

Oceanographic Data of the 32nd Japanese  
Antarctic Research Expedition  
from November 1990 to March 1991

Hiromi Nakamura and Ken-ichi Noguchi

Hydrographic Department, Maritime Safety Agency  
3-1, Tsukiji 5-chome, Chuo-ku, Tokyo 104

1. Oceanographic Observations

The track chart of the icebreaker "Shirase" and the station sites of oceanographic observations are shown in Figs.1 and 2.

Surface water sampling and XBT were made during the cruise. CTD and serial observations were made in the Southern Ocean off Australia.

Four surface drifting buoys and seven XCPs were deployed in the area of the Antarctic Circumpolar Current.

(1) Surface water sampling

Sea surface water sampling for surface temperature measurement and chemical analyses were made twice or three times a day. The results are given in Table 1.

(2) XBT observation

XBT (expendable bathythermograph) observations were carried out at 202 stations in the Southern Ocean en route from Fremantle to Sydney and Breid Bay. The results are given in Table 2 and Figs. 3,4,5 and 6.

(3) CTD observation

CTD (conductivity, temperature and depth profiling system of Neil Brown Smart CTD type-c) observations were carried out at 5 stations in the Southern Ocean off Australia.

The results are given in Table 3 and Table 4.

(4) Serial observation

Serial observations were carried out at 6 stations. The results including interpolated and calculated values of temperature, practical salinity, sigma-t and dynamic depth anomaly at each standard depth together with meteorological data are given in Table 5.

(5) Chemical analyses of sea water

The following methods and instruments were used for chemical analyses:

Practical salinity	: Conductive salinometer (Auto-Sal Model 8400A)
pH	: Digital pH meter (Horiba Seisakujo F-16)
Dissolved oxygen	: The Winkler's method with a Metrohm Model E415-20S Titrator.
Phosphate-P(*)	: Molybdenum blue method
Silicate-Si(*)	: Molybdenum yellow method
Nitrate-N(*)	: Modified Morris and Riley method
Nitrite-N(*)	: Sulphanilamide and N-(1-naphthyl)-ethylenediamine dihydrochloride were used as reagents.
Ammonium-N(*)	: Indophenol method
Petroleum oil(**)	: Integrated Global Ocean Service System method
Cd, Cu and Zn(**)	: Japan Hydrographic Department method

(\* The nutrient matters were analyzed with a Shimadzu Model UV-120 spectrophotometer with auto flow cell system.)

(\*\* These items are employed at 19 stations (P1-P19) for surface water samples in order to monitor the level of marine pollution.)

The results are given in Table 6.

(6) The tidal stream observation

The tidal stream observation was carried out 50 hours at 70° 16' S, 39° 37' E with a ACM4M (ALEC ELECTRONICS Co.).

Observation depth was 10m below the sea surface. The results are given in Fig. 7.

(7) Current observation with four surface drifting buoys

The first surface drifting buoy was deployed at 49° 37' S, 109° 57' E on December 7, 1990, the second was deployed at 54° 31' S, 110° 04' E on December 8, 1990, the third was deployed at 53° 23' S, 150° 00' E on March 16, 1991, and the fourth was deployed at 48° 36' S, 149° 58' E on March 17, 1991. But the second one died soon.

The trajectories are shown in Fig. 8.

(8) Vertical current observation with XCP

XCP(expendable current profiler, system of Sippican Inc. U.S.A)  
observations were carried out at 7 stations as follows. (Figs. 9 and 10):

①	November 23, 1990	23:00 (UT)	16°-11' S,	114°-05' E
②	December 20, 1990	11:30 (UT)	68°-24' S,	23°-49' E
③	February 25, 1991	10:20 (UT)	70°-08' S,	24°-00' E
④	March 5, 1991	03:00 (UT)	64°-42' S,	46°-47' E
⑤	March 10, 1991	05:00 (UT)	62°-00' S,	110°-00' E
⑥	March 13, 1991	09:00 (UT)	62°-00' S,	146°-55' E
⑦	March 15, 1991	08:50 (UT)	55°-30' S,	150°-05' E

## 2. Tidal Observation

The tidal observation at Syowa Station has been carried out since 1965. At present, a pressure gauge (strain gauge) is operated. The sensor is placed in the Nisi-no-ura Cove on East Ongul Island at a sea bottom of about 15m and the data logger is installed in the nearby Earth Science Laboratory.

We had been asked by Mr. K. Nagasaka, a member of the wintering party of JARE-31, to take care of the tide gauge from February 1990 to January 1991.

A new tide gauge (Meisei Denki Co. QWP-8-303D) was set on January 22, 1990 and for backup, the same type gauge was set on January 25, 1991. They have been operated in parallel since then (Fig. 11). Hourly, daily and monthly mean sea levels from February 1990 to January 1991 are given in Table 7.

We have asked Mr. M. Yamamoto, a member of the wintering party of JARE-32, to take care of the tide gauges from February 1991 onward.

## Acknowledgments

The authors would like to express their sincere thanks to Prof. S. Kokubun, the leader of JARE-32, and Dr. Y. Fujii, the over winter party leader of JARE-32, and to all the members of the expedition for their helpful support and valuable advice, and to the leader Prof. Y. Naito and the other members of JARE-31 for their cooperation in maintenance and calibration of the tide gauge.

The authors also express their thanks to Captain K. Saito, the officers and the crew of the icebreaker "Shirase".

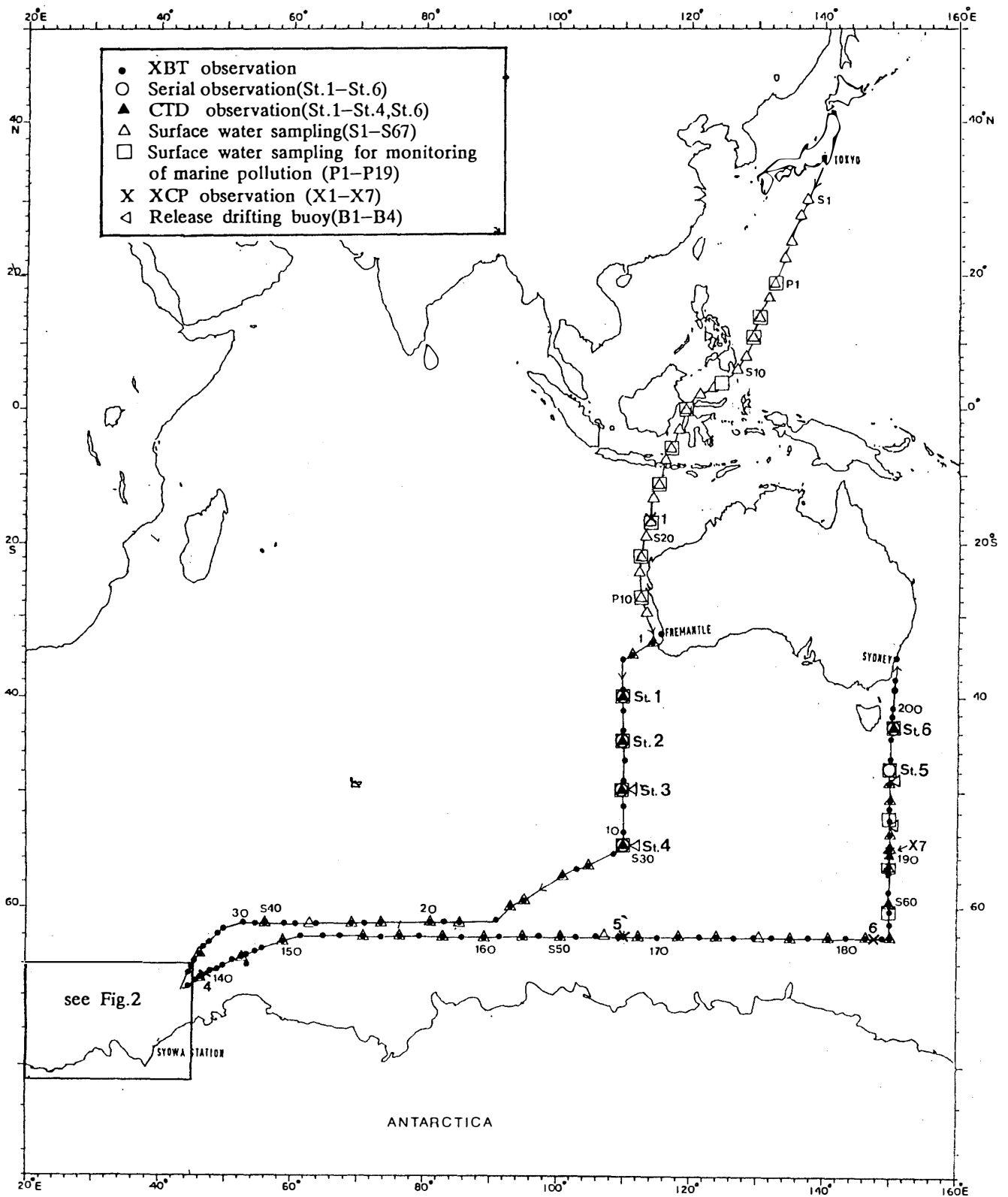


Fig. 1. The track chart of the icebreaker "Shirase" and the station sites of oceanographic observation at the course from Japan to the Antarctic.

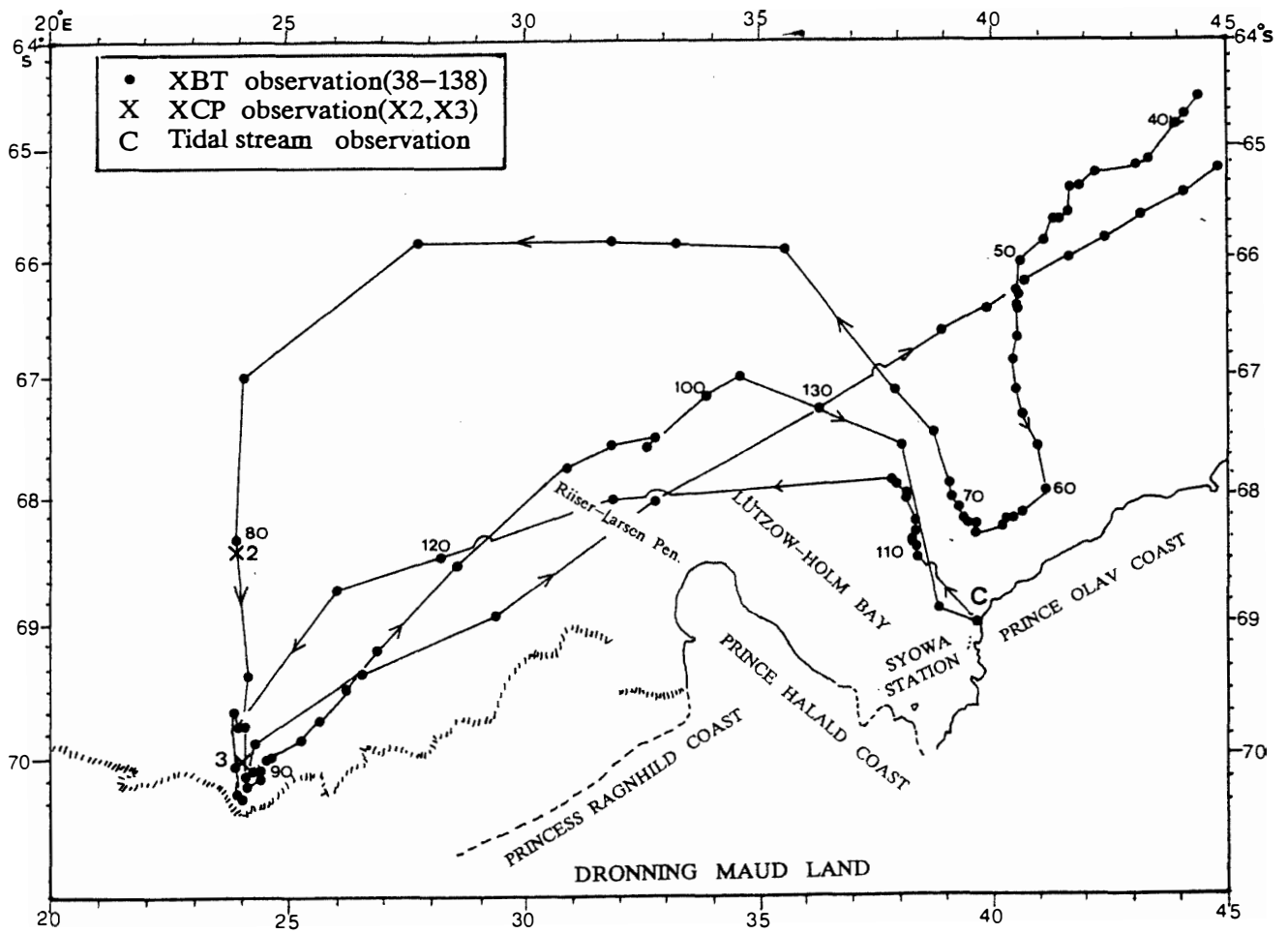


Fig. 2. The track chart of the icebreaker "Shirase" and the station sites of oceanographic observation offshore the Syowa Station, Antarctica.

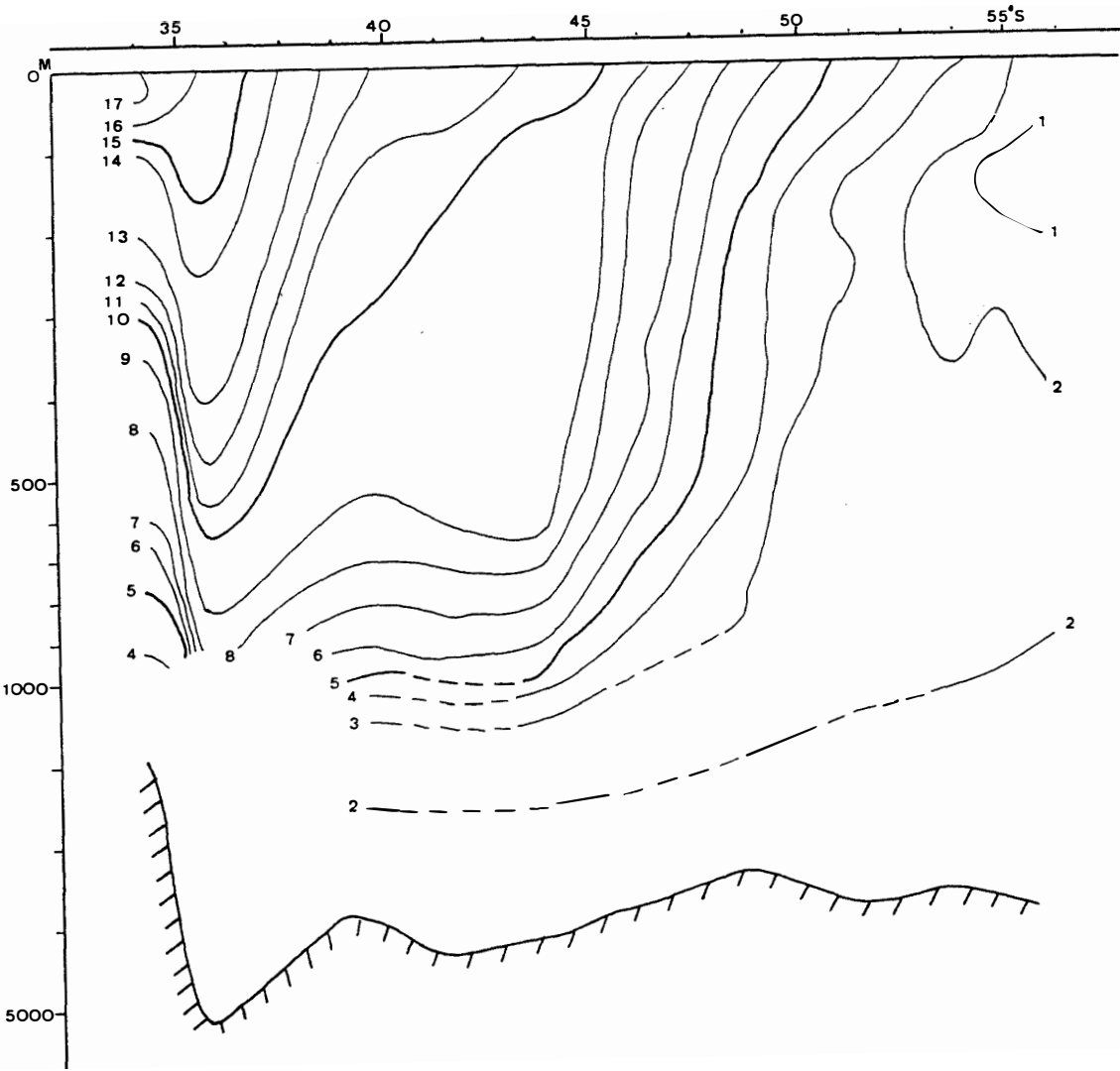


Fig. 3. Vertical profile of water temperature (°C) observed on 110° E line.

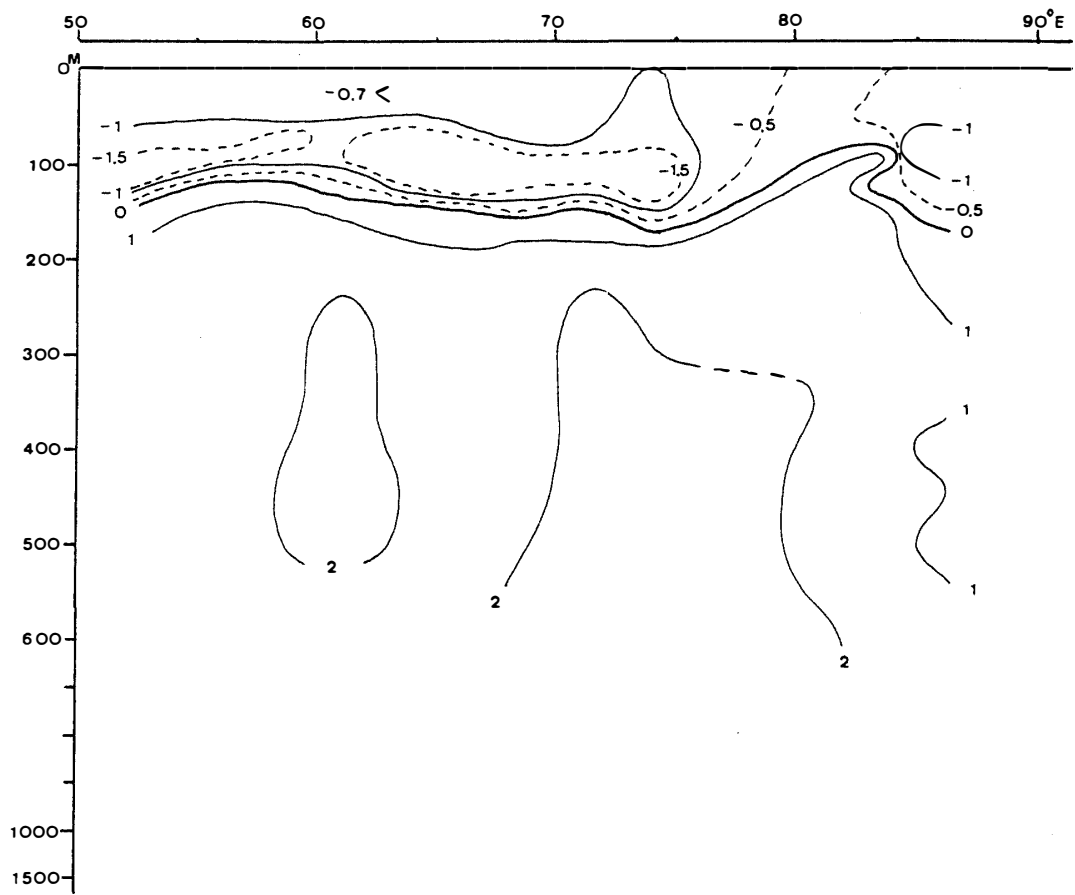


Fig. 4. Vertical profile of water temperature ( $^{\circ}\text{C}$ ) observed on  $61^{\circ}\text{S}$  line.

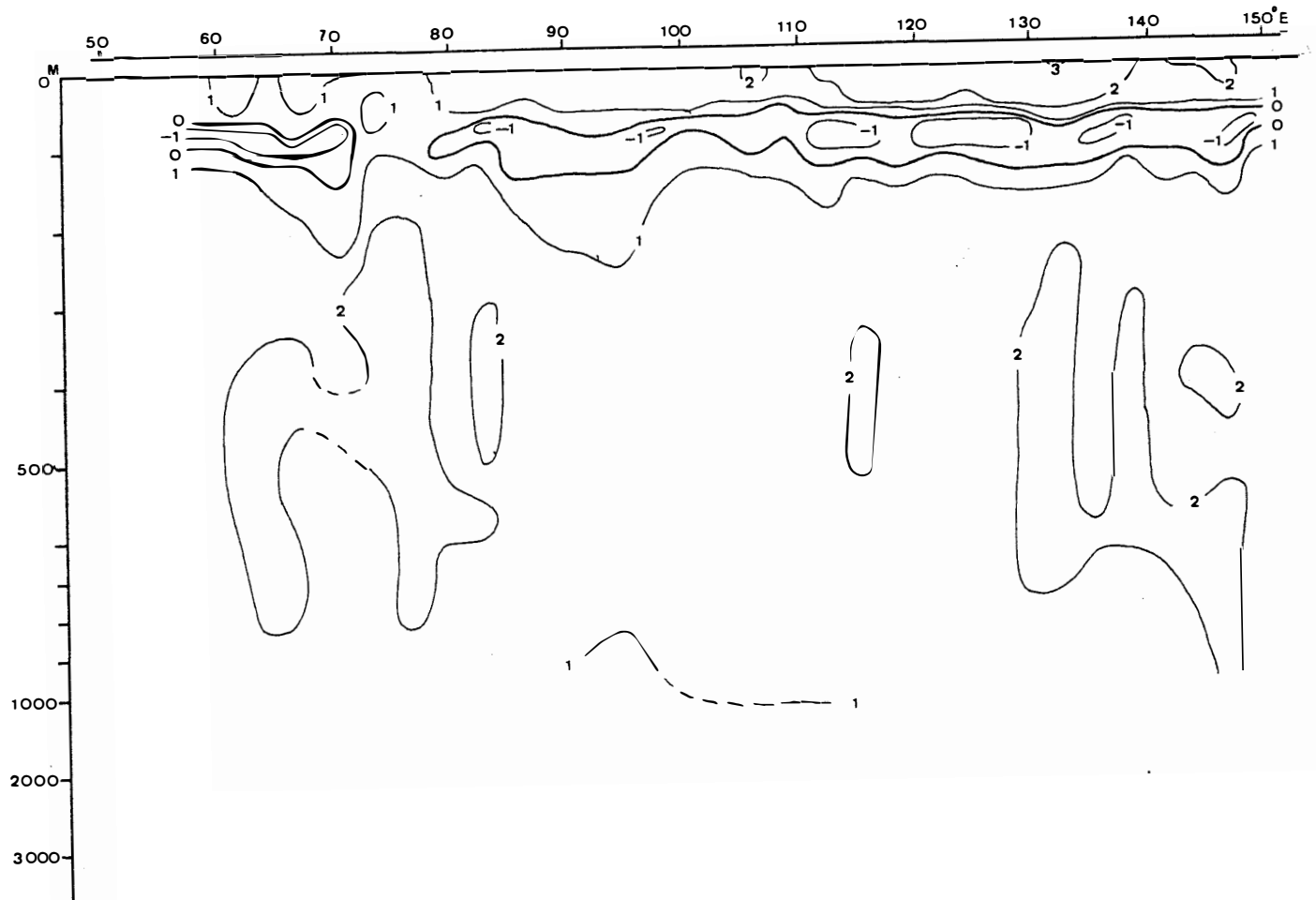


Fig. 5. Vertical profile of water temperature ( $^{\circ}\text{C}$ ) observed on  $62^{\circ}\text{S}$  line.



