT) : 02:00
 Weather : bc
 Air temperature(dry) : -1.2°C
 Humidity : 75%
 Atmospheric Pressure : 995.6hPa

Wind direction : E
 Velocity : 10m/s
 Wave : E/3
 Swell : SE/1
 Visibility : 30km

Water Sampling by Niskin bottles										Observed by CTD		
Pressure* (dbar)	Temperature* (ITS-90)	Salinity (PSS78)	pH	DO2	PO4-P	SiO3-Si	NO2-N	NO3-N	NH4-N	Pressure (dbar)	Temperature (ITS-90)	Salinity (PSS78)
				(μmol/l)								
0	---	33.831	7.90	---	1.65	---	0.28	26	0.03	10	0.741	33.847
54	-1.568	34.239	8.06	---	2.21	---	0.22	31	0.04	20	0.733	33.849
81	-1.780	34.309	8.04	---	2.23	---	0.11	32	0.03	30	0.732	33.850
105	-1.784	34.324	8.04	---	2.24	---	0.05	32	0.03	50	-1.003	34.099
130	-1.781	34.331	8.04	---	2.22	---	0.03	32	0.04	75	-1.597	34.283
155	-1.281	34.373	8.03	---	2.28	---	0.04	33	0.03	100	-1.606	34.327
206	0.139	34.529	7.98	---	2.35	---	0.03	34	0.03	125	-1.765	34.341
254	0.707	34.610	7.95	---	2.35	---	0.02	34	0.03	150	-1.709	34.357
305	1.048	34.666	7.96	---	2.34	---	0.01	34	0.03	200	-0.660	34.467
407	1.208	34.705	7.96	---	2.33	---	0.01	33	0.04	250	0.493	34.593
506	1.229	34.720	7.96	---	2.32	---	0.00	33	0.04	300	1.069	34.669
605	1.169	34.723	7.97	---	2.31	---	0.00	33	0.04	400	1.276	34.719
704	1.060	34.721	7.96	---	2.32	---	0.01	33	0.04	500	1.264	34.733
805	0.930	34.716	7.96	---	2.34	---	0.01	33	0.04	600	1.145	34.732
907	0.828	34.713	7.96	---	2.36	---	0.01	34	0.04	700	1.042	34.728
1006	0.741	34.713	7.96	---	2.38	---	0.01	34	0.05	800	0.893	34.721
1255	0.521	34.697	7.96	---	2.39	---	0.00	34	0.04	1000	0.766	34.719
1504	0.338	34.690	7.96	---	2.42	---	0.00	34	0.04	1200	0.565	34.711
2005	0.114	34.681	7.94	---	2.40	---	0.01	34	0.04	1500	0.351	34.699
2505	-0.088	34.673	7.94	---	2.37	---	0.00	34	0.03	2000	0.129	34.690
3004	-0.140	34.670	7.92	---	2.35	---	0.02	33	0.04	2500	-0.078	34.681
										3000	-0.140	34.677

ITS-90 : International Temperature Scale of 1990.

PSS78 : Practical Salinity Scale of 1978.

* : The value of the CTD observation. ("0"dbar temperature is the value of the digital thermometer.)

Station 440012

Beginning of cast

Meteorological observation

Date : March 7, 2003
 Time(UT) : 00:47
 Latitude : 64-00.5S
 Longitude : 110-55.6E
 Depth : 3392m

Time(UT) : 01:00
 Weather : bc
 Air temperature(dry) : -0.4°C
 Humidity : 71%
 Atmospheric Pressure : 993.9hPa

Wind direction : ENE
 Velocity : 11m/s
 Wave : ENE/4
 Swell : E/3
 Visibility : 20km

Water Sampling by Niskin bottles										Observed by CTD		
Pressure* (dber)	Temperature* (ITS-90)	Salinity (PSS78)	pH	DO2	PO4-P	SiO3-Si	NO2-N	NO3-N	NH4-N	Pressure (dber)	Temperature (ITS-90)	Salinity (PSS78)
				(umol/l)								
0	0.5	33.742	8.10	---	1.53	---	0.34	24	0.03	10	0.836	33.705
52	-1.671	34.266	8.05	---	2.10	---	0.23	30	0.04	20	0.835	33.705
78	-1.233	34.350	7.95	---	2.15	---	0.17	31	0.03	30	0.834	33.705
102	-0.405	34.472	7.94	---	2.16	---	0.08	32	0.03	50	0.667	33.765
129	0.593	34.581	7.90	---	2.30	---	0.07	33	0.04	75	-1.634	34.283
154	0.922	34.624	7.91	---	2.25	---	0.05	33	0.04	100	-1.369	34.367
204	1.312	34.677	7.92	---	2.23	---	0.06	33	0.04	125	-0.114	34.522
253	1.338	34.694	7.92	---	2.22	---	0.04	33	0.03	150	0.554	34.615
305	1.401	34.709	7.91	---	2.21	---	0.02	33	0.03	200	1.168	34.687
407	1.391	34.727	7.92	---	2.18	---	0.01	32	0.03	250	1.316	34.713
509	1.337	34.732	7.92	---	2.19	---	0.03	32	0.05	300	1.366	34.725
607	1.239	34.729	7.94	---	2.20	---	0.02	32	0.05	400	1.348	34.736
708	1.177	34.765	7.93	---	2.19	---	0.03	32	0.04	500	1.276	34.739
807	1.071	34.724	7.92	---	2.21	---	0.02	32	0.03	600	1.195	34.739
907	0.982	34.720	7.92	---	2.21	---	0.01	32	0.03	700	1.103	34.734
1006	0.898	34.715	7.92	---	2.22	---	0.01	32	0.05	800	1.019	34.731
1256	0.616	34.698	7.92	---	2.25	---	0.01	33	0.03	1000	0.822	34.722
1504	0.414	34.688	7.91	---	2.26	---	0.01	33	0.03	1200	0.641	34.712
2000	0.125	34.680	7.91	---	2.27	---	0.00	33	0.03	1500	0.436	34.704
2496	-0.034	34.675	7.91	---	2.26	---	0.02	32	0.03	2000	0.120	34.690
										2500	-0.039	34.686

ITS-90 : International Temperature Scale of 1990.

PSS78 : Practical Salinity Scale of 1978.

* : The value of the CTD observation. ("0"dber temperature is the value of the digital thermometer.)

Station 440013

Beginning of cast

Meteorological observation

Date : March 7, 2003
 Time(UT) : 23:43
 Latitude : 64-00.6S
 Longitude : 120-08.9E
 Depth : 3446m

Time(UT) : 00:00
 Weather : bc
 Air temperature(dry) : -2.6°C
 Humidity : 75%
 Atmospheric Pressure : 987.5hPa

Wind direction : ESE
 Velocity : 11m/s
 Wave : ESE/4
 Swell : ESE/3
 Visibility : 30km

Water Sampling by Niskin bottles										Observed by CTD		
Pressure* (dbar)	Temperature* (ITS-90)	Salinity (PSS78)	pH	DO2	PO4-P	SiO3-Si	NO2-N	NO3-N	NH4-N	Pressure (dbar)	Temperature (ITS-90)	Salinity (PSS78)
				(μmol/l)								
0	1.5	33.631	8.11	---	1.57	---	0.38	24	0.10	10	1.705	33.657
51	-0.882	34.256	8.06	---	2.04	---	0.17	26	0.06	20	1.700	33.657
80	0.134	34.469	7.98	---	2.28	---	0.20	32	0.06	30	1.708	33.658
102	1.056	34.607	7.93	---	2.31	---	0.11	33	0.06	50	-1.056	34.212
129	1.393	34.660	7.92	---	2.31	---	0.04	33	0.05	75	-0.638	34.391
153	1.432	34.676	7.92	---	2.31	---	0.01	33	0.07	100	0.950	34.590
208	1.464	34.694	7.92	---	2.29	---	0.02	33	0.05	125	1.091	34.634
257	1.505	34.710	7.92	---	2.26	---	0.00	33	0.06	150	1.329	34.677
306	1.483	34.720	7.92	---	2.26	---	0.00	32	0.07	200	1.484	34.707
407	1.482	34.732	7.92	---	2.23	---	0.02	32	0.06	250	1.427	34.711
506	1.400	34.731	7.93	---	2.21	---	0.00	32	0.06	300	1.515	34.733
608	1.302	34.731	7.93	---	2.23	---	0.01	32	0.06	400	1.496	34.743
707	1.246	34.726	7.94	---	2.23	---	0.01	32	0.08	500	1.409	34.744
807	1.148	34.726	7.91	---	2.24	---	0.00	32	0.03	600	1.325	34.747
906	1.071	34.724	7.93	---	2.25	---	0.00	32	0.03	700	1.225	34.742
1006	1.006	34.722	7.93	---	2.24	---	0.02	32	0.04	800	1.164	34.742
1255	0.788	34.712	7.92	---	2.26	---	0.00	32	0.03	1000	1.000	34.734
1499	0.597	34.706	7.91	---	2.36	---	0.02	33	0.03	1200	0.822	34.724
1999	0.215	34.683	7.89	---	2.27	---	0.01	32	0.06	1500	0.584	34.714
										2000	0.214	34.694

ITS-90 : International Temperature Scale of 1990.

PSS78 : Practical Salinity Scale of 1978.

* : The value of the CTD observation. ("0"dbar temperature is the value of the digital thermometer.)

Station 440015

Beginning of cast

Meteorological observation

Date : March 9, 2003
 Time(UT) : 22:48
 Latitude : 63-59.7S
 Longitude : 139-58.7E
 Depth : 3701m

Time(UT) : 23:00
 Weather : bc
 Air temperature(dry) : 0.3°C
 Humidity : 77%
 Atmospheric Pressure : 999.7hPa

Wind direction : NW
 Velocity : 8m/s
 Wave : NW/3
 Swell : W/3
 Visibility : 20

Water Sampling by Niskin bottles										Observed by CTD		
Pressure* (dbar)	Temperature* (ITS-90)	Salinity (PSS78)	pH	DO2	PO4-P	SiO3-Si	NO2-N	NO3-N	NH4-N	Pressure (dbar)	Temperature (ITS-90)	Salinity (PSS78)
				(umol/l)								
0	1.4	33.809	8.06	---	1.77	---	0.42	28	0.03	10	1.588	33.813
53	0.038	34.044	8.05	---	1.92	---	0.22	30	0.05	20	1.563	33.817
77	1.229	34.420	7.94	---	2.32	---	0.17	35	0.03	30	1.558	33.815
102	1.840	34.547	7.88	---	2.46	---	0.08	37	0.02	50	0.222	33.964
128	1.909	34.575	7.87	---	2.43	---	0.02	37	0.03	75	0.895	34.377
154	1.928	34.602	7.87	---	2.41	---	0.03	36	0.02	100	1.675	34.540
203	1.920	34.631	7.89	---	2.38	---	0.02	36	0.03	125	1.772	34.568
254	1.898	34.656	7.87	---	2.36	---	0.01	35	0.05	150	1.833	34.594
304	1.792	34.665	7.89	---	2.32	---	0.02	35	0.03	200	1.901	34.626
407	1.785	34.695	7.90	---	2.27	---	0.01	34	0.03	250	1.954	34.669
507	1.819	34.725	7.91	---	2.24	---	0.00	33	0.04	300	1.971	34.692
607	1.781	34.737	7.92	---	2.17	---	-0.01	33	0.04	400	1.878	34.717
707	1.712	34.743	7.92	---	2.13	---	0.00	33	0.04	500	1.732	34.724
807	1.641	34.749	7.90	---	2.18	---	-0.02	32	0.04	600	1.771	34.745
907	1.558	34.749	7.92	---	2.13	---	0.00	32	0.06	700	1.732	34.754
1008	1.470	34.742	7.92	---	2.19	---	-0.01	32	0.03	800	1.653	34.758
1254	1.204	34.728	7.92	---	2.22	---	0.00	33	0.03	1000	1.474	34.755
1506	0.984	34.719	7.92	---	2.24	---	-0.01	33	0.03	1200	1.268	34.747
2004	0.605	34.706	7.91	---	2.27	---	0.00	34	0.06	1500	0.984	34.731
2502	0.300	34.690	7.89	---	2.28	---	-0.01	34	0.04	2000	0.574	34.709
3002	0.060	34.679	7.88	---	2.24	---	0.00	34	0.05	2500	0.294	34.699
										3000	0.063	34.688

ITS-90 : International Temperature Scale of 1990.

