

OCEANOGRAPHIC DATA OF THE 23RD JAPANESE ANTARCTIC
RESEARCH EXPEDITION FROM NOVEMBER 1981 TO APRIL 1982

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This report presents the data of the oceanographic observations made on board the icebreaker Fuji and the tidal observation at Syowa Station, which were carried out in the summer mission of the 23rd Japanese Antarctic Research Expedition in 1981-1982.

1. The Oceanographic Observation

Figure 1 shows the track chart of the icebreaker Fuji from November 25, 1981 to April 20, 1982. The surface observations, the current measurement with geomagnetic electrokinetograph (GEK), bathythermograph (BT) and serial observations were made during the cruise.

In addition, two stations for tidal stream observation were occupied on the fast ice near Syowa Station.

(1) The surface observations

Surface temperature measurements and surface water samplings for chemical analysis were made in principle twice or three times a day during the cruise. The results are given in Table 1.

(2) The surface current measurement

Measurements of surface current were made with GEK at the surface observation stations except in the magnetic equator region, in the pack ice area and in the stormy seas as far as GEK works properly. The results are given also in Table 1.

(3) The BT observation

Castings of a mechanical bathythermograph (MBT) were made twice a day (at 0800 and 1800 local mean time) during the cruise from Tokyo to Fremantle and from Mauritius to Tokyo except in channels and in shallow areas. The results are given in Table 2.

The expendable bathythermograph (XBT) observations were made in the Southern Ocean between Fremantle and Mauritius via Syowa Station. Locations of the stations are shown in Fig. 2. The results are given in Table 3.

(4) The serial observation

The serial observations were made at 7 stations (see Fig. 2). The results together with meteorological data are given in Table 4, which also includes interpolated and computed values of temperature, practical salinity, sigma-t and dynamic depth anomalies at standard depth.

(5) Chemical analyses of sea water

The following methods or instruments were used for chemical analyses.

Practical salinity	Inductive salinometer (Auto-Lab model 601 MK III)
pH	Digital pH meter (Denki Kagaku Keiki Co. HG-3)
Dissolved oxygen	The Winkler's method with a Metrhom Model E 415-20S titrator
Phosphate-P	Molybdenum blue method
Silicate-Si	Molybdenum yellow method
Nitrate-N	Modified Morris and Riley method
Nitrite-N	Sulphanilamide and N-(1-naphtyl)-ethylene-diamine 2 HCl were used as reagents.
Ammonium-N	Indophenol method

The nutrient matters were measured with a Shimazu Model UV-210A spectrophotometer with the auto flow cell system.

(6) The tidal stream observation

Two stations S-1 and S-2 occupied in the fast ice near Syowa Station are shown in Fig. 3.

At station S-1 (69° 00.0' S, 39° 35.0' E; 10 m in depth), tidal stream down to the 5 m depth was measured with an Aanderaa current meter (model 4) for 16 days, January 16 - February 1, 1982. Ten harmonic constants were computed using the hourly data and are given in Table 5.

At station S-2 (69° 00.0' S, 39° 36.0' E; 24 m in depth), tidal stream down to the 5 m depth was measured with a MTCM-4 (Tsurumiseiki Co.) for 8 days, January 23 - February 1, 1982. Harmonic constants could not be computed for small speed less than 2 cm/s.

2. The Tidal Observation

The tidal observation at Syowa Station has been carried out since 1965. At present, a pressure-type tide gauge with a strain-gauge as the pressure sensor (Kyowa Shoko Co. SWL-7) is operated. It was installed on January 31, 1975 and the pressure sensor was replaced by a complete one on January 13, 1981 in the summer mission of JARE-22. The sensor of the tide gauge is placed in the Nisi-no-ura Cove on East Ongul Island, and the recorder is placed in the Earth Science Laboratory (see Fig. 3). The leveling between the astronomical station and the bench mark No. 1040 via the bench mark No. 1025 and the reference level measurement of the tide gauge were carried out on January 25 - February 1, 1982 (see Fig. 4). The reference level does not vary between the measurement made immediately after the change of sensor and that made on January 25, 1982. Table 6 shows hourly, daily mean and monthly mean values from February 1, 1981 to January 31, 1982.

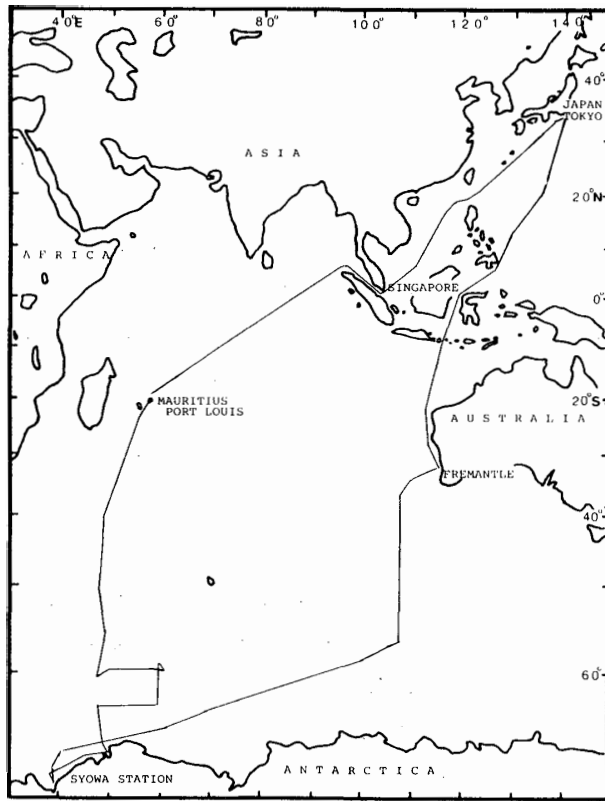


Fig. 1. The track chart of the icebreaker Fuji from November 25, 1981 to April 20, 1982.