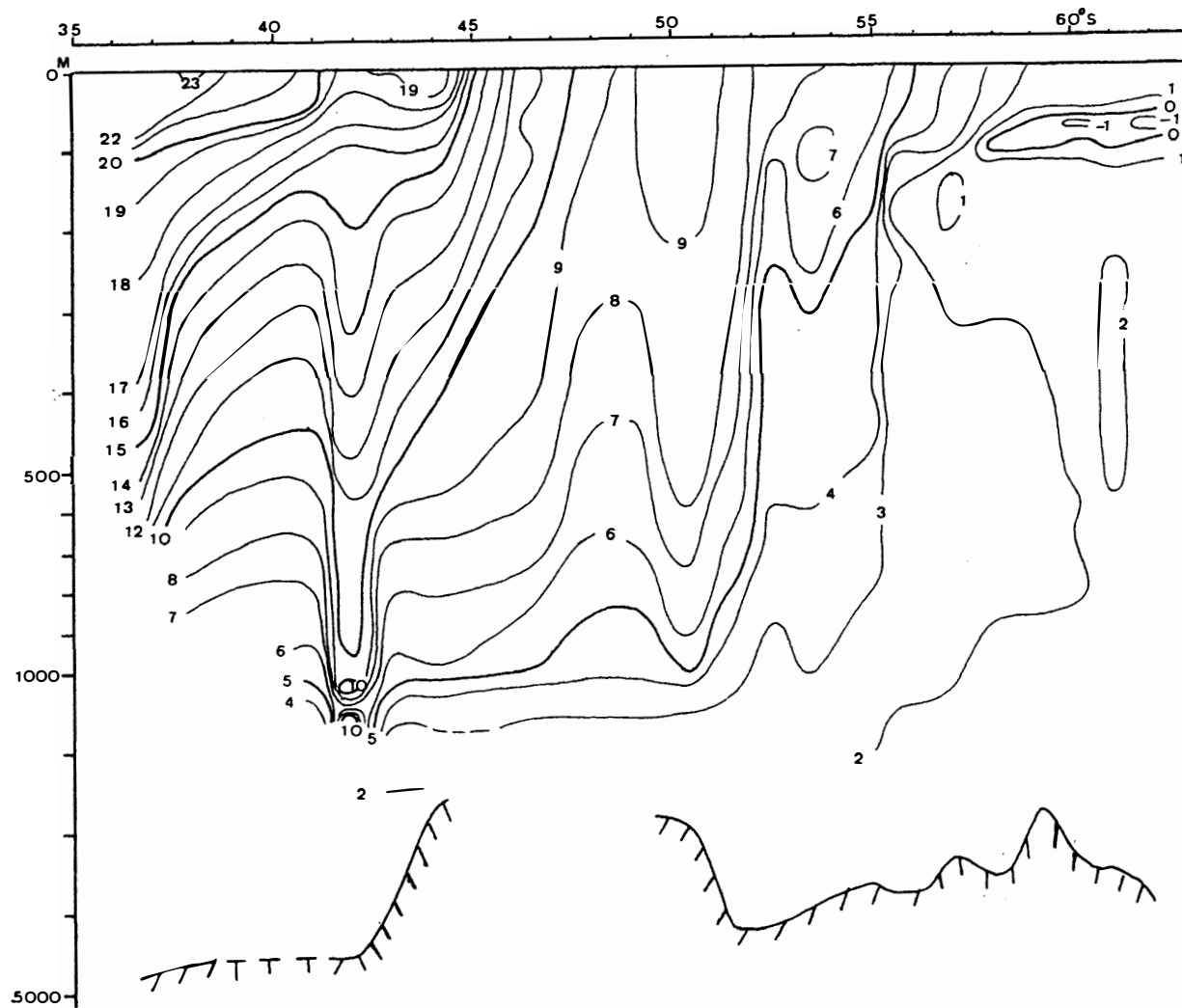


Fig. 6. Vertical profile of water temperature (°C) observed on 150° E line.

STATION : 32CM01  
 DATE (UT) : 1/6~1/8, 1991  
 LAT. 70°16'S  
 LNG. 39°37'E  
 DEPTH : 120m  
 Obs. Depth: -10m  
 TIME (UT) : 06:30 (1/6)~08:30 (1/8)

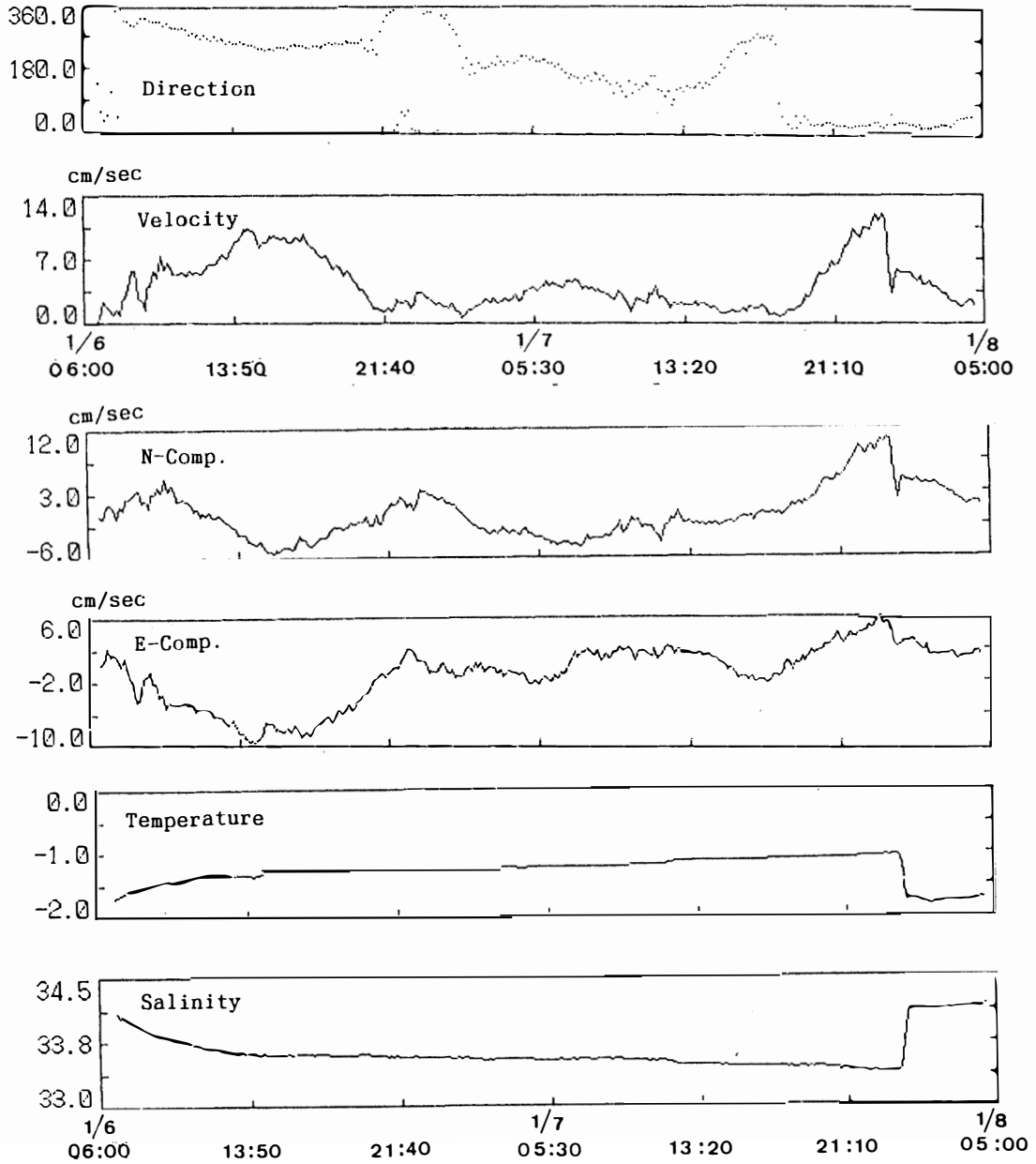


Fig. 7. The tidal stream observed in Breid Bay.

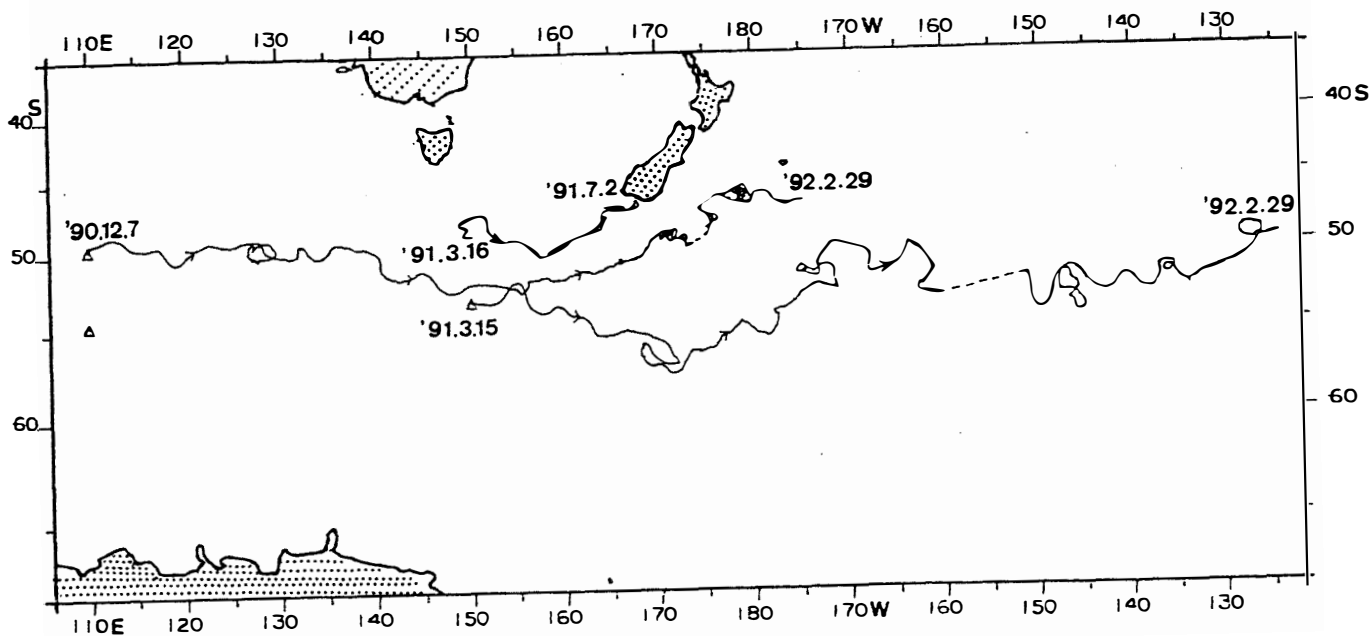


Fig. 8. The trajectory of surface drifting buoy deployed on March 15, 1990.

32XCP-1 (X1)  
 1990.11.23 23:00 (UT)  
 LAT. 16-11S  
 LNG. 114-05E

32XCP-2 (X2)  
 1990.12.20 11:30 (UT)  
 LAT. 68-24S  
 LNG. 23-49E

32XCP-3 (X3)  
 1991.2.25 10:20 (UT)  
 LAT. 70-08S  
 LNG. 24-00E

32XCP-4 (X4)  
 1991.3.5 03:00 (UT)  
 LAT. 64-42S  
 LNG. 46-47E

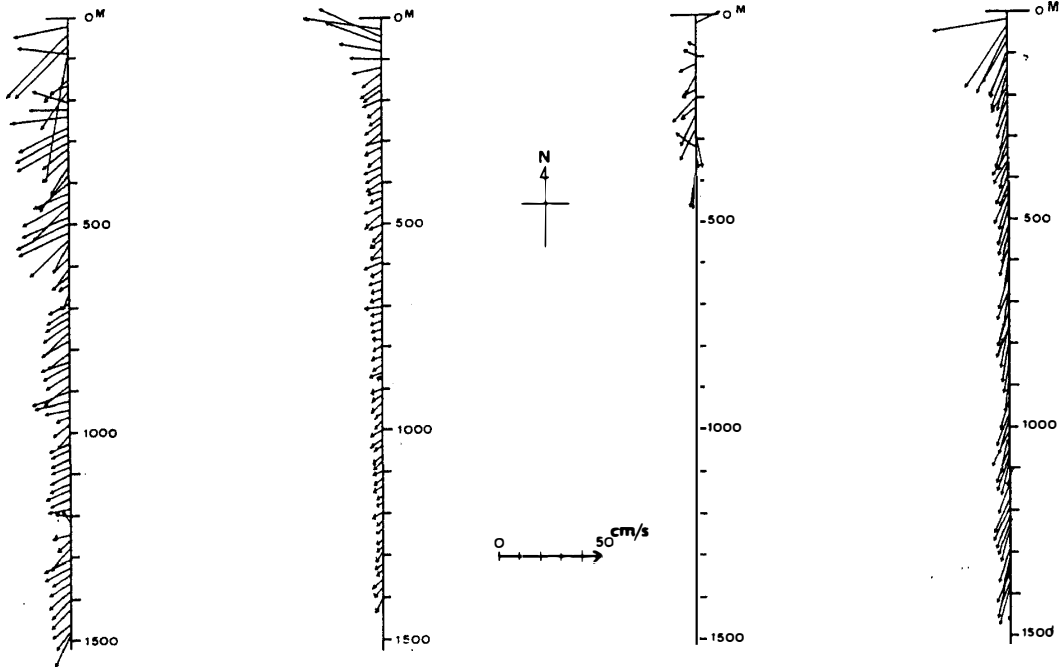


Fig. 9. Vertical profile of ocean current by XCP (X1-X4).

32XCP-5 (X5)  
 1991.3.10 05:00 (UT)  
 LAT. 62-00S  
 LNG. 110-00E

32XCP-6 (X6)  
 1991.3.13 09:00 (UT)  
 LAT. 62-00S  
 LNG. 146-55E

32XCP-7 (X7)  
 1991.3.15 08:50 (UT)  
 LAT. 55-30S  
 LNG. 150-05E

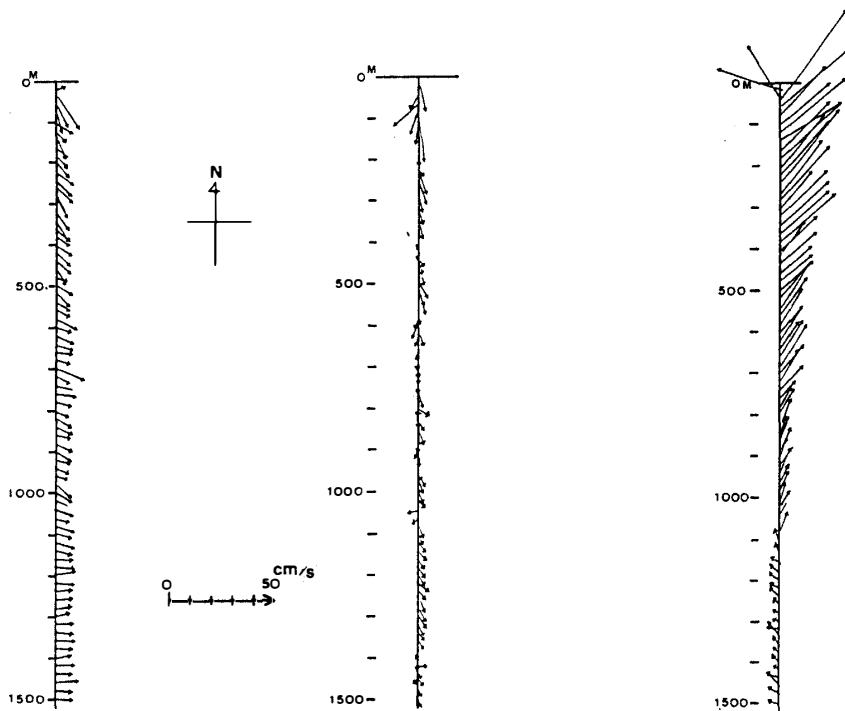
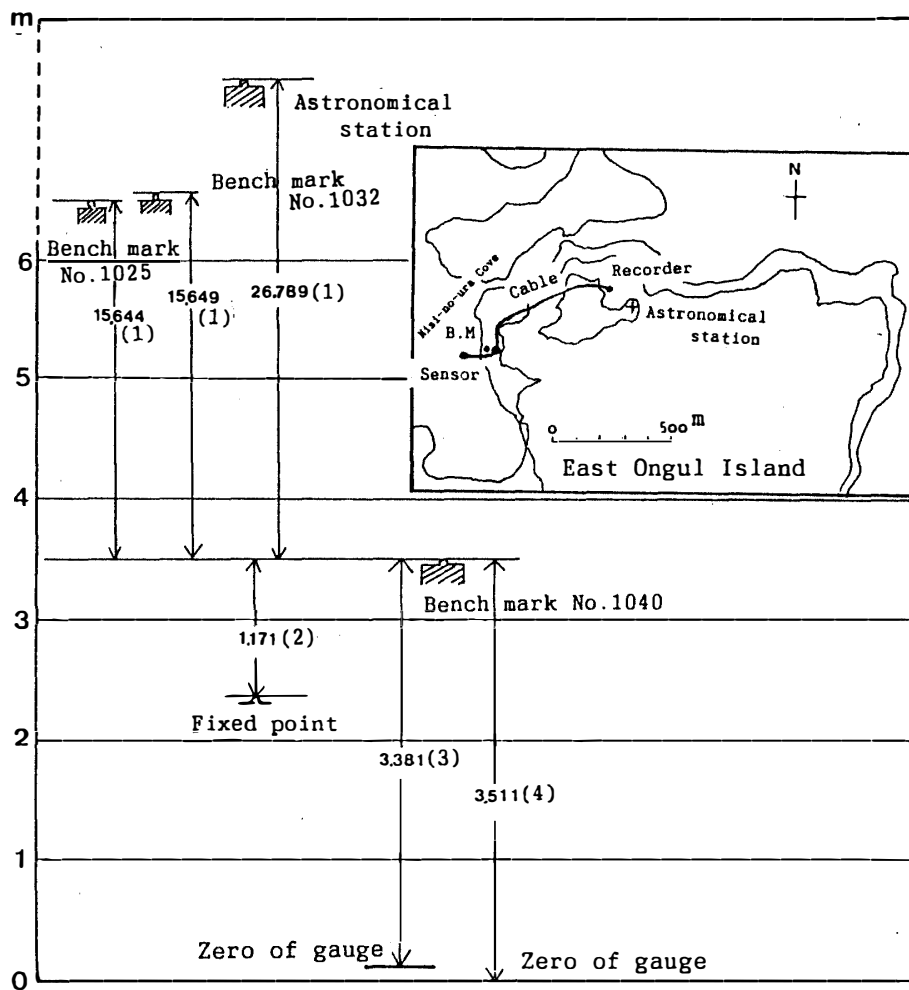


Fig.10. Vertical profile of ocean current by XCP (X5-X7).



- |                             |                             |
|-----------------------------|-----------------------------|
| (1) Measured on Jan.27,1991 | (3) Measured on Jan.23,1990 |
| (2) Measured on Jan.30,1991 | (4) Measured on Jan.31,1991 |

Fig. 11. The point of "zero of gage" and height of bench mark.

Table 1. Data of surface observation on board the icebreaker "Shirase" in 1990-1991.

Date	Time		Position		Air Temp.	Water Temp.	S	pH	DO	PO <sub>4</sub> -P	SiO <sub>3</sub> -Si	NO <sub>2</sub> -N	NO <sub>3</sub> -N	NH <sub>4</sub> -N
	UT	LMT	Lat.	Long.	°C					μmol / l				
1990														
Nov. 14			Left Tokyo											
15	2305*	0730	30-47N	137-44E	21.3	23.9	34.703	8.10	221	0.42	4	0.05	0	3.7
	0905	1805	28-25	136-37	22.6	25.1	34.939	8.22	213	0.11	2	0.00	0	0.5
16	2300*	0730	25-06	135-10	24.8	26.8	34.807	7.96	212	0.03	0	0.01	0	0.5
	0900	1800	22-51	134-07	25.8	27.1	34.795	8.31	207	0.03	0	0.00	0	0.6
17	2230*	0730	19-33	132-58	27.1	28.0	34.515	8.18	204	0.06	1	0.02	0	0.3
	0900	1800	17-17	131-57	28.0	28.4	34.247	8.22	207	0.05	1	0.04	0	0.2
18	2250*	0750	14-03	130-36	28.4	28.5	33.109	8.31	207	0.05	0	0.03	0	0.1
	0930	1830	11-35	129-32	27.2	28.1	34.811	8.26	206	0.06	1	0.00	0	0.0
19	2300*	0800	8-08	128-13	26.5	28.1	34.145	8.28	207	0.05	1	0.00	1	0.1
	0900	1800	6-05	127-06	28.0	29.1	34.188	8.24	204	0.06	0	0.01	0	0.0
20	2300*	0800	3-58	123-53	27.7	28.1	34.240	8.12	205	0.03	2	0.00	0	0.2
	0900	1800	2-34	121-48	28.4	29.5	34.264	8.14	215	0.02	1	0.00	0	0.0
21	2230*	0730	0-03	119-27	28.2	29.1	33.775	8.14	204	0.03	2	0.02	1	0.0
	0900	1800	2-25S	118-34	29.2	29.9	34.092	8.15	206	0.09	1	0.01	0	0.1
22	2300*	0800	5-30	117-08	29.1	29.7	34.252	8.14	207	0.03	0	0.01	1	0.0
	0900	1800	7-38	116-17	28.6	29.1	34.402	8.13	204	0.09	2	0.00	0	0.0
23	2300*	0800	10-44	115-17	28.1	28.8	34.377	7.90	206	0.06	0	0.00	1	0.1
	0900	1800	13-02	114-46	27.8	29.5	34.346	8.24	203	0.09	2	0.00	0	0.1
24	2300*	0800	16-15	114-05	24.9	27.1	34.536	8.16	207	0.11	2	0.00	0	0.0
	0900	1800	18-28	113-37	24.5	25.3	34.659	8.22	216	0.11	2	0.01	0	0.0
25	2300*	0800	21-43	112-53	22.4	22.8	35.213	8.18	---	0.11	2	0.00	0	0.1
	0900	1800	23-53	112-23	22.4	22.9	35.071	8.83	221	0.15	1	0.01	0	0.1
26	2300*	0800	27-01	112-36	19.6	20.9	35.489	8.93	230	0.08	2	0.01	0	0.3
	0900	1800	29-17	113-33	19.6	19.8	35.681	8.17	234	0.09	1	0.01	0	0.5
Nov. 28			Arrived in Fremantle											
Dec. 3			Left Fremantle											
3	1000	1800	32-39S	114-10E	19.4	19.4	35.755	7.57	238	0.12	2	0.00	0	0.1
4	0000	0800	34-17	111-20	14.5	16.9	35.727	7.56	251	0.15	2	0.01	0	0.1

\* The time of the date of the preceding day.

Date	Time		Position		Air Temp.	Water Temp.	S	p H	D O	PO <sub>4</sub> -P	SiO <sub>3</sub> -Si	NO <sub>2</sub> -N	NO <sub>3</sub> -N	NH <sub>4</sub> -N
	U T	LMT	Lat.	Long.	°C									
Dec. 9	0100	0800	45-06S	110-06 E	11.3	10.7	33.948	7.70	353	1.90	31	0.29	16	0.2
	1100	1800	46-26	110-10	11.0	9.9	33.979	7.65	355	2.02	21	0.29	18	0.2
10	0200	0800	49-39	110-01	4.3	5.9	33.907	7.62	364	1.56	23	0.24	15	0.3
	1200	1800	50-31	109-57	3.7	4.7	33.895	7.70	360	1.79	30	0.23	14	0.2
11	0300	0800	51-45	109-55	3.3	3.8	33.886	7.94	363	1.68	39	0.29	18	0.2
	1300	1800	54-19	108-47	1.5	1.7	33.968	7.70	355	1.54	46	0.20	17	0.1
12	0300	0800	54-55	108-08	1.5	1.7	33.828	7.70	369	1.68	50	0.18	20	0.3
	1300	1800	55-37	106-23	1.5	1.8	33.711	7.77	367	1.81	54	0.27	23	0.2
13	0400	0800	57-18	101-13	0.6	0.3	33.635	7.75	364	1.72	55	0.19	21	0.2
	1400	1800	57-46	99-17	1.7	0.3	33.804	7.72	362	1.50	51	0.22	23	0.1
14	0400	0800	58-14	97-20	1.7	0.3	33.645	7.74	364	1.51	55	0.22	18	0.1
	1400	1800	59-48	90-58	1.3	0.0	33.741	7.76	361	1.57	54	0.17	18	0.2
15	0500	0800	59-58	88-43	1.4	-0.5	33.755	7.81	364	1.66	52	0.20	18	0.2
Arrived at the ice edge off Syowa Station														
Mar. 3	Left the ice edge off Breid Bay													
	0600	0900	69-53S	24-16E	-6.3	-1.8	33.648	7.64	400	1.56	49	0.08	9	0.1
	1500	1800	68-45	29-25	-2.6	-1.0	33.914	7.56	376	1.85	52	0.12	12	0.3
4	0500	0800	67-01	37-16	0.0	-0.8	33.998	7.56	356	1.54	53	0.12	12	0.0
	1500	1800	66-00	41-32	0.9	0.8	33.898	7.55	346	1.32	49	0.35	9	0.1
5	0500	0800	64-36	47-18	0.6	0.7	33.886	7.64	346	1.73	38	0.17	11	0.2
	1500	1800	63-31	52-36	-0.5	1.4	33.846	7.60	342	1.78	38	0.23	11	0.9
6	0400	0800	62-11	59-20	1.7	1.3	33.693	7.69	344	1.75	29	0.27	9	0.7
	1400	1800	62-01	64-28	0.5	0.9	33.693	7.60	346	1.91	29	0.26	9	0.8
7	0300	0800	62-02	70-20	1.1	0.8	33.730	7.68	---	1.76	24	0.25	14	0.6
	1300	1800	61-59	76-32	1.3	0.6	33.890	7.78	339	1.78	30	0.24	9	0.5
8	0300	0800	62-00	82-46	2.5	1.5	33.824	7.66	335	1.76	28	0.26	4	0.4
	1300	1800	61-58	88-58	2.3	1.9	33.906	7.70	335	1.56	36	0.20	5	0.4
9	0200	0800	62-00	95-24	-0.8	1.6	34.084	7.68	335	1.60	41	0.20	11	0.5
	1200	1800	62-00	100-24	-0.9	0.3	33.935	7.68	340	1.69	34	0.34	5	0.6
10	0100	0800	62-00	107-07	0.0	1.9	33.949	7.72	336	1.69	36	0.34	17	0.6
	1100	1800	61-59	112-17	2.2	2.2	33.895	7.72	322	1.75	35	0.33	16	0.5

Date	Time		Position		Air Temp.	Water Temp.	S	p H	D O	PO <sub>4</sub> -P	SiO <sub>3</sub> -Si	NO <sub>2</sub> -N	NO <sub>3</sub> -N	NH <sub>4</sub> -N
	U T	LMT	Lat.	Long.	°C									
Mar. 11	0000	0800	62-00S	119-16E	2.9	2.7	33.864	7.73	326	1.75	31	0.43	15	0.3
	1000	1800	62-00	124-02	2.4	2.2	33.859	7.70	332	1.51	36	0.45	15	0.3
12	2300*	0800	62-00	130-12	1.9	2.7	33.829	7.72	331	1.24	30	0.27	18	0.1
	0900	1800	62-00	135-03	2.2	2.4	33.850	7.71	334	1.50	35	0.38	15	0.4
13	2300*	0800	62-00	141-45	1.7	1.7	33.832	7.68	334	1.73	30	0.39	16	0.5
	0900	1800	62-00	146-45	1.9	1.9	33.784	7.73	337	1.83	30	0.40	17	0.4
14	2200*	0800	60-53	149-59	1.8	1.8	33.793	7.76	341	1.88	31	0.28	16	0.5
	0800	1800	59-11	149-56	2.3	2.3	33.848	7.68	330	1.66	40	0.35	16	0.5
15	0200	1200	56-19	150-15	4.1	4.5	33.888	7.74	320	1.78	3	0.24	10	0.4
	0800	1800	55-34	150-10	4.2	4.2	33.890	7.75	312	1.69	2	0.25	9	0.6
16	2200*	0700	53-23	150-00	7.6	7.6	34.016	7.80	304	1.94	1	0.24	16	0.4
	0800	1800	51-29	150-00	8.2	8.4	34.141	7.79	294	1.21	0	0.27	13	0.6

\* The time of the date of the preceding day.