PSS78 : Practical Salinity Scale of 1978.

* : The value of the CTD observation. ("0"dbar temperature is the value of the digital thermometer.)

Station 440016a

Beginning of cast

Meteorological observation

Date : March 10, 2003
 Time(UT) : 22:44
 Latitude : 65-33.1S
 Longitude : 140-00.4E
 Depth : 1502m

Time(UT) : 23:00
 Weather : c
 Air temperature(dry) : -2.1°C
 Humidity : 87%
 Atmospheric Pressure : 994.1hPa

Wind direction : W
 Velocity : 5m/s
 Wave : W/3
 Swell : NNW/3
 Visibility : 10km

Water Sampling by Niskin bottles										Observed by CTD		
Pressure* (dber)	Temperature* (ITS-90)	Salinity (PSS78)	pH	DO2	PO4-P	SiO3-Si ($\mu\text{mol/l}$)	NO2-N	NO3-N	NH4-N	Pressure (dber)	Temperature (ITS-90)	Salinity (PSS78)
53	-0.500	34.602	8.05	---	1.93	---	0.23	29	0.03	20	-1.538	33.642
77	-1.189	34.631	8.02	---	2.08	---	0.21	31	0.03	30	-1.160	33.826
104	-1.339	34.656	8.01	---	2.17	---	0.17	32	0.03	50	-1.016	34.048
124	-1.416	34.665	8.00	---	2.17	---	0.07	32	0.03	75	-1.200	34.269
152	-1.259	34.695	8.00	---	2.18	---	0.04	32	0.02	100	-1.518	34.385
201	-0.855	34.725	7.98	---	2.21	---	0.03	33	0.03	125	-1.562	34.402
250	-0.322	34.737	7.95	---	2.24	---	0.04	33	0.03	150	-1.547	34.415
303	0.191	34.743	7.95	---	2.22	---	0.03	33	0.05	200	-1.080	34.484
403	0.624	34.749	7.94	---	2.23	---	0.01	33	0.04	250	-0.394	34.558
503	0.665	34.749	7.96	---	2.25	---	0.03	33	0.03	300	0.146	34.619
600	0.612	34.742	7.96	---	2.27	---	0.03	33	0.02	400	0.571	34.667
703	0.489	34.728	7.93	---	2.30	---	0.01	33	0.02	500	0.633	34.692
802	0.340	34.719	7.95	---	2.29	---	0.02	33	0.04	600	0.596	34.699
903	0.147	34.706	7.93	---	2.28	---	0.03	33	0.02	700	0.461	34.701
1001	0.050	34.690	7.93	---	2.29	---	0.03	33	0.02	800	0.319	34.693
1249	-0.689	34.679	7.93	---	2.20	---	0.06	32	0.02	1000	0.048	34.685
										1200	-0.284	34.666

ITS-90 : International Temperature Scale of 1990.

PSS78 : Practical Salinity Scale of 1978.

* : The value of the CTD observation. ("0"dber temperature is the value of the digital thermometer.)

Station 440019

Beginning of cast

Meteorological observation

Date : March 14, 2003
 Time(UT) : 21:50
 Latitude : 59-06.0S
 Longitude : 150-00.8E
 Depth : 3074m

Time(UT) : 22:00
 Weather : s
 Air temperature(dry) : 1.2°C
 Humidity : 87%
 Atmospheric Pressure : 986.2hPa

Wind direction : NNE
 Velocity : 11m/s
 Wave : NNE/4
 Swell : ESE/3
 Visibility : 10km

Water Sampling by Niskin bottles									Observed by CTD			
Pressure* (dber)	Temperature* (ITS-90)	Salinity (PSS78)	pH	DO2	PO4-P	SiO3-Si	NO2-N	NO3-N	NH4-N	Pressure (dber)	Temperature (ITS-90)	Salinity (PSS78)
				(umol/l)								
---	---	---	---	---	---	---	---	---	---	10	2.166	33.731
---	---	---	---	---	---	---	---	---	---	20	2.165	33.733
---	---	---	---	---	---	---	---	---	---	30	2.167	33.735
---	---	---	---	---	---	---	---	---	---	50	2.168	33.735
---	---	---	---	---	---	---	---	---	---	75	-0.302	34.229

ITS-90 : International Temperature Scale of 1990.

PSS78 : Practical Salinity Scale of 1978.

* : The value of the CTD observation. ("0"dber temperature is the value of the digital thermometer.)

Station 440021

Beginning of cast

Meteorological observation

Date : March 16, 2003
 Time(UT) : 22:00
 Latitude : 49-04.8S
 Longitude : 150-02.6E
 Depth : 1518m

Time(UT) : 22:00
 Weather : c
 Air temperature(dry) : 11.6°C
 Humidity : 96%
 Atmospheric Pressure : 1010.4hPa

Wind direction : N
 Velocity : 15m/s
 Wave : N/5
 Swell : SW/3
 Visibility : 8km

Water Sampling by Niskin bottles										Observed by CTD		
Pressure* (dber)	Temperature* (ITS-90)	Salinity (PSS78)	pH	DO2	PO4-P	SiO3-Si	NO2-N	NO3-N	NH4-N	Pressure (dber)	Temperature (ITS-90)	Salinity (PSS78)
				(μmol/l)								
0	10.1	34.462	8.12	---	0.89	---	0.29	12	0.04	10	10.094	34.422
52	9.819	34.412	8.13	---	0.94	---	0.26	12	0.03	20	10.090	34.422
80	9.498	34.560	8.10	---	1.02	---	0.29	14	0.03	30	10.076	34.419
102	9.217	34.601	8.09	---	1.08	---	0.09	15	0.02	50	10.050	34.419
129	9.168	34.614	8.09	---	1.10	---	0.06	15	0.02	75	9.922	34.405
157	9.154	34.627	8.09	---	1.06	---	0.08	14	0.02	100	9.944	34.413
208	9.141	34.649	8.09	---	1.07	---	0.06	14	0.02	125	9.478	34.587
257	9.072	34.637	8.08	---	1.09	---	0.06	15	0.03	150	9.493	34.672
307	8.992	34.624	8.05	---	1.13	---	0.06	15	0.03	200	9.350	34.668
406	8.932	34.621	8.07	---	1.15	---	0.09	16	0.03	250	9.126	34.642
505	8.504	34.549	8.03	---	1.26	---	0.09	18	0.02	300	9.104	34.645
606	7.665	34.431	8.04	---	1.39	---	0.10	20	0.02	400	8.961	34.627
705	7.171	34.450	7.98	---	1.67	---	0.07	24	0.03	500	8.499	34.556
803	5.968	---	---	---	---	---	---	---	---	600	7.711	34.442
903	5.290	34.344	7.97	---	1.98	---	0.08	29	0.07	700	7.213	34.451
994	4.494	34.329	7.94	---	2.11	---	0.09	30	0.04	800	6.008	34.370
										1000	4.447	34.328

ITS-90 : International Temperature Scale of 1990.

PSS78 : Practical Salinity Scale of 1978.

* : The value of the CTD observation. ("0"dber temperature is the value of the digital thermometer.)

Station 44022

Beginning of cast Meteorological observation

Date	: March 17, 2003	Time(UT)	: 22:00	Wind direction	: N
Time(UT)	: 21:55	Weather	: bc	Velocity	: 13m/s
Latitude	: 44-30.0S	Air temperature(dry)	: 16.2°C	Wave	: N/4
Longitude	: 151-02.7E	Humidity	: 96%	Swell	: NW/3
Depth	: 3115m	Atmospheric Pressure	: 1014.5hPa	Visibility	: 10km

Water Sampling by Niskin bottles										Observed by CTD		
Pressure* (dber)	Temperature* (ITS-90)	Salinity (PSS78)	pH	DO2	PO4-P	SiO3-Si	NO2-N	NO3-N	NH4-N	Pressure (dber)	Temperature (ITS-90)	Salinity (PSS78)
				(μmol/l)								
0	---	34.901	8.10	---	0.34	---	0.18	1	0.03	10	14.421	34.885
55	13.902	34.865	8.19	---	0.13	---	0.14	2	0.05	20	14.417	34.885
81	13.033	35.062	8.16	---	0.62	---	0.23	7	0.02	30	14.454	34.902
103	12.775	35.222	8.11	---	0.70	---	0.03	8	0.02	50	13.719	34.804
130	12.440	35.204	8.11	---	0.74	---	0.05	9	0.02	75	11.918	34.857
158	11.989	35.119	8.10	---	0.82	---	0.03	10	0.02	100	11.843	35.072
207	11.324	35.011	8.11	---	0.89	---	0.02	11	0.04	125	11.786	35.102
256	10.736	34.915	8.08	---	1.04	---	0.03	14	0.02	150	11.245	34.993
308	9.707	34.746	8.05	---	1.26	---	0.02	18	0.02	200	10.651	34.904
407	8.797	34.619	8.02	---	1.46	---	0.02	21	0.02	250	9.953	34.775
508	8.067	34.550	8.01	---	1.60	---	0.04	23	0.02	300	9.559	34.717
606	7.570	34.522	7.98	---	1.75	---	0.02	25	0.01	400	8.914	34.630
707	6.748	34.472	7.96	---	1.90	---	0.02	27	0.01	500	8.407	34.579
806	6.031	34.445	7.95	---	2.05	---	0.02	29	0.02	600	7.590	34.499
907	5.095	34.380	7.95	---	2.15	---	0.03	31	0.03	700	6.597	34.432
1008	4.232	34.348	7.93	---	2.24	---	0.02	32	0.01	800	5.729	34.379
1255	3.493	34.448	7.89	---	2.45	---	0.02	34	0.02	1000	4.216	34.350
1502	2.942	---	7.88	---	2.53	---	0.02	35	0.01	1200	3.593	34.431
1999	2.290	34.665	7.88	---	2.41	---	0.02	34	0.03	1500	2.924	34.557
										2000	2.292	34.678

ITS-90 : International Temperature Scale of 1990.

PSS78 : Practical Salinity Scale of 1978.

* : The value of the CTD observation. ("0"dber temperature is the value of the digital thermometer.)