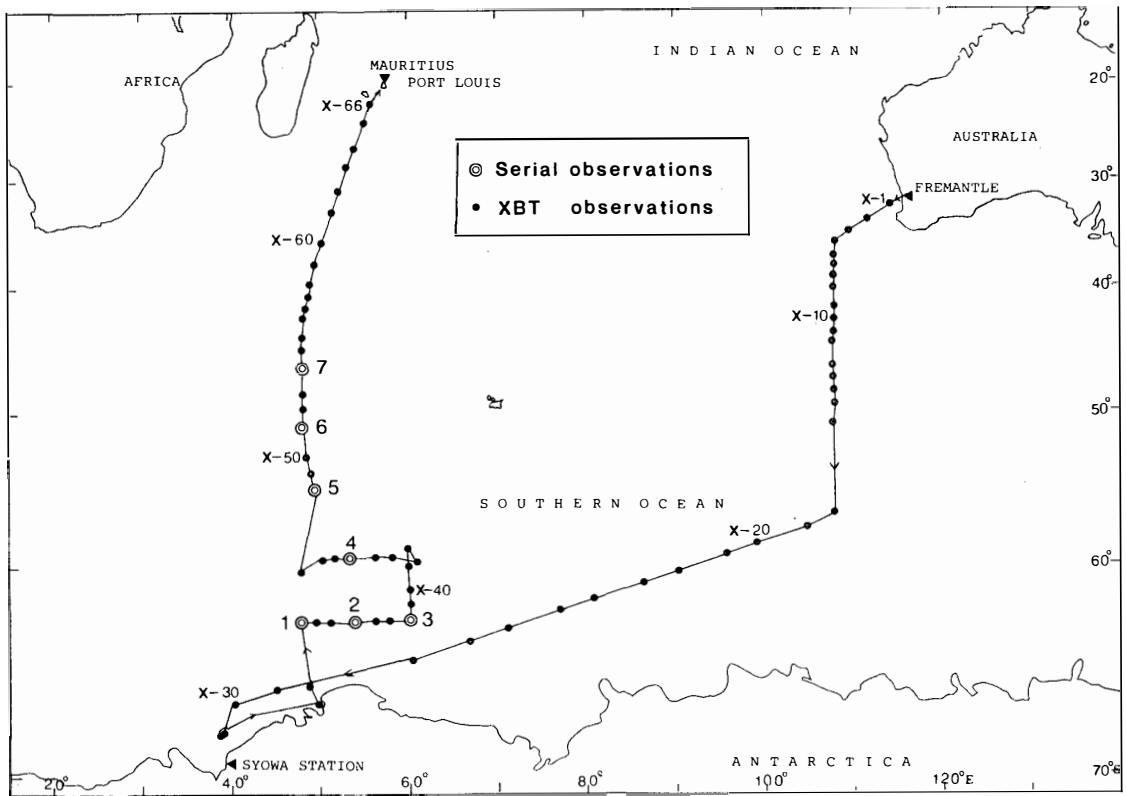


Fig. 2. The station locations of the serial observation and XBT observation.