Table 2. XBT observation data.

STATION	DATE	TIME		POSITION		TEMPERATURE(°C)															S.L. (M)		
		UT	LT	LAT.	LONG.	0	10	20	30	50	75	100	125	150	200	250	300	350	400	450		500	
						DEPTH(M)																	
						600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800					
32001	90/12/03	10-00	18-00	32-38.6S	114-09.7E	19.4 9.1	19.3 8.2	19.4 6.3	19.3 5.2	19.2 4.6	18.7 4.4	17.7 4.2	17.3 4.1	16.6 3.9	15.3 -	14.0 -	12.8 -	12.2 -	11.3	10.2	9.7	69	
32002	90/12/04	00-00	08-00	34-16.6S	111-20.0E	16.9 7.2	17.0 5.6	17.0 4.8	17.0 4.1	16.5 3.8	15.4 3.6	14.2 3.4	13.4 3.3	13.3 3.2	13.2	12.6	10.2	9.1	8.4	7.9	7.5	37	
32003	90/12/04	10-00	18-00	35-32.9S	109-54.8E	16.0 10.5	15.9 9.6	15.9 9.1	15.9 8.3	15.9 -	15.5 -	15.4 -	15.4 -	15.2 -	14.2 -	14.0 -	13.9 -	13.6 -	13.2	12.5	11.9	59	
32004	90/12/05	01-00	08-00	38-52.0S	110-00.0E	12.5 8.9	12.4 8.3	12.4 7.4	12.4 6.3	12.4 -	12.0 -	11.6 -	11.4 -	11.1 -	10.5 -	10.4 -	10.0 -	9.8 -	9.6	9.6	9.3	67	
32005	90/12/05	15-00	22-00	41-11.5S	110-00.2E	11.9 9.2	11.9 8.3	11.7 7.3	11.6 6.3	11.6 -	11.1 -	10.9 -	10.3 -	10.2 -	10.0 -	9.8 -	9.7 -	9.8 -	9.7	9.7	9.7	59	
32006	90/12/06	01-00	08-00	43-40.2S	110-00.5E	10.7 9.6	10.7 8.4	10.6 7.3	10.5 6.1	10.4 5.2	9.9 4.3	9.8 3.9	9.8 3.4	9.7 3.2	9.6 3.1	9.6 2.9	9.7 2.8	9.7 2.7	9.7	9.6	9.6	30	
32007	90/12/06	15-00	22-00	46-15.5S	110-00.8E	9.1 5.7	9.1 4.7	9.0 4.2	8.8 -	8.4 -	8.0 -	7.8 -	7.8 -	7.8 -	7.6 -	7.3 -	7.4 -	6.6 -	7.2	6.9	6.8	22	
32008	90/12/07	01-00	08-00	48-40.6S	110-00.9E	6.1 3.4	6.3 3.1	6.3 2.9	6.2 3.1	6.1 -	5.7 -	5.5 -	5.5 -	5.2 -	4.6 -	4.3 -	4.8 -	4.6 -	4.4	4.2	4.1	51	
32009	90/12/07	15-00	22-00	51-05.1S	109-58.8E	4.6 2.4	4.6 2.5	4.6 2.4	4.6 2.4	4.5 -	4.1 -	3.7 -	3.4 -	3.0 -	2.7 -	3.1 -	2.8 -	2.8 -	2.7	2.7	2.6	71	
32010	90/12/08	01-00	08-00	53-33.7S	109-59.8E	3.4 2.2	3.0 2.2	3.0 2.1	2.9 2.1	2.9 2.0	2.9 2.0	2.3 1.9	1.7 1.9	1.5 1.9	1.4 -	1.6 -	1.7 -	1.8 -	2.1	2.1	2.2	97	
32011	90/12/08	17-00	22-00	55-26.0S	108-24.0E	1.7 2.3	1.6 2.2	1.7 2.1	1.6 2.0	1.6 -	1.5 -	0.6 -	0.1 -	0.1 -	0.6 -	1.7 -	1.8 -	1.9 -	2.1	2.2	2.3	84	
32012	90/12/09	01-00	08-00	56-19.9S	104-51.7E	1.2 2.0	1.1 1.9	1.1 1.9	1.1 1.8	1.1 1.7	1.1 1.6	0.2 1.5	-0.4 1.4	0.3 1.3	1.6 1.3	1.9 1.2	2.0 -	2.0 -	2.0	2.1	2.0	84	
32013	90/12/09	06-00	13-00	56-49.3S	103-03.3E	0.6 1.6	0.3 1.6	0.3 1.5	0.3 1.5	0.2 -	0.1 -	0.0 -	-1.1 -	-0.8 -	0.6 -	1.5 -	1.5 -	1.6 -	1.6	1.6	1.6	103	
32014	90/12/09	11-00	18-00	57-17.5S	101-05.3E	0.7 2.1	0.7 2.1	0.7 2.0	0.6 2.0	0.5 1.9	0.4 1.8	0.3 1.7	0.8 1.6	-0.9 1.5	1.4 -	1.7 -	1.8 -	1.9 -	1.9	2.0	2.0	99	
32015	90/12/10	02-00	08-00	58-47.1S	95-09.2E	-0.2 1.8	-0.1 1.7	-0.2 1.6	-0.2 1.5	-0.2 1.4	-0.2 1.4	-0.5 1.3	-1.5 -	-0.5 -	1.5 -	1.7 -	1.8 -	1.8 -	1.8	1.7	1.8	85	
32016	90/12/10	07-00	13-00	59-18.3S	93-04.5E	-0.2 1.9	-0.2 1.9	-0.2 1.9	-0.2 -	-0.2 -	-0.3 -	-0.7 -	-0.8 -	0.0 -	1.4 -	1.5 -	1.5 -	1.6 -	1.8	1.9	1.8	74	

STATION	DATE	TIME		POSITION		TEMPERATURE(°C)															S.L.	
						DEPTH(M)																
						0	10	20	30	50	75	100	125	150	200	250	300	350	400	450		500
600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800										
32017	90/12/10	12-00	18-00	59-43.5S	91-07.3E	0.2 1.7	0.2 1.7	0.2 1.7	0.1 1.8	0.1 1.7	0.1 —	0.0 —	-0.1 —	1.0 —	1.6 —	1.9 —	1.9 —	2.0 —	1.9	1.8	1.8	—
32018	90/12/11	03-00	08-00	60-52.0S	85-37.4E	-0.7 1.1	-0.6 1.2	-0.6 1.1	-0.6 1.1	-0.6 1.0	-1.3 0.9	-1.2 —	-0.8 —	-0.3 —	0.7 —	1.0 —	1.1 —	1.2 —	0.8	1.1	0.9	47
32019	90/12/11	08-30	13-30	60-56.4S	83-13.1E	-0.4 —	-0.5 —	-0.5 —	-0.5 —	-0.6 —	0.0 —	1.3 —	0.0 —	1.7 —	1.7 —	1.7 —	1.8 —	1.8 —	1.8	1.8	1.7	55
32020	90/12/11	13-30	18-30	60-59.0S	81-02.3E	-0.4 —	-0.4 —	-0.4 —	-0.3 —	-0.4 —	-0.1 —	0.9 —	1.6 —	1.8 —	1.9 —	1.9 —	1.9 —	2.0 —	1.8	1.8	1.8	67
32021	90/12/12	03-30	08-30	61-01.0S	73-54.1E	-1.0 —	-0.9 —	-1.0 —	-1.0 —	-1.0 —	-1.0 —	-1.6 —	-1.7 —	-1.3 —	1.6 —	1.9 —	2.0 —	2.0 —	2.0	2.0	2.0	91
32022	90/12/12	08-00	13-00	60-59.8S	71-28.8E	-0.9 —	-0.9 —	-0.9 —	-0.9 —	-0.9 —	-1.0 —	-1.7 —	-1.4 —	0.2 —	1.8 —	2.1 —	2.2 —	2.2 —	2.2	2.2	2.2	82
32023	90/12/12	13-00	18-00	60-59.1S	69-05.7E	-0.9 —	-0.8 —	-0.8 —	-0.8 —	-0.8 —	-0.9 —	-1.6 —	-1.4 —	-0.8 —	1.3 —	1.7 —	1.9 —	1.9 —	1.9	1.9	2.0	76
32024	90/12/13	02-00	06-00	60-59.9S	63-32.0E	-1.0 1.9	-1.0 —	-1.0 —	-1.0 —	-1.0 —	-1.7 —	-1.8 —	-1.6 —	0.3 —	1.3 —	1.6 —	1.7 —	1.8 —	1.9	2.0	1.9	—
32025	90/12/13	10-00	14-00	61-00.1S	60-50.4E	-0.8 —	-0.8 —	-0.8 —	-0.8 —	-0.8 —	-1.4 —	-1.5 —	-0.4 —	0.9 —	1.9 —	2.0 —	2.2 —	2.3 —	2.3	2.4	2.3	63
32026	90/12/13	18-00	22-00	61-00.0S	58-55.2E	-0.8 —	-0.7 —	-0.7 —	-0.7 —	-0.7 —	-1.5 —	-0.8 —	0.1 —	1.2 —	1.8 —	1.9 —	1.9 —	1.9 —	2.0	2.0	2.0	—
32027	90/12/14	04-00	08-00	61-00.0S	55-54.0E	-0.8 1.8	-0.7 1.7	-0.8 1.7	-0.8 —	-0.8 —	-1.4 —	-1.6 —	0.3 —	1.3 —	1.7 —	1.8 —	1.8 —	1.8 —	1.8	1.9	1.8	56
32028	90/12/14	10-30	14-30	61-00.5S	53-00.0E	-0.7 —	-0.6 —	-0.7 —	-0.7 —	-0.7 —	-1.3 —	-1.6 —	-1.5 —	0.6 —	—	—	—	—	—	—	—	—
32029	90/12/14	11-00	15-00	61-00.5S	52-50.1E	-0.7 —	-0.7 —	-0.7 —	-0.7 —	-0.7 —	-1.1 —	-1.6 —	-1.4 —	0.1 —	1.7 —	1.8 —	1.9 —	2.0 —	2.0	2.0	2.0	65
32030	90/12/14	18-30	22-30	61-25.9S	49-20.2E	-0.7 —	-0.6 —	-0.6 —	-0.6 —	-1.2 —	-1.7 —	-1.6 —	-0.2 —	1.0 —	1.7 —	1.8 —	1.8 —	1.9 —	1.9	1.9	1.8	47
32031	90/12/14	21-00	01-00	61-56.1S	48-38.8E	-0.6 —	-0.6 —	-0.7 —	-0.7 —	-1.7 —	-1.7 —	-1.7 —	-0.2 —	0.9 —	1.5 —	1.5 —	1.6 —	1.6 —	1.6	1.6	1.7	43
32032	90/12/15	00-00	03-00	62-31.9S	47-43.4E	-0.8 1.6	-0.8 1.6	-0.9 1.5	-0.9 1.4	-1.1 —	-1.8 —	-1.8 —	-0.7 —	1.0 —	1.4 —	1.6 —	1.6 —	1.6 —	1.7	1.7	1.6	50

STATION	DATE	TIME		POSITION		TEMPERATURE(°C)															S.L. (M)		
		UT	LT	LAT.	LONG.	0 600	10 700	20 800	30 900	50 1000	75 1100	100 1200	125 1300	150 1400	200 1500	250 1600	300 1700	350 1800	400	450		500	
32033	90/12/15	03-00	06-00	63-10.0S	46-46.7E	-0.9	-0.9	-0.9	-1.0	-1.7	-1.7	-0.6	1.3	1.5	1.6	1.6	1.6	1.6	1.6	1.5	1.5	35	
32034	90/12/15	04-00	07-00	63-21.6S	46-28.9E	-0.9	-0.8	-0.9	-1.5	-1.8	-1.8	-1.1	1.0	1.3	1.4	1.5	1.5	1.5	1.5	1.5	1.5	27	
32035	90/12/15	06-00	09-00	63-46.6S	45-47.2E	-0.9	-0.9	-1.0	-1.5	-1.8	-1.7	0.0	1.0	1.4	1.5	1.6	1.6	1.6	1.6	1.6	1.5	26	
32036	90/12/15	07-20	10-20	64-04.6S	45-17.8E	-1.0	-1.0	-1.1	-1.6	-1.7	-1.7	-0.9	1.0	1.4	1.5	1.5	1.5	1.5	1.5	1.5	1.5	35	
32037	90/12/15	08-50	11-50	64-23.4S	44-42.9E	-1.2	-1.1	-1.3	-1.6	-1.8	-0.6	1.2	1.2	1.3	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.6	-
32038	90/12/15	10-00	13-00	64-32.8S	44-22.0E	-1.1	-1.1	-1.1	-1.1	-1.7	-0.3	1.3	1.4	1.5	1.5	1.6	1.6	1.6	1.6	1.6	1.6	32	
32039	90/12/15	11-00	14-00	64-43.7S	43-59.2E	-1.4	-1.4	-1.4	-1.7	-1.9	-0.5	1.1	1.3	1.4	1.4	1.4	1.4	1.3	1.3	1.2	1.2	74	
32040	90/12/15	11-30	14-30	64-49.1S	43-51.0E	-1.4	-1.4	-1.4	-1.4	-1.7	-1.2	1.3	1.4	1.5	1.5	1.5	1.5	1.5	1.5	1.4	1.4	74	
32041	90/12/15	13-55	16-55	65-08.0S	43-17.4E	-1.7	-1.7	-1.7	-1.5	-1.4	-0.5	1.5	2.0	2.2	2.4	2.4	2.4	2.4	2.5	2.6	2.6	65	
32042	90/12/15	15-00	18-00	65-10.4S	43-01.1E	-1.6	-1.7	-1.6	-1.6	-1.6	-1.6	-1.5	-0.7	0.3	1.1	1.2	1.5	1.5	1.5	1.5	1.5	100	
32043	90/12/15	17-20	20-20	65-05.2S	42-09.0E	-1.4	-1.5	-1.7	-1.8	-1.8	-0.8	1.1	1.4	1.5	1.5	1.5	1.5	1.4	1.4	1.3	1.3	62	
32044	90/12/15	18-20	21-20	65-13.2S	41-50.3E	-1.7	-1.7	-1.8	-1.8	-1.9	-1.9	-0.6	1.0	1.2	1.4	1.4	1.4	1.4	1.3	1.3	1.3	92	
32045	90/12/15	19-20	22-20	65-22.6S	41-38.5E	-1.7	-1.7	-1.8	-1.8	-1.8	-1.8	0.4	1.1	1.3	1.4	1.4	1.4	1.4	1.4	1.3	1.3	89	
32046	90/12/15	21-20	23-20	65-34.4S	41-35.5E	-1.5	-1.6	-1.7	-1.6	-1.5	-1.2	0.5	1.6	1.8	2.1	2.2	2.3	2.4	2.5	2.5	2.5	64	
32047	90/12/15	20-50	23-50	65-37.9S	41-25.2E	-1.5	-1.6	-1.7	-1.8	-1.8	-1.8	0.7	1.1	1.3	1.4	1.4	1.4	1.4	1.4	1.5	1.4	87	
32048	90/12/15	21-15	00-15	65-39.1S	41-17.5E	-1.7	-1.7	-1.8	-1.8	-1.8	-1.8	0.5	1.2	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.3	81	

STATION	DATE	TIME		POSITION		TEMPERATURE(°C)															S.L. (M)		
		UT	LT	LAT.	LONG.	0	10	20	30	50	75	100	DEPTH(M)					400	450	500			
						600	700	800	900	1000	1100	1200	125	150	200	250	300	350	400	450	500		
32049	90/12/15	22-30	01-30	65-49.2S	41-04.2E	-1.4	-1.5	-1.6	-1.6	-1.7	-1.6	0.9	1.3	1.4	1.5	1.6	1.5	1.5	1.5	1.5	1.5	1.4	74
32050	90/12/16	00-00	03-00	66-01.9S	40-32.8E	-1.4	-1.4	-1.4	-1.7	-1.7	0.7	1.3	1.4	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.4	1.4	63
32051	90/12/16	01-10	04-10	66-16.7S	40-30.3E	-1.3	-1.5	-1.6	-1.7	-1.6	0.6	1.0	1.2	1.4	1.5	1.5	1.6	1.6	1.7	1.7	1.7	1.7	48
32052	90/12/16	01-30	04-30	66-19.7S	40-31.3E	-1.5	-1.6	-1.5	-1.4	-1.4	-0.7	1.3	1.7	1.8	1.9	1.9	1.9	1.9	1.9	1.8	1.8	1.8	64
32053	90/12/16	01-50	04-50	66-23.5S	40-30.7E	-1.4	-1.4	-1.6	-1.7	-1.7	-0.1	1.0	1.4	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.4	60
32054	90/12/16	02-10	05-10	66-26.7S	40-30.1E	-1.5	-1.5	-1.6	-1.6	-1.7	-0.2	1.2	1.4	1.4	1.5	1.5	1.5	1.4	1.4	1.4	1.4	1.3	50
32055	90/12/16	03-50	06-50	66-42.9S	40-30.3E	-1.5	-1.6	-1.7	-1.7	-1.4	0.8	0.9	1.1	1.3	1.5	1.5	1.5	1.5	1.5	1.5	1.5	-	49
32056	90/12/16	05-10	08-10	66-52.3S	40-28.3E	-1.7	-1.7	-1.7	-1.8	-1.8	-1.5	-0.6	0.2	0.7	1.1	1.4	1.5	1.5	1.5	1.5	1.6	1.7	95
32057	90/12/16	07-15	10-15	67-06.9S	40-30.2E	-1.5	-1.7	-1.7	-1.7	-1.8	-1.8	-1.6	-0.5	0.6	1.3	1.4	1.4	-	-	-	-	100	
32058	90/12/16	09-50	12-50	67-20.9S	40-32.5E	-1.4	-1.5	-1.6	-1.8	-1.8	-1.8	-1.8	-1.8	-1.6	-0.3	0.3	0.6	0.8	0.8	0.8	0.8	0.9	144
32059	90/12/16	14-30	17-30	67-36.1S	40-58.8E	-1.0	-1.3	-1.3	-1.7	-1.7	-1.8	-1.8	-1.8	-1.8	-1.8	-1.7	-0.8	0.7	1.3	1.7	1.8	26	
32060	90/12/16	15-50	18-50	67-56.8S	41-05.6E	-0.9	-1.0	-1.2	-1.3	-1.6	-1.7	-1.7	-1.8	-1.8	-1.8	-1.7	-1.6	-1.5	-1.5	-1.4	-1.4	50	
32061	90/12/16	17-10	20-10	68-09.0S	40-33.6E	-1.2	-1.4	-1.7	-1.7	-1.8	-1.8	-1.8	-1.8	-1.9	-1.9	-	-	-	-	-	-	15	
32062	90/12/16	17-35	20-35	68-12.0S	40-25.0E	-1.1	-1.5	-1.7	-1.8	-1.8	-1.8	-1.8	-1.8	-1.8	-1.9	-1.9	-1.9	-1.8	-1.7	-1.4	-	24	
32063	90/12/16	19-40	22-40	68-12.2S	40-23.2E	-1.7	-1.7	-1.8	-1.8	-1.8	-1.8	-1.8	-1.8	-1.8	-1.8	-1.8	-1.6	-1.5	-	-	-	276	
32064	90/12/17	04-00	07-00	68-13.8S	40-13.8E	-1.8	-1.8	-1.8	-1.7	-1.6	-1.6	-1.5	-1.5	-1.4	-1.4	-1.3	-1.1	-0.9	-	-	-	-	



STATION	DATE	TIME		POSITION		TEMPERATURE(°C)															S.L. (M)		
		UT	LT	LAT.	LONG.	0	10	20	30	50	75	100	125	150	200	250	300	350	400	450		500	
						DEPTH(M)																	
						600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800					
32081	90/12/20	18-55	21-55	69-23.2S	24-06.9E	-1.4 1.0	-1.4 1.0	-1.5 1.0	-1.6 —	-1.8 —	-1.8 —	-1.8 —	-1.8 —	-1.8 —	-1.2 —	-0.5 —	0.3 —	0.6 —	0.7 —	0.9 —	0.9 —	35	
32082	90/12/20	21-30	00-30	69-45.5S	24-03.8E	-1.1 —	-1.1 —	-1.4 —	-1.7 —	-1.8 —	-1.8 —	-1.9 —	-1.9 —	-1.9 —	-1.9 —	-1.9 —	-1.9 —	-1.9 —	-1.1 —	0.0 —	0.3 —	14	
32083	90/12/21	03-35	06-35	70-14.8S	23-53.8E	-1.0 —	-1.0 —	-1.0 —	-1.1 —	-1.2 —	-1.4 —	-1.4 —	-1.3 —	-1.3 —	-1.1 —	— —	— —	— —	— —	— —	— —	80	
32084	90/12/21	06-00	09-00	70-15.7S	23-48.7E	-1.3 —	-1.4 —	-1.5 —	-1.6 —	-1.7 —	-1.7 —	-1.7 —	-1.7 —	-1.7 —	— —	— —	— —	— —	— —	— —	— —	—	
32085	90/12/28	11-15	14-15	70-11.9S	24-09.1E	-1.1 —	-1.2 —	-1.2 —	-1.4 —	-1.6 —	-1.6 —	-1.7 —	-1.7 —	-1.7 —	-1.8 —	— —	— —	— —	— —	— —	— —	42	
32086	90/12/28	11-40	14-40	70-08.9S	24-13.6E	-1.0 —	-1.0 —	-1.1 —	-1.3 —	-1.5 —	-1.6 —	-1.6 —	-1.7 —	-1.7 —	-1.7 —	-1.8 —	— —	— —	— —	— —	— —	38	
32087	90/12/28	11-50	14-50	70-07.7S	24-16.2E	-1.0 —	-1.0 —	-1.1 —	-1.3 —	-1.4 —	-1.4 —	-1.5 —	-1.6 —	-1.6 —	-1.6 —	-1.6 —	-1.6 —	-1.6 —	-1.5 —	-1.4 —	— —	—	
32088	90/12/28	12-15	15-15	70-05.6S	24-21.0E	-1.3 —	-1.3 —	-1.3 —	— —	-1.5 —	-1.6 —	— —	-1.5 —	-1.5 —	-1.4 —	-1.4 —	-1.4 —	-1.2 —	-1.1 —	-0.9 —	— —	—	
32089	90/12/28	12-45	15-45	70-01.4S	24-32.5E	-1.1 0.8	-1.2 0.7	-1.3 1.0	-1.3 —	-1.5 —	-1.6 —	-1.8 —	-1.7 —	-1.7 —	-1.8 —	-1.8 —	-1.7 —	-1.7 —	-1.6 —	-1.4 —	0.3 —	—	
32090	90/12/28	13-00	16-00	69-58.8S	24-34.1E	-1.1 1.5	-1.0 1.3	-1.1 1.1	-1.2 1.2	-1.2 1.0	-1.5 1.0	-1.7 —	-1.7 —	-1.7 —	-1.8 —	-1.8 —	-1.7 —	-1.7 —	-1.4 —	-0.8 —	1.1 —	87	
32091	90/12/28	15-20	18-20	69-51.3S	25-25.9E	-1.2 0.6	-1.1 0.5	-1.4 0.2	-1.5 0.1	-1.8 0.2	-1.9 0.2	-1.9 0.2	-1.9 0.2	-1.9 0.2	-1.9 —	-1.9 —	-1.8 —	-1.7 —	-1.2 —	-0.4 —	0.4 —	29	
32092	90/12/28	16-40	19-40	69-43.0S	25-42.5E	-1.4 0.0	-1.5 0.1	-1.5 —	-1.6 —	-1.7 —	-1.8 —	-1.8 —	-1.8 —	-1.8 —	-1.8 —	-1.8 —	-1.8 —	-1.7 —	-1.3 —	-0.7 —	-0.3 —	36	
32093	90/12/28	18-30	21-30	69-28.2S	26-15.1E	-1.2 1.2	-1.1 1.2	-1.3 1.2	-1.6 1.3	-1.7 1.3	-1.8 —	-1.7 —	-1.8 —	-1.8 —	-1.8 —	-1.8 —	-1.8 —	-1.6 —	-1.4 —	-0.7 —	0.1 —	46	
32094	90/12/28	21-05	00-05	69-11.5S	26-49.3E	-1.5 —	-1.4 —	-1.5 —	-1.6 —	-1.8 —	-1.8 —	-1.9 —	-1.9 —	-1.8 —	-1.8 —	-1.8 —	-1.6 —	-1.0 —	-0.4 —	0.1 —	0.5 —	28	
32095	90/12/29	04-00	07-00	68-33.4S	28-32.4E	-1.7 —	-1.7 —	-1.7 —	-1.8 —	-1.8 —	-1.8 —	-1.8 —	— —	— —	— —	— —	— —	— —	— —	— —	— —	—	
32096	90/12/29	09-50	12-50	67-46.4S	30-51.9E	-1.3 0.6	-1.6 0.6	-1.5 —	-2.0 —	-1.8 —	-1.9 —	-1.9 —	-1.9 —	-1.9 —	-1.8 —	-1.5 —	-0.5 —	-0.1 —	0.1 —	0.5 —	0.5 —	—	