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

Station No.	Date	Time		Position		Air Temp.	Water Temp.	Petroleum Oil	Cadmium	Mercury
		UT	LMT	Latitude	Longitude	(°C)		(μ g/l)		
	2002									
1	12/5	0615	1315	40-21.1S	110-01.7E	14.3	12.7	0.07	0.007	0.0012
2	6	0557	1257	44-31.9S	110-00.5E	9.4	10.5	0.07	0.089	0.0010
3	7	0600	1300	49-19.3S	109-50.8E	5.3	4.7	0.15	0.075	0.0022
4	8	0600	1300	54-51.3S	109-54.6E	3.2	2.0	0.09		0.0013
5	9	0619	1319	60-00.1S	109-42.3E	0.3	0.2	0.06	0.078	0.0009
	2003									
6	2/27	0710	1010	63-58.7S	50-01.9E	0.1	1.9	0.14	0.055	0.0113
7	28	0610	1010	63-59.3S	60-38.3E	0.6	1.4	0.10	0.057	0.3219
8	3/1	0430	0930	64-01.1S	70-42.8E	0.4	0.8	0.17	0.048	0.0162
9	4	0506	1006	64-46.2S	78-16.3E	-1.6	0.6			
10	5	0510	1010	63-24.6S	89-12.0E	-1.2	0.4	0.08	0.035	0.3218
12	7	0320	1020	64-03.3S	110-46.3E	-0.5	0.5		0.050	0.0217
18	13	2256	0956	63-36.8S	148-52.9E	-3.8	0.4	0.26	0.076	0.0637
19	14	2219	0819	59-06.5S	150-00.1E	1.2	1.8	0.10	0.009	0.0300
20	15	2257	0857	53-47.2S	150-06.2E	6.0	6.3	0.15	0.033	0.0144
21	16	2320	0920	49-06.6S	150-06.2E	11.7	10.1	0.17	0.026	0.0384
22	18	0020	1020	44-33.2S	151-07.6E	16.0	15.2	0.06	0.024	0.0043

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

Table 6. Hourly tidal observation at Syowa Station from February 2002 to January 2003 (time is LMT(UT+3 hours)).

STATION : SYOWASTATION
 LATITUDE : 69°00' 28"S
 LONGITUDE : 39°34' 13"E
 DURATION : FEB . 1 , - FEB . 28 , 2002
 UNIT : CENTIMETRE

The zero level of the tide gauge relative to the bench mark No. 1040 : -5.000m
 The revision quantity to the zero level of the tide gauge : -0.699m

Date	Time																							(24H)		(25H)																								
	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	SUM	MEAN																						
1	242	230	227	236	254	273	290	299	298	289	269	243	216	194	187	189	204	224	244	263	275	278	269	259	5952	248	6198	248																						
2	246	233	224	223	235	255	271	284	293	295	285	266	246	229	216	212	220	231	248	262	273	275	270	259	6051	252	6296	252																						
3	245	231	217	208	212	223	238	251	262	269	270	264	252	243	235	229	231	239	251	258	269	274	268	259	5898	246	6148	246																						
4	250	235	222	210	205	210	218	227	238	245	252	253	248	249	247	244	243	249	254	260	267	269	266	260	5821	243	6075	243																						
5	254	245	232	218	211	205	205	207	214	221	227	236	240	247	252	259	261	264	268	269	271	273	270	267	5816	242	6079	243																						
6	263	257	247	235	227	217	207	202	201	203	208	217	228	239	251	268	275	276	280	281	279	278	277	273	5889	245	6161	246																						
7	272	268	263	257	252	240	228	212	205	198	197	202	212	234	252	267	282	289	293	291	284	280	274	271	6021	251	6292	252																						
8	271	274	272	269	264	255	241	219	203	189	184	184	191	209	232	256	277	292	297	294	290	281	276	271	5991	250	6263	251																						
9	272	276	283	286	287	281	270	251	226	206	191	187	191	204	229	254	279	296	305	305	296	286	274	268	6203	258	6472	259																						
10	269	271	279	288	293	291	280	262	236	211	189	177	177	188	209	238	265	286	299	299	294	285	269	260	6115	255	6373	255																						
11	258	263	272	284	292	296	289	272	248	219	191	173	164	170	192	218	246	269	284	288	285	273	257	245	5948	248	6189	248																						
12	241	244	256	270	284	293	290	279	255	225	198	173	160	161	177	204	232	258	277	286	287	276	262	251	5839	243	6084	243																						
13	245	246	262	283	302	317	325	322	308	281	256	229	211	205	217	239	268	293	313	325	324	312	297	282	6662	278	6929	277																						
14	267	262	267	283	304	320	326	324	313	289	259	231	210	199	201	217	238	259	277	286	286	275	257	240	6390	266	6615	265																						
15	225	216	219	231	250	272	282	286	282	265	240	217	195	181	181	193	214	236	256	268	272	266	251	233	5731	239	5950	238																						
16	219	208	207	216	232	254	270	278	277	270	251	228	207	193	190	196	211	230	249	261	265	261	246	230	5649	235	5863	235																						
17	214	201	196	200	215	232	250	262	265	263	252	234	219	206	202	207	220	235	251	263	269	265	258	240	5619	234	5844	234																						
18	225	213	205	205	217	232	249	261	270	274	267	258	248	239	237	239	245	257	270	280	284	280	272	257	5984	249	6228	249																						
19	244	230	218	213	217	227	238	248	256	261	261	255	247	241	242	243	247	255	263	272	274	269	263	250	5934	247	6170	247																						
20	236	223	210	203	199	203	211	216	223	229	232	234	232	233	240	245	250	255	263	269	270	267	261	254	5658	236	5904	236																						
21	246	234	225	217	211	211	212	214	218	223	231	237	241	250	261	272	280	285	287	290	290	285	278	272	5970	249	6233	249																						
22	263	256	248	239	232	225	218	212	209	209	211	220	230	243	261	276	289	296	299	301	298	290	285	282	6092	254	6364	255																						
23	279	277	274	271	265	256	245	232	221	214	212	215	228	244	266	286	300	310	310	309	300	291	283	275	6363	265	6635	265																						
24	272	273	274	273	268	260	243	223	204	188	177	179	189	207	232	261	285	299	306	307	297	287	279	270	6053	252	6321	253																						
25	268	273	280	288	287	283	269	244	220	194	177	170	174	192	219	249	280	303	316	317	308	294	280	270	6155	256	6423	257																						
26	268	272	283	293	302	303	292	271	241	210	182	163	157	169	195	224	255	283	300	303	297	280	262	248	6053	252	6298	252																						
27	245	251	264	281	296	305	304	289	261	224	192	166	149	151	171	198	231	261	282	290	286	271	252	234	5854	244	6080	243																						
28	226	229	242	263	286	303	313	307	288	257	222	190	167	159	168	192	219	245	268	277	272	259	239	216	5807	242	6009	240																						
																							MONTHLY MEAN		249.3 cm																									

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

The zero level of the tide gauge relative to the bench mark No. 1040 : -5.000m
 The revision quantity to the zero level of the tide gauge : -0.708m

Date	Time																								(24H)		(25H)			
	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	SUM	MEAN		
1	202	195	207	228	254	277	293	300	294	274	244	215	189	175	177	193	218	243	263	276	277	266	245	223	5728	239	5930	237		
2	202	192	192	208	236	262	264	300	304	295	277	249	224	208	204	212	230	252	268	282	283	273	252	232	5921	247	6130	245		
3	209	189	184	189	207	234	257	274	285	288	279	264	246	230	224	230	240	256	275	286	290	287	271	250	5944	248	6176	247		
4	232	213	198	197	207	223	244	262	275	286	285	277	269	262	253	253	260	269	285	293	292	289	278	260	6162	257	6403	256		
5	241	223	209	198	198	206	219	233	246	255	263	264	262	264	266	267	271	279	288	297	297	294	286	274	6100	254	6357	254		
6	257	242	230	217	211	212	213	217	224	234	238	244	248	254	262	269	274	277	282	286	286	283	275	270	6005	250	6264	251		
7	259	248	237	230	221	214	209	207	206	208	213	220	229	241	256	268	277	282	284	285	282	278	272	267	5893	246	6155	246		
8	262	259	256	251	245	236	224	216	207	204	202	210	221	234	252	270	283	291	292	289	282	276	268	263	5993	250	6255	250		
9	262	261	263	263	260	252	242	226	210	200	193	194	207	223	244	268	286	297	303	303	294	285	276	275	6087	254	6363	255		
10	276	281	290	295	297	293	282	261	240	224	209	204	211	225	246	271	292	304	311	307	295	281	269	262	6426	268	6688	268		
11	262	269	278	287	294	293	282	265	241	216	198	187	190	204	227	253	279	295	303	303	290	274	259	250	6199	258	6447	258		
12	248	256	271	282	298	303	295	279	257	231	209	192	189	201	220	247	269	287	299	297	283	266	248	233	6160	257	6389	256		
13	229	238	252	270	287	298	295	284	263	236	210	189	180	186	203	226	253	273	285	284	273	254	233	219	5920	247	6132	245		
14	212	216	233	256	276	292	297	289	271	248	220	198	183	184	199	222	246	269	282	285	275	255	232	215	5855	244	6060	242		
15	205	204	218	240	266	284	295	296	282	258	236	214	196	192	202	223	247	266	279	282	274	254	231	211	5855	244	6055	242		
16	200	195	205	227	252	277	290	295	289	270	250	226	206	202	205	219	243	263	276	281	275	257	234	211	5848	244	6043	242		
17	195	186	192	209	234	258	278	289	285	277	261	240	225	217	217	229	249	268	280	286	282	269	244	223	5893	246	6096	244		
18	203	191	191	201	223	248	267	280	286	283	271	256	244	235	231	239	257	271	283	289	289	277	255	233	6003	250	6216	249		
19	213	198	192	198	214	234	254	268	276	277	271	261	251	245	244	250	258	271	282	290	286	276	258	238	6005	250	6221	249		
20	216	202	193	192	201	217	231	244	253	260	261	257	250	251	252	255	263	274	283	287	286	278	264	245	5915	246	6142	246		
21	227	213	202	198	199	208	219	231	239	247	256	255	257	261	265	271	276	285	292	294	290	284	271	259	5999	250	6243	250		
22	244	230	220	213	209	211	213	219	222	231	235	242	248	258	269	277	285	290	295	294	290	282	273	263	6013	251	6263	251		
23	254	245	233	226	218	213	208	202	201	204	209	218	225	242	258	270	282	289	288	286	281	271	263	256	5842	243	6092	244		
24	250	246	241	233	229	220	205	193	186	183	186	192	202	221	245	264	279	286	288	284	273	265	254	249	5674	236	5920	237		
25	246	250	255	255	252	243	228	206	190	176	169	171	185	208	233	259	280	292	296	289	274	264	253	247	5721	238	5971	239		
26	250	259	267	277	284	279	265	244	216	194	181	175	183	205	231	261	286	299	308	301	287	269	253	245	6019	251	6268	251		
27	249	258	275	293	305	307	296	277	247	215	191	179	176	190	214	241	268	288	295	291	275	253	232	220	6035	251	6252	250		
28	217	227	248	273	294	306	307	294	268	236	209	187	176	185	206	231	257	280	290	286	271	248	223	202	5921	247	6116	245		
29	195	204	225	251	280	307	318	315	296	269	239	212	192	188	202	226	250	270	278	277	259	233	205	178	5869	245	6031	241		
30	162	162	179	207	241	271	291	297	292	273	251	223	203	195	203	223	246	267	278	281	271	247	216	190	5669	236	5838	234		
31	169	162	169	194	226	260	283	301	306	298	284	264	246	236	238	253	272	292	302	309	299	279	251	223	6116	255	6314	253		
MONTHLY MEAN																											248.4		cm	