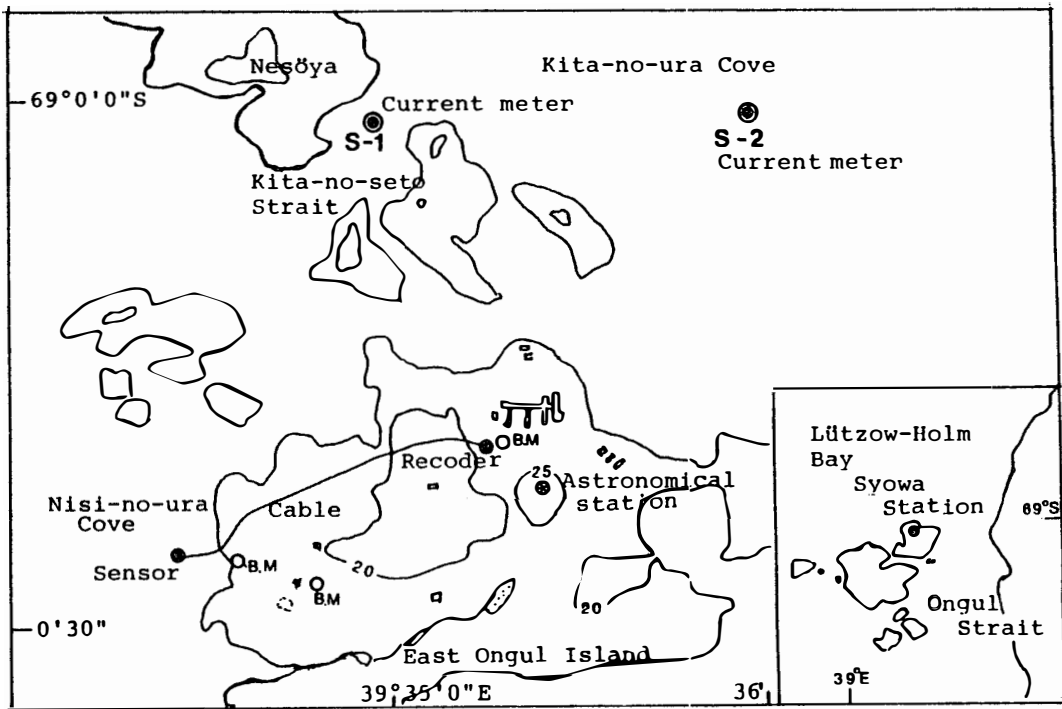
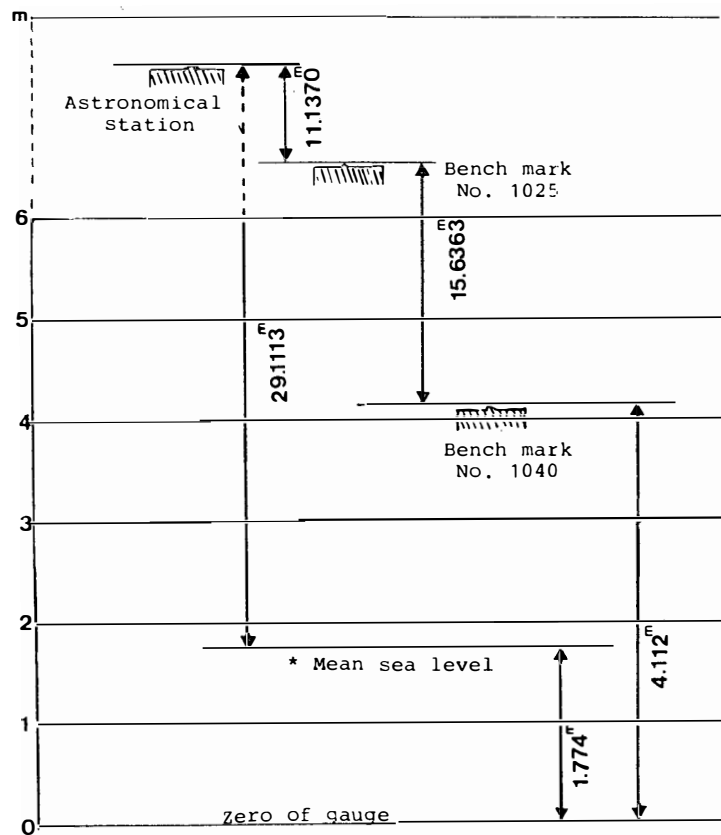


Fig. 3. The locations of tide gauge and the tidal stream observation.



* Duration : February 1981 - January 1982

Fig. 4. The relationship of various levels.

Table 1. Surface observation data (November 26, 1981 - April 17, 1982).