STATION	DATE	TIME		POSITION		TEMPERATURE(°C)																	S.L. (M)
		UT	LT	LAT.	LONG.	0	10	20	30	50	75	100	DEPTH(M)							400	450	500	
						600	700	800	900	1000	1100	1200	125	150	200	250	300	350	400	450	500		
32097	90/12/29	12-30	15-30	67-37.0S	31-49.5E	-1.4 0.0	-1.5 0.1	-1.7 0.1	-1.8 0.1	-1.9 0.1	-2.0 0.0	-2.0 0.0	-2.0	-2.0	-1.9	-1.6	-1.2	-0.7	-	-0.2	-0.1	-	
32098	90/12/29	15-00	18-00	67-35.6S	32-34.2E	-1.8	-1.8	-1.8	-1.8	-1.9	-1.9	-1.9	-1.9	-1.9	-1.9	-1.7	-1.2	-0.7	-0.2	0.0	0.1	253	
32099	90/12/29	15-45	18-45	67-30.8S	32-44.5E	-1.5 0.2	-1.6 0.2	-1.7 0.0	-1.8	-1.8	-1.9	-1.9	-1.9	-1.9	-1.8	-1.7	-1.3	-0.8	-0.6	-0.3	0.0	210	
32100	90/12/29	19-35	22-35	67-10.1S	33-55.3E	-1.6 0.8	-1.6 0.8	-1.7 0.7	-1.7	-1.8	-1.8	-1.8	-1.8	-1.8	-1.4	-0.9	-0.2	0.2	0.2	0.3	0.4	-	
32101	90/12/29	21-05	00-05	67-00.0S	34-32.8E	-1.6 1.1	-1.7 1.1	-1.7 1.0	-1.8	-1.8	-1.7	-1.5	-0.7	0.4	1.2	1.3	1.3	1.3	1.2	1.2	1.2	108	
32102	90/12/30	06-00	09-00	67-34.3S	38-01.8E	-1.5	-1.5	-1.6	-1.6	-1.7	-1.7	-1.7	-1.5	-	-	-	-	-	-	-	-	111	
32103	91/01/03	08-00	11-00	68-53.4S	38-48.6E	-0.8	-1.1	-1.8	-1.8	-1.8	-1.7	-1.7	-	-	-	-	-	-	-	-	-	10	
32104	91/01/07	07-00	10-00	69-00.3S	39-37.1E	-1.4	-1.7	-1.7	-1.7	-1.7	-1.6	-1.5	-1.5	-1.4	-	-	-	-	-	-	-	187	
32105	91/02/14	08-55	11-55	68-28.5S	38-21.8E	-1.8	-1.8	-1.8	-1.8	-1.8	-1.7	-1.8	-1.8	-1.8	-1.8	-1.8	-1.7	-1.6	-	-	-	-	
32106	91/02/14	14-10	17-10	68-27.4S	38-21.2E	-1.8	-1.7	-1.5	-1.5	-1.6	-1.1	-1.1	-1.1	-1.1	-1.1	-1.1	-0.8	-	-	-	-	-	
32107	91/02/18	12-20	15-20	68-25.4S	38-20.0E	-1.8	-1.6	-1.7	-1.7	-1.6	-1.6	-1.6	-1.6	-	-	-	-	-	-	-	-	-	
32108	91/02/18	14-50	17-50	68-25.2S	38-19.4E	-1.8	-1.7	-1.8	-1.8	-1.7	-1.5	-1.7	-1.8	-	-	-	-	-	-	-	-	-	
32109	91/02/18	15-05	18-05	68-25.2S	38-19.4E	-1.8	-1.7	-1.7	-1.7	-1.7	-1.4	-1.7	-1.8	-1.8	-1.7	-1.7	-1.7	-1.6	-1.6	-1.5	-	-	
32110	91/02/20	11-10	14-10	68-24.0S	38-17.4E	-1.8	-1.7	-1.8	-1.8	-1.8	-1.7	-1.5	-1.7	-1.8	-1.7	-1.6	-1.7	-1.7	-1.5	-0.7	0.3	421	
32111	91/02/23	11-00	14-00	68-22.1S	38-17.5E	-1.9	-1.8	-1.8	-1.8	-1.8	-1.6	-1.7	-1.7	-	-	-	-	-	-	-	-	-	
32112	91/02/23	11-20	14-20	68-22.0S	38-17.5E	-1.9	-1.7	-1.7	-1.7	-1.7	-1.5	-1.6	-1.7	-1.7	-	-	-	-	-	-	-	-	

STATION	DATE	TIME		POSITION		TEMPERATURE(°C)															S.L. (M)		
		UT	LT	LAT.	LONG.	DEPTH(M)																	
						0	10	20	30	50	75	100	125	150	200	250	300	350	400	450		500	
32113	91/02/23	15-00	18-00	68-19.5S	38-18.7E	-1.9	-1.7	-1.7	-1.7	-1.7	-1.7	-1.7	-1.6	-1.7	-1.7	-1.7	-1.7	-1.7	-1.6	-0.9	0.1	-	373
32114	91/02/23	15-45	18-45	68-16.3S	38-21.8E	-1.9	-1.7	-1.8	-1.8	-1.8	-1.7	-1.7	-1.7	-1.7	-	-	-	-	-	-	-	-	-
32115	91/02/23	16-50	19-50	68-11.1S	38-17.0E	-1.8	-1.8	-1.9	-1.8	-1.8	-1.7	-1.8	-1.7	-1.8	-1.7	-1.7	-1.7	-1.5	-	-	-	-	-
32116	91/02/23	18-20	21-20	68-03.1S	38-08.4E	-1.8	-1.7	-1.7	-1.8	-1.8	-1.6	-1.7	-1.7	-1.7	-1.7	-1.7	-1.7	-1.4	0.0	1.2	1.2	345	
32117	91/02/23	19-30	22-30	67-54.7S	37-56.7E	-1.8	-1.8	-1.8	-1.7	-1.5	-1.3	-1.5	-1.2	-1.9	-1.9	-1.9	-1.7	-1.1	0.3	0.8	0.9	-	
32118	91/02/23	19-50	22-50	67-52.2S	37-50.3E	-1.7	-1.6	-1.6	-1.7	-1.7	-1.5	-1.7	-1.8	-1.8	-1.8	-1.8	-1.7	-1.2	0.7	0.5	1.2	306	
32119	91/02/24	05-00	08-00	68-03.1S	31-50.5E	-1.2 0.4	-1.1 0.3	-1.1 0.2	-1.0	-1.0	-1.2	-1.4	-1.8	-1.8	-1.8	-1.6	-1.1	-0.5	0.0	0.2	0.3	-	
32120	91/02/24	10-30	13-30	68-28.2S	28-16.8E	-1.0 0.2	-1.0 0.3	-1.0 0.3	-1.1	-0.8	-1.4	-1.9	-1.9	-1.9	-1.8	-1.8	-1.7	-1.2	-0.7	0.0	0.0	35	
32121	91/02/24	14-00	17-00	68-43.4S	26-00.0E	-0.8 0.3	-0.7 0.4	-0.8 0.4	-0.8	-1.3	-1.9	-1.9	-1.9	-1.9	-1.9	-1.9	-1.8	-1.6	-1.0	-0.6	0.1	47	
32122	91/02/24	19-00	22-00	69-37.5S	23-53.8E	-1.8 0.7	-1.7	-1.4	-1.2	-0.9	-1.1	-1.7	-1.8	-1.8	-1.8	-1.8	-1.6	-1.6	-1.2	-0.3	0.3	-	
32123	91/02/24	20-15	23-15	69-45.1S	23-58.4E	-1.8	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.4	-1.5	-1.2	-0.4	0.0	-	
32124	91/02/25	05-00	08-00	70-04.6S	23-49.2E	-1.8 -0.2	-1.8 0.1	-1.8 0.0	-1.8 0.2	-1.8 0.2	-1.8 0.2	-1.8 0.2	-1.8 0.2	-1.8 0.2	-1.8	-1.8	-1.8	-1.7	-1.7	-1.6	-1.3	-1.0	352
32125	91/02/25	09-00	12-00	70-07.8S	24-02.0E	-1.8	-1.8	-1.8	-1.8	-1.7	-1.7	-1.7	-1.7	-1.7	-1.7	-1.8	-1.8	-1.7	-1.6	-1.5	-1.1	-0.4	-
32126	91/03/03	06-00	09-00	69-52.5S	24-16.1E	-1.8 0.9	-1.4 0.8	-1.4 1.0	-1.4 0.9	-1.5 0.9	-1.7 0.9	-1.7 0.9	-1.7	-1.7	-1.7	-1.7	-1.7	-1.3	-0.5	0.1	0.4	0.3	63
32127	91/03/03	10-00	13-00	69-22.4S	26-31.8E	-1.4	-1.3	-1.3	-1.3	-1.1	-1.5	-1.7	-1.7	-1.7	-1.7	-1.6	-1.2	-0.4	-0.3	0.0	0.0	0.1	63
32128	91/03/03	15-00	18-00	68-44.5S	29-25.4E	-1.0 0.5	-0.8 0.6	-0.9 0.5	-0.9	-0.9	-1.0	-1.8	-1.8	-1.8	-1.8	-1.8	-1.8	-1.2	-0.6	-0.1	0.1	0.4	89



STATION	DATE	TIME		POSITION		TEMPERATURE(°C)															S.L. (M)	
		UT	LT	LAT.	LONG.	DEPTH(M)																
						0 600	10 700	20 800	30 900	50 1000	75 1100	100 1200	125 1300	150 1400	200 1500	250 1600	300 1700	350 1800	400	450		500
32129	91/03/03	21-00	00-00	68-01.8S	32-44.2E	-1.0	-0.9	-1.0	-1.0	-0.9	1.6	-1.7	-1.8	-1.8	-1.5	-1.1	-0.1	0.1	0.2	0.1	0.1	58
32130	91/03/04	03-00	06-00	67-16.7S	36-07.7E	-0.4	-0.2	-0.3	-0.3	-0.3	-0.4	-1.7	-1.1	-0.5	0.5	0.7	0.8	1.2	1.4	1.4	1.2	75
32131	91/03/04	09-00	12-00	66-38.0S	38-55.4E	0.4	0.3	0.3	0.3	0.2	-1.7	-1.6	0.6	1.3	1.5	1.5	1.5	1.4	1.4	1.3	1.3	53
32132	91/03/04	11-00	14-00	66-25.2S	39-50.5E	0.4	0.4	0.3	0.3	0.3	-0.5	1.0	1.2	1.4	1.4	1.5	1.5	1.4	1.4	1.4	1.3	62
32133	91/03/04	13-00	16-00	66-13.0S	40-41.0E	0.0	0.0	0.0	0.0	0.0	-0.4	-1.8	-1.6	-0.9	0.5	1.1	1.4	1.4	1.4	1.2	1.3	75
32134	91/03/04	15-00	18-00	66-00.4S	41-31.9E	0.8	0.7	0.6	0.6	0.5	-1.4	-0.1	1.1	1.3	1.4	1.5	1.5	1.5	1.5	1.5	1.5	57
32135	91/03/04	16-55	19-55	65-48.9S	42-19.9E	0.8	0.7	0.5	0.4	0.3	0.2	-0.5	-0.5	0.2	1.3	1.3	1.3	1.3	1.3	1.0	0.9	79
32136	91/03/04	18-55	21-55	65-36.4S	43-10.7E	0.4	0.4	0.3	0.2	0.2	-1.5	-1.0	-0.1	0.2	1.1	1.1	1.1	1.1	1.1	1.1	1.1	56
32137	91/03/04	21-00	00-00	65-23.5S	44-06.8E	0.4	0.3	0.3	0.2	0.2	-1.2	0.0	0.6	1.1	1.4	1.4	1.3	1.3	1.3	1.3	1.2	57
32138	91/03/05	00-00	03-00	65-10.6S	44-55.6E	0.4	0.4	0.3	0.3	0.2	-1.6	-1.3	-1.0	-0.4	0.7	0.8	0.9	0.9	0.8	0.8	0.9	56
32139	91/03/05	00-55	03-55	64-59.4S	45-40.8E	0.4	0.6	0.5	0.4	0.4	-1.5	-0.9	-0.2	0.1	0.6	0.6	0.7	1.0	1.0	1.0	0.9	63
32140	91/03/05	03-00	06-00	64-47.2S	46-28.2E	0.5	0.6	0.6	0.5	0.5	-1.1	-1.5	-1.6	-1.4	-0.2	0.1	0.2	0.6	0.6	0.5	0.8	64
32141	91/03/05	03-55	06-55	64-42.3S	46-46.9E	0.5	0.5	0.4	0.4	0.4	-1.6	-1.2	-0.5	0.2	0.9	1.1	1.1	1.1	1.1	1.3	1.2	61
32142	91/03/05	06-15	09-15	64-28.0S	47-58.2E	0.5	0.6	0.6	0.6	0.5	-1.5	-1.4	-1.2	-0.2	0.0	0.7	0.7	0.9	1.0	1.1	1.1	65
32143	91/03/05	07-30	10-30	64-19.8S	48-39.1E	0.7	1.0	0.9	0.9	0.3	-1.2	-1.0	-0.2	0.4	0.4	1.4	1.4	1.3	1.2	1.2	1.0	67
32144	91/03/05	09-00	12-00	64-10.1S	49-27.2E	1.5	1.3	1.3	1.3	1.0	-1.2	0.3	1.2	1.4	1.5	1.5	1.5	1.5	1.6	1.5	1.6	38

STATION	DATE	TIME		POSITION		TEMPERATURE(°C)															S.L. (M)	
		UT	LT	LAT.	LONG.	0 600	10 700	20 800	30 900	50 1000	75 1100	100 1200	125 1300	150 1400	200 1500	250 1600	300 1700	350 1800	400	450		500
32145	91/03/05	13-00	16-00	63-44.1S	51-39.9E	1.3 1.6	1.1 1.5	1.1 1.5	1.1 —	1.0 —	-0.4 —	-0.6 —	1.0 —	1.4 —	1.5 —	1.7 —	1.7 —	1.7 —	1.7	1.7	1.7	74
32146	91/03/05	15-00	18-00	63-31.4S	52-36.0E	1.2 1.5	1.1 1.5	1.1 1.4	1.1 —	1.1 —	-0.3 —	0.9 —	1.4 —	1.5 —	1.6 —	1.7 —	1.7 —	1.7 —	1.7	1.6	1.6	67
32147	91/03/05	17-05	20-05	63-18.0S	53-48.7E	1.5 —	1.4 —	1.4 —	1.5 —	1.4 —	-1.0 —	-1.3 —	0.3 —	1.2 —	1.6 —	1.6 —	1.7 —	1.7 —	1.8	1.7	1.7	59
32148	91/03/05	19-05	22-05	63-04.9S	54-49.2E	1.4 —	1.2 —	1.2 —	1.2 —	1.1 —	0.2 —	-1.5 —	0.2 —	1.4 —	1.6 —	1.7 —	1.7 —	1.7 —	1.7	1.8	1.8	68
32149	91/03/05	20-00	00-00	62-58.6S	55-16.8E	1.4 —	1.0 —	1.0 —	1.0 —	1.0 —	-1.3 —	-0.1 —	1.2 —	1.6 —	1.7 —	1.7 —	1.8 —	1.8 —	1.8	1.8	1.7	50
32150	91/03/06	02-00	06-00	62-20.8S	58-20.9E	0.9 1.7	0.8 1.6	0.8 1.5	0.8 —	0.8 —	-1.3 —	-0.6 —	1.1 —	1.5 —	1.7 —	1.8 —	1.8 —	1.8 —	1.8	1.8	1.8	67
32151	91/03/06	08-00	12-00	61-59.9S	61-12.6E	1.3 —	1.1 —	1.0 —	1.0 —	1.0 —	-1.4 —	-0.1 —	1.1 —	1.5 —	1.7 —	1.9 —	1.9 —	1.9 —	2.0	2.0	2.0	—
32152	91/03/06	14-00	18-00	62-00.6S	64-28.0E	0.9 2.1	0.8 2.0	0.7 2.0	0.7 —	0.7 —	-1.1 —	-1.3 —	-0.6 —	0.8 —	1.6 —	1.8 —	1.9 —	2.0 —	2.0	2.0	2.0	60
32153	91/03/06	19-00	00-00	61-59.5S	67-10.1E	1.4 —	1.3 —	1.3 —	1.3 —	1.3 —	0.2 —	-1.1 —	-0.5 —	0.4 —	1.6 —	1.8 —	1.9 —	2.0 —	2.0	2.0	—	72
32154	91/03/07	01-00	06-00	62-02.0S	70-20.0E	1.1 —	0.9 —	0.9 —	0.9 —	0.8 —	-1.6 —	-0.9 —	0.0 —	-0.3 —	1.1 —	2.0 —	1.4 —	—	—	—	—	49
32155	91/03/07	07-00	12-00	61-57.3S	73-20.2E	1.0 1.9	0.9 1.8	0.9 1.8	1.0 —	1.0 —	1.0 —	0.7 —	1.8 —	1.8 —	2.0 —	2.1 —	2.1 —	2.1 —	2.0	2.0	2.0	73
32156	91/03/07	13-00	18-00	61-59.2S	76-31.7E	0.6 2.1	0.4 2.1	0.5 2.0	0.5 1.9	0.6 —	0.7 —	0.3 —	1.3 —	1.8 —	2.0 —	2.1 —	2.2 —	2.2 —	2.2	2.2	2.1	78
32157	91/03/07	19-00	00-00	62-00.2S	79-36.8E	1.5 —	1.2 —	1.2 —	1.2 —	1.2 —	0.5 —	-0.1 —	0.6 —	1.4 —	1.7 —	1.7 —	1.8 —	1.8 —	1.8	1.8	1.9	69
32158	91/03/08	01-00	06-00	62-00.0S	82-46.5E	1.1 —	1.0 —	1.0 —	1.0 —	1.0 —	-1.1 —	0.2 —	1.5 —	1.7 —	1.8 —	1.9 —	2.0 —	2.0 —	2.0	2.0	2.0	56
32159	91/03/08	07-00	12-00	61-59.3S	85-53.1E	1.6 —	1.5 —	1.5 —	1.5 —	0.0 —	-0.9 —	-0.7 —	-0.3 —	0.4 —	1.2 —	1.0 —	1.2 —	1.2 —	1.1	1.1	1.3	39
32160	91/03/08	13-00	18-00	61-58.0S	88-57.7E	1.9 1.3	1.9 1.2	1.9 1.1	1.8 —	1.7 —	-0.5 —	-0.5 —	0.0 —	0.2 —	0.7 —	1.1 —	1.3 —	1.3 —	1.4	1.4	1.3	55

STATION	DATE	TIME		POSITION		TEMPERATURE (°C)															S.L. (M)		
		UT	LT	LAT.	LONG.	0	10	20	30	50	75	100	125	150	200	250	300	350	400	450		500	
						DEPTH (M)																	
						600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800					
32161	91/03/08	18-00	00-00	61-59.1S	91-27.2E	1.9	1.8	1.8	1.8	1.8	0.2	-0.3	-0.3	0.2	0.8	1.0	1.2	1.3	1.3	1.3	1.3	65	
32162	91/03/09	00-00	06-00	61-59.4S	94-28.6E	1.5	1.4	1.4	1.4	1.5	0.5	-0.8	-0.6	-0.1	0.7	0.9	1.1	1.2	1.2	1.2	1.2	54	
32163	91/03/09	06-00	12-00	62-00.1S	97-26.0E	1.6	1.5	1.5	1.5	1.5	-0.4	-0.2	0.7	0.9	1.0	1.3	1.4	1.5	1.5	1.7	1.9	54	
32164	91/03/09	12-00	18-00	62-00.0S	100-24.3E	1.7	1.7	1.7	1.7	1.3	-0.4	0.4	0.9	1.3	1.6	1.6	1.7	1.7	1.7	1.7	1.6	45	
32165	91/03/09	18-00	00-00	61-59.5S	102-55.9E	1.5	1.3	1.3	1.3	0.9	-0.8	0.1	1.0	1.3	1.3	1.3	1.5	1.3	1.4	1.5	1.5	43	
32166	91/03/09	23-00	06-00	61-59.1S	106-04.3E	2.1	2.1	2.0	2.0	0.9	-0.9	-0.4	0.2	1.2	1.3	1.5	1.5	1.6	1.6	1.6	1.6	43	
						1.5	1.5	1.5															
32167	91/03/10	05-00	12-00	61-59.7S	109-09.8E	1.9	1.6	1.7	1.6	0.0	-0.7	0.0	0.8	1.3	1.5	1.5	1.7	1.8	1.8	1.8	1.9	37	
32168	91/03/10	06-30	13-30	62-00.0S	110-00.0E	1.6	1.8	1.7	1.6	0.6	-0.7	-0.1	0.3	0.7	1.1	1.1	1.2	1.3	1.4	1.4	1.4	45	
						1.4	1.2	1.2	1.1	1.1	1.0	0.9	0.8	0.8	0.7	0.6	0.6	0.5					
32169	91/03/10	11-00	18-00	61-59.2S	112-17.4E	2.2	2.1	2.0	1.9	1.8	-1.1	-1.1	-0.5	0.3	1.2	1.4	1.5	1.5	1.6	1.6	1.7	57	
						1.6	1.6	1.6															
32170	91/03/10	16-00	00-00	62-00.3S	114-58.6E	2.7	2.3	2.3	2.3	2.3	-0.6	-1.0	0.2	1.4	1.7	1.7	1.9	2.0	2.0	2.0	2.0	55	
32171	91/03/10	22-00	06-00	61-59.0S	118-15.8E	2.5	2.5	2.4	2.3	2.2	-0.4	-0.9	-0.8	0.8	1.5	1.7	1.8	1.9	1.9	1.9	1.9	-	
						1.9	1.8	1.8															
32172	91/03/11	04-40	12-40	62-00.6S	121-30.3E	2.5	2.1	2.1	2.1	2.0	-1.2	-1.0	0.3	1.4	1.7	1.8	1.8	1.9	1.9	1.9	1.9	47	
32173	91/03/11	10-00	18-00	62-00.0S	124-01.9E	2.2	2.1	2.0	2.0	1.9	-1.3	-1.0	0.6	1.3	1.7	1.8	1.8	1.7	1.7	1.7	1.7	59	
						1.7	1.7	1.6	1.5														
32174	91/03/11	15-00	00-00	62-00.3S	126-28.1E	2.5	2.2	2.2	2.2	2.2	-1.1	-1.4	-0.2	0.7	1.7	1.8	1.8	1.8	1.8	1.8	1.8	61	
32175	91/03/11	21-00	06-00	61-59.3S	129-18.1E	2.3	2.3	2.2	2.1	2.1	-1.3	-1.4	-1.1	0.7	1.6	1.9	1.9	2.0	2.0	2.0	2.0	59	
						2.0	2.0	1.9	1.9														
32176	91/03/12	03-00	12-00	62-00.5S	132-08.5E	3.1	2.9	2.9	2.9	2.9	1.2	-0.3	-0.4	0.8	1.9	2.0	2.1	2.1	2.1	2.0	2.0	68	