STATION : SYOWA STATION
 LATITUDE : 89°00'28"S
 LONGITUDE : 39°34'13"E
 DURATION : APR. 1, - APR. 30, 2002
 UNIT : CENTIMETRE

The zero level of the tide gauge relative to the bench mark No. 1040 : -5.000m
 The revision quantity to the zero level of the tide gauge : -0.716m

Date	Time																							(24H)		(25H)			
	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	SUM	MEAN	
1	198	180	179	193	215	244	269	289	300	301	293	280	266	255	252	258	270	286	298	301	294	279	254	224	6178	257	6379	255	
2	201	182	169	171	186	208	228	247	261	270	272	265	261	258	258	263	273	290	299	308	305	295	281	259	6010	250	6247	250	
3	237	220	208	200	207	216	229	244	254	262	269	267	268	271	272	274	280	287	295	299	298	288	276	260	6181	258	6424	257	
4	243	229	214	207	204	205	210	216	224	233	242	249	255	261	271	278	283	289	295	300	297	292	284	276	6057	252	6323	253	
5	266	257	250	242	236	234	232	229	230	235	242	248	257	267	279	290	293	298	298	293	291	283	277	270	6297	262	6560	262	
6	263	261	257	254	246	242	235	226	219	219	222	229	243	259	272	287	299	302	302	297	292	282	277	274	6259	261	6531	261	
7	272	271	274	275	273	264	252	241	226	218	216	221	230	247	263	282	292	296	297	288	278	268	258	255	6257	261	6513	261	
8	256	262	268	272	274	269	258	241	224	208	201	201	209	221	244	260	276	285	280	274	262	246	235	232	5958	248	6196	248	
9	238	248	262	276	282	282	272	256	234	216	202	198	203	218	237	258	276	286	285	274	258	242	229	222	5954	248	6179	247	
10	225	237	251	269	276	282	275	261	236	216	201	190	192	206	228	253	274	286	286	276	261	239	222	213	5855	244	6074	243	
11	219	231	251	273	292	304	301	289	269	246	227	216	212	223	244	266	285	296	297	286	268	244	222	209	6170	257	6378	255	
12	208	219	241	266	289	305	310	305	285	261	241	226	218	223	239	259	278	291	294	283	264	235	213	195	6148	256	6336	253	
13	188	194	215	242	268	287	297	297	283	265	244	225	216	218	231	250	269	283	288	281	264	237	211	192	5945	248	6124	245	
14	179	185	201	228	259	282	299	305	296	281	264	247	233	231	241	259	276	290	295	291	274	248	219	194	6077	253	6255	250	
15	178	176	185	207	233	259	277	268	286	272	261	244	230	225	231	244	261	275	284	280	268	245	215	191	5815	242	5987	239	
16	172	166	170	187	214	241	261	276	281	278	269	259	248	244	247	258	273	284	292	292	280	260	235	209	5896	246	6084	243	
17	188	175	174	163	203	226	248	264	271	277	275	266	260	258	258	266	278	287	294	294	286	271	248	221	5971	249	6173	247	
18	202	185	178	183	195	210	229	244	254	262	265	265	263	263	264	269	277	286	292	293	287	276	257	236	5935	247	6154	246	
19	219	203	192	191	195	205	218	229	242	252	259	264	267	274	277	282	288	296	302	301	295	287	274	257	6069	253	6310	252	
20	241	227	215	209	205	207	211	217	225	234	245	252	263	272	281	289	293	297	299	297	291	282	274	264	6090	254	6344	254	
21	254	246	239	231	225	218	216	211	215	218	225	240	253	265	280	290	297	301	299	295	287	276	271	267	6119	255	6381	255	
22	262	260	258	254	247	236	225	215	206	206	209	220	236	253	273	287	294	298	294	285	277	266	257	256	6074	253	6322	253	
23	261	264	268	273	268	259	246	228	212	200	199	204	222	239	258	279	290	295	288	279	265	249	240	240	6026	251	6274	251	
24	248	261	275	290	294	290	276	253	231	212	203	204	214	233	255	277	294	297	293	279	260	236	223	223	6121	255	6352	254	
25	231	246	271	292	305	310	301	281	255	230	211	204	207	224	246	267	284	290	284	267	243	218	196	188	6051	252	6243	250	
26	192	213	236	268	292	305	307	296	271	244	223	207	203	216	234	254	271	281	276	260	234	204	178	160	5825	243	5984	239	
27	159	174	202	236	264	290	305	302	284	266	243	223	218	222	237	256	274	284	284	273	247	213	184	157	5797	242	5946	238	
28	149	154	176	211	242	272	294	301	296	281	261	243	230	230	243	257	275	288	290	284	265	231	200	175	5848	244	6003	240	
29	155	153	169	196	229	262	288	305	313	307	296	285	272	270	277	292	309	323	328	324	307	283	250	219	6412	267	6608	264	
30	196	182	182	202	224	250	278	297	306	307	304	293	284	276	276	284	295	308	313	311	298	277	249	219	6411	267	6608	264	
MONTHLY MEAN																										252.5		cm	

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

The zero level of the tide gauge relative to the bench mark No. 1040 : -5.000m
 The revision quantity to the zero level of the tide gauge : -0.724m

Date	Time																							(24H)		(25H)				
	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	SUM	MEAN		
1	197	178	169	176	192	211	232	250	264	271	272	269	267	266	264	268	279	290	296	298	292	277	257	234	5969	249	6184	247		
2	215	195	184	182	189	200	218	233	245	257	266	268	269	274	276	279	287	296	300	305	301	292	282	268	6081	253	6336	253		
3	255	241	233	229	229	234	245	256	266	279	291	295	303	312	317	318	325	328	331	333	330	323	315	307	6895	287	7192	288		
4	297	287	281	271	263	260	261	257	262	271	278	285	294	300	306	310	310	312	310	303	299	288	282	276	6863	286	7135	285		
5	272	266	260	257	250	244	239	233	234	235	241	251	261	271	283	289	295	291	287	261	274	269	263	260	6306	263	6569	263		
6	263	265	264	267	263	253	245	237	226	222	225	232	243	257	268	277	280	277	268	259	247	238	233	231	6040	252	6274	251		
7	234	242	249	252	254	248	237	226	211	204	202	208	219	232	245	256	263	263	256	243	229	221	214	214	5622	234	5844	234		
8	222	234	249	258	264	263	253	239	225	212	206	207	218	229	248	260	266	267	259	245	227	214	204	204	5673	236	5888	236		
9	215	229	246	264	275	279	272	257	241	226	215	214	222	232	251	265	272	273	266	248	227	205	193	190	5777	241	5978	239		
10	201	217	236	257	276	284	283	272	256	239	223	219	223	231	251	265	274	277	271	254	229	209	191	182	5820	243	6009	240		
11	189	205	229	254	278	293	299	292	276	260	244	233	234	243	257	272	282	285	277	263	239	212	188	175	5979	249	6154	246		
12	175	189	211	239	267	288	298	296	285	269	254	243	237	243	257	270	281	288	285	269	245	216	192	172	5969	249	6136	245		
13	167	175	197	225	252	276	294	299	294	281	269	258	251	252	262	277	289	297	285	265	234	207	183	168	6086	254	6257	250		
14	171	173	184	212	240	269	286	298	297	288	277	269	261	255	264	275	287	294	293	287	268	238	209	182	6077	253	6242	250		
15	165	158	167	184	213	237	264	278	288	284	279	273	264	263	267	275	286	297	299	294	277	251	226	200	5989	250	6167	247		
16	178	166	167	179	196	220	243	262	272	281	279	275	274	272	272	279	291	298	303	304	293	275	251	225	6055	252	6261	250		
17	206	191	183	187	200	217	237	252	267	279	279	281	286	288	289	294	303	312	315	319	314	303	283	263	6348	265	6595	264		
18	247	232	221	217	222	232	246	256	275	283	293	297	301	303	306	307	309	312	313	316	306	299	288	272	6653	277	6912	276		
19	259	242	231	220	219	219	222	231	240	250	260	268	275	286	289	290	292	292	291	290	286	281	274	269	6276	262	6537	261		
20	261	252	243	234	224	221	214	216	219	224	239	252	263	272	280	284	283	280	279	273	267	264	264	262	6070	253	6335	253		
21	265	263	263	257	249	240	228	219	216	217	224	236	248	258	269	274	274	269	261	249	239	234	233	236	5921	247	6165	247		
22	244	254	263	264	263	250	236	224	211	203	205	214	226	240	253	260	261	255	243	229	213	202	201	208	5622	234	5807	232		
23	218	238	252	267	274	265	254	239	219	206	200	205	215	230	244	252	255	253	237	217	195	176	169	172	5452	227	5637	225		
24	185	209	235	258	274	281	274	258	241	224	214	214	222	237	249	258	266	264	251	229	203	180	162	158	5546	231	5720	229		
25	174	193	223	252	277	293	299	290	274	254	240	233	236	249	260	274	280	279	269	249	215	185	159	149	5806	242	5958	238		
26	152	167	200	228	256	282	295	290	283	264	247	238	235	242	257	268	276	281	272	251	218	192	160	138	5692	237	5830	233		
27	138	145	165	199	230	259	280	290	289	275	265	254	245	251	263	276	288	293	290	278	252	220	187	161	5793	241	5936	237		
28	143	141	156	179	209	239	263	277	283	280	271	265	255	254	259	271	284	291	292	283	263	236	206	178	5778	241	5935	237		
29	157	144	150	165	190	220	240	261	276	276	275	273	266	264	266	275	290	299	303	305	291	269	240	215	5910	246	6103	244		
30	193	177	171	178	194	215	236	258	273	281	281	282	280	275	275	277	288	298	307	304	296	286	264	240	6129	255	6350	254		
31	221	205	192	192	198	216	234	248	263	271	274	275	275	273	270	271	276	282	286	290	284	279	265	248	6088	254	6319	253		
MONTHLY MEAN																											250.4 cm			

STATION : SYOWA STATION
 LATITUDE : 69°00'28"S
 LONGITUDE : 39°34'13"E
 DURATION : JUN 1 . - JUNE 30 . 2002
 UNIT : CENTIMETRE

The zero level of the tide gauge relative to the bench mark No. 1040 : -5.000m
 The revision quantity to the zero level of the tide gauge : -0.732m