Date	Time		Position		Air temp.	Water temp.	S	pH	O ₂ (ml/l)	PO ₄ -P	SiO ₃ -Si	NO ₂ -N	NO ₃ -N	NH ₄ -N	Current	
	GMT	LMT	Latitude	Longitude	(°C)	(µg-atoms/l)					Dir.	Speed (kn)				
November 25			Left Tokyo													
26	23-00*	08-00	31° 50'N	138° 34'E	16.4	20.7	34.468	8.32	4.84	0.16	3	0.20		0.1	102°	0.7
	09-00	18-00	29° 33'	138° 08'	20.0	22.3	34.649	8.31	4.81	0.00	2	0.00		0.0	162	0.5
27	23-00*	08-00	26° 18'	137° 47'	25.0	24.1	34.753	8.38	4.66	0.00	2	0.00		0.1	123	0.7
	09-00	18-00	24° 11'	136° 50'	26.0	25.2	34.800	8.37	4.56	0.03	1	0.00	0.0	0.4	217	0.6
28	23-00*	08-00	21° 13'	135° 16'	28.1	25.9	34.811	8.36	4.51	0.03	1	0.00	0.0	0.4	213	0.5
	09-00	18-00	19° 23'	133° 55'	28.4	27.1	34.641	8.41	4.44	0.00	1	0.00	0.0	0.0	246	0.8
29	23-00*	08-00	16° 26'	132° 04'	29.2	28.4	34.157	8.42	4.38	0.13	0	0.00	0.0	0.3	296	0.1
	09-00	18-00	14° 48'	130° 59'	30.4	28.5	34.090	8.40	4.33	0.13	0	0.00	0.0	0.4		
30	23-00*	08-00	12° 29'	129° 23'	30.3	28.3	34.156	8.41	4.40	0.05	1	0.00	0.0	0.0		
December 1	00-00	08-00	08° 20'	127° 17'	30.0	29.1	34.023	8.41	4.35	0.05	1	0.00	0.0	0.3		
	10-00	18-00	06° 10'	126° 18'	29.4	29.0	33.910	8.40	4.33	0.05	1	0.00	0.0	0.0		
2	00-00	08-00	04° 00'	123° 51'	28.3	29.0	33.751	8.39	4.39	0.05	3	0.00	0.0	0.1		
	10-00	18-00	02° 33'	122° 18'	28.0	28.8	33.346	8.34	4.39	0.00	3	0.00	0.0	0.0		
3	00-00	08-00	01° 08'	120° 03'	28.3	28.8	33.168	8.31	4.40	0.00	5	0.00	0.0	0.1		
	10-00	18-00	00° 40'S	119° 13'E	30.3	29.4	33.606	8.31	4.38	0.05	3	0.00	0.0	0.0		
4	00-00	08-00	03° 29'	118° 26'	29.2	29.0	33.985	8.34	4.63	0.03	3	0.03	0.0	0.2		
	10-00	18-00	05° 19'	117° 17'	30.2	28.8	33.832	8.25	4.35	0.08	5	0.00	0.1	0.0		
5	00-00	08-00	08° 00'	116° 04'	28.2	28.0	33.936	8.24	4.32	0.11	1	0.03	0.1	0.3		
	10-00	18-00	09° 54'	115° 23'	29.4	28.8	33.903	8.28	4.39	0.05	2	0.00	0.0	0.0	26	1.4
6	00-00	08-00	12° 57'	114° 43'	28.6	27.8	34.411	8.29	4.42	0.08	3	0.00	0.0	0.1	337	1.8
	10-00	18-00	14° 44'	114° 19'	27.5	28.2	34.414	8.27	4.42	0.05	2	0.00	0.0	0.0	22	1.1
7	00-00	08-00	17° 22'	113° 52'	26.9	26.4	34.609	8.31	4.52	0.08	2	0.00	0.0	0.3	344	0.2
	10-00	18-00	19° 32'	113° 28'	25.3	25.6	34.836	8.25	4.57	0.00	3	0.00	0.0	0.8	345	0.8
8	00-00	08-00	22° 29'	112° 52'	24.2	23.2	35.158	8.30	4.72	0.13	3	0.02	0.0	0.2	326	0.9
	10-00	18-00	24° 24'	112° 30'	24.9	23.0	35.333	8.35	4.71	0.08	3	0.00	0.0	0.0		

* The time of date of the preceding day.

Date	Time		Position		Air temp.	Water temp.	S	pH	O ₂ (ml/l)	PO ₄ -P	SiO ₃ -Si	NO ₂ -N	NO ₃ -N	NH ₄ -N	Current		
	GMT	LMT	Latitude	Longitude	(°C)	Dir.									Speed (kn)		
December 9	00-00	08-00	27° 06'S	112° 45'E	24.4	22.2	35.417	8.34	4.85	0.11	3	0.00	0.0	0.3	272	0.4	
	10-00	18-00	29° 07'	113° 25'	24.8	22.8	35.477	8.30	4.86	0.11	3	0.00	0.0	0.0	139	0.7	
10	00-00	08-00	31° 20'	114° 59'	20.6	20.3	35.629	8.31	5.06	0.11	2	0.00	0.0	0.3			
11			Arrived in Fremantle														
16			Left Fremantle														
	10-00	18-00	32° 32'S	114° 22'E	18.0	18.5	35.748	8.30	5.34	0.05	3	0.00	0.0	0.0	345	0.7	
17	00-15	08-15	33° 59'	111° 36'	16.0	17.7	35.802	8.34	5.39	0.16	3	0.00	0.6	0.4	61	0.2	
	10-00	18-00	35° 00'	109° 46'	14.1	14.4	35.236	8.36	5.87	0.37	2	0.08	2.7	0.2	327	0.8	
18	01-00	08-00	37° 09'	108° 02'	12.0	15.4	35.542	8.33	5.73	0.21	1	0.02	0.5	0.6	60	0.4	
	06-00	13-00	38° 06'	108° 01'	12.2	13.0	34.953	8.23	6.09	0.56	1	0.11	6.1	0.3			
	11-00	18-00	39° 04'	108° 01'	12.0	12.1	34.865	8.27	6.08	0.66	3	0.14	8.4	0.5	352	0.5	
	16-00	23-00	40° 02'	107° 59'	11.9	11.8	34.854	8.27	6.04	0.75	5	0.14	8.6	0.2			
19	01-00	08-00	41° 47'	108° 00'	12.0	11.4	34.859	8.28	6.12	0.70	3	0.17	8.4	0.6	3	0.3	
	06-00	13-00	42° 46'	107° 59'	11.7	10.7	34.736	8.26	6.21	0.77	5	0.21	10.0	0.2			
	11-00	18-00	43° 45'	107° 59'	11.0	10.1	34.709	8.26	6.25	0.89	4	0.20	11.	0.4	12	0.7	
	16-00	23-00	44° 38'	107° 43'	10.6	10.1	34.729	8.26	6.26	0.84	5	0.21	12.	0.8			
20	01-00	08-00	46° 26'	107° 47'	9.1	9.5	34.616	8.27	6.30	1.01	5	0.22	13.	0.8			
	06-00	13-00	47° 23'	107° 49'	7.1	6.4	34.058	8.23	6.86	1.38	9	0.24	22.	0.3			
	11-00	18-00	48° 22'	107° 52'	5.8	6.6	34.067	8.21	6.80	1.33	7	0.23	20.	0.9			
	16-00	23-00	49° 23'	107° 52'	6.1	4.9	33.965	8.21	7.09	1.57	5	0.20	23.	1.1			
21	01-00	08-00	50° 50'	107° 45'	3.8	2.8	33.992	8.21	7.45	1.68	7	0.16	25.	0.8			
23	23-45*	06-45	56° 49'	108° 00'	0.8	0.6	34.038	8.15	7.74	1.92	26	0.20	32.	0.7			
	10-30	17-30	57° 41'	104° 50'	0.7	0.1	33.846	8.16	7.87	1.78	29	0.22	29.	0.7	19	0.3	
24	02-00	08-00	58° 39'	99° 13'	0.3	0.0	33.886	8.19	7.89	1.85	34	0.26	30.	1.1	282	0.6	
	11-30	17-30	59° 17'	95° 47'	0.4	-0.2	33.835	8.14	8.00	1.66	31	0.24	30.	0.8	340	0.4	
25	02-00	08-00	60° 18'	90° 21'	-0.2	0.0	33.832	8.14	7.98	1.64	33	0.22	30.	1.1	188	0.3	
	12-00	18-00	60° 57'	86° 27'	-0.6	-0.6	33.917	8.18	8.23	1.50	54	0.15	26.	1.0	131	0.2	