STATION	DATE	TIME		POSITION		TEMPERATURE (°C)																S.L. (M)
		UT	LT	LAT.	LONG.	DEPTH (M)																
						0 600	10 700	20 800	30 900	50 1000	75 1100	100 1200	125 1300	150 1400	200 1500	250 1600	300 1700	350 1800	400	450	500	
32177	91/03/12	09-00	18-00	61-59.7S	135-03.1E	2.4 2.0	2.2 1.9	2.0 1.9	2.0 1.8	2.0 —	-0.6 —	-1.2 —	-0.3 —	0.7 —	1.7 —	1.9 —	1.9 —	1.9 —	1.9	1.9	1.9	75
32178	91/03/12	15-00	00-00	62-00.0S	137-54.0E	2.1 —	2.0 —	2.0 —	2.0 —	1.8 —	-1.0 —	-0.5 —	1.3 —	1.8 —	1.9 —	1.9 —	2.0 —	2.1 —	2.1	2.2	2.4	—
32179	91/03/12	21-00	06-00	62-01.2S	140-48.6E	1.7 2.0	1.6 1.9	1.5 1.9	1.5 1.8	1.4 —	-0.9 —	-0.9 —	0.6 —	0.9 —	1.8 —	1.9 —	1.9 —	1.9 —	1.9	1.9	1.9	—
32180	91/03/13	02-00	12-00	62-00.5S	143-45.9E	2.5 —	1.9 —	1.9 —	1.9 —	1.9 —	-0.7 —	-0.8 —	0.6 —	1.4 —	1.7 —	1.9 —	1.9 —	1.9 —	2.0	1.9	1.9	52
32181	91/03/13	08-00	18-00	61-59.7S	146-45.4E	2.3 2.0	2.1 2.0	2.0 2.0	2.0 2.0	1.9 —	-0.6 —	-1.0 —	-0.8 —	0.2 —	1.7 —	1.8 —	1.9 —	1.9 —	2.0	2.0	1.9	62
32182	91/03/13	14-00	00-00	61-59.6S	149-00.8E	1.5 1.6	1.3 1.6	1.2 1.5	1.2 1.4	1.1 —	-1.0 —	0.5 —	1.4 —	1.4 —	1.6 —	1.6 —	1.7 —	1.7 —	1.6	1.6	1.6	54
32183	91/03/13	16-30	02-30	61-57.0S	150-00.0E	1.4 1.8	1.2 1.8	1.2 1.7	1.2 1.6	1.0 1.5	-1.0 —	0.1 —	1.2 —	1.7 —	1.8 —	1.8 —	1.8 —	1.8 —	1.8	1.8	1.8	49
32184	91/03/13	21-00	07-00	61-04.0S	149-58.0E	1.9 1.9	1.9 1.9	1.9 1.9	1.8 1.8	1.8 1.7	-0.7 1.7	-0.3 1.6	0.9 1.5	1.8 1.4	1.9 1.3	2.0 1.3	2.0 1.2	2.0 1.1	2.0	2.0	2.0	—
32185	91/03/14	02-00	12-00	60-10.1S	150-02.8E	1.9 2.1	1.6 1.9	1.5 2.1	1.5 —	1.5 —	-1.0 —	0.4 —	1.3 —	1.6 —	1.7 —	1.8 —	1.7 —	1.6 —	1.8	1.9	1.9	—
32186	91/03/14	08-00	18-00	59-11.4S	149-55.5E	1.7 2.1	1.5 2.1	1.4 2.0	1.4 1.9	1.4 1.8	-0.9 —	-0.4 —	1.1 —	1.5 —	1.6 —	1.7 —	1.8 —	2.0 —	2.1	2.1	2.1	—
32187	91/03/14	14-00	00-00	58-11.8S	149-58.0E	2.6 2.2	2.2 2.3	2.2 2.2	2.2 1.9	2.2 1.8	1.8 1.7	-0.4 1.5	1.2 1.5	1.7 1.5	1.9 1.5	1.9 1.5	1.9 —	2.2 —	2.2	2.2	2.2	—
32188	91/03/14	21-00	07-00	56-53.2S	150-00.5E	4.1 2.2	4.0 2.2	3.9 2.2	3.9 2.1	3.9 2.1	3.9 2.0	3.6 2.0	1.5 1.9	0.9 1.9	0.9 1.7	1.5 —	1.7 —	2.3 —	2.0	1.9	2.1	—
32189	91/03/15	02-00	12-00	56-19.2S	150-14.5E	4.5 2.3	4.4 2.2	4.3 2.3	4.3 2.3	4.3 2.2	4.3 2.1	3.3 2.1	2.5 2.0	1.2 2.0	1.3 —	1.9 —	2.2 —	2.2 —	2.4	2.4	2.3	91
32190	91/03/15	08-00	18-00	55-33.8S	150-10.0E	6.1 2.4	5.8 2.3	5.8 2.3	5.8 2.3	5.8 2.2	5.8 2.2	3.1 2.1	2.2 2.0	2.0 2.0	1.9 1.9	3.1 1.8	2.4 1.7	2.1 1.6	2.2	2.2	2.2	82
32191	91/03/15	14-00	00-00	55-01.2S	149-59.6E	6.3 3.5	6.2 3.1	6.1 3.0	6.1 3.0	6.1 2.7	6.0 2.7	6.0 2.6	5.7 2.6	5.7 2.4	4.7 2.4	4.4 2.4	4.7 2.3	4.5 2.2	3.7	4.3	3.9	106
32192	91/03/15	21-00	07-00	53-23.1S	150-00.4E	7.2 4.0	7.0 3.4	6.9 3.5	6.9 3.1	6.9 3.1	6.9 2.8	7.6 2.7	7.6 2.6	6.9 —	6.5 —	6.4 —	5.3 —	4.3 —	4.6	4.9	4.4	88

STATION	DATE	TIME		POSITION		TEMPERATURE(°C)															S.L. (M)	
		UT	LT	LAT.	LONG.	DEPTH(M)																
						0 600	10 700	20 800	30 900	50 1000	75 1100	100 1200	125 1300	150 1400	200 1500	250 1600	300 1700	350 1800	400	450		500
32193	91/03/16	02-15	12-15	52-24.9S	150-02.9E	7.5 3.8	7.4 3.6	7.3 3.3	7.2 2.8	7.2 2.7	7.0 2.7	6.6 2.6	5.9 2.6	5.5 2.5	5.6 2.5	5.0 2.5	4.0 2.4	4.8 2.4	4.4	3.9	4.1	60
32194	91/03/16	08-00	18-00	51-28.6S	150-00.4E	8.4 6.4	8.5 5.3	8.4 4.8	8.3 3.9	8.3 3.7	8.3 3.4	8.4 3.1	8.5 3.0	8.6 2.7	8.7 2.7	8.4 -	8.1 -	7.7 -	7.3	7.0	6.7	239
32195	91/03/16	14-00	00-00	50-22.6S	149-45.0E	9.7 8.0	9.7 7.3	9.6 6.8	9.6 6.1	9.6 5.3	9.6 4.4	9.7 4.0	9.7 3.5	9.7 3.3	9.2 3.0	8.8 2.9	9.0 2.7	9.0 2.6	8.9	8.7	8.6	165
32196	91/03/16	20-45	06-45	48-52.3S	149-52.0E	8.9 6.3	8.8 5.9	8.8 5.3	8.7 4.6	8.7 4.3	8.6 4.0	8.7 3.7	8.8 3.6	8.3 3.4	8.3 3.1	8.2 3.0	7.7 -	7.3 -	7.1	6.9	6.6	115
32197	91/03/17	12-00	22-00	46-13.7S	150-00.0E	11.5 8.0	11.7 7.5	11.7 6.4	11.7 5.7	11.0 5.0	10.7 4.4	11.1 3.8	11.1 3.6	10.7 3.5	10.3 3.3	9.7 2.9	9.4 2.8	9.2 2.8	9.1	8.9	8.6	-
32198	91/03/17	21-00	07-00	44-06.2S	150-12.5E	19.5 8.6	19.7 7.9	19.6 7.3	19.5 6.5	18.5 5.8	16.5 5.0	16.1 4.0	15.5 4.1	14.8 3.8	13.8 3.6	12.9 3.4	12.1 -	11.0 -	10.1	9.7	9.5	42
32199	91/03/18	10-00	20-00	41-52.3S	150-35.8E	18.5 10.8	18.2 10.7	18.2 10.3	17.4 10.5	17.2 9.1	16.8 10.3	15.5 10.2	15.5 7.7	15.3 6.9	15.1 10.7	14.7 -	14.2 -	13.8 -	13.1	12.5	11.8	24
32200	91/03/18	14-00	00-00	40-54.7S	150-49.7E	20.8 8.4	20.9 7.6	20.7 6.8	20.6 6.0	20.1 5.4	18.1 4.9	16.8 4.5	15.8 4.1	14.9 3.8	13.6 3.5	12.9 3.3	11.9 3.1	11.2 2.8	10.5	9.9	9.3	-
32201	91/03/19	02-00	12-00	38-02.8S	151-24.2E	23.3 9.1	23.0 8.3	22.9 7.3	22.5 -	21.0 -	20.2 -	19.4 -	18.5 -	18.0 -	16.9 -	14.9 -	13.7 -	12.9 -	12.0	11.0	10.3	-
32202	91/03/19	08-00	18-00	36-45.9S	151-29.9E	22.5 12.3	22.4 -	22.3 -	22.3 -	22.3 -	22.3 -	20.2 -	19.6 -	19.2 -	18.1 -	18.0 -	17.8 -	17.5 -	16.4	15.4	14.2	80

Table 3. CTD observation data (St.1-St.3).

32CTD-1 (St. 1)  
 1990. 12. 5 11:10 (UT)  
 LAT. 39-47S  
 LNG. 110-00E

PRESS (db)	TEMP. (°C)	PSAL
0.0	11.98	-
10.4	11.74	-
20.2	11.64	-
30.3	11.62	-
50.3	11.50	-
75.2	10.84	-
100.3	10.96	-
125.5	10.93	-
151.1	10.80	-
200.5	10.41	34.861
250.8	10.13	34.819
300.5	10.01	34.788
350.2	9.84	34.756
400.2	9.83	34.767
450.9	9.73	34.749
499.5	9.51	34.720
550.9	9.24	34.662
599.5	8.74	34.605
651.3	8.39	34.559
700.1	7.91	34.520
751.2	7.41	34.484
800.3	6.79	34.455
850.3	6.26	34.423
899.2	5.58	34.377
950.5	5.19	34.363

32CTD-2 (St. 2)  
 1990. 12. 6 11:10 (UT)  
 LAT. 44-36S  
 LNG. 109-58E

PRESS (db)	TEMP. (°C)	PSAL
0.0	10.73	34.577
10.1	10.70	34.581
21.5	10.55	34.601
29.9	10.49	34.590
50.0	10.03	34.588
75.9	9.76	34.615
100.3	9.62	34.627
126.3	9.45	34.630
149.9	9.55	34.657
201.5	9.44	37.673
251.1	9.71	34.703
302.5	9.70	34.657
350.8	9.73	34.656
400.5	9.61	34.632
449.8	9.52	34.589
500.2	8.90	34.507
549.9	8.70	34.497
600.7	8.21	34.482
650.6	7.76	34.443
700.1	7.35	34.469
751.1	6.81	34.433
800.5	6.11	34.398
850.0	5.61	34.377

32CTD-3 (St. 3)  
 1990. 12. 7 12:30 (UT)  
 LAT. 49-38S  
 LNG. 109-51E

PRESS (db)	TEMP. (°C)	PSAL
0.0	-	33.940
10.2	5.65	33.955
19.9	5.61	33.968
30.2	5.58	33.949
50.2	5.55	33.951
74.7	5.07	33.953
98.0	4.63	33.977
126.4	4.28	33.959
151.5	4.14	-
201.3	3.76	34.000
250.4	3.81	-
301.5	3.86	-
351.4	3.42	-
400.2	-	34.191
450.7	3.08	34.222
499.8	2.89	34.266
550.7	2.76	34.294
600.4	2.68	34.327
650.3	2.59	34.362
700.1	2.60	34.412
750.0	2.55	34.436
800.4	2.55	34.479

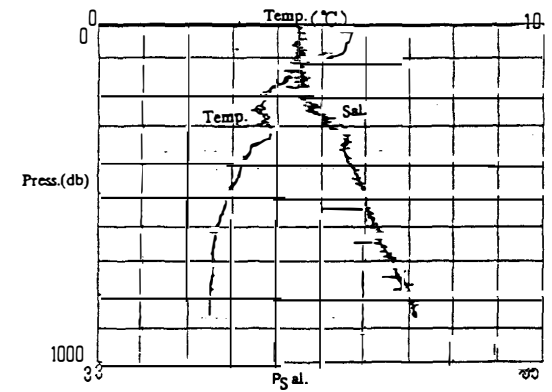
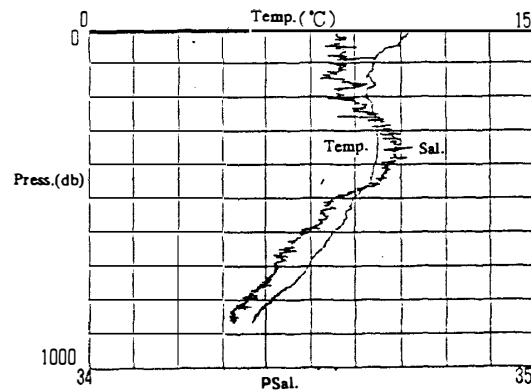
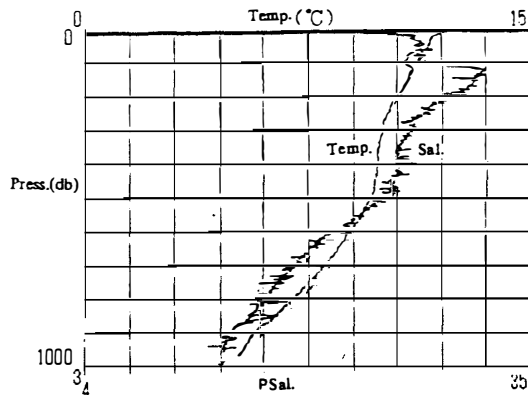


Table 4. CTD observation data (St. 4, St. 6).

32CTD-4 (St. 4)  
 1990. 12. 8 12:10 (UT)  
 LAT. 54-31S  
 LNG. 110-04E

PRESS (db)	TEMP. (°C)	PSAL
0.0	2.76	33.887
10.6	2.75	33.913
20.5	2.70	33.905
29.9	2.69	33.889
49.9	2.62	33.915
74.9	2.58	33.932
99.8	1.44	33.974
125.1	1.05	33.986
150.0	0.96	34.100
200.3	-	34.188
250.6	2.04	34.302
300.3	2.11	34.362
350.7	2.20	34.426
401.2	2.28	34.486
450.5	2.29	34.521
499.9	2.27	34.561
550.1	2.26	34.577
600.2	2.28	34.615
649.9	2.27	34.639
700.1	2.27	34.663
733.4	2.25	34.669

32CTD-5 (St. 6)  
 1991. 3. 18 02:00 (UT)  
 LAT. 42-57S  
 LNG. 150-24E

PRESS (db)	TEMP. (°C)	PSAL
0.0	18.72	35.601
18.3	18.72	35.616
20.8	18.62	35.603
29.6	18.34	35.601
50.1	18.09	35.612
74.8	17.43	35.525
100.3	16.20	35.442
124.8	15.21	35.396
149.3	14.51	35.352
200.4	13.67	35.292
250.1	12.86	35.204
299.9	12.24	35.134
350.4	11.39	35.015
399.9	10.60	34.886
450.2	10.08	34.808
499.9	9.49	34.738
550.3	8.97	34.678
600.9	8.52	34.629
649.8	8.24	34.609
700.1	7.78	34.576
750.0	7.46	34.561
800.2	7.07	34.527
850.0	6.65	34.507
899.9	6.29	34.494
950.6	6.02	34.489

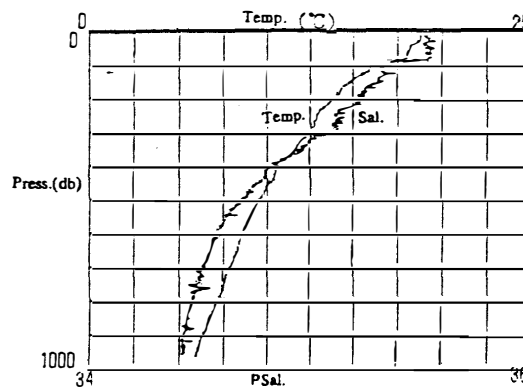
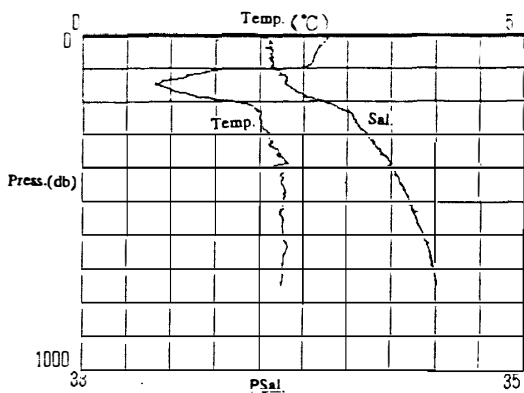


Table 5. Serial observation data.

Station 32001

Meteorological observation

Date : December 05.1990  
 Time (UT) : 05:00  
 Latitude : 39° 47' S  
 Longitude : 110° 00' E  
 Depth : 4653 m

Weather time (UT) : 05:00  
 Weather : bc  
 Air temprature (dry) : 13.2 °C  
 Atmospheric pressure : 1019.2 hPa

Wind direction : SW  
 velocity : 5m/s  
 Humidity : 81 %  
 Wave : SW / 4  
 Swell : SW / 3  
 Visibility : 30

O b s e r v e d										I n t e r p o l a t e d				
Depth (m)	T (°C)	S	pH	DO	PO <sub>4</sub> -P	SiO <sub>3</sub> -Si	NO <sub>2</sub> -N	NO <sub>3</sub> -N	NH <sub>4</sub> -N	depth (m)	T (°C)	S	σ <sub>t</sub>	ΔD
0	11.90	35.151	7.78	278	0.77	2	0.15	9.	0.2	0	11.90	35.151	26.726	0.
9	11.86	35.172	7.95	279	0.74	2	0.33	8.	0.2	10	11.84	35.173	26.755	0.0130
18	11.68	35.175	7.98	270	0.76	2	0.32	8.	0.2	20	11.66	35.176	26.791	0.0256
26	-----	-----	-----	-----	-----	-----	-----	-----	-----	30	11.58	35.179	26.808	0.0381
42	11.50	35.180	7.99	279	0.86	4	0.15	6.	0.3	50	11.35	35.178	26.850	0.0624
63	11.11	35.169	7.98	280	0.88	5	0.19	10.	0.4	75	10.96	35.159	26.907	0.0919
83	10.91	35.144	7.98	278	0.89	2	0.18	7.	0.2	100	11.05	35.064	26.817	0.1219
103	11.07	35.051	7.98	272	0.83	4	0.60	6.	0.6	125	10.86	35.062	26.850	0.1527
123	10.87	35.058	7.97	266	0.86	2	0.15	8.	0.0	150	10.72	35.089	26.896	0.1827
165	10.64	35.084	7.98	266	0.94	2	0.02	11.	0.2	200	10.32	34.886	26.808	0.2440
205	10.28	34.856	7.95	258	1.05	6	0.17	13.	0.2	250	10.13	34.824	26.793	0.3083
246	10.15	34.828	7.96	266	0.97	4	0.02	9.	0.0	300	9.95	34.785	26.793	0.3734
338	9.82	34.762	7.95	269	1.08	4	0.00	13.	0.1	400	9.72	34.757	26.810	0.5043
410	9.71	34.757	7.94	267	1.16	4	0.02	12.	0.1	500	9.44	34.711	26.821	0.6357
495	9.47	34.715	7.93	261	1.29	6	0.00	13.	0.1	600	8.73	34.603	26.850	0.7667
571	8.98	34.637	7.92	249	1.28	5	0.01	17.	0.1	700	7.86	34.512	26.912	0.8942
652	8.25	34.546	7.87	240	1.57	5	0.00	18.	0.2	800	6.96	34.460	26.999	1.0151
734	7.58	34.494	7.85	224	1.79	12	0.03	19.	0.2	900	5.85	34.400	27.098	1.1270
815	6.81	34.453	7.80	213	1.72	16	0.02	25.	0.0	1000	4.82	34.354	27.184	1.2293
1018	4.64	34.347	7.76	216	2.30	29	0.06	25.	0.1	1250	3.53	34.399	27.355	1.4524
1218	3.64	34.387	7.72	196	2.55	50	0.04	30.	1.0	1500	2.97	34.512	27.498	1.6374
1426	3.08	34.478	7.69	180	2.40	71	0.06	26.	1.0	1750	2.69	34.611	27.602	1.7942
1636	2.81	34.571	7.68	173	2.61	79	0.04	25.	---	2000	2.46	34.677	27.675	1.9315
2058	2.44	34.688	7.68	180	2.42	85	0.00	31.	0.2	2250	2.28	34.717	27.722	2.0559
2479	2.13	34.737	7.70	194	2.31	88	0.01	30.	0.1	2500	2.11	34.738	27.753	2.1720
2932	1.69	34.742	7.69	206	2.37	97	0.02	26.	0.1	2750	1.88	34.744	27.776	2.2816
3419	1.19	34.720	7.68	210	2.28	111	0.01	30.	0.1	3000	1.62	34.741	27.793	2.3850



Station 32002

Meteorological observation

Date : December 06 ,1990  
 Time (UT) : 05:00  
 Latitude : 44° 37' S  
 Longitude : 109° 58' E  
 Depth : 4200 m

Weather time (UT) : 05:00  
 Weather : c  
 Air temprature (dry) : 12.0 °C  
 Atmospheric pressure : 1015.9 hPa

Wind direction : W  
 velocity : 6 m/s  
 Humidity : 88 %  
 Wave : W / 3  
 Swell : W / 4  
 Visibility : 10

O b s e r v e d										I n t e r p o l a t e d				
Depth (m)	T (°C)	S	pH	DO	PO <sub>4</sub> -P	SiO <sub>3</sub> -Si ( μmol / l )	NO <sub>2</sub> -N	NO <sub>3</sub> -N	NH <sub>4</sub> -N	depth (m)	T (°C)	S	σ t	Δ D
9	10.55	34.318	8.02	290	0.85	1	0.22	10.	0.0	10	10.53	34.341	26.346	0.0159
18	10.44	34.583	8.01	290	0.85	1	0.24	12.	0.0	20	10.43	34.594	26.561	0.0316
27	10.41	34.583	8.02	292	0.85	1	0.22	11.	0.2	30	10.40	34.581	26.556	0.0463
46	10.27	34.584	8.00	288	0.86	2	0.21	11.	0.0	50	10.18	34.599	26.608	0.0753
62	9.89	34.644	7.99	284	0.88	2	0.26	17.	0.1	75	9.72	34.642	26.720	0.1098
81	9.67	34.634	7.99	282	0.92	1	0.32	14.	0.2	100	9.53	34.625	26.739	0.1429
103	9.52	34.624	7.98	280	0.98	1	0.39	13.	0.3	125	9.48	34.622	26.744	0.1758
124	9.48	34.621	7.97	278	1.01	2	0.40	13.	0.2	150	9.57	34.642	26.745	0.2087
158	9.61	34.652	7.97	278	0.99	2	0.37	13.	0.1	200	9.69	34.693	26.765	0.2745
195	9.69	34.692	7.96	277	0.99	1	0.23	12.	0.1	250	9.64	34.688	26.769	0.3403
235	9.67	34.690	7.96	276	1.02	2	0.08	13.	0.1	300	9.51	34.675	26.781	0.4061
312	9.46	34.670	7.95	270	1.08	1	0.00	13.	0.1	400	9.06	34.606	26.800	0.5376
388	9.10	34.612	7.94	267	1.16	4	0.01	17.	0.1	500	8.49	34.539	26.838	0.6679
464	8.80	34.574	7.93	259	1.26	4	0.00	20.	0.0	600	7.79	34.470	26.889	0.7952
542	8.11	34.499	7.79	249	1.44	5	0.01	26.	0.1	700	6.97	34.451	26.991	0.9159
641	7.55	34.460	7.88	243	1.54	8	0.00	24.	0.1	800	5.93	34.398	27.086	1.0275
694	7.03	34.454	7.82	220	1.79	13	0.00	24.	0.1	900	4.95	34.354	27.169	1.1302
770	6.25	34.415	7.83	215	1.81	17	0.00	26.	0.2	1000	4.19	34.334	27.237	1.2252
962	4.42	34.336	7.76	217	2.21	29	0.00	30.	0.1	1250	3.20	34.396	27.385	1.4357
1155	3.50	34.358	7.74	209	2.30	42	0.01	30.	0.1	1500	2.77	34.512	27.517	1.6129
1346	2.98	34.443	7.70	191	2.27	55	0.00	29.	0.2	1750	2.55	34.617	27.619	1.7639
1538	2.73	34.530	7.69	184	2.49	63	0.00	33.	0.2	2000	2.40	34.692	27.692	1.8962
1938	2.43	34.679	7.69	186	2.34	75	0.00	35.	0.2	2250	2.25	34.730	27.735	2.0166
2360	2.18	34.738	7.71	200	2.18	78	0.00	38.	0.2	2500	2.05	34.744	27.763	2.1296
2806	1.74	34.743	7.70	207	2.27	92	0.00	36.	0.2	2750	1.80	34.745	27.783	2.2362
3275	1.26	34.726	7.69	211	2.25	107	0.00	30.	0.2	3000	1.54	34.739	27.798	2.3369

Station 32003

Meteorological observation

Date : December 07, 1990  
 Time (UT) : 06:00  
 Latitude : 49° 36' S  
 Longitude : 109° 57' E  
 Depth : 3230 m

Weather time (UT) : 06:00  
 Weather : c  
 Air temperature (dry) : 6.7 °C  
 Atmospheric pressure : 1026.1h Pa

Wind direction : W  
 velocity : 9m/s  
 Humidity : 75 %  
 Wave : W / 4  
 Swell : SW / 4  
 Visibility : 30