Date	Time																							(24H)		(25H)				
	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	SUM	MEAN		
1	231	217	207	198	200	209	216	230	243	253	262	266	270	271	270	270	271	273	279	283	278	273	268	258	5998	250	6242	250		
2	246	233	226	220	217	218	220	231	238	243	255	261	266	269	272	271	268	267	271	273	268	270	264	258	6025	251	6281	251		
3	256	250	243	240	235	229	232	234	239	246	254	264	268	272	276	274	271	266	264	262	256	257	255	254	6097	254	6357	254		
4	260	257	256	253	249	243	239	235	233	237	241	249	255	261	267	264	261	257	246	243	234	234	233	237	5944	248	6185	247		
5	241	249	252	257	258	253	247	237	235	232	233	242	250	259	265	265	264	257	245	237	227	219	217	228	5867	244	6099	244		
6	232	244	257	265	267	268	262	250	244	236	237	244	251	262	270	272	275	266	255	241	227	219	216	222	5982	249	6218	249		
7	236	254	271	287	299	305	295	291	283	268	265	268	273	283	290	299	296	285	275	254	234	220	208	211	6450	269	6675	267		
8	225	241	261	280	295	299	298	290	277	263	257	256	256	267	276	279	280	273	258	238	217	199	183	178	6146	256	6334	253		
9	188	207	227	249	269	289	291	287	278	263	253	253	254	263	268	279	282	277	266	241	215	191	169	163	5922	247	6087	243		
10	165	179	206	234	260	275	291	290	283	274	260	258	257	260	274	282	290	291	284	264	236	211	187	170	5981	249	6153	246		
11	172	182	200	233	261	282	304	310	306	300	290	281	277	278	285	297	305	305	300	287	260	229	201	179	6324	264	6490	260		
12	166	166	185	209	235	262	282	296	298	290	282	277	267	269	274	283	293	298	293	284	259	231	201	178	6078	253	6239	250		
13	161	152	158	180	207	233	257	276	284	288	282	276	270	269	271	280	291	296	302	295	280	255	226	197	5986	249	6162	246		
14	176	162	164	172	192	218	240	258	274	280	279	278	275	270	266	273	281	288	293	292	283	265	239	212	5930	247	6122	245		
15	192	168	161	160	176	190	211	232	249	258	262	265	260	258	259	257	262	271	280	281	276	268	249	229	5674	236	5882	235		
16	208	190	177	171	179	187	204	222	238	250	261	265	267	264	262	260	261	270	273	280	280	279	269	259	5776	241	6021	241		
17	245	230	218	207	204	204	212	221	231	246	258	266	266	267	265	260	257	258	259	259	261	262	261	256	5873	245	6127	245		
18	254	247	237	226	219	212	212	219	225	233	246	256	261	261	262	255	251	244	243	244	243	243	249	255	5797	242	6056	242		
19	259	260	260	256	251	243	237	235	237	240	249	259	267	267	269	266	257	249	238	231	225	227	232	244	5958	248	6212	248		
20	254	264	271	274	277	269	259	250	244	245	249	257	264	272	272	271	262	246	236	219	209	204	207	216	5993	250	6227	249		
21	234	251	269	282	289	289	283	271	264	257	255	260	267	275	280	279	274	262	241	222	203	190	185	190	6072	253	6278	251		
22	206	228	254	277	291	298	298	287	274	265	261	261	267	275	283	286	282	272	253	228	203	183	169	168	6069	253	6242	250		
23	181	201	229	256	280	296	302	296	288	276	268	265	268	278	287	290	291	287	274	250	224	197	174	165	6123	255	6296	252		
24	173	190	215	247	277	302	316	320	313	302	296	291	290	296	307	316	319	317	307	284	259	226	197	177	6537	272	6709	268		
25	172	178	201	225	259	284	302	312	312	304	294	287	281	283	291	302	310	312	308	294	266	236	205	179	6397	267	6560	262		
26	163	163	178	200	228	255	279	291	296	293	287	279	272	270	276	288	301	306	307	298	281	252	222	195	6180	256	6354	254		
27	174	168	174	187	215	241	263	283	294	294	290	284	276	272	275	283	295	308	311	309	297	274	250	224	6241	260	6441	258		
28	200	188	182	191	213	235	257	274	287	296	295	293	285	278	277	282	293	306	314	314	311	295	274	250	6390	266	6620	265		
29	230	214	206	206	217	236	255	270	284	291	289	287	282	274	267	266	273	281	289	295	293	285	268	248	6306	263	6534	261		
30	228	214	199	195	198	211	226	239	250	257	259	257	253	248	241	235	238	244	253	258	262	259	249	239	5712	238	5935	237		
MONTHLY MEAN																											252.5		cm	

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

The zero level of the tide gauge relative to the bench mark No. 1040 : -5.000m
 The revision quantity to the zero level of the tide gauge : -0.740m

Date	Time																							(24H)		(25H)			
	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	SUM	MEAN	
1	223	212	201	195	197	205	213	227	238	245	255	255	251	251	242	238	235	238	246	254	256	259	255	251	5642	235	5883	235	
2	241	237	231	226	227	231	233	238	253	260	262	269	267	261	260	252	243	241	244	248	249	249	252	254	5928	247	6182	247	
3	254	246	244	241	241	236	238	241	244	245	248	254	252	250	248	241	232	228	226	222	223	227	227	232	5738	239	5980	239	
4	242	242	246	245	249	249	249	251	250	255	259	262	267	283	261	257	252	242	233	230	227	227	229	236	5923	247	6168	247	
5	245	256	264	270	272	273	271	268	264	258	263	288	268	270	267	261	253	243	229	218	214	205	204	211	6015	251	6236	249	
6	221	239	250	259	269	273	271	268	262	259	259	259	262	264	263	260	258	246	230	213	201	190	184	188	5846	244	6047	242	
7	201	217	236	253	269	276	276	275	284	260	256	254	260	259	265	265	258	251	237	215	195	177	167	166	5752	240	5932	237	
8	180	197	221	245	264	278	282	283	278	269	260	258	259	267	273	276	275	267	254	229	207	185	166	160	5833	243	6001	240	
9	168	182	204	232	259	278	289	290	285	277	266	262	260	265	271	278	278	275	263	239	215	187	160	146	5828	243	5971	239	
10	143	157	177	203	233	260	276	282	283	275	267	259	256	259	268	276	281	284	278	260	235	204	174	150	5740	239	5882	235	
11	142	149	164	190	219	250	275	289	295	293	286	280	276	278	284	293	300	307	306	295	271	239	211	182	6074	253	6237	249	
12	163	156	162	185	210	238	261	278	285	284	281	273	265	264	265	274	284	294	300	295	279	255	224	192	5967	249	6136	245	
13	169	155	155	162	185	210	235	255	265	273	268	262	258	249	246	255	264	278	287	286	282	268	241	214	5722	238	5912	236	
14	190	169	159	164	176	195	219	239	255	258	258	255	245	234	230	231	239	250	264	273	273	268	254	234	5532	231	5746	230	
15	214	192	181	181	186	202	221	237	252	266	274	272	267	260	251	248	257	264	276	288	294	299	294	267	5963	248	6236	249	
16	273	251	242	234	234	237	246	261	269	278	285	280	273	264	253	239	235	235	240	248	251	261	261	259	6109	255	6362	254	
17	253	247	237	229	224	219	225	230	240	245	252	253	247	239	229	219	207	205	205	212	218	225	230	241	5531	230	5777	231	
18	246	250	250	248	247	247	245	248	254	257	262	264	267	261	252	246	231	222	214	211	212	217	224	238	5813	242	6062	242	
19	249	260	269	275	279	276	270	269	271	267	267	271	272	271	266	254	244	227	215	204	194	192	196	205	5963	248	6187	247	
20	224	243	259	269	280	282	279	275	270	267	266	268	269	272	267	263	252	238	220	201	186	174	171	178	5873	245	6064	243	
21	191	212	238	259	275	285	291	285	281	274	272	272	277	281	285	288	281	271	258	238	215	199	184	185	6097	254	6292	252	
22	195	218	239	268	292	311	316	316	311	303	294	294	294	300	307	310	309	302	289	267	241	212	190	178	6556	273	6728	269	
23	181	195	218	243	269	294	306	311	306	296	287	282	279	284	292	301	306	304	297	277	251	221	192	173	6365	265	6537	261	
24	172	179	199	224	252	281	299	308	307	298	290	282	279	282	290	303	312	316	313	301	276	246	214	190	6413	267	6592	264	
25	179	174	193	214	242	269	288	301	301	295	284	275	268	265	275	289	300	310	312	307	286	260	231	205	6323	263	6506	260	
26	183	177	185	201	230	256	275	295	297	294	285	276	270	264	271	285	297	307	317	314	306	283	256	231	6355	265	6565	263	
27	210	194	194	206	230	253	274	290	296	297	289	278	267	259	259	265	282	297	310	312	305	292	269	242	6370	265	6595	264	
28	225	208	202	208	225	244	265	280	288	286	282	272	261	249	248	250	265	285	281	294	304	302	297	280	262	6278	262	6524	261
29	246	233	227	227	240	257	275	289	299	304	298	285	277	265	257	254	262	276	288	294	299	292	282	263	6489	270	6740	270	
30	251	242	231	229	237	248	262	275	283	286	282	275	267	254	246	242	241	251	263	277	277	280	281	270	6250	260	6513	261	
31	263	253	249	245	250	257	268	278	284	287	289	283	269	257	247	242	242	244	251	258	264	271	270	270	6291	262	6557	262	
MONTHLY MEAN																										250.8 cm			

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

The zero level of the tide gauge relative to the bench mark No. 1040 : -5.000
 The revision quantity to the zero level of the tide gauge : -0.748m

Date	Time																								(24H)		(25H)	
	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	SUM	MEAN
1	266	261	257	255	259	260	270	275	283	284	281	278	266	256	247	235	229	228	230	235	238	240	246	250	6129	255	6374	255
2	245	251	253	252	256	261	261	264	272	271	270	267	262	256	247	236	228	225	219	223	223	228	233	235	5938	247	6179	247
3	241	254	260	267	270	274	278	278	281	279	276	276	272	269	267	253	247	235	228	222	218	216	222	230	6113	255	6354	254
4	241	252	267	279	289	295	296	297	294	289	287	285	281	281	273	268	258	245	231	218	205	200	195	201	6227	259	6438	258
5	211	226	246	266	280	287	291	291	282	280	275	269	269	270	270	269	261	252	238	219	203	189	179	183	6006	250	6205	248
6	199	217	242	269	293	308	319	321	313	307	300	296	296	300	302	304	304	295	281	261	235	212	196	191	6561	273	6762	270
7	201	213	237	266	292	314	326	330	323	312	304	298	293	298	304	311	314	308	296	274	244	218	191	175	6642	277	6814	273
8	172	184	208	237	265	290	306	314	311	298	286	277	274	278	284	296	306	307	301	285	253	223	193	166	6314	263	6468	259
9	154	160	178	202	234	261	283	295	294	285	271	261	257	256	266	283	297	308	308	301	279	246	214	187	6080	253	6247	250
10	167	162	177	197	225	255	279	291	295	290	277	264	254	251	258	274	293	308	317	315	304	279	248	218	6198	258	6393	256
11	195	180	183	197	223	249	270	286	291	289	275	258	243	235	235	246	263	279	296	304	300	287	259	231	6074	253	6281	251
12	207	187	182	190	205	226	249	264	272	273	259	246	231	215	213	219	232	252	273	290	295	295	280	262	5817	242	6058	242
13	241	221	213	214	227	242	259	277	285	286	279	259	243	230	215	211	217	236	251	267	280	284	283	274	5994	250	6258	250
14	264	250	240	237	244	252	269	277	283	287	282	269	255	234	220	211	206	214	226	235	245	256	259	257	5972	249	6225	249
15	253	247	241	238	239	243	252	260	263	265	263	255	240	226	216	202	194	194	196	206	217	222	232	242	5806	234	5851	234
16	245	251	253	256	258	263	266	273	275	275	276	270	260	252	241	232	220	209	205	207	209	216	220	231	5863	244	6108	244
17	245	256	269	278	283	286	288	289	288	288	286	284	279	274	265	256	247	231	218	213	207	200	207	215	6152	256	6380	255
18	228	247	267	280	295	300	303	302	298	295	292	290	287	289	284	278	273	260	243	230	216	199	200	200	6358	265	6570	263
19	214	233	254	275	291	302	307	302	295	290	285	281	280	280	283	282	277	268	252	233	210	192	180	176	6242	260	6428	257
20	186	200	226	250	271	287	296	293	283	276	264	261	260	265	273	278	280	275	266	244	217	194	172	164	5981	249	6149	246
21	168	182	203	230	254	275	286	285	277	266	253	248	244	252	264	275	284	282	275	260	234	204	177	161	5839	243	5998	240
22	159	166	190	217	242	266	280	285	276	263	251	240	235	244	256	271	284	292	289	275	251	223	193	175	5823	243	6002	240
23	160	166	183	207	238	263	278	284	279	263	253	240	230	236	248	267	282	295	298	291	274	245	218	192	5890	245	6069	243
24	179	178	186	211	238	262	280	288	282	271	254	238	225	225	238	256	275	294	304	301	290	267	238	214	5994	250	6192	248
25	198	188	196	216	240	265	286	295	293	281	265	249	237	235	240	256	279	298	313	317	311	293	268	245	6264	261	6490	260
26	226	214	216	228	249	271	285	295	294	283	264	245	231	221	219	229	250	269	284	293	289	279	257	236	6127	255	6345	254
27	218	205	203	210	228	248	264	272	273	267	251	232	214	207	203	208	232	249	266	286	292	283	275	258	5844	244	6090	244
28	246	237	235	241	256	269	282	292	297	294	279	265	244	234	227	221	234	257	270	283	289	289	278	267	6286	262	6546	262
29	260	247	239	241	251	259	271	278	277	272	261	246	219	207	199	195	195	206	219	228	237	240	239	236	5722	238	5949	238
30	227	226	229	233	237	248	263	265	273	279	269	252	243	232	219	217	218	222	227	239	247	250	253	251	5819	242	6067	243
31	248	247	252	256	260	261	266	268	270	266	258	247	235	221	210	203	199	195	200	202	209	212	218	223	5826	234	5859	234
MONTHLY MEAN																								252.0		cm		