* The time of date of the preceding day.

Date	Time		Position		Air temp.	Water temp.	S	pH	O ₂	PO ₄ -P	SiO ₃ -Si	NO ₂ -N	NO ₃ -N	NH ₄ -N	Current	
	GMT	LMT	Latitude	Longitude	(°C)	(ml/l)									(µg-atoms/l)	Dir.
December 26	03-00	08-00	61° 50'S	80° 50'E	-0.1	-0.6	33.952	8.15	7.99	1.73	48	0.24	28.	1.7	329°	1.3
	13-00	18-00	62° 27'	76° 58'	-0.4	-0.4	33.806	8.15	8.11	1.54	43	0.25	26.	1.6	332	0.7
27	03-00	08-00	63° 20'	71° 09'	0.0	-0.6	33.765	8.18	8.23	1.47	42	0.26	25.	0.8	318	0.6
	13-00	18-00	63° 59'	66° 49'	0.8	0.3	33.744	8.15	8.22	1.19	36	0.28	23.	0.8		0.0
28	03-00	08-00	64° 57'	60° 23'	0.4	-0.2	33.626	8.23	8.25	1.43	40	0.26	24.	1.3	274	0.3
30	04-00	08-00	66° 16'	45° 11'	-1.2	-1.6	33.768	8.14	7.64	2.04	67	0.19	32.	0.7		
31	04-00	07-00	66° 55'	40° 29'	0.2	-1.2	33.911	8.13	7.66	1.94	66	0.17	30.	0.6		
January 2	07-40	10-40	68° 12'	39° 17'	-2.0	-1.5	34.148	8.12	7.71	1.92	62	0.06	30.			
Arrived at the Ongul Islands																
February 18	Left the Ongul Islands															
	14-45	17-45	66° 57'S	49° 54'E	-2.3	-0.8	33.836	8.13	9.13	1.71	46	0.16	23.	1.6		
21	15-00	18-00	66° 09'	48° 50'	-0.1	-0.3	34.171	8.13	8.02	1.90	60	0.20	29.	1.9	274	0.5
22	05-00	08-00	63° 00'	48° 00'	0.2	1.1	33.892	8.12	7.80	1.83	44	0.42	25.	0.4	304	1.6
	15-00	18-00	63° 00'	49° 35'	0.2	1.2	33.850	8.09	7.83	1.78	44	0.34	28.	0.3	341	1.5
23	20-00	23-00	63° 00'	51° 12'	-1.4	1.1	33.878	8.13	7.84	1.85	44	0.35	28.			
	04-00	08-00	63° 00'	54° 00'	0.4	1.3	33.819	8.12	7.74	1.85	40	0.37	25.		138	0.2
	14-00	18-00	62° 58'	56° 13'	-0.4	0.6	33.937	8.11	7.90	1.87	43	0.29	28.		247	0.6
24	19-00	23-00	62° 59'	57° 45'	-1.9	1.1	33.851	8.10	7.89	1.75	37	0.30	27.	0.0		
	04-00	08-00	63° 00'	60° 06'	-1.6	0.8	33.922	8.16	7.80	1.80	39	0.33	25.	0.3	323	0.6
25	14-00	18-00	62° 04'	60° 13'	-0.9	1.1	33.847	8.13	7.79	1.83	32	0.32	27.	1.5	16	0.4
	19-00	23-00	61° 18'	60° 14'	0.9	1.4	33.838	8.13	7.75	1.71	29	0.30	26.	0.3		
	04-00	08-00	60° 00'	60° 02'	2.2	1.4	33.844	8.13	7.82	1.78	28	0.34	26.	1.5		
	14-00	18-00	58° 55'	59° 59'	3.0	2.1	33.930	8.10	7.63	1.87	26	0.30	27.	1.8		