O b s e r v e d										I n t e r p o l a t e d				
Depth (m)	T (°C)	S	pH	DO	PO <sub>4</sub> -P	SiO <sub>3</sub> -Si	NO <sub>2</sub> -N	NO <sub>3</sub> -N	NH <sub>4</sub> -N	depth (m)	T (°C)	S	σ t	Δ D
				( μ mol / l )										
0	6.60	33.973	7.63	317	1.53	43	0.22	15.	0.2	0	6.60	33.973	26.664	0.
9	5.58	33.951	7.89	319	1.54	43	0.22	14.	0.1	10	5.56	33.950	26.777	0.0131
18	5.58	33.951	7.91	320	1.56	43	0.23	18.	0.0	20	5.56	33.951	26.778	0.0257
24	5.52	33.951	7.91	321	1.57	42	0.22	13.	0.1	30	5.45	33.951	26.791	0.0383
38	5.36	33.950	7.92	320	1.59	44	0.22	16.	0.1	50	5.30	33.951	26.809	0.0631
59	5.28	33.952	7.93	321	1.53	49	0.22	10.	0.1	75	5.25	33.951	26.815	0.0940
77	5.24	33.951	7.93	320	1.56	67	0.22	20.	0.2	100	4.77	33.955	26.873	0.1241
92	4.99	33.954	7.93	319	1.60	77	0.22	22.	0.1	125	4.32	33.957	26.923	0.1530
108	4.55	33.956	7.92	318	1.68	81	0.22	16.	0.2	150	4.11	33.962	26.949	0.1810
144	4.18	33.960	7.92	318	1.72	83	0.24	17.	0.4	200	3.77	34.004	27.017	0.2349
177	3.84	33.976	---	315	---	---	---	---	---	250	3.77	34.015	27.026	0.2871
210	3.77	34.016	7.89	302	1.81	89	0.01	24.	0.0	300	3.72	34.017	27.032	0.3392
279	3.77	34.008	7.85	275	1.99	91	0.00	23.	0.2	400	3.71	34.171	27.156	0.4378
344	3.63	34.060	7.80	258	2.17	92	0.00	13.	0.0	500	2.78	34.318	27.360	0.5212
410	3.70	34.191	7.86	290	1.94	94	0.01	24.	0.0	600	2.56	33.461	26.694	0.6262
478	2.88	34.255	7.76	237	2.34	95	0.00	30.	0.0	700	2.52	33.397	26.646	0.7649
542	2.68	34.282	7.75	230	2.42	98	0.00	32.	0.0	800	2.49	33.469	26.707	0.9033
609	2.55	34.333	7.72	219	2.48	100	0.00	31.	0.0	900	2.45	33.532	26.760	1.0368
676	2.53	34.379	7.72	206	2.43	102	0.00	29.	0.1	1000	2.40	33.583	26.805	1.1660
842	2.47	34.498	7.70	190	2.54	106	0.00	29.	0.2	1250	2.33	34.086	27.213	1.4377
1010	2.40	34.588	7.70	186	2.43	112	0.00	32.	0.2	1500	2.19	34.923	27.895	1.5853
1178	2.35	34.664	7.71	191	2.12	116	0.00	31.	0.1	1750	2.00	34.743	27.766	1.6705
1346	2.29	34.701	7.73	194	2.30	119	0.00	28.	0.2	2000	1.80	34.746	27.784	1.7689
1751	2.00	34.741	7.72	205	2.22	126	0.00	29.	0.1					
2230	1.60	34.737	7.72	237	2.21	126	0.00	26.	0.0					

Station 32004

Meteorological observation

Date : December 08, 1990  
 Time (UT) : 06:00  
 Latitude : 54° 31' S  
 Longitude : 110° 04' E  
 Depth : 3600 m

Weather time (UT) : 06:00  
 Weather : c  
 Air temperature (dry) : 3.8 °C  
 Atmospheric pressure : 1021.5 hPa

Wind direction : W  
 velocity : 11 m/s  
 Humidity : 88 %  
 Wave : W / 4  
 Swell : WNW / 3  
 Visibility : 25

O b s e r v e d										I n t e r p o l a t e d				
Depth (m)	T (°C)	S	pH	DO	PO <sub>4</sub> -P	SiO <sub>3</sub> -Si ( μmol / l )	NO <sub>2</sub> -N	NO <sub>3</sub> -N	NH <sub>4</sub> -N	depth (m)	T (°C)	S	σ <sub>t</sub>	ΔD
9	2.65	33.911	7.86	341	1.77	14	0.26	9.	0.1	10	2.65	33.911	27.046	0.0100
18	2.67	33.911	7.89	341	1.81	16	0.26	19.	0.0	20	2.67	33.911	27.045	0.0201
25	2.66	33.910	7.89	341	1.78	14	0.27	12.	0.2	30	2.67	33.910	27.044	0.0301
38	2.65	33.910	7.90	341	1.78	16	0.26	9.	0.2	50	2.55	33.909	27.053	0.0502
43	2.59	33.909	7.91	340	1.75	16	0.26	10.	0.0	75	2.50	33.910	27.058	0.0752
55	2.54	33.909	7.91	340	1.77	14	0.26	14.	0.0	100	1.67	33.939	27.146	0.0990
70	2.49	33.910	7.91	339	1.75	16	0.26	22.	0.1	125	1.00	33.972	27.219	0.1209
80	2.49	33.910	7.91	339	1.82	16	0.26	16.	0.0	150	0.91	33.995	27.243	0.1417
108	1.28	33.954	7.89	336	2.02	23	0.26	13.	0.3	200	1.26	34.111	27.313	0.1810
130	0.97	33.977	7.87	331	2.06	26	0.35	12.	0.2	250	1.81	34.261	27.394	0.2170
158	0.93	34.005	7.86	329	2.12	27	0.26	22.	0.3	300	1.99	34.331	27.436	0.2502
209	1.37	34.139	7.80	279	2.28	39	0.00	19.	0.0	400	2.02	34.436	27.518	0.3112
259	1.89	34.284	7.74	235	2.48	49	0.00	20.	0.0	500	2.14	34.531	27.585	0.3658
306	2.00	34.337	7.72	221	2.51	55	0.00	23.	0.0	600	2.19	34.594	27.631	0.4156
348	2.20	34.415	7.71	212	2.54	60	0.00	26.	0.0	700	2.19	34.648	27.674	0.4618
391	2.03	34.435	7.70	202	2.55	63	0.00	33.	0.0	800	2.16	34.677	27.700	0.5052
436	2.03	34.447	7.69	199	2.59	67	0.00	27.	0.0	900	2.11	34.704	27.726	0.5466
481	2.12	34.513	7.69	192	2.51	70	0.00	23.	0.0	1000	2.06	34.723	27.745	0.5863
587	2.19	34.585	7.69	189	2.52	74	0.00	24.	0.1					
696	2.19	34.647	7.69	191	2.40	75	0.00	29.	0.1					
805	2.16	34.678	7.71	192	2.15	75	0.00	22.	0.0					
918	2.10	34.708	7.73	195	2.33	79	0.00	20.	0.2					
1168	1.96	34.734	7.72	202	2.27	82	0.00	11.	0.2					
1438	1.72	34.742	7.72	206	2.25	88	0.00	26.	0.2					
1780	1.39	34.735	7.73	213	2.25	97	0.00	35.	0.4					

Station 32005

Meteorological observation

Date : March 17, 1991  
 Time (UT) : 03:00  
 Latitude : 47° 46' S  
 Longitude : 150° 04' E  
 Depth : 2820 m

Weather time (UT) : 03:00  
 Weather : c  
 Air temperature (dry) : 12.3 °C  
 Atmospheric pressure : 1005.6 hPa

Wind direction : NW  
 velocity : 12m/s  
 Humidity : 86 %  
 Wave : NW / 4  
 Swell : W / 4  
 Visibility : 30

O b s e r v e d										I n t e r p o l a t e d				
Depth (m)	T (°C)	S	pH	DO	PO <sub>4</sub> -P	SiO <sub>3</sub> -Si	NO <sub>2</sub> -N	NO <sub>3</sub> -N	NH <sub>4</sub> -N	depth (m)	T (°C)	S	σ <sub>t</sub>	ΔD
0	9.40	34.236	7.80	291	1.10	0	0.21	13.	0.2	0	9.40	34.236	26.456	0.
10	9.15	34.229	7.88	293	1.08	1	0.20	15.	0.2	10	9.15	34.229	26.491	0.0155
16	9.16	34.237	7.89	302	1.12	0	0.20	16.	0.1	20	9.16	34.235	26.494	0.0308
20	9.16	34.235	7.90	294	1.13	1	0.20	13.	0.2	30	9.14	34.239	26.500	0.0461
30	9.14	34.239	7.90	291	0.97	1	0.21	13.	0.3	50	9.20	34.271	26.516	0.0766
40	9.14	34.240	7.91	294	1.12	1	0.19	13.	0.1	75	9.29	34.265	26.496	0.1148
53	9.22	34.282	7.91	292	1.09	0	0.23	8.	0.2	100	8.98	34.355	26.617	0.1519
65	9.27	34.316	7.91	287	1.03	1	0.18	8.	0.4	125	8.57	34.455	26.759	0.1860
76	9.29	34.259	7.90	284	1.08	0	0.18	9.	0.4	150	8.49	34.499	26.806	0.2180
99	9.00	34.350	7.90	283	1.08	0	0.25	12.	0.4	200	8.45	34.530	26.837	0.2804
123	8.59	34.450	7.87	290	1.13	1	0.31	11.	0.1	250	8.32	34.529	26.856	0.3421
147	8.49	34.495	7.88	276	1.18	2	0.04	13.	0.1	300	8.10	34.505	26.870	0.4034
195	8.46	34.529	7.87	273	1.19	2	0.07	15.	0.1	400	7.34	34.391	26.892	0.5253
241	8.34	34.530	7.85	272	1.24	3	0.01	14.	0.0	500	6.72	34.333	26.932	0.6452
288	8.19	34.516	7.86	270	1.21	3	0.00	18.	0.0	600	6.32	34.342	26.992	0.7613
334	7.81	34.464	7.85	270	1.28	3	0.04	20.	0.4	700	5.79	34.339	27.057	0.8723
382	7.44	34.402	7.84	275	1.27	5	0.01	18.	0.0	800	5.03	34.349	27.156	0.9758
429	7.18	34.376	7.83	275	1.40	6	0.00	18.	0.2					
476	6.84	34.337	7.82	271	1.38	6	0.06	20.	0.3					
590	6.36	34.342	7.77	246	1.62	8	0.00	19.	0.3					
694	5.83	34.339	7.73	233	1.79	12	0.03	17.	0.3					
849	4.89	34.352	7.70	219	1.83	19	0.01	14.	0.3					

Station 32006

Meteorological observation

Date : March 18, 1991  
 Time (UT) : 02:00  
 Latitude : 42° 57' S  
 Longitude : 150° 24' E  
 Depth : 3600 m

Weather time (UT) : 02:00  
 Weather : c  
 Air temperature (dry) : 15.4 °C  
 Atmospheric pressure : 1016.5 hPa

Wind direction : ENE  
 velocity : 7m/s  
 Humidity : 86%  
 Wave : ENE/ 2  
 Swell : SW / 3  
 Visibility : 30

O b s e r v e d										I n t e r p o l a t e d				
Depth (m)	T (°C)	S	pH	DO	PO <sub>4</sub> -P	SiO <sub>3</sub> -Si	NO <sub>2</sub> -N	NO <sub>3</sub> -N	NH <sub>4</sub> -N	depth (m)	T (°C)	S	σ <sub>t</sub>	ΔD
0	19.70	35.603	7.83	236	0.14	0	0.03	1.	0.3	0	19.70	35.603	25.302	0.
8	18.70	35.603	8.00	237	0.14	0	0.01	1.	0.3	10	18.65	35.602	25.572	0.0253
17	18.69	35.597	7.99	237	0.16	1	0.00	1.	0.0	20	18.66	35.595	25.564	0.0495
24	18.61	35.593	8.01	237	0.17	0	0.03	1.	0.1	30	18.54	35.591	25.591	0.0735
43	18.32	35.576	7.99	231	0.20	0	0.08	1.	0.1	50	18.09	35.553	25.674	0.1207
64	17.56	35.501	7.95	209	0.38	0	0.12	4.	0.0	75	17.17	35.471	25.836	0.1770
86	16.75	35.446	7.94	216	0.42	1	0.15	4.	0.1	100	16.11	35.416	26.043	0.2290
108	15.75	35.400	7.92	200	0.58	2	0.02	7.	0.1	125	15.18	35.363	26.213	0.2767
128	15.09	35.357	7.91	202	0.81	2	0.02	8.	0.1	150	14.56	35.326	26.320	0.3213
171	14.16	35.304	7.91	206	0.71	3	0.01	10.	0.1	200	13.63	35.270	26.474	0.4048
214	13.42	35.256	7.90	215	0.77	2	0.04	10.	0.1	250	13.07	35.232	26.559	0.4831
257	13.01	35.227	7.92	164	0.73	2	0.01	10.	0.0	300	12.43	35.151	26.624	0.5584
351	11.64	35.031	7.87	215	0.99	3	0.01	13.	0.1	400	11.01	34.904	26.699	0.7037
429	10.42	34.853	7.82	208	1.24	5	0.01	17.	0.0	500	9.69	34.739	26.797	0.8210
515	9.42	34.724	7.83	211	1.37	7	0.00	19.	0.0	600	8.59	34.634	26.897	0.9299
601	8.62	34.633	7.80	205	1.54	10	0.00	22.	0.1	700	7.76	34.564	26.967	1.0525
687	7.88	34.573	7.76	202	1.70	14	0.00	23.	0.1	800	6.90	34.506	27.044	1.1686
772	7.10	34.518	7.74	196	1.86	19	0.00	21.	0.0	900	6.24	34.479	27.110	1.2781
859	6.51	34.488	7.74	208	1.88	24	0.00	25.	0.1	1000	5.60	34.466	27.181	1.3813
1072	5.17	34.465	7.69	188	2.20	39	0.00	27.	0.2	1250	4.23	34.486	27.353	1.6099
1291	4.04	34.492	7.66	183	2.30	59	0.00	24.	0.1	1500	3.16	34.503	27.474	1.8014
1508	3.13	34.504	7.63	177	2.27	66	0.00	25.	0.1	1750	2.83	34.596	27.578	1.9654
1727	2.87	34.588	7.63	166	2.43	81	0.00	30.	0.3	2000	2.46	34.668	27.668	2.1070
2168	2.22	34.702	7.64	183	2.33	85	0.00	29.	0.3	2250	2.15	34.712	27.729	2.2306
2644	1.90	34.736	7.65	190	2.29	94	0.00	26.	0.5	2500	1.98	34.732	27.759	2.3435
3137	1.57	34.737	7.63	198	2.32	107	0.02	24.	0.4	2750	1.83	34.739	27.776	2.4511
										3000	1.66	34.740	27.790	2.5548

Table 6. Petroleum oil, Cd, Cu, Zn and Hg concentrations in surface sea water.

Station No.	Date	Time		Position		Air Temp.	Water Temp.	Petroleum Oil	Cadmium	Copper	Zinc	Mercury
		U T	LMT	Lat.	Long.	(^C)		( $\mu\text{g/l}$ )				
	1990								*	*		
P - 1	11.17	22:45	07:45	19-35N	132-59E	27.1	28.0	3.4	0.000	0.3	4.0	0.002
2	11.18	23:00	08:00	14-02	135-36	28.4	28.5	1.9	0.000	0.3	0.9	0.039
3	11.19	23:10	08:10	8-08	128-13	26.5	28.1	1.2	0.000	0.3	0.5	0.014
4	11.20	22:30	07:30	4-12	124-13	27.7	28.1	2.4	0.000	0.2	3.2	0.013
5	11.21	22:30	07:30	0-03	119-27	28.2	29.1	3.5	0.000	0.1	4.3	0.025
6	11.22	23:00	08:00	5-30S	117-08	29.0	29.7	7.7	0.000	0.0	1.6	0.021
7	11.23	23:00	08:00	10-44	115-17	28.1	28.8	1.4	0.000	0.0	4.8	0.042
8	11.24	23:00	08:00	16-15	114-05	24.9	27.1	1.0	0.000	0.2	0.6	0.023
9	11.25	23:00	08:00	21-42	112-53	22.4	22.8	1.2	0.000	0.3	1.3	0.035
10	11.26	23:00	08:00	27-00	112-36	19.6	20.9	1.2	0.000	0.2	3.2	0.032
11	12. 5	06:00	13:00	39-47	110-00	13.2	11.9	1.4	0.003	0.5	4.8	0.039
12	12. 6	05:30	12:30	44-37	109-58	12.0	10.7	0.8	0.000	0.2	1.6	0.044
13	12. 7	05:30	12:30	49-36	109-57	6.7	6.6	0.4	0.015	1.0	3.9	0.028
14	12. 8	05:30	12:30	54-30	109-59	3.8	2.7	0.8	0.008	0.6	4.0	0.100
	1991											
15	3.14	02:00	12:00	60-11	150-03	1.8	1.9	1.8	0.007	0.9	7.6	0.018
16	3.15	22:00	08:00	56-19	150-15	4.1	4.5	2.0	0.003	0.5	3.2	0.023
17	3.16	22:00	08:00	52-25	150-03	7.6	7.5	1.3	0.000	0.5	5.5	0.023
18	3.17	22:00	08:00	47-44	150-03	12.3	1.7	1.6	0.000	0.2	2.6	0.014
19	3.18	22:00	08:00	42-57	150-22	19.3	19.7	2.6	0.008	0.0	1.8	0.009

\* ZERO means under detection limit ( Cd:0.0005 Cu:0.05)

Table 7. Hourly tidal observation data from February 1990 to January 1991.

Station : SYOWA STATION  
 Latitude : 69° 0' 28" S  
 Longitude : 39° 34' 13" E  
 Duration : Feb. 1-Feb. 29 1990  
 Unit : CENTIMETER

Date	Time																							SUM	MEAN	SUM (25)	MEAN (25)		
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22					23	
1	128	108	93	90	97	113	132	148	161	168	166	159	148	139	136	134	139	151	166	177	180	180	169	154	3436	143	3574	143	
2	138	118	101	91	88	98	109	120	132	141	146	145	142	143	142	146	152	160	169	180	183	181	174	162	3361	140	3509	140	
3	148	131	115	102	94	95	99	103	113	123	129	137	142	147	155	165	174	179	186	192	192	189	183	173	3466	144	3630	145	
4	164	150	133	121	111	101	95	90	91	91	95	104	113	124	141	156	168	175	180	183	183	178	172	166	3285	137	3444	138	
5	159	150	141	131	117	107	92	79	69	62	62	69	80	96	117	139	159	172	179	182	180	176	170	167	3055	127	3223	129	
6	168	164	161	158	151	140	126	107	92	77	67	70	79	96	123	150	177	195	204	206	204	196	189	185	3485	145	3668	147	
7	183	185	187	189	186	179	163	138	113	90	73	62	67	83	108	135	165	185	197	201	195	186	175	168	3613	151	3781	151	
8	168	173	181	188	194	196	184	162	135	106	80	65	61	72	94	122	151	177	192	197	191	179	164	154	3586	149	3737	149	
9	151	155	168	182	195	201	195	179	154	121	92	64	56	62	80	108	139	164	183	189	184	170	157	144	3493	146	3627	145	
10	134	142	153	169	188	203	205	197	177	146	113	84	68	67	77	104	132	156	175	186	181	167	150	132	3506	146	3625	145	
11	119	117	129	147	168	189	200	195	181	159	128	96	76	69	77	94	124	145	166	175	173	162	142	124	3355	140	3464	139	
12	109	102	109	124	149	171	187	193	187	170	144	117	95	84	87	100	125	147	166	180	179	168	150	131	3374	141	3489	140	
13	115	104	102	116	139	164	183	193	195	188	166	144	127	113	110	119	139	161	178	190	193	185	165	145	3634	151	3765	151	
14	131	114	110	115	129	153	171	184	189	186	174	156	139	127	125	130	143	162	178	189	189	182	166	144	3686	154	3810	153	
15	124	109	98	99	111	129	146	160	168	169	163	150	138	131	130	134	145	157	170	182	184	178	164	145	3484	145	3611	144	
16	127	112	100	94	99	112	123	134	146	150	150	144	138	133	137	140	148	159	170	179	184	178	166	152	3375	141	3512	140	
17	137	122	110	104	103	109	116	126	132	137	142	141	138	140	145	151	157	167	175	181	183	179	170	157	3422	143	3566	143	
18	144	131	121	112	109	107	110	113	112	118	122	124	129	134	142	152	162	167	174	178	178	172	166	156	3333	139	3479	139	
19	146	136	127	119	113	108	105	100	96	96	98	102	112	124	137	150	165	173	176	176	174	169	162	156	3220	134	3371	135	
20	151	145	140	136	127	122	112	100	92	85	85	91	101	117	136	156	173	183	186	189	185	177	169	165	3323	138	3484	139	
21	161	160	160	157	151	142	131	112	95	82	75	73	82	100	121	147	168	181	186	186	173	167	162	154	3326	139	3479	139	
22	153	158	164	168	172	168	153	135	116	96	79	77	82	98	124	151	176	192	200	201	190	175	165	157	3550	148	3707	148	
23	157	160	168	181	185	179	171	150	121	94	72	57	71	95	124	153	173	185	186	174	160	145	132	3350	140	3483	139		
24	133	142	156	172	186	193	187	168	142	113	84	67	61	70	95	126	158	182	199	202	189	175	155	140	3495	146	3632	145	
25	137	144	160	181	200	212	216	200	173	144	112	84	68	68	87	114	144	168	186	188	178	160	140	122	3586	149	3697	148	
26	111	113	131	157	183	206	218	215	200	172	142	113	92	85	94	117	142	168	186	190	182	162	138	117	3634	151	3732	149	
27	98	93	105	131	158	184	204	211	204	186	159	131	108	96	101	116	137	161	177	183	178	160	131	107	3519	147	3604	144	
28	85	75	78	96	125	153	178	192	197	189	170	146	129	116	113	126	147	165	180	189	185	168	143	113	3458	144			
SUM	3879	3713	3701	3830	4028	4234	4311	4204	3983	3659	3288	2972	2828	2905	3229	3706	4262	4725	5069	5237	5144	4879	4502	4122	TOTAL	96410			
MEAN	139	133	132	137	144	151	154	150	142	131	117	106	101	104	115	132	152	169	181	187	184	174	161	147	MONTHLY MEAN	143.5CM			

Station : SYOWA STATION  
 Latitude : 69° 0' 28" S  
 Longitude : 39° 34' 13" E  
 Duration : Mar. 1-Mar. 31 1990  
 Unit : CENTIMETER

Date	Time																							SUM	MEAN	SUM (25)	MEAN (25)			
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22					23		
1	88	72	65	76	97	124	149	166	175	176	168	152	140	130	127	134	150	167	180	186	184	172	150	122	3350	140	3449	138		
2	99	80	66	65	81	100	120	140	153	161	159	154	149	144	142	147	160	173	186	193	189	180	162	139	3342	139	3455	138		
3	113	95	79	70	74	87	99	112	126	135	141	143	143	148	153	160	171	183	193	200	198	192	179	163	3357	140	3500	140		
4	143	126	111	101	96	98	105	113	120	126	134	144	150	157	170	185	194	202	210	214	213	205	196	186	3699	154	3869	155		
5	170	156	146	133	123	115	111	105	103	104	111	117	128	141	157	172	186	194	197	199	196	189	182	174	3609	150	3777	151		
6	168	164	156	150	143	131	119	106	96	91	91	97	110	126	148	168	186	195	199	198	193	186	177	172	3570	149	3740	150		
7	170	168	169	168	165	155	138	118	100	87	77	77	87	101	125	150	168	182	186	182	172	162	150	146	3403	142	3549	142		
8	146	150	160	166	167	164	147	125	99	77	61	56	61	77	101	126	150	165	170	167	155	140	129	124	3083	128	3209	128		
9	126	133	150	162	173	173	166	145	118	94	74	60	61	77	99	127	149	168	175	171	157	141	124	116	3139	131	3257	130		
10	118	129	146	168	183	190	189	172	146	118	93	75	70	78	98	125	148	167	172	168	151	131	113	96	3244	135	3335	133		
11	91	102	121	142	167	183	186	175	156	129	100	79	70	74	95	119	143	162	171	168	152	131	110	90	3116	130	3195	128		
12	79	87	104	131	157	180	190	187	174	149	122	101	89	85	98	124	145	164	173	172	158	136	111	91	3207	134	3285	131		
13	78	75	90	114	143	170	185	189	183	164	142	122	104	97	108	129	150	168	181	181	170	149	121	97	3310	138	3391	136		
14	81	74	81	103	132	157	177	187	186	174	157	138	123	115	120	136	154	171	185	185	175	155	130	104	3400	142	3484	139		
15	84	74	74	89	113	138	159	171	177	171	160	145	133	128	128	141	161	175	190	193	186	175	150	127	3442	143	3550	142		
16	108	95	92	100	121	144	165	179	188	187	181	169	164	158	157	168	181	197	209	212	208	193	174	150	3900	163	4030	161		
17	130	115	106	109	121	136	151	166	177	178	176	171	165	164	165	171	183	194	203	206	203	190	175	153	3908	163	4039	162		
18	131	117	106	102	108	116	128	140	147	152	154	154	154	155	159	168	175	185	194	196	193	185	171	156	3646	152	3786	151		
19	140	124	113	108	106	111	116	121	125	133	139	141	146	154	163	172	181	190	196	197	193	186	177	168	3600	150	3752	150		
20	152	142	134	129	124	121	120	119	119	121	127	134	141	152	164	177	186	188	191	193	186	178	170	162	3630	151	3785	151		
21	155	149	143	139	132	126	118	111	103	102	105	110	121	139	154	168	181	186	186	182	173	165	157	153	3458	144	3608	144		
22	150	150	150	150	147	138	127	112	99	90	90	94	108	126	148	169	186	190	192	187	177	167	159	156	3462	144	3622	145		
23	160	166	175	180	181	175	161	143	122	109	99	100	112	131	154	179	200	209	211	201	187	171	157	154	3837	160	3994	160		
24	157	168	184	193	201	201	185	164	138	114	96	93	98	115	139	168	190	202	201	188	170	150	133	127	3775	157	3905	156		
25	130	142	163	183	199	207	202	182	156	129	104	91	92	103	127	150	171	184	186	174	154	130	107	95	3561	148	3657	146		
26	96	111	137	165	187	204	207	196	172	144	119	99	92	101	121	147	169	187	191	183	161	133	108	93	3523	147	3610	144		
27	87	102	128	157	189	215	228	228	213	187	162	140	126	130	143	162	185	200	203	194	173	140	109	86	3887	162	3959	158		
28	72	73	93	124	156	186	203	214	205	185	165	144	123	119	129	146	165	178	183	175	159	129	95	68	3489	145	3537	141		
29	48	42	57	84	116	149	176	193	199	192	180	165	153	148	152	168	186	199	205	204	191	165	131	100	3603	150	3681	147		
30	78	62	63	80	105	136	161	183	192	196	191	182	173	171	171	182	197	210	217	216	205	187	157	128	3843	160	3945	158		
31	102	79	73	77	90	110	130	147	160	167	168	165	164	164	165	172	185	198	207	210	202	188	168	144	3635	151				
SUM	3650	3635	4297	4818	4627	4046	3750	4280	5336	5943	5584	4532	109028														TOTAL			
MEAN	118	117	139	155	149	131	121	138	172	192	180	146	146.5CM														MONTHLY MEAN			
	3522	3918	4640	4809	4342	3812	3908	4810	5733	5895	5101	4040																		
	114	126	150	155	140	123	126	155	185	190	165	130																		