STATION : SYOWA STATION
 LATITUDE : 69°00'28"S
 LONGITUDE : 39°34'13"E
 DURATION : SEP. 1. - SEP. 30, 2002
 UNIT : CENTIMETRE

The zero level of the tide gauge relative to the bench mark No. 1040 : -5.000m
 The revision quantity to the zero level of the tide gauge : -0.756m

Date	Time																							(24H)		(25H)				
	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	SUM	MEAN		
1	233	237	246	255	262	287	271	274	271	287	261	255	245	238	232	223	215	210	205	206	206	206	211	220	5716	238	5949	238		
2	233	247	263	275	290	296	300	300	298	292	285	281	278	272	266	260	252	240	228	218	213	204	203	211	6203	258	6424	257		
3	221	241	260	280	296	303	307	304	298	289	280	277	271	272	275	271	267	255	237	220	200	188	179	180	6171	257	6364	255		
4	193	214	238	263	283	295	301	298	288	278	272	264	263	269	276	281	275	270	253	231	208	186	171	166	6036	252	6212	248		
5	176	196	221	251	276	294	304	299	288	276	263	259	255	261	275	285	293	290	276	256	227	196	173	160	6050	252	6213	249		
6	163	177	202	233	259	284	294	294	283	269	255	242	240	249	264	282	295	301	296	279	250	218	186	162	5977	249	6133	245		
7	156	163	184	211	241	264	282	283	273	257	241	225	218	226	244	266	288	303	309	298	279	247	211	187	5856	244	6024	241		
8	168	167	181	209	233	256	274	277	270	251	229	209	195	194	207	231	255	277	293	292	283	258	223	196	5628	235	5803	232		
9	175	165	171	190	212	238	254	260	255	236	214	190	173	165	169	190	221	246	265	279	279	265	241	216	5269	220	5462	218		
10	193	181	180	195	213	236	251	259	256	245	223	200	176	165	162	175	199	225	250	269	280	279	264	246	5324	222	5556	222		
11	232	220	214	221	235	254	271	278	275	267	249	222	199	185	173	179	194	218	237	256	268	271	267	262	5647	235	5899	236		
12	252	243	238	242	250	263	278	283	281	277	263	242	221	200	190	183	188	203	216	233	248	253	259	260	5766	240	6026	241		
13	260	256	260	259	264	273	283	290	289	285	277	258	240	227	213	199	196	196	201	214	222	229	239	246	5876	245	6125	245		
14	249	255	261	265	270	275	279	283	281	277	271	259	247	235	223	213	203	196	192	192	195	198	206	217	5742	239	5971	239		
15	229	241	258	275	283	294	296	297	304	304	295	303	293	289	285	284	273	265	252	240	233	228	224	234	8479	270	6721	269		
16	242	260	274	288	300	306	305	298	291	285	277	273	268	268	267	265	257	247	230	216	202	190	184	191	6184	258	6386	255		
17	202	220	241	261	279	287	288	283	273	268	262	260	262	265	272	280	278	270	258	239	220	205	192	192	6057	252	6258	250		
18	201	220	240	265	284	293	297	289	274	263	255	249	252	258	271	278	284	281	271	249	225	201	183	177	6060	253	6243	250		
19	183	198	218	244	266	279	286	278	265	253	240	232	236	247	266	278	289	293	287	269	244	218	196	181	5946	248	6129	245		
20	183	198	219	246	269	284	291	284	270	254	238	226	223	236	257	275	291	301	297	283	262	233	207	191	6018	251	6205	248		
21	187	197	217	242	265	282	289	284	267	247	230	217	213	222	240	265	285	301	304	297	277	252	225	206	6011	250	6207	248		
22	196	202	220	241	267	284	293	290	273	253	232	214	206	213	230	255	277	295	304	303	288	265	239	218	6058	252	6262	250		
23	204	203	217	236	257	275	283	282	270	246	223	203	192	191	204	226	252	272	287	292	283	263	238	219	5818	242	6022	241		
24	204	201	209	228	249	265	275	276	265	246	222	199	185	180	189	210	237	261	278	286	287	273	254	237	5716	238	5941	238		
25	225	220	223	238	257	272	280	282	273	256	233	209	190	180	183	198	219	242	262	274	276	268	255	242	5757	240	5988	240		
26	231	223	226	237	250	266	274	276	269	254	232	208	188	176	175	184	202	220	239	253	259	260	251	240	5593	233	5825	233		
27	232	229	231	238	251	264	272	276	269	258	239	216	197	182	178	183	191	208	227	239	248	253	251	247	5579	232	5822	233		
28	243	245	249	255	266	277	285	285	283	276	261	246	231	219	209	209	214	221	232	245	252	258	264	264	5989	250	6252	250		
29	263	269	274	280	288	296	299	298	292	284	270	256	240	226	217	212	206	207	214	219	222	229	234	240	6035	251	6282	251		
30	247	257	265	272	282	286	288	286	282	274	265	253	242	233	227	220	212	209	207	204	204	206	211	222	5854	244	6085	243		
MONTHLY MEAN																													245.0 cm	

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

The zero level of the tide gauge relative to the bench mark No. 1040 : -5.000m
 The revision quantity to the zero level of the tide gauge : -0.764m

Date	Time																							(24H)		(25H)				
	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	SUM	MEAN		
1	231	246	262	273	282	286	287	283	276	269	259	252	245	240	237	232	221	212	203	191	182	179	181	191	5720	238	5926	237		
2	206	222	240	259	272	277	275	266	257	248	238	236	235	235	239	241	234	221	207	191	176	159	159	163	5456	227	5635	225		
3	179	205	226	248	266	276	275	267	256	244	236	233	235	246	259	266	267	259	242	222	198	178	168	166	5617	234	5797	232		
4	180	200	226	251	273	286	284	273	256	241	226	221	227	240	259	270	280	279	269	243	214	186	166	156	5706	238	5869	235		
5	183	180	205	232	255	269	272	263	241	222	208	201	202	222	246	269	289	299	295	276	249	217	191	176	5642	235	5810	232		
6	168	183	205	229	254	271	273	265	244	218	200	184	181	194	221	253	278	299	306	299	276	244	215	195	5655	236	5839	234		
7	184	191	209	229	254	271	274	266	246	218	190	168	158	161	186	216	247	275	293	294	282	260	233	209	5514	230	5709	228		
8	195	191	203	226	246	262	270	263	245	219	188	160	144	142	158	185	216	246	275	286	288	276	255	236	5375	224	5595	224		
9	220	216	220	236	259	275	282	280	267	243	211	182	163	151	156	178	205	233	263	281	291	290	277	266	5645	235	5897	236		
10	252	247	247	260	274	289	298	294	285	266	238	210	184	166	160	168	185	207	229	248	259	268	264	258	5756	240	6008	240		
11	252	247	246	255	264	277	283	281	275	259	238	215	190	170	159	159	165	176	194	207	221	231	235	238	5437	227	5679	227		
12	242	244	246	252	262	272	278	280	279	269	255	241	224	206	194	191	188	191	201	209	216	226	233	240	5639	235	5886	235		
13	247	253	261	267	273	279	279	281	276	270	258	245	235	224	216	208	202	197	197	198	202	204	212	221	5705	238	5938	238		
14	233	247	259	269	275	278	278	274	270	265	257	252	246	244	238	233	226	220	209	203	198	197	202	213	5786	241	6010	240		
15	224	242	258	270	281	284	282	274	267	262	255	251	251	254	256	257	252	242	229	217	206	198	198	206	5916	247	6134	245		
16	218	234	252	266	278	280	276	264	253	246	238	235	240	248	257	262	262	256	239	224	205	192	188	189	5802	242	6003	240		
17	201	217	236	255	266	270	266	253	240	226	217	217	224	236	252	264	270	270	261	239	220	204	192	192	5688	237	5888	236		
18	200	219	238	259	272	278	271	258	242	224	216	211	221	235	253	271	280	283	275	259	236	215	198	194	5808	242	6005	240		
19	197	215	232	256	277	278	276	260	240	221	207	200	206	225	250	273	291	300	299	283	263	241	222	212	5924	247	6136	245		
20	212	228	247	267	283	291	284	270	249	227	207	195	196	215	237	263	286	301	302	294	276	250	231	216	6029	251	6241	250		
21	212	223	244	262	280	289	290	274	251	226	201	188	186	198	223	253	281	299	308	305	292	269	250	236	6040	252	6270	251		
22	230	235	253	268	284	296	294	282	261	233	205	187	177	182	207	231	258	280	292	295	285	264	248	234	5981	249	6204	248		
23	223	224	236	253	268	279	280	269	248	222	194	173	157	157	175	200	228	250	268	276	273	261	244	231	5589	233	5812	232		
24	223	222	231	244	260	271	272	265	250	227	197	176	159	155	165	186	212	237	256	272	277	268	257	249	5531	230	5772	231		
25	241	239	246	259	271	285	287	282	267	246	219	195	177	167	170	183	207	229	248	262	270	268	264	257	5739	239	5993	240		
26	254	253	256	265	277	289	291	287	279	260	235	210	193	178	176	184	198	216	234	249	259	264	265	261	5833	243	6093	244		
27	260	265	266	272	285	293	294	293	284	270	250	227	211	197	188	190	198	208	219	233	243	249	257	257	5909	246	6168	247		
28	259	265	269	273	283	288	289	287	281	268	256	239	219	210	203	196	194	199	202	210	217	224	232	240	5803	242	6050	242		
29	247	256	263	268	273	276	275	274	266	260	249	237	228	221	213	206	203	197	194	196	198	201	212	222	5635	235	5867	235		
30	232	248	260	267	273	274	272	264	259	250	244	239	237	234	232	229	221	211	202	196	190	186	195	207	5622	234	5840	234		
31	218	237	253	265	273	271	263	253	244	234	230	231	235	239	244	246	242	227	214	199	186	180	181	189	5554	231	5761	230		
MONTHLY MEAN																											238.0		cm	