Date	Time		Position		Air temp.	Water temp.	S	pH	O ₂ (ml/l)	PO ₄ -P	SiO ₃ -Si	NO ₂ -N	NO ₃ -N	NH ₄ -N	Current			
	GMT	LMT	Latitude	Longitude	(°C)	(µg-atoms/l)					Dir.	Speed (kn)						
February 26	04-00	08-00	59° 44'S	60° 58'E	2.6	1.4	33.846	8.12	7.82	1.71	28	0.34	26.	1.5				
	14-00	18-00	59° 29'	58° 08'	2.1	2.0	33.886	8.09	7.70	1.40	31	0.32	27.	1.6				
	19-00	23-00	59° 28'	56° 21'	2.0	2.0	33.888	8.16	7.70	1.64	26	0.32	26.	1.2				
27	04-00	08-00	59° 26'	53° 24'	1.1	2.0	33.826	8.23	7.69	1.73	31	0.36	24.	0.4	203	0.1		
	14-00	18-00	59° 32'	51° 41'	2.6	2.1	33.865	8.14		1.71	26	0.36	26.	2.2			277	0.4
	19-00	23-00	59° 37'	50° 18'	2.0	2.3	33.843	8.16	7.70	1.59	31	0.34	26.	0.5				
28	05-00	08-00	60° 17'	47° 59'	2.9	2.0	33.802	8.21	7.73	1.66	35	0.32	25.	0.6				
March 2	05-00	08-00	55° 17'	49° 28'	3.1	2.9	33.982	8.30	7.51	1.80	32	0.30	24.	0.6				
	15-00	18-00	54° 09'	49° 01'	3.7	2.7	33.968	8.29	7.59	1.75	33	0.32	26.	2.0				
	20-00	23-00	53° 04'	48° 27'	4.1	3.6	33.931	8.26	7.43	1.68	26	0.30	26.	0.5				
	3	05-00	08-00	51° 03'	48° 06'	4.7	4.8	33.736	8.26	7.25	1.64	12	0.29	22.	0.6			
		15-00	18-00	49° 39'	48° 13'	5.5	5.0	33.770	8.24	7.34	1.57	11	0.28	23.	1.9			
	4	19-00	23-00	48° 33'	48° 12'	5.9	6.4	33.728	8.29	7.19	1.33	5	0.28	21.	0.3			
		05-00	08-00	46° 40'	48° 16'	6.9	7.3	33.761	8.27	6.95	1.38	6	0.27	19.	0.2			
		15-00	18-00	45° 10'	48° 10'	10.7	8.0	33.682	8.26	7.00	1.36	6	0.28	21.	0.8			
	5	20-00	23-00	44° 06'	48° 12'	13.6	8.6	33.678	8.25	6.86	1.40	5	0.26	21.	0.3			
		05-00	08-00	42° 29'	28° 17'	13.9	11.9	33.629	8.31	6.47	1.05	3	0.21	13.	0.4			
		10-00	13-00	41° 44'	48° 35'	12.9	17.8	35.217	8.39	5.54	0.21	2	0.00	0.1	0.2			
		15-00	18-00	40° 42'	48° 53'	14.0	19.7	35.487	8.40	5.30	0.11	2	0.00	0.1	0.1			
6	20-00	23-00	39° 35'	49° 03'	14.8	19.2	35.505	8.40	5.41	0.18	2	0.00	0.1	0.4				
	04-00	08-00	37° 55'	49° 36'	16.0	19.7	35.370	8.38	5.38	0.16	1	0.00	0.1	0.8				
	14-00	18-00	35° 57'	50° 27'	18.4	21.4	35.441	8.38	5.21	0.13	1	0.00	0.1	0.1				
7	04-00	08-00	33° 05'	51° 39'	21.1	21.7	35.396	8.33	5.17	0.16	2	0.00	0.1	0.4				
	14-00	18-00	31° 04'	52° 16'	23.0	24.5	35.079	8.35	4.89	0.08	1	0.00	0.0	0.2				
8	04-00	08-00	28° 37'	53° 14'	25.8	25.0	35.138	8.36	4.86	0.13	2	0.00	0.0	0.2				
	14-00	18-00	26° 49'	54° 09'	26.5	26.2	35.176	8.38	4.88	0.05	2	0.00	0.0	0.1				