Station : SYOWA STATION  
 Latitude : 69° 0' 28" S  
 Longitude : 39° 34' 13" E  
 Duration : Apr. 1-Apr. 30 1990  
 Unit : CENTIMETER

Date	Time																							SUM	MEAN	SUM (25)	MEAN (25)		
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22					23	
1	119	100	85	79	84	95	107	117	128	136	144	148	152	158	167	172	182	193	200	204	199	193	178	160	3500	146	3644	146	
2	144	127	113	104	99	101	106	113	121	128	136	148	154	168	178	187	194	201	206	205	204	196	186	177	3696	154	3864	155	
3	168	155	147	137	127	121	116	111	108	113	118	125	137	150	162	177	185	187	191	190	184	178	170	167	3624	151	3787	151	
4	163	159	156	151	144	134	121	110	100	95	97	103	115	131	148	166	176	179	176	172	166	155	149	151	3417	142	3572	143	
5	155	160	167	170	169	161	148	129	115	105	103	107	118	135	156	175	186	191	186	175	166	153	145	146	3621	151	3772	151	
6	151	160	173	182	187	184	172	154	133	118	110	107	116	132	154	173	184	192	188	175	161	145	132	130	3713	155	3850	154	
7	137	151	168	187	200	202	193	178	156	135	124	118	124	139	162	181	195	204	202	190	172	154	138	133	3943	164	4082	163	
8	139	155	178	199	216	225	223	208	186	164	144	133	132	145	165	183	198	206	204	189	168	145	125	113	4143	173	4257	170	
9	114	128	149	175	198	211	216	206	186	164	143	128	125	133	150	173	189	200	201	189	167	142	119	101	3907	163	4006	160	
10	99	111	135	163	190	212	221	218	203	181	163	144	136	141	154	173	191	199	200	189	167	140	113	95	3938	164	4025	161	
11	87	91	111	138	165	188	205	209	199	185	167	152	143	143	156	174	191	204	204	197	178	149	123	100	3859	161	3944	158	
12	85	85	99	123	152	181	197	208	208	197	181	170	159	154	164	179	197	206	211	205	189	166	135	111	3962	165	4055	162	
13	93	89	95	112	141	165	186	198	204	197	186	175	168	164	164	176	193	202	205	205	191	168	142	116	3935	164	4030	161	
14	95	86	86	96	119	141	162	175	186	185	180	174	168	168	173	184	195	210	220	219	209	191	168	144	3934	164	4059	162	
15	125	110	104	111	123	140	158	171	180	184	184	179	177	175	177	182	192	202	209	209	204	191	169	148	4004	167	4135	165	
16	131	118	108	110	116	129	145	157	167	175	180	181	181	185	188	192	201	209	215	216	210	202	186	166	4068	170	4220	169	
17	152	140	129	126	125	131	137	147	156	164	172	179	184	190	197	199	205	210	214	212	208	199	187	177	4140	173	4305	172	
18	165	153	145	140	136	131	133	136	140	144	154	163	169	182	190	195	197	200	198	194	191	184	177	171	3988	166	4155	166	
19	167	159	154	150	143	136	129	125	123	126	131	143	155	169	185	190	193	194	189	184	179	169	167	166	3826	159	3992	160	
20	166	168	170	168	161	155	143	132	120	119	120	131	146	160	176	186	192	192	184	175	162	152	150	151	3779	157	3937	157	
21	158	171	177	185	185	175	164	145	133	121	118	126	139	156	175	192	197	198	188	175	159	145	140	142	3864	161	4020	161	
22	156	171	189	204	209	208	197	176	155	139	129	127	136	152	170	185	193	192	179	160	138	118	104	106	3893	162	4012	160	
23	119	139	162	183	201	205	198	182	160	136	122	115	120	132	150	166	177	176	166	142	114	89	71	64	3489	145	3565	143	
24	76	97	125	155	179	195	198	187	168	147	127	115	115	125	141	157	168	169	159	140	109	79	53	39	3223	134	3263	131	
25	40	60	88	120	152	179	189	190	177	157	139	128	123	129	144	159	169	175	169	152	121	85	58	36	3139	131	3167	127	
26	28	39	66	99	136	165	187	197	197	186	172	162	156	158	169	186	199	202	201	186	157	124	90	58	3520	147	3562	142	
27	42	40	53	78	108	137	163	176	182	180	172	164	157	152	161	177	186	198	199	189	167	136	102	67	3386	141	3431	137	
28	45	32	31	46	74	99	121	141	153	158	154	155	150	150	156	165	178	189	192	187	172	149	121	91	3109	130	3173	127	
29	64	45	38	41	56	73	93	109	124	134	139	140	145	145	148	156	168	178	186	186	176	163	145	122	2974	124	3073	123	
30	99	81	68	65	72	81	91	105	118	131	137	145	150	152	159	163	167	175	181	183	176	170	159	143	3171	132			
SUM	3482	3669	4367	4819	4686	4346	4350	4939	5638	5823	5164	4102													TOTAL	110765			
MEAN	116	122	146	161	156	145	145	165	188	194	172	137													MONTHLY MEAN	153.8CM			

Station : SYOWA STATION  
 Latitude : 69° 0' 28" S  
 Longitude : 39° 34' 13" E  
 Duration : May 1-May 31 1990  
 Unit : CENTIMETER

Date	Time																							SUM	MEAN	SUM (25)	MEAN (25)		
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22					23	
1	126	114	101	91	85	84	88	97	106	116	126	135	142	149	157	160	162	165	169	171	168	165	158	150	3185	133	3329	133	
2	144	136	129	117	111	105	101	103	106	112	118	129	138	147	155	160	160	161	159	154	150	149	147	146	3237	135	3383	135	
3	146	147	144	139	134	122	116	111	105	106	111	119	131	140	152	155	157	153	149	143	134	130	128	129	3201	133	3337	133	
4	136	144	150	149	148	142	130	118	110	104	108	113	123	137	148	153	154	150	141	131	118	109	109	112	3137	131	3259	130	
5	122	137	150	159	162	160	150	135	126	115	113	118	129	138	151	162	163	157	146	131	113	99	93	95	3224	134	3332	133	
6	108	124	145	159	168	169	163	150	133	124	115	116	124	134	148	158	161	158	149	129	110	92	80	82	3199	133	3293	132	
7	94	113	135	156	174	183	181	169	156	141	131	127	134	146	159	168	174	170	161	144	121	97	82	78	3394	141	3479	139	
8	85	104	131	156	178	192	197	190	176	166	151	142	148	157	169	181	188	187	179	160	132	107	86	74	3636	152	3711	148	
9	75	89	114	139	165	183	193	190	179	169	153	144	141	149	163	174	183	186	178	160	135	108	84	67	3521	147	3583	143	
10	62	73	93	120	149	169	185	189	183	171	161	150	146	149	161	175	186	190	186	174	149	119	94	72	3506	146	3567	143	
11	61	67	81	107	133	157	175	183	184	174	163	156	148	149	158	170	180	187	186	176	155	126	98	75	3449	144	3507	140	
12	58	57	69	88	113	140	162	173	180	177	168	162	159	155	158	172	182	189	193	186	168	144	121	93	3467	144	3543	142	
13	76	66	71	85	107	131	155	171	182	185	180	178	176	172	178	185	196	206	209	208	196	176	151	127	3767	157	3877	155	
14	110	96	93	99	114	134	154	169	184	190	189	186	185	184	185	189	196	204	210	211	202	185	165	143	3977	166	4100	164	
15	123	107	96	96	103	118	134	147	163	168	171	176	173	174	173	174	179	190	194	195	192	181	166	150	3743	156	3878	155	
16	135	118	108	107	107	112	124	135	145	157	166	170	172	175	174	174	175	179	184	184	183	176	169	160	3689	154	3839	154	
17	150	138	127	122	118	119	122	129	138	148	158	167	172	174	176	177	173	173	172	170	171	167	167	164	3692	154	3851	154	
18	159	152	145	137	131	125	123	123	126	133	142	151	160	165	168	168	163	159	154	150	147	148	150	149	3528	147	3683	147	
19	155	157	155	157	149	138	132	126	124	125	131	140	151	162	164	166	160	150	142	133	123	123	129	131	3423	143	3568	143	
20	145	155	159	165	164	156	145	132	121	120	122	128	134	146	151	154	150	136	124	108	96	93	93	101	3198	133	3314	133	
21	116	136	156	168	175	172	168	150	142	135	131	137	147	150	159	164	164	150	137	116	96	86	83	92	3330	139	3436	137	
22	106	130	153	182	197	207	207	195	183	170	165	166	170	181	190	196	196	186	166	145	115	93	79	80	3858	161	3955	158	
23	97	119	148	177	201	215	218	214	205	188	177	172	175	184	193	198	198	191	174	148	114	86	63	52	3907	163	3966	159	
24	59	77	106	139	168	195	210	211	207	198	186	178	177	186	195	202	204	204	190	167	136	104	76	56	3831	160	3883	155	
25	52	63	86	117	151	180	204	218	220	216	206	200	197	203	215	226	235	234	222	203	174	141	108	77	4148	173	4209	168	
26	61	59	71	95	123	150	176	194	203	203	198	192	186	186	193	205	214	219	222	211	189	162	129	98	3939	164	4014	161	
27	75	60	61	77	99	126	150	171	187	192	193	193	187	186	190	199	211	220	222	220	205	185	158	130	3897	162	4002	160	
28	105	85	77	79	94	113	131	153	169	178	182	185	182	181	178	182	190	200	209	210	203	193	176	153	3808	159	3939	158	
29	131	110	95	89	92	105	118	133	148	157	162	167	168	165	160	158	161	168	175	179	180	177	168	154	3520	147	3660	146	
30	140	126	111	101	98	102	113	127	138	150	159	167	168	172	169	167	163	162	169	173	173	174	169	165	3556	148	3715	149	
31	159	148	141	132	123	122	126	130	136	146	153	160	163	163	166	161	154	152	154	157	157	160	164	161	3588	150			
SUM	3371	3601	4234	4751	4865	4789	4906	5256	5532	5425	4705	3843													TOTAL	110555			
MEAN	109	116	137	153	157	154	158	170	178	175	178	175	152	124											MONTHLY MEAN	148.6CM			

Station : SYOWA STATION  
 Latitude : 69° 0' 28" S  
 Longitude : 39° 34' 13" E  
 Duration : Jun. 1-Jun. 30 1990  
 Unit : CENTIMETER

Date	Time																							SUM	MEAN	SUM (25)	MEAN (25)	
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22					23
1	163	165	157	152	145	141	137	134	140	141	150	155	157	157	158	154	145	138	132	124	125	126	130	134	3460	144	3600	144
2	140	147	150	148	149	147	138	133	131	131	135	144	147	151	151	152	144	134	125	116	107	108	113	122	3263	136	3393	136
3	130	141	151	166	167	165	163	154	150	148	151	156	163	168	171	172	168	156	145	131	116	113	109	117	3571	149	3702	148
4	131	147	158	172	183	187	180	173	167	160	157	161	166	168	170	173	166	155	138	121	99	90	83	86	3591	150	3686	147
5	95	114	130	153	168	171	173	170	160	154	150	148	154	161	167	171	169	161	151	130	106	87	77	76	3396	142	3483	139
6	87	105	126	150	169	183	188	183	177	167	157	159	157	165	172	175	175	170	156	135	113	90	70	62	3491	145	3565	143
7	74	87	107	135	159	178	190	189	182	176	165	164	164	168	178	186	190	186	176	157	131	109	83	71	3605	150	3673	147
8	68	81	102	126	155	179	197	199	197	193	182	177	175	177	186	194	204	204	195	181	158	129	101	80	3840	160	3916	157
9	76	79	92	117	145	172	189	198	203	198	188	183	178	175	186	196	204	208	206	195	171	144	119	94	3916	163	3995	160
10	79	76	85	108	133	162	181	195	204	201	194	185	180	175	185	191	202	207	209	201	183	159	131	100	3926	164	4009	160
11	83	73	77	87	112	138	159	175	186	188	180	179	170	165	166	172	185	195	198	197	186	167	140	114	3692	154	3783	151
12	91	79	72	82	98	122	141	161	173	177	177	172	167	158	159	160	170	185	191	194	189	176	151	132	3577	149	3690	148
13	113	94	86	89	99	117	134	155	167	175	181	174	170	167	161	162	168	175	188	193	191	187	171	154	3671	153	3809	152
14	138	120	109	104	108	119	131	148	160	168	171	172	168	158	151	150	150	153	161	168	171	170	162	150	3560	148	3697	148
15	137	129	117	108	105	110	119	128	140	148	152	152	150	145	138	131	125	124	131	138	139	143	144	144	3197	133	3336	133
16	139	131	123	120	114	113	115	120	131	134	142	150	149	145	137	131	123	116	115	119	120	130	135	141	3093	129	3240	130
17	147	150	149	147	144	142	139	138	144	150	152	160	161	158	154	146	134	122	113	110	107	115	121	131	3334	139	3482	139
18	148	158	163	168	172	168	164	158	157	155	158	162	164	166	163	154	140	127	113	99	93	94	95	109	3448	144	3578	143
19	130	146	162	173	183	185	180	175	172	168	168	167	167	171	168	164	149	134	115	93	80	73	70	79	3472	145	3569	143
20	97	117	139	160	180	188	190	186	178	173	168	168	169	169	170	169	159	145	125	99	72	56	46	46	3369	140	3429	137
21	60	82	109	135	163	179	187	191	184	176	171	170	172	178	184	185	180	169	154	129	96	69	50	41	3414	142	3459	138
22	45	62	89	120	149	174	190	198	198	189	183	182	181	184	192	199	200	192	185	162	128	96	69	48	3615	151	3657	146
23	42	52	72	100	134	161	186	201	203	201	192	186	181	186	194	200	210	210	206	194	166	131	96	70	3774	157	3827	153
24	53	48	59	80	111	140	164	182	189	191	187	180	172	171	179	189	202	208	211	207	187	159	127	95	3691	154	3763	151
25	72	60	60	74	95	125	145	165	180	182	176	172	165	157	159	168	179	192	201	203	193	174	150	121	3568	149	3663	147
26	95	78	71	79	97	113	138	157	171	178	171	168	162	151	150	155	160	172	183	191	189	184	164	147	3524	147	3648	146
27	124	101	88	88	96	111	132	148	163	168	173	162	152	147	139	141	141	154	172	170	180	179	171	156	3456	144	3597	144
28	141	131	115	106	108	123	135	143	158	168	170	167	164	150	145	137	133	147	158	164	171	177	175	165	3551	148	3713	149
29	162	152	141	134	134	136	147	155	165	169	170	170	166	151	145	135	130	131	131	138	147	149	152	154	3564	149	3715	149
30	151	149	144	143	140	140	149	155	159	165	168	168	167	154	146	136	127	121	116	118	120	129	131	134	3430	143		
SUM	3211	3403	4115	4781	5089	5039	4958	4924	4932	4800	4234	3536	TOTAL														106059	
MEAN	107	113	137	159	170	168	165	164	164	160	141	118	MONTHLY MEAN														147.3CM	
	108	124	150	166	170	167	163	165	163	153	130	109																

Station : SYOWA STATION  
 Latitude : 69° 0' 28" S  
 Longitude : 39° 34' 13" E  
 Duration : Jul. 1-Jul. 31 1990  
 Unit : CENTIMETER

Date	Time																							SUM	MEAN	SUM (25)	MEAN (25)		
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22					23	
1	137	145	146	144	147	146	148	152	155	159	158	162	157	150	147	135	128	117	113	107	107	109	113	121	3303	138	3434	137	
2	131	143	157	162	169	173	172	174	178	179	182	184	186	183	179	176	168	153	145	135	129	124	123	131	3836	160	3977	159	
3	141	150	165	175	184	186	186	189	186	184	182	180	181	181	174	173	162	149	138	120	108	102	94	95	3785	158	3893	156	
4	108	122	138	156	166	177	179	177	170	166	160	163	165	163	168	167	160	155	142	123	106	95	87	88	3501	146	3601	144	
5	100	120	143	166	186	201	209	207	204	196	191	192	194	193	196	201	194	186	172	151	129	105	88	81	4005	167	4092	164	
6	87	99	121	147	167	186	198	199	195	184	179	175	175	178	186	192	194	189	180	157	133	105	83	73	3782	158	3859	154	
7	77	88	108	133	162	181	194	202	199	186	181	171	173	172	183	192	198	201	194	175	152	123	95	79	3819	159	3888	156	
8	69	72	93	119	147	171	191	198	195	191	181	169	166	166	173	186	193	197	198	185	161	131	104	79	3735	156	3799	152	
9	64	64	77	98	128	154	174	188	195	188	178	167	159	156	162	172	186	196	199	195	176	145	120	93	3634	151	3708	148	
10	74	66	73	90	115	143	167	180	191	186	178	173	165	158	163	176	193	211	220	222	210	188	157	129	3828	160	3933	157	
11	105	89	82	95	114	137	159	174	186	186	176	165	153	140	138	146	158	171	185	192	186	174	150	126	3587	149	3691	148	
12	104	88	78	85	95	113	138	149	159	165	157	146	132	119	109	112	123	136	155	165	168	167	151	131	3145	131	3258	130	
13	113	98	89	92	100	116	136	152	164	168	166	157	144	131	122	118	124	134	150	163	170	177	170	158	3312	138	3463	139	
14	151	139	133	134	136	149	166	182	192	202	198	191	178	159	147	134	133	138	146	154	164	168	171	164	3829	160	3989	160	
15	160	150	144	140	139	144	152	162	167	172	169	163	154	140	124	114	107	107	110	119	127	138	145	152	3399	142	3558	142	
16	159	162	163	168	168	169	173	180	183	186	185	181	174	159	144	133	118	105	103	105	107	116	126	132	3599	150	3746	150	
17	147	157	168	176	181	186	187	192	193	193	192	194	187	177	168	160	146	131	115	109	105	105	109	114	3792	158	3926	157	
18	134	149	166	182	196	204	204	207	206	201	203	202	195	188	183	175	161	144	126	104	92	85	83	89	3879	162	3982	159	
19	103	124	142	164	188	199	204	204	200	196	194	191	190	193	191	189	176	167	147	121	95	81	65	65	3789	158	3861	154	
20	72	91	113	145	168	184	195	200	193	186	182	178	176	181	185	186	186	175	160	135	108	77	57	47	3580	149	3626	145	
21	46	60	84	113	141	164	183	190	186	179	171	163	162	168	176	185	187	189	182	159	131	98	69	50	3436	143	3476	139	
22	40	46	67	95	128	156	177	186	188	179	171	157	155	160	166	181	192	197	197	184	157	125	93	65	3462	144	3511	140	
23	49	47	57	83	113	139	161	173	178	172	161	146	141	140	147	162	181	193	201	197	180	154	122	91	3388	141	3459	138	
24	71	62	64	85	109	135	157	174	179	173	164	150	135	129	134	150	166	185	196	201	194	171	144	120	3448	144	3543	142	
25	95	81	77	87	109	132	151	170	175	170	161	148	129	119	116	128	144	165	181	189	190	184	163	139	3403	142	3522	141	
26	119	103	95	98	116	137	156	169	180	177	167	153	136	123	115	118	129	147	166	181	185	185	173	156	3484	145	3626	145	
27	142	126	121	122	131	147	164	176	180	181	173	160	145	129	121	113	118	131	146	160	165	170	163	155	3539	147	3685	147	
28	146	134	130	126	131	144	155	167	175	173	167	159	142	126	114	105	106	110	123	134	146	148	150	150	3361	140	3505	140	
29	144	139	140	140	145	151	164	172	179	181	177	170	156	150	139	131	127	131	134	144	150	154	162	165	3645	152	3813	153	
30	168	173	178	187	193	197	207	215	218	221	224	217	210	196	186	176	162	152	151	150	150	151	154	161	4397	183	4565	183	
31	168	172	181	188	194	197	204	211	211	208	207	203	194	191	177	168	162	150	144	142	136	132	135	145	4220	176			
SUM	3424	3693	4566	5411	5760	5535	5109	4833	4882	4919	4517	3819	3459	4095	5018	5671	5688	5330	4918	4854	4912	4778	4187	3544	TOTAL	112922			
MEAN	110	119	147	175	186	179	165	156	157	159	146	123	112	132	162	183	183	172	159	157	158	154	135	114	MONTHLY MEAN	151.8CM			

Station : SYOWA STATION  
 Latitude : 69° 0' 28" S  
 Longitude : 39° 34' 13" E  
 Duration : Aug. 1-Aug. 31 1990  
 Unit : CENTIMETER

Date	Time																							SUM	MEAN	SUM (25)	MEAN (25)		
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22					23	
1	154	164	176	187	200	204	206	209	204	200	196	190	184	180	172	165	154	144	131	122	112	100	98	99	3951	165	4064	163	
2	113	126	146	162	178	189	189	190	186	179	179	175	170	171	170	165	164	152	139	123	106	95	88	85	3640	152	3738	150	
3	98	114	135	159	178	196	198	196	192	186	183	179	176	182	184	185	185	178	166	148	125	107	95	89	3834	160	3929	157	
4	95	113	133	163	185	204	213	211	204	193	184	178	175	183	189	195	195	193	180	159	131	106	81	75	3938	164	4015	161	
5	77	87	109	137	164	184	195	202	194	184	174	165	164	168	177	186	199	196	187	170	143	115	85	65	3727	155	3791	152	
6	64	69	89	117	149	172	186	191	186	174	160	149	145	149	161	177	191	196	197	186	162	133	105	78	3586	149	3651	146	
7	65	68	87	112	139	166	185	190	186	174	159	145	134	135	149	164	186	199	203	198	179	150	119	92	3584	149	3658	146	
8	74	66	77	99	124	150	172	182	182	166	150	136	120	113	121	141	161	179	193	194	183	161	131	107	3382	141	3467	139	
9	85	75	79	95	115	146	159	175	178	167	155	131	116	113	112	130	150	173	193	201	203	186	163	141	3441	143	3564	143	
10	123	109	104	113	134	156	173	186	191	180	166	147	130	114	111	121	143	161	184	202	205	201	186	173	3713	155	3870	155	
11	157	145	139	146	160	178	195	205	209	203	187	168	146	128	113	112	122	138	156	176	182	186	176	168	3895	162	4054	162	
12	159	148	144	145	150	164	178	187	185	179	169	150	128	114	96	90	91	101	118	132	145	153	154	151	3431	143	3581	143	
13	150	146	144	149	156	165	174	183	183	185	173	159	140	123	107	95	90	95	100	111	120	130	136	141	3355	140	3500	140	
14	145	150	154	160	168	175	183	187	189	187	184	169	154	140	123	114	104	96	96	98	103	109	115	128	3431	143	3565	143	
15	134	147	160	173	184	191	199	203	205	200	197	194	184	175	168	158	149	134	125	125	114	113	122	131	3885	162	4027	161	
16	142	160	180	201	212	222	225	225	222	214	208	203	193	187	185	172	164	148	130	111	94	84	77	81	4040	168	4135	165	
17	95	110	133	155	176	192	196	195	191	182	178	173	171	174	175	174	172	162	140	122	101	78	65	63	3573	149	3648	146	
18	75	93	117	147	171	189	199	198	193	186	180	170	175	182	188	197	204	195	180	160	129	101	80	64	3773	157	3842	154	
19	69	86	107	137	165	185	194	194	188	175	161	153	153	164	173	190	200	204	196	174	148	114	85	69	3684	154	3745	150	
20	61	72	92	118	145	168	181	186	173	162	146	138	129	138	156	175	194	204	203	197	168	135	109	81	3531	147	3601	144	
21	70	74	87	113	141	165	181	181	172	159	138	124	116	114	133	154	177	196	202	204	182	157	126	97	3463	144	3547	142	
22	84	81	91	113	139	161	175	184	177	160	142	124	109	106	117	140	166	188	204	210	200	183	158	130	3542	148	3655	146	
23	113	104	109	126	150	170	186	190	188	170	150	127	112	100	100	119	145	167	182	196	195	180	158	135	3572	149	3690	148	
24	118	104	107	118	138	159	174	181	174	165	144	118	103	88	83	92	113	134	151	171	175	169	154	137	3270	136	3395	136	
25	125	113	113	123	137	154	171	175	172	165	146	123	105	94	81	84	101	117	134	154	160	161	154	144	3206	134	3342	134	
26	136	131	132	137	150	166	179	186	184	178	166	146	127	112	101	102	110	122	137	147	160	163	161	156	3489	145	3639	146	
27	150	150	153	158	163	175	187	188	187	183	169	153	132	123	111	105	104	109	117	129	136	139	140	144	3505	146	3649	146	
28	144	145	144	153	161	173	178	184	179	177	167	158	140	128	119	108	106	105	103	110	113	115	120	123	3353	140	3484	139	
29	131	137	146	155	164	171	175	181	179	173	168	159	150	141	131	125	117	113	107	108	105	106	110	115	3367	140	3495	140	
30	128	137	151	162	172	181	183	183	179	175	169	166	159	152	150	142	132	126	116	108	100	95	95	99	3460	144	3572	143	
31	112	128	147	161	175	184	185	180	176	172	164	159	160	158	159	157	150	144	131	118	103	93	85	90	3491	145			
SUM	3446	3885	4943	5774	5808	5212	4500	4315	4639	4801	4482	3731	TOTAL	111112															
MEAN	111	125	159	186	187	168	145	139	150	155	145	120	MONTHLY MEAN	149.3CM															