STATION : SYOWA STATION
 LATITUDE : 69°00'28"S
 LONGITUDE : 39°34'13"E
 DURATION : NOV. 1. - NOV. 30, 2002
 UNIT : CENTIMETRE

The zero level of the tide gauge relative to the bench mark No. 1040 : -5.000m
 The revision quantity to the zero level of the tide gauge : -0.773m

Date	Time																							(24H)		(25H)				
	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	SUM	MEAN		
1	207	228	247	262	269	270	262	247	234	228	219	221	230	240	258	268	267	261	244	223	200	188	180	184	5635	235	5832	233		
2	197	217	237	255	264	264	252	237	216	199	188	190	202	220	244	265	277	278	265	245	220	200	188	184	5504	229	5694	228		
3	190	211	230	248	262	263	251	229	205	182	166	164	176	199	227	259	281	291	288	271	248	225	205	195	5466	228	5666	227		
4	200	214	233	251	267	268	258	238	209	180	158	146	151	176	205	239	271	288	296	292	273	249	228	210	5500	229	5710	228		
5	210	221	238	255	267	274	264	246	216	183	152	134	130	143	172	207	243	270	287	293	285	266	247	231	5434	226	5657	226		
6	223	228	243	260	276	284	278	263	236	203	170	140	127	133	153	183	218	247	270	286	287	278	265	252	5503	229	5748	230		
7	245	242	253	269	284	293	294	281	264	234	197	168	148	139	149	170	198	227	250	269	282	279	271	265	5671	236	5931	237		
6	260	255	260	273	286	296	300	293	279	255	224	196	172	157	155	166	185	207	228	248	259	265	266	264	5749	240	6012	240		
9	263	259	263	272	282	293	298	295	286	270	248	219	199	182	172	173	183	197	212	229	243	252	257	260	5807	242	6070	243		
10	263	265	266	271	277	287	291	291	285	277	260	242	225	210	199	195	195	199	208	219	229	240	248	255	5897	246	6158	246		
11	261	266	270	273	278	284	283	284	280	274	264	255	242	233	225	217	215	211	212	216	222	229	238	246	5980	249	6236	249		
12	256	265	269	274	274	272	270	267	263	259	253	249	242	237	234	227	220	215	209	207	206	208	216	225	5817	242	6054	242		
13	237	249	258	266	267	263	259	255	251	246	243	244	245	248	252	251	248	239	231	224	216	221	229	5859	244	6101	244			
14	242	255	265	273	276	274	264	254	246	238	235	240	246	255	262	269	271	263	251	241	231	226	225	230	6032	251	6273	251		
15	241	255	267	275	278	273	263	250	237	224	219	222	231	246	261	271	275	275	263	250	237	226	223	224	5986	249	6220	249		
16	234	249	260	269	275	272	259	241	225	212	203	207	217	234	253	271	280	280	273	262	245	230	223	223	5897	246	6128	245		
17	231	245	259	269	274	272	258	238	218	200	190	190	199	219	244	268	284	290	288	278	264	247	236	232	5893	246	6134	245		
18	241	252	267	281	288	287	275	253	231	209	192	189	195	213	240	266	287	300	302	294	281	263	250	243	6099	254	6346	254		
19	247	256	270	284	291	291	281	259	234	207	184	175	177	192	219	247	272	291	298	297	284	269	258	248	6031	251	6276	251		
20	245	254	270	280	288	292	284	264	238	210	184	169	165	176	202	229	255	278	292	293	286	274	261	252	5941	248	6188	248		
21	247	253	263	277	289	291	286	271	247	217	187	168	159	165	188	213	242	269	285	296	297	285	277	270	5942	248	6205	248		
22	263	266	275	288	298	308	305	291	270	241	213	188	171	170	182	203	228	254	273	291	293	289	282	274	6116	255	6390	256		
23	271	270	274	287	300	308	306	297	282	254	225	201	181	174	177	192	215	238	257	274	283	284	282	278	6110	255	6384	255		
24	274	272	275	285	295	302	302	296	285	264	238	211	189	177	172	181	196	215	229	250	260	267	267	267	5969	249	6235	249		
25	266	264	268	272	279	288	289	287	280	265	242	222	202	188	178	180	188	201	218	232	246	256	261	262	5834	243	6102	244		
26	268	269	271	273	281	286	288	285	279	270	256	238	223	210	199	194	195	197	207	217	225	236	245	254	5866	244	6125	245		
27	259	264	268	266	268	274	271	269	267	263	255	248	238	229	220	212	208	205	208	209	218	224	234	246	5823	243	6077	243		
28	254	263	268	269	268	269	263	260	258	253	251	251	251	250	246	242	232	225	218	214	213	216	225	237	5896	246	6143	246		
29	247	256	265	267	266	262	252	241	234	231	231	237	244	252	259	259	255	245	232	222	215	212	217	227	5828	243	6065	243		
30	237	250	260	262	260	251	236	220	211	202	201	209	223	240	255	265	267	259	248	235	219	212	210	215	5647	235	5873	235		
MONTHLY MEAN																											242.7		cm	

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

The zero level of the tide gauge relative to the bench mark No. 1040 : -5.000m
 The revision quantity to the zero level of the tide gauge : -0.781m

Date	Time																								(24H)		(25H)	
	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	SUM	MEAN
1	226	240	250	256	259	250	232	213	195	185	182	190	206	230	256	278	293	294	286	273	256	243	238	239	5770	240	6018	241
2	248	261	275	281	282	273	256	229	204	182	172	173	189	214	242	274	296	305	304	293	275	260	248	243	5979	249	6227	249
3	248	259	272	282	285	279	261	234	204	175	154	148	157	178	210	241	271	289	301	298	284	269	256	247	5802	242	6050	242
4	248	258	268	278	284	284	269	243	212	176	151	133	132	149	178	212	246	273	292	300	296	285	273	260	5700	238	5958	238
5	258	267	282	291	300	303	293	272	243	208	177	148	136	143	158	188	220	248	272	284	287	283	271	263	5795	241	6053	242
6	258	259	269	283	293	298	297	284	260	229	195	166	145	138	148	169	197	224	248	266	276	276	272	267	5717	238	5978	239
7	261	258	262	275	286	295	297	291	275	251	219	191	165	151	150	163	182	206	230	247	262	269	269	267	5722	238	5985	239
8	263	261	262	269	281	293	296	298	290	275	253	229	207	191	184	189	199	217	235	252	269	278	281	282	6054	252	6337	253
9	283	280	278	280	288	295	300	304	299	286	271	252	233	215	204	202	203	212	226	238	251	262	268	270	6200	258	6471	259
10	271	270	267	266	267	272	275	276	275	270	260	248	236	224	215	205	207	208	213	224	233	243	250	258	5933	247	6192	248
11	259	261	260	259	259	259	258	264	264	261	258	255	248	243	237	235	230	227	229	234	239	245	254	258	5996	250	6259	250
12	263	266	268	265	260	256	253	252	250	248	249	249	249	247	248	245	243	239	237	233	235	238	241	249	5983	249	6236	249
13	253	255	257	254	248	242	233	227	225	222	222	226	231	238	244	247	247	243	238	233	230	228	232	237	5712	238	5957	238
14	245	250	252	252	248	239	226	215	207	202	205	209	217	232	241	251	256	252	248	240	233	230	232	235	5617	234	5861	234
15	244	251	256	255	253	241	227	212	199	192	189	195	206	224	241	255	264	267	263	255	247	238	237	238	5649	235	5894	236
16	245	251	257	260	256	248	233	215	197	184	178	179	191	211	233	254	270	275	273	270	260	248	244	244	5676	237	5925	237
17	249	256	267	269	267	260	246	221	199	181	170	167	175	195	217	241	261	274	277	274	266	253	246	244	5675	236	5922	237
18	247	254	264	271	272	269	254	233	209	185	168	160	169	188	216	246	269	287	297	298	293	283	272	265	5869	245	6137	245
19	268	275	286	295	298	295	284	261	234	205	181	167	167	179	203	228	253	278	295	296	293	284	273	265	6063	253	6325	253
20	262	267	276	285	292	293	285	266	240	208	179	159	150	156	175	202	233	259	278	289	291	285	277	270	5877	245	6143	246
21	266	267	278	288	296	300	297	284	259	229	200	174	158	156	167	190	218	246	267	283	289	287	282	273	5954	248	6221	249
22	267	266	273	282	292	300	301	291	274	247	215	188	167	158	180	175	198	223	247	264	275	276	273	270	5882	244	6153	246
23	264	258	261	270	282	291	295	290	281	262	235	207	186	170	164	172	190	211	233	252	266	275	277	273	5865	245	6136	245
24	271	268	265	270	281	290	295	298	294	283	262	240	221	203	191	193	202	216	235	251	263	274	281	277	6124	255	6398	256
25	274	271	266	264	269	276	279	282	284	277	264	248	230	215	203	196	198	205	215	228	242	249	257	258	5950	248	6205	248
26	255	254	250	245	243	246	250	252	255	255	252	243	233	223	215	205	201	201	205	215	225	230	239	247	5639	235	5887	235
27	248	246	242	238	233	230	229	233	235	239	241	243	243	242	237	233	228	222	220	221	227	232	237	244	5643	235	5889	236
28	246	245	245	239	229	220	213	208	209	212	216	225	234	238	245	249	247	240	234	230	231	233	235	245	5568	232	5816	233
29	248	250	252	242	235	223	207	194	189	187	191	202	218	233	247	260	266	261	254	249	241	239	241	243	5572	232	5821	233
30	249	255	254	249	241	228	209	191	175	166	164	174	192	214	236	257	270	275	271	265	257	249	245	249	5535	231	5786	231
31	251	256	261	264	257	244	223	198	178	159	149	153	168	192	219	248	270	283	289	285	276	266	258	258	5605	234	5865	235
MONTHLY MEAN																										242.1 cm		

STATION : SYOWA STATION
 LATITUDE : 69°00'28"S
 LONGITUDE : 39°34'13"E
 DURATION : JAN . 1 . - JAN . 31 . 2003
 UNIT : CENTIMETRE

The zero level of the tide gauge relative to the bench mark No. 1040 : -5.000m
 The revision quantity to the zero level of the tide gauge : -0.789m