Date	Time		Position		Air temp.	Water temp.	S	pH	O ₂ (ml/l)	PO ₄ -P	SiO ₃ -Si	NO ₂ -N	NO ₃ -N	NH ₄ -N	Current		
	GMT	LMT	Latitude	Longitude	(°C)	(µg-atoms/l)					Dir.	Speed (kn)					
March	9	04-00	08-00	24° 11'S	55° 20'E	27.1	26.8	35.071	8.41	4.70	0.05	1	0.00	0.0	0.6		
		14-00	18-00	22° 14'	55° 55'	28.2	28.2	35.228	8.36	4.67	0.11	2	0.00	0.0	0.1		
	10			Arrived at Mauritius													
	17			Left Mauritius													
		14-00	18-00	19° 19'S	58° 31'E	26.9	27.2	34.857	8.35	4.93	0.18	3	0.00	0.0	0.0		
	18	04-00	08-00	18° 00'	60° 43'	27.8	27.6	34.862	8.40	4.80	0.00	2	0.00	0.0	0.1		
		14-00	18-00	17° 03'	62° 14'	28.3	28.4	34.785	8.35	4.80	0.16	2	0.00	0.0	0.1		
	19	04-00	08-00	15° 42'	64° 18'	28.0	27.8	34.613	8.37	4.85	0.16	2	0.00	0.0	0.0	258°	1.2
		14-00	18-00	14° 45'	66° 05'	28.0	27.7	34.763	8.38	4.84	0.16	2	0.00	0.0	0.0	335	1.2
	20	03-00	08-00	12° 57'	68° 29'	28.0	28.0	34.454	8.34	4.77	0.26	3	0.01	0.0	0.2	351	0.8
		13-00	18-00	11° 50'	70° 15'	28.3	28.6	34.340	8.36	4.73	0.21	3	0.00	0.0	0.1		
	21	03-00	08-00	10° 16'	72° 38'	24.8	28.4	34.080	8.34	4.72	0.13	3	0.00	0.0	0.1	329	1.1
		13-00	18-00	09° 05'	74° 24'	27.7	28.8	34.376	8.33	4.72	0.16	2	0.00	0.0	0.0		
	22	03-00	08-00	07° 20'	76° 56'	28.7	28.8	33.938	8.31	4.74	0.11	2	0.00	0.1	0.2	350	1.7
		13-00	18-00	06° 02'	78° 28'	29.0	29.1	34.420	8.38	4.70	0.13	2	0.00	0.0	0.0	356	1.4
	23	03-00	08-00	04° 22'	80° 43'	28.8	28.5	34.328	8.39	4.73	0.18	3	0.00	0.0	0.3		
		13-00	18-00	03° 28'	81° 49'	28.5	28.9	34.388	8.38	4.69	0.18	3	0.00	0.0	0.2		
	24	03-00	08-00	01° 41'	84° 06'	29.0	28.8	34.754	8.40	4.69	0.18	3	0.00	0.0	0.2		
		13-00	18-00	00° 28'	85° 44'	28.9	30.2	34.807	8.37	4.62	0.24	2	0.00	0.0	0.8		
	25	02-00	08-00	01° 06'N	87° 59'E	28.0	28.9	34.597	8.34	4.66	0.21	2	0.00	0.0	0.5		
		12-00	18-00	02° 11'	89° 42'	29.2	29.3	34.382	8.33	4.68	0.18	3	0.00	0.0	0.2		
	26	02-00	08-00	03° 48'	91° 55'	28.6	28.9	34.634	8.33	4.68	0.18	1	0.00	0.0	0.2		
		12-00	18-00	05° 01'	93° 29'	29.0	30.0	34.786	8.41	4.64	0.18	3	0.01	0.0	0.1		
	27	02-00	08-00	06° 10'	95° 18'	30.0	29.4	33.054	8.38	4.71	0.13	3	0.00	0.0	0.5		
		12-00	18-00	05° 45'	96° 46'		29.7	32.722	8.38	4.70	0.11	5	0.00	0.0	0.4		
	28	01-00	08-00	04° 52'	98° 33'		29.1	32.790	8.35	4.73	0.13	4	0.00	0.0	0.0		
		11-00	18-00	04° 07'	99° 48'		29.7	31.788	8.33	4.68	0.18	7	0.00	0.0	0.2		