Station : SYOWA STATION  
 Latitude : 69° 0' 28" S  
 Longitude : 39° 34' 13" E  
 Duration : Sep. 1-Sep. 30 1990  
 Unit : CENTIMETER

Date	Time																							SUM	MEAN	SUM (25)	MEAN (25)	
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22					23
1	97	114	139	158	175	183	188	186	172	169	160	156	159	160	166	168	167	156	142	124	105	85	69	72	3470	145	3549	142
2	79	95	121	147	168	182	186	181	168	156	148	143	142	155	166	175	179	178	163	146	121	95	75	68	3437	143	3510	140
3	73	85	113	141	165	178	186	181	166	149	138	130	131	143	155	171	183	188	181	162	135	106	80	69	3409	142	3474	139
4	65	77	99	129	154	174	182	177	161	145	128	114	115	128	145	168	187	196	195	184	159	131	102	83	3398	142	3476	139
5	78	86	105	135	162	182	194	190	178	158	141	118	113	124	143	166	193	209	213	210	191	159	130	105	3683	153	3774	151
6	91	87	105	129	152	172	185	183	167	146	122	97	84	92	108	133	159	185	197	202	192	169	141	115	3413	142	3514	141
7	101	95	104	125	148	167	179	179	169	146	122	96	83	79	86	111	145	174	193	206	208	194	176	158	3444	144	3586	143
8	142	133	139	156	172	191	204	204	194	174	145	118	96	82	83	97	125	149	169	188	194	188	173	163	3679	153	3829	153
9	150	140	141	153	169	188	200	201	196	181	157	130	109	94	89	95	113	137	160	180	191	194	192	186	3746	156	3924	157
10	178	177	175	187	197	213	222	225	219	206	186	157	133	113	99	93	99	113	128	144	156	161	162	163	3906	163	4068	163
11	162	163	165	170	178	188	195	200	193	184	171	151	129	113	99	86	84	88	98	108	116	124	131	138	3434	143	3578	143
12	144	154	166	170	181	191	197	199	194	189	181	171	154	142	134	122	112	106	101	105	106	107	115	126	3567	149	3704	148
13	137	151	168	180	188	196	201	199	196	189	185	176	168	157	151	139	127	118	107	97	93	91	91	104	3609	150	3724	149
14	115	130	149	168	181	186	190	186	181	173	171	169	165	167	168	165	161	150	134	117	106	94	92	95	3613	151	3727	149
15	114	133	154	178	196	205	208	201	192	186	180	175	180	186	190	197	192	186	168	142	123	99	86	83	3954	165	4048	162
16	94	111	134	160	179	190	190	181	169	157	146	140	144	160	174	186	194	192	180	158	131	108	89	79	3646	152	3732	149
17	86	101	126	145	166	180	180	169	150	131	119	111	111	126	150	166	182	187	180	162	135	105	81	71	3320	138	3391	136
18	71	85	109	131	154	172	172	166	146	124	108	95	96	111	133	160	181	194	194	182	162	131	102	89	3268	136	3352	134
19	84	90	113	138	156	176	179	172	152	131	110	95	90	102	129	152	176	200	206	202	186	162	133	115	3449	144	3552	142
20	103	104	120	141	165	180	184	176	159	134	113	90	80	84	103	130	154	181	192	197	186	167	143	125	3411	142	3521	141
21	110	108	121	141	166	180	187	183	168	150	127	103	95	91	107	131	161	187	209	218	218	203	184	168	3716	155	3870	155
22	154	153	163	176	196	212	220	217	204	186	157	133	113	104	108	122	148	170	188	200	204	195	180	165	4068	170	4222	169
23	154	149	150	164	178	190	200	198	188	171	146	120	101	85	87	99	111	134	153	167	173	170	164	157	3609	150	3759	150
24	150	144	148	156	171	184	191	194	186	171	151	129	110	94	90	91	103	118	135	147	156	159	157	153	3488	145	3636	145
25	148	149	152	158	172	183	188	190	183	175	158	136	119	104	96	95	101	111	120	134	142	147	151	151	3463	144	3614	145
26	151	158	165	173	178	188	196	194	188	185	172	151	137	125	115	112	110	111	118	126	128	131	138	143	3593	150	3738	150
27	145	153	163	168	178	186	186	189	188	179	170	160	150	140	137	128	124	121	117	120	120	122	127	131	3602	150	3746	150
28	144	151	167	177	183	184	186	185	178	171	166	157	151	149	144	139	134	126	116	111	108	105	107	114	3553	148	3680	147
29	127	144	157	170	182	182	184	175	168	165	157	158	157	159	158	160	151	141	132	120	107	98	97	103	3552	148	3668	147
30	116	134	154	170	180	182	180	169	163	152	145	146	147	154	164	167	165	154	146	130	110	98	95	100	3521	147		
SUM	3563	4185	5190	5740	5336	4480	3762	3877	4421	4735	4462	3763	3754	4694	5565	5650	4933	4025	3723	4124	4660	4689	4098	3592	TOTAL	107021		
MEAN	119	140	173	191	178	149	125	129	147	158	149	125	125	124	137	155	156	156	156	149	137	125	120	MONTHLY MEAN	148.6CM			

Station : SYOWA STATION  
 Latitude : 69° 0' 28" S  
 Longitude : 39° 34' 13" E  
 Duration : Oct. 1-Oct. 31 1990  
 Unit : CENTIMETER

Date	Time																							SUM	MEAN	SUM (25)	MEAN (25)		
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22					23	
1	114	136	161	182	198	207	204	193	179	170	160	161	167	180	197	208	211	206	192	171	148	128	112	109	4094	171	4212	168	
2	118	134	156	178	194	199	192	175	155	135	124	120	127	143	165	186	196	201	192	172	149	124	102	95	3732	156	3829	153	
3	97	113	134	156	174	181	177	160	138	114	98	88	94	111	142	166	186	196	198	182	159	131	108	94	3397	142	3486	139	
4	89	101	121	144	162	171	168	152	125	100	78	65	65	80	110	140	168	189	199	194	175	151	125	111	3183	133	3285	131	
5	102	109	126	148	166	178	179	163	137	110	81	62	56	66	95	128	161	186	204	208	198	177	158	141	3339	139	3470	139	
6	131	129	143	159	178	186	186	174	150	118	86	59	45	44	64	95	124	153	177	188	186	181	163	150	3269	136	3409	136	
7	140	140	149	166	180	193	196	188	168	142	109	79	60	49	58	77	103	133	160	174	184	184	176	168	3376	141	3539	142	
8	163	159	164	177	196	205	209	204	191	169	138	109	86	69	64	74	90	113	133	149	164	169	166	166	3527	147	3689	148	
9	162	164	168	178	192	206	209	209	203	186	163	139	116	98	89	87	95	108	121	136	149	156	162	166	3662	153	3830	153	
10	168	172	180	186	194	201	207	208	203	191	176	154	138	119	106	98	95	98	107	113	122	131	139	149	3655	152	3809	152	
11	154	163	173	178	189	194	197	197	194	186	178	168	157	145	135	128	119	110	108	110	111	113	120	129	3656	152	3799	152	
12	143	153	167	173	181	184	184	176	175	168	164	160	156	153	148	144	131	120	116	102	95	92	96	103	3484	145	3601	144	
13	117	134	150	160	164	163	166	151	147	145	142	142	147	152	158	160	153	141	127	114	101	91	95	103	3323	138	3439	138	
14	116	132	151	163	170	173	163	150	140	131	126	128	137	144	155	168	168	160	146	130	110	95	91	93	3340	139	3443	138	
15	103	122	140	156	168	167	160	144	128	117	107	111	119	134	153	170	178	176	164	147	123	101	91	94	3273	136	3370	135	
16	97	113	131	146	158	160	149	131	112	95	78	78	88	109	132	156	170	176	168	155	133	109	94	87	3025	126	3117	125	
17	92	107	127	144	159	162	150	136	112	90	75	67	77	96	123	150	174	188	189	179	161	142	121	111	3132	131	3247	130	
18	115	122	140	161	169	177	170	149	122	101	81	68	68	85	110	135	164	183	190	189	173	152	133	119	3276	137	3392	136	
19	116	121	140	158	172	176	171	157	132	103	78	60	56	64	88	119	145	168	186	186	180	166	148	136	3226	134	3359	134	
20	133	137	153	170	186	195	192	182	159	131	103	84	73	77	92	120	150	175	192	200	197	186	173	161	3621	151	3772	151	
21	151	153	167	183	197	204	207	196	177	150	124	102	83	82	93	112	139	163	181	194	197	191	181	170	3797	158	3959	158	
22	162	161	168	181	197	205	207	203	188	164	136	113	96	87	90	106	128	148	168	184	190	189	184	177	3832	160	4005	160	
23	173	169	174	183	201	210	211	209	197	178	155	131	112	99	96	103	117	138	154	168	177	182	180	176	3893	162	4067	163	
24	174	176	178	183	193	203	205	204	196	181	161	138	119	106	99	100	106	120	133	146	154	162	162	164	3763	157	3930	157	
25	167	167	169	174	181	188	193	190	187	177	162	147	131	117	111	109	110	115	125	136	142	149	157	162	3666	153	3833	153	
26	167	170	175	179	185	190	192	189	184	178	168	156	143	132	125	120	115	114	114	116	120	127	132	139	3630	151	3775	151	
27	145	153	159	162	165	165	162	160	154	149	141	137	131	124	121	119	112	104	101	99	99	103	112	118	3195	133	3326	133	
28	131	144	152	159	164	161	154	149	145	141	139	140	141	145	149	147	142	135	125	115	110	107	112	123	3330	139	3465	139	
29	135	149	162	170	173	171	160	151	143	136	134	139	146	155	163	169	167	160	147	131	119	112	110	115	3517	147	3644	146	
30	127	140	157	167	169	164	153	136	122	113	111	115	127	145	163	174	178	175	163	146	127	113	108	108	3401	142	3522	141	
31	121	135	151	165	168	167	149	129	112	95	90	95	113	134	157	180	192	194	186	174	151	133	122	119	3432	143			
SUM	4123	4786	5543	5622	4875	3866	3374	3751	4487	4866	4604	4133	TOTAL	108046															
MEAN	133	154	179	181	157	125	109	121	145	157	149	133	MONTHLY MEAN	145.2CM															

Station : SYOWA STATION  
 Latitude : 69° 0' 28" S  
 Longitude : 39° 34' 13" E  
 Duration : Nov. 1-Nov. 30 1990  
 Unit : CENTIMETER

Date	Time																							SUM	MEAN	SUM (25)	MEAN (25)		
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22					23	
1	125	142	158	169	176	169	153	130	104	83	69	69	82	105	136	165	188	197	196	187	168	148	131	127	3377	141	3507	140	
2	130	140	153	168	174	171	156	131	101	74	52	44	51	75	105	140	170	193	202	198	186	168	153	143	3278	137	3421	137	
3	143	151	167	180	190	191	178	156	125	91	62	45	42	57	86	117	150	178	195	201	194	183	168	157	3407	142	3560	142	
4	153	160	173	186	196	195	189	171	140	106	71	47	34	40	58	89	118	149	172	186	188	184	177	171	3353	140	3514	141	
5	161	165	178	191	201	206	204	187	166	135	101	70	46	40	49	69	97	122	145	167	175	178	176	171	3400	142	3568	143	
6	168	168	176	187	199	209	210	201	185	162	131	102	75	60	57	67	86	106	125	143	158	167	166	168	3476	145	3644	146	
7	168	168	169	181	192	202	205	203	191	178	154	131	108	85	77	75	82	94	109	123	137	150	154	160	3496	146	3658	146	
8	162	165	166	168	175	182	186	185	183	174	159	143	123	108	95	88	87	90	98	108	117	129	137	144	3372	141	3522	141	
9	150	155	157	159	161	165	167	167	165	164	159	150	139	130	122	113	106	103	102	106	113	119	131	141	3344	139	3493	140	
10	149	158	163	166	167	166	165	165	165	164	167	166	168	168	165	160	151	142	133	131	130	131	138	145	3723	155	3878	155	
11	155	161	167	169	165	159	151	142	137	135	136	141	146	151	161	163	161	148	137	130	123	119	121	130	3508	146	3646	146	
12	138	149	160	164	164	153	141	128	122	115	114	121	134	147	161	169	169	167	157	146	136	129	126	133	3443	143	3590	144	
13	147	155	163	168	167	160	146	129	114	105	102	106	120	139	157	171	183	183	173	163	147	136	131	134	3499	146	3644	146	
14	145	155	167	170	171	166	150	133	114	97	90	92	108	127	150	173	188	193	190	179	165	154	145	144	3566	149	3716	149	
15	150	164	173	183	184	179	163	141	118	97	82	77	90	108	135	161	181	192	195	186	171	157	148	141	3576	149	3725	149	
16	149	160	171	181	186	186	170	148	122	95	78	71	76	91	118	149	171	190	198	199	186	177	167	158	3597	150	3756	150	
17	159	168	181	191	197	201	189	169	141	113	90	73	72	83	107	133	161	180	194	194	184	173	161	149	3663	153	3809	152	
18	146	150	161	173	182	184	177	159	133	104	77	58	49	58	76	103	130	156	170	179	177	168	157	147	3274	136	3418	137	
19	144	145	153	168	177	182	178	165	142	113	86	63	48	49	58	84	110	132	153	166	168	166	156	148	3154	131	3299	132	
20	145	142	151	164	174	181	180	171	151	127	100	78	59	53	59	77	102	124	143	161	168	167	161	154	3192	133	3342	134	
21	150	150	154	162	173	184	184	181	168	146	121	98	78	67	66	77	93	113	134	150	161	164	162	160	3296	137	3454	138	
22	158	156	156	161	172	182	186	184	174	158	140	116	96	85	78	84	95	108	127	143	154	164	164	162	3403	142	3564	143	
23	161	160	157	161	168	176	180	178	175	165	148	133	115	101	94	91	95	104	116	131	141	149	155	156	3410	142	3565	143	
24	155	156	154	153	158	163	165	166	166	159	151	140	126	117	109	104	105	106	113	121	127	137	145	147	3343	139	3494	140	
25	151	152	152	150	150	151	152	154	155	153	152	148	142	137	133	129	125	123	122	126	127	136	142	147	3409	142	3562	142	
26	153	155	154	151	148	142	137	137	135	134	136	139	142	143	142	140	136	131	128	126	124	128	134	142	3337	139	3487	139	
27	150	153	157	153	148	138	131	123	117	119	125	133	140	151	157	162	161	156	147	141	135	135	137	142	3411	142	3563	143	
28	152	157	160	159	152	140	125	112	103	100	102	112	127	144	160	170	177	173	167	153	146	140	137	142	3410	142	3560	142	
29	150	156	161	162	155	143	124	104	88	77	78	88	107	129	154	176	186	191	187	178	164	156	150	150	3414	142	3568	143	
30	154	164	169	171	167	153	133	106	84	63	56	62	77	100	131	159	184	193	198	191	182	170	161	158	3386	141			
SUM	4521	4881	5189	5179	4975	4184	3289	2920	3356	4148	4626	4652	4491	4680	5069	5179	4626	3706	3016	3048	3758	4437	4713	4582	4471	TOTAL	102517		
MEAN	151	163	173	166	139	110	97	112	138	154	155	150	156	163	169	173	166	154	124	101	102	125	148	153	149	MONTHLY MEAN	142.4CM		



Station : SYOWA STATION  
 Latitude : 69° 0' 28" S  
 Longitude : 39° 34' 13" E  
 Duration : Dec. 1-Dec. 31 1990  
 Unit : CENTIMETER

Date	Time																							SUM	MEAN	SUM (25)	MEAN (25)		
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22					23	
1	162	170	178	182	181	171	150	124	93	67	48	42	55	77	106	138	171	194	205	206	200	191	181	173	3465	144	3641	146	
2	176	183	192	200	204	199	182	154	122	88	60	44	44	57	85	117	150	177	199	208	207	204	194	186	3632	151	3821	153	
3	189	195	203	211	219	220	211	190	160	122	89	64	50	57	73	98	130	159	185	204	208	206	200	190	3833	160	4024	161	
4	191	189	200	212	221	225	224	211	186	152	117	86	62	56	63	79	106	131	155	176	188	191	186	185	3792	158	3973	159	
5	181	177	184	195	205	216	219	212	199	172	142	113	87	69	63	71	92	113	133	156	172	179	179	177	3706	154	3880	155	
6	174	168	168	178	187	199	205	207	203	187	165	143	115	97	84	81	92	107	125	141	155	165	168	167	3681	153	3846	154	
7	165	159	154	156	163	170	180	183	186	179	169	154	134	116	105	97	98	106	121	133	145	154	160	161	3548	148	3709	148	
8	161	156	151	146	146	154	161	168	174	174	172	168	159	150	142	133	132	134	138	150	158	169	174	179	3749	156	3926	157	
9	177	174	169	164	155	154	151	154	155	154	155	156	152	149	144	141	132	130	131	132	137	142	146	150	3604	150	3757	150	
10	153	150	148	141	132	126	118	115	117	120	127	131	138	143	145	150	150	143	143	144	144	148	151	155	3332	139	3492	140	
11	160	162	160	153	145	137	127	119	114	114	118	126	134	148	156	165	170	165	163	155	153	151	151	153	3499	146	3658	146	
12	159	162	161	155	146	135	121	106	93	87	88	95	106	120	134	151	160	162	160	152	148	145	143	145	3234	135	3382	135	
13	148	154	157	157	152	141	128	111	96	87	83	90	103	124	145	165	179	188	189	184	177	168	167	168	3461	144	3630	145	
14	169	174	180	180	175	168	150	131	108	90	79	77	88	106	129	150	172	187	189	186	182	170	164	162	3566	149	3728	149	
15	162	168	176	180	180	171	157	135	109	87	70	64	70	86	109	136	161	177	186	186	183	173	161	158	3445	144	3606	144	
16	161	165	173	179	184	181	167	145	121	95	73	59	58	72	95	120	149	170	184	189	186	176	169	161	3432	143	3594	144	
17	162	167	175	184	191	191	182	166	141	113	87	66	59	65	86	111	139	165	182	189	188	183	173	165	3530	147	3691	148	
18	161	161	169	182	190	192	186	172	147	119	90	65	52	52	67	89	115	142	162	178	178	175	164	157	3365	140	3520	141	
19	155	152	161	174	186	194	193	184	164	138	110	83	64	59	66	81	110	134	153	170	179	175	167	161	3413	142	3564	143	
20	151	146	151	161	174	186	189	185	174	150	125	98	77	64	63	77	98	121	144	162	172	173	166	160	3367	140	3520	141	
21	153	146	146	154	167	177	187	187	179	165	142	121	98	84	79	87	102	120	140	156	168	174	169	162	3463	144	3618	145	
22	155	149	144	144	153	166	173	178	179	168	151	133	113	98	91	91	99	114	130	146	158	166	167	160	3426	143	3580	143	
23	154	146	139	137	143	154	162	167	172	168	159	145	129	116	107	103	105	114	126	137	149	152	155	154	3393	141	3540	142	
24	147	140	131	125	124	130	136	142	149	150	150	146	137	131	123	120	121	122	128	138	147	150	151	152	3290	137	3437	137	
25	147	136	128	120	112	111	114	116	120	125	131	132	131	130	129	128	125	126	130	133	137	142	144	145	3092	129	3239	130	
26	147	138	130	121	113	104	102	100	105	111	115	127	134	144	150	155	155	156	154	152	155	155	156	156	3235	135	3394	136	
27	159	154	146	138	126	112	102	95	90	91	95	109	120	136	150	160	170	172	169	167	163	161	158	157	3300	138	3459	138	
28	159	157	153	144	132	118	100	82	71	65	66	77	91	112	136	156	172	179	183	180	174	168	163	163	3201	133	3364	135	
29	163	163	161	156	146	130	109	83	64	49	40	44	58	81	108	137	160	177	186	185	179	175	168	164	3086	129	3251	130	
30	165	170	172	172	168	157	136	108	81	57	39	33	41	63	91	122	151	176	190	195	193	186	177	172	3215	134	3388	136	
31	173	179	184	190	191	187	169	144	114	79	52	38	37	47	72	101	137	166	186	198	198	193	184	175	3394	141			
SUM	5039	5044	5111	5111	5111	4891	4186	3307	2896	3296	4203	4969	5281	5156											TOTAL				
	5010	5091	5076	4574	3723	3029	3009	3710	4627	5188	5260	5073													106749				
MEAN	163	163	165	158	135	107	93	106	136	160	170	166													MONTHLY MEAN				
	162	164	164	148	120	98	97	120	149	167	170	164													143.5CM				

Station : SYOWA STATION  
 Latitude : 69° 0' 28" S  
 Longitude : 39° 34' 13" E  
 Duration : Jan. 1-Jan. 31 1991  
 Unit : CENTIMETER

Date	Time																							SUM	MEAN	SUM	MEAN	
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22					23
1	176	182	189	197	204	205	199	179	150	113	79	54	37	39	56	83	114	145	169	182	191	190	176	167	3476	145	3638	146
2	162	167	173	188	198	207	209	199	179	147	112	79	56	50	57	77	105	134	160	180	191	189	182	172	3573	149	3738	150
3	165	158	164	179	194	206	217	215	203	183	152	119	93	77	77	86	108	131	155	176	186	188	182	170	3784	158	3945	158
4	161	150	149	156	171	187	196	204	202	190	169	142	115	95	88	91	102	124	144	161	173	176	170	159	3675	153	3825	153
5	150	135	128	128	138	153	168	178	184	179	168	150	130	114	103	101	110	124	141	155	168	173	171	162	3511	146	3661	146
6	150	136	128	122	124	135	150	159	171	170	168	159	148	135	126	121	126	133	144	158	166	171	171	165	3536	147	3689	148
7	153	141	129	119	116	119	128	137	146	150	152	150	146	141	137	135	136	141	148	156	163	166	167	164	3440	143	3595	144
8	155	145	135	125	116	114	115	115	123	130	134	136	140	140	143	146	150	151	154	159	165	168	167	163	3389	141	3548	142
9	159	149	141	132	124	115	111	107	107	111	114	120	130	138	145	153	160	162	167	168	168	170	168	166	3385	141	3551	142
10	166	158	151	145	134	126	113	103	101	99	95	103	114	126	139	153	165	170	174	175	172	170	166	167	3385	141	3552	142
11	167	164	161	155	149	140	123	110	98	87	83	87	96	115	134	152	167	177	183	182	178	173	170	167	3418	142	3586	143
12	168	169	169	167	162	154	140	122	104	88	78	77	86	102	124	148	166	179	186	187	179	172	167	166	3460	144	3625	145
13	165	168	170	174	171	165	150	130	109	89	72	65	69	84	109	133	158	177	186	186	182	174	163	160	3409	142	3569	143
14	160	162	169	178	180	177	163	145	119	95	74	61	60	76	96	123	150	173	187	192	189	180	168	162	3439	143	3600	144
15	161	164	173	185	191	192	186	166	140	112	87	66	59	67	89	115	142	168	185	191	190	180	168	160	3537	147	3692	148
16	155	160	169	184	197	202	199	186	164	135	106	80	68	67	82	108	136	162	184	191	192	184	170	159	3640	152	3792	152
17	152	152	162	178	194	205	208	204	189	160	131	106	87	84	95	117	144	173	197	210	212	204	192	178	3934	164	4102	164
18	168	164	170	186	200	216	224	222	210	186	159	129	104	90	91	103	126	150	168	184	190	185	168	155	3948	165	4092	164
19	144	132	132	145	163	181	192	197	194	179	154	128	106	93	89	99	118	141	162	175	185	182	170	156	3617	151	3759	150
20	142	130	126	134	151	170	183	194	198	187	170	150	129	115	109	111	127	146	164	179	187	186	175	163	3726	155	3873	155
21	147	131	122	124	135	151	168	177	186	185	175	159	144	131	123	121	131	144	159	170	180	180	172	156	3671	153	3814	153
22	143	129	113	108	113	126	139	150	161	168	166	158	150	143	138	138	143	153	168	176	184	185	177	168	3597	150	3752	150
23	155	139	126	114	113	118	125	135	147	152	155	158	154	153	153	157	160	165	171	177	181	181	175	167	3631	151	3785	151
24	154	140	124	113	103	100	100	101	112	120	126	132	138	146	152	160	168	171	174	179	182	180	176	172	3423	143	3502	140
25	79	150	138	126	113	101	93	89	92	95	101	110	121	135	149	160	172	182	186	189	187	184	179	176	3307	138	3475	139
26	168	162	154	144	131	117	103	90	81	77	79	84	98	116	138	160	178	189	195	196	195	188	182	179	3404	142	3580	143
27	176	175	170	165	157	143	123	102	84	69	60	62	74	94	120	150	173	190	201	202	199	191	185	181	3446	144	3625	145
28	179	179	181	182	177	168	150	122	95	71	51	41	46	64	88	120	151	176	191	196	192	184	177	173	3354	140	3527	141
29	173	180	188	198	205	205	194	171	144	113	84	68	62	73	95	127	161	186	204	210	202	195	181	168	3787	158	3951	158
30	164	168	178	191	202	209	204	186	157	121	95	59	45	48	66	92	122	151	173	164	164	153	138	122	3372	141	3502	140
31	130	131	144	160	178	192	197	188	169	136	101	66	45	40	50	72	100	129	151	164	164	153	138	122	3120	130		
SUM	4847	4770	4726	4802	4904	4999	4970	4783	4097	4519	3650	3258	3091	3361	3812	4369	4897	5331	5570	5657	5555	5311	5065		TOTAL	109394		
MEAN	156	154	152	155	158	161	160	154	132	146	118	105	98	108	123	141	158	172	180	182	179	171	163		MONTHLY MEAN	147.0CM		