Date	Time																							(24H)		(25H)				
	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	SUM	MEAN		
1	260	265	272	277	275	265	246	218	191	164	144	137	147	166	193	225	254	276	288	289	285	274	264	258	5633	235	5893	236		
2	260	267	276	282	287	283	267	243	213	179	155	138	134	147	171	203	234	262	281	289	286	278	268	259	5662	236	5919	237		
3	257	259	271	281	289	291	280	262	234	199	167	142	130	134	151	175	207	236	258	273	276	271	264	254	5561	232	5809	232		
4	248	250	258	268	280	286	284	272	251	221	188	157	138	132	140	161	187	216	241	259	269	269	261	254	5490	229	5736	229		
5	246	241	247	260	275	285	289	283	269	245	214	185	160	146	146	160	180	205	230	248	261	264	258	251	5548	231	5791	232		
6	243	235	235	244	257	271	278	279	272	259	232	204	182	165	159	164	177	199	218	238	252	257	253	247	5520	230	5762	230		
7	242	233	228	233	243	257	267	270	270	262	244	222	202	186	176	175	182	197	215	232	246	253	252	247	5534	231	5775	231		
8	241	233	227	226	232	245	255	261	263	261	250	235	219	206	196	193	198	206	218	233	242	247	250	245	5582	233	5822	233		
9	240	232	224	218	220	225	231	240	245	244	241	233	221	214	206	203	204	209	215	225	234	240	241	240	5445	227	5681	227		
10	236	229	221	213	211	212	216	220	224	227	224	223	219	216	216	215	216	216	223	228	235	236	238	242	5356	223	5595	224		
11	239	233	225	220	214	207	209	210	208	215	219	217	220	221	226	227	231	231	230	235	239	238	240	241	5395	225	5635	225		
12	240	235	231	222	218	209	201	198	196	197	201	204	211	219	228	237	242	244	244	244	243	242	241	242	5389	225	5633	225		
13	244	240	237	233	226	220	208	197	192	189	189	196	206	220	235	248	260	263	266	263	260	258	255	255	5560	232	5816	233		
14	256	258	255	251	246	236	223	206	194	186	183	183	195	210	228	248	262	270	271	268	264	260	254	251	5658	236	5908	236		
15	250	254	255	252	249	240	222	203	184	171	161	158	166	185	207	232	252	264	271	271	265	257	250	248	5467	228	5715	229		
16	248	251	254	257	256	249	234	211	188	167	153	145	150	165	190	219	244	263	275	280	277	268	257	252	5453	227	5704	228		
17	251	255	264	268	270	267	254	232	207	180	157	143	143	155	178	207	236	257	274	280	277	272	262	253	5542	231	5792	232		
18	250	253	259	268	273	276	266	245	220	188	158	139	127	131	150	179	208	235	256	267	269	263	253	244	5377	224	5616	225		
19	239	238	245	255	267	272	269	257	234	204	171	143	128	123	135	161	190	217	242	260	265	264	255	246	5280	220	5517	221		
20	237	231	238	253	264	276	280	274	257	234	201	170	146	131	137	155	180	207	232	251	261	263	254	244	5376	224	5609	224		
21	233	227	229	243	258	272	282	284	278	261	234	206	178	165	166	174	192	218	241	262	273	276	271	261	5684	237	5935	237		
22	251	240	237	243	260	275	282	292	292	283	263	238	213	191	184	184	193	211	231	247	261	265	262	252	5850	244	6085	243		
23	240	228	219	216	224	238	250	260	267	265	256	240	222	206	192	189	195	205	221	236	247	255	256	245	5572	232	5807	232		
24	235	223	212	204	205	214	225	235	246	253	253	247	238	230	218	214	214	218	230	241	249	252	253	250	5559	232	5799	232		
25	240	231	216	205	201	203	206	214	222	231	236	239	238	235	235	232	231	231	236	242	247	250	252	251	5524	230	5768	231		
26	244	234	224	211	203	198	191	194	200	204	215	225	232	239	244	248	252	252	252	252	255	256	255	254	5534	231	5786	231		
27	252	247	237	228	218	207	195	190	188	189	197	208	221	238	252	266	275	279	278	278	276	273	270	272	5734	239	6005	240		
28	271	267	263	257	245	232	215	198	188	182	182	188	203	224	245	265	284	294	296	293	289	283	279	277	5920	247	6198	248		
29	278	280	281	279	272	261	245	219	198	184	174	175	185	204	232	259	281	297	304	303	296	288	282	277	6054	252	6331	253		
30	277	283	287	289	288	281	265	240	215	189	171	163	167	182	207	235	264	284	298	300	294	285	275	266	6005	250	6272	251		
31	267	272	279	286	292	290	276	255	228	197	169	155	149	159	183	212	242	268	287	294	291	280	269	257	5857	244	6112	244		
MONTHLY MEAN																											232.7		cm	

Table 7. Harmonic constants at Syowa Station.

(1) POSITION		(3) MEAN SEA LEVEL	
LAT	69 00 28S	S0	246.3 CM
LONG	39 34 13E		
(2) EPOCH & DURATION OF ANALYSIS		(4) SPECIAL REMARKS	
EPOCH	2002 2 1	O-P MAX	41.7 CM
CENTRAL DATE	2002 8 2	O-P S.D.	9.8 CM
DURATION IN DAYS	365 DAYS		
MISSING HOUR	0 HOURS		
ERROR	0		

	H(CM)	κ (DEG)		H(CM)	κ (DEG)
SA	6.80	72.78	M2	24.82	233.00
SSA	1.44	326.58	MKS2	0.14	249.51
MM	3.57	152.73	LAM2	0.28	217.17
MSF	0.81	185.42	L2	1.46	213.35
MF	4.10	217.23	T2	1.23	240.40
2Q1	0.90	0.25	S2	20.19	251.13
SIG1	1.15	9.37	R2	0.25	283.63
Q1	5.73	12.90	K2	5.80	249.65
RHO1	1.00	18.51	MSN2	0.06	162.48
O1	24.34	24.64	KJ2	0.32	118.78
MP1	0.40	40.03	2SM2	0.23	193.40
M1	1.22	31.71	MO3	0.08	304.11
CHI1	0.33	32.20	M3	0.23	16.05
PI1	0.48	47.58	SO3	0.02	82.17
P1	7.45	33.22	MK3	0.03	327.84
S1	0.25	131.16	SK3	0.40	86.07
K1	22.15	34.89	MN4	0.24	188.45
PSI1	0.23	358.37	M4	0.40	251.95
PHI1	0.12	51.88	SN4	0.06	262.61
THE1	0.13	358.17	MS4	0.17	321.88
J1	0.94	34.04	MK4	0.07	299.44
SO1	0.30	30.78	S4	0.03	352.64
OO1	0.56	11.17	SK4	0.10	329.62
OQ2	0.06	253.84	2MN6	0.07	231.36
MNS2	0.10	78.28	M6	0.14	304.77
2N2	0.46	179.62	MSN6	0.09	21.53
MU2	0.57	178.10	2MS6	0.33	45.58
N2	4.46	219.72	2MK6	0.09	38.19
NU2	0.79	235.92	2SM6	0.12	111.79
OP2	0.03	181.99	MSK6	0.08	118.33

NON-HARMONIC CONSTANTS

	M2	S2	K1	O1
H	24.82	20.19	22.15	24.34
κ	233.00	251.13	34.89	24.64
H(M2+S2) =	45.01	$\kappa(S2-M2) =$	18.13	
H(K1+O1) =	46.48	$\kappa(K1-O1) =$	10.25	
H(K1+O1)/H(M2+S2) =	1.03	$\kappa(K1)/15 =$	2.33	
H(S2)/H(M2) =	0.81	$\kappa(K1)/15-K(M2)/29 =$	-5.71	
H(O1)/H(K1) =	1.10			
M.H.W.I. =	8.034 (8H 2M)			
H(M2+S2+K1+O1) =	91.49			

Table 8. Harmonic analysis of tidal current for 15 days near Syowa Station.

Depth=16m

		M2	S2	K2	N2	K1	O1	P1	Q1	M4	MS4	CONSTANT
North	V(cm/s)	1.54	1.54	0.41	0.93	0.36	0.36	0.1	0.36	0.31	0.31	1.13
Comp.	κ(deg.)	212.3	258.2	258.2	144.1	110.7	107.1	110.7	324.7	318.1	351.4	
East	V(cm/s)	0.26	0.46	0.15	0.26	0.31	0.41	0.1	0.21	0.31	0.36	1.23
Comp.	κ(deg.)	0.5	125.8	125.8	26	93.7	214	93.7	192	331	329.4	
Main Dir.	V(cm/s)	1.54	1.59	0.41	0.93	0.31	0.36	0.1	0.36	0.26	0.26	0.93
351.6°	κ(deg.)	211.6	260.1	260.1	146.3	113.1	98.2	113.1	328.3	315.5	355.6	

Depth=20m

		M2	S2	K2	N2	K1	O1	P1	Q1	M4	MS4	CONSTANT
North	V(cm/s)	1.29	1.13	0.31	0.67	0.26	0.51	0.1	0.21	0.36	0.36	0.87
Comp.	κ(deg.)	214.6	261.2	261.2	126.7	128.9	79.6	128.9	226.9	297.9	334.7	
East	V(cm/s)	0.21	0.31	0.1	0.31	0.36	0.62	0.1	0.51	0.31	0.21	0.93
Comp.	κ(deg.)	337	121.1	121.1	28.7	134.2	178.7	134.2	206.2	352.3	334	
Main Dir.	V(cm/s)	1.29	1.13	0.31	0.67	0.21	0.51	0.05	0.1	0.31	0.36	0.72
350.4°	κ(deg.)	213.2	262.8	262.8	131.1	127.3	68.5	127.3	243.8	290.6	334.8	

Depth=24m

		M2	S2	K2	N2	K1	O1	P1	Q1	M4	MS4	CONSTANT
North	V(cm/s)	0.98	0.87	0.26	0.51	0.15	0.41	0.05	0.26	0.1	0.36	0.98
Comp.	κ(deg.)	223.8	257.8	257.8	122	88.6	90.2	88.6	232.2	322.3	325	
East	V(cm/s)	0.57	0.36	0.1	0.62	0.41	0.72	0.15	0.41	0.15	0.15	0.98
Comp.	κ(deg.)	296.8	141	141	20.7	159.9	184.1	159.9	192.9	352.9	1.7	
Main Dir.	V(cm/s)	0.93	0.67	0.21	0.51	0.26	0.51	0.1	0.46	0.21	0.36	1.34
33.4°	κ(deg.)	242.6	242.4	242.4	78.5	136.7	142.8	136.7	212.3	336.5	333.4	

Depth=28m

		M2	S2	K2	N2	K1	O1	P1	Q1	M4	MS4	CONSTANT
North	V(cm/s)	0.72	1.08	0.31	0.67	0.15	0	0.05	0.26	0.15	0.41	1.13
Comp.	κ(deg.)	231.3	242.4	242.4	110.3	56	145.2	56	228.4	306.9	327.5	
East	V(cm/s)	0.77	0.36	0.1	0.87	0.36	0.72	0.1	0.51	0.05	0.21	1.08
Comp.	κ(deg.)	289.6	158.3	158.3	13.5	191.6	195	191.6	168.7	348.7	275.7	
Main Dir.	V(cm/s)	0.82	1.03	0.26	0.67	0.1	0.26	0.05	0.36	0.15	0.41	1.44
21.9°	κ(deg.)	248.3	234.7	234.7	80.3	128	191.8	128	202.7	310.6	319.4	

Depth=32m

		M2	S2	K2	N2	K1	O1	P1	Q1	M4	MS4	CONSTANT
North	V(cm/s)	0.77	1.13	0.31	0.62	0.21	0.1	0.05	0.1	0.05	0.46	1.18
Comp.	κ(deg.)	246.4	236.8	236.8	96	20.3	233.5	20.3	212.7	277.4	306.2	
East	V(cm/s)	0.77	0.36	0.1	0.82	0.36	0.62	0.1	0.62	0.05	0.31	1.03
Comp.	κ(deg.)	284.4	140.3	140.3	4.4	209.2	190.9	209.2	166.5	190	262.9	
Main Dir.	V(cm/s)	0.93	1.08	0.31	0.62	0.05	0.26	0	0.26	0.05	0.51	1.39
16.5°	κ(deg.)	254.9	231.4	231.4	74	7.1	207.7	7.1	182.2	260.6	298.9	