Date	Time		Position		Air temp.	Water temp.	S	pH	O ₂ (ml/l)	PO ₄ -P	SiO ₃ -Si	NO ₂ -N	NO ₃ -N	NH ₄ -N	Current		
	GMT	LMT	Latitude	Longitude	(°C)	(µg-atoms/l)					Dir.	Speed (kn)					
March	30	01-00	08-00	03° 04'N	100° 34'E		29.4	31.637	8.37	4.73	0.21	9	0.02	0.0	0.2		
		11-00	18-00	02° 07'	102° 05'		29.1	32.078	8.32	4.60	0.37	8	0.08	0.0	0.2		
March	31	00-00	08-00	01° 11'	103° 50'		28.9	32.238	8.30	4.50	0.29	4	0.08	0.4	0.3		
Arrived in Singapore																	
April	8	10-00	18-00	01° 43'N	105° 05'E		29.6	32.677	8.33	4.94	0.05	2	0.00	0.0	0.0		
	9	00-00	08-00	02° 40'	107° 37'		29.4	32.840	8.37	4.93	0.03	5	0.00	0.0	0.1		
		10-00	18-00	04° 11'	108° 57'		29.2	33.480	8.36	4.94	0.05	3	0.00	0.0	0.0		
	10	00-00	08-00	06° 37'	110° 14'	27.7	28.6	33.874	8.39	4.94	0.08	2	0.01	0.0	0.2		
		10-00	18-00	08° 05'	111° 00'	29.0	28.4	33.813	8.34	4.97	0.13	3	0.00	0.0	0.2		
	11	00-00	08-00	10° 29'	112° 36'	27.5	28.1	33.486	8.36	4.94	0.05	3	0.00	0.0	0.3		
		10-00	18-00	12° 07'	113° 46'	27.8	27.6	33.513	8.35	4.92	0.08	3	0.00	0.0	0.1		
	12	00-00	08-00	14° 19'	115° 14'	27.0	28.2	33.595	8.38	4.92	0.08	3	0.00	0.0	0.1		
		10-00	18-00	16° 09'	116° 06'	26.2	26.3	33.938	8.37	4.90	0.05	3	0.00	0.0	0.3	186	1.1
	13	00-00	08-00	18° 33'	118° 03'	25.5	25.0	34.184	8.40	5.10	0.05	2	0.00	0.0	0.5	339	0.7
10-00		18-00	19° 34'	120° 17'	25.2	24.7	34.395	8.40	5.12	0.16	3	0.02	0.0	0.3	328	1.9	
14	00-00	08-00	21° 10'	123° 10'	24.9	23.9	34.787	8.39	5.14	0.03	3	0.00	0.0	0.4	267	0.6	
	10-00	18-00	22° 48'	124° 55'	22.6	23.7	34.752	8.39	5.15	0.03	1	0.00	0.0	0.3	163	1.1	
15	23-00*	08-00	24° 49'	127° 04'	20.4	22.0	34.835	8.41	5.29	0.05	1	0.00	0.0	0.6	16	0.9	
	09-00	18-00	26° 20'	128° 39'	21.2	22.4									251	0.2	
16	23-00*	08-00	28° 22'	130° 59'	21.0	21.4									217	1.7	
	09-00	18-00	29° 40'	131° 53'	22.0	21.2									195	1.0	
17	23-00*	08-00	32° 09'	133° 57'	17.1	19.6									99	1.5	
	09-00	18-00	33° 20'	136° 04'	15.6	15.8									163	1.4	

* The time of date of the preceding day.

Table 2. Mechanical bathythermograph data.

Station Number	Date	Time		Position		Temperature (°C) at indicated depth (m)										
		GMT	LMT	Latitude	Longitude	0	10	20	30	50	75	100	125	150	200	250
1	26 November 1981	23-00	08-00	31° 50'N	138° 34'E	20.7	20.7	20.7	20.7	20.7	20.7	20.7	17.9	15.3	12.9	10.5
2	26	09-00	18-00	29° 33'	138° 08'	22.3	22.3	22.3	22.3	22.2	22.2	22.0	20.6	19.6	18.4	18.0
3	27	23-00	08-00	26° 18'	137° 47'	24.1	24.1	24.0	23.9	23.7	23.5	21.9	20.0	19.2	17.8	16.5
4	27	09-00	18-00	24° 11'	136° 50'	25.2	25.1	24.8	24.7	24.6	23.8	21.7	20.1	18.8	17.8	16.9
5	28	23-00	08-00	21° 13'	135° 16'	25.9	26.0	25.8	25.7	25.7	25.1	23.6	22.0	20.5	18.6	17.5
6	28	09-00	18-00	19° 23'	133° 55'	27.1	27.1	27.1	27.0	26.9	25.5	21.1	19.7	18.6	17.6	16.6
7	29	23-00	08-00	16° 26'	132° 04'	28.4	28.5	28.5	28.4	28.4	28.1	27.9	25.9	23.9	20.2	15.9
8	29	09-00	18-00	14° 48'	130° 59'	28.5	28.6	28.6	28.6	28.5	28.1	27.6	25.3	22.1	17.9	
9	30	23-00	08-00	12° 29'	129° 23'	28.3	28.3	28.3	28.2	27.9	26.1	23.1	21.7	19.2	15.6	12.4
10	1 December	00-00	08-00	08° 20'	127° 17'	29.1	29.1	29.1	29.1	29.1	27.8	25.1	22.3	19.4	15.0	11.6
11	1	10-00	18-00	06° 10'	126° 18'	29.0	29.0	29.0	29.0	28.9	28.6	26.0	22.5			
12	2	00-00	08-00	04° 00'	123° 51'	29.0	29.0	29.0	28.9	28.6	28.4	27.3	26.5	26.9	14.6	12.3
13	2	10-00	18-00	02° 32'	122° 18'	28.8	28.8	28.7	28.6	28.3	27.5	26.9	25.5	23.9	15.8	11.4
14	3	00-00	08-00	01° 08'	120° 03'	28.8	28.8	28.9	28.9	28.4	26.4	24.2	21.5	17.8	16.2	12.4
15	3	10-00	18-00	00° 40S	119° 13E	29.4	29.4	29.2	29.2	28.1	27.0	24.7	22.2	21.1	17.1	
16	4	00-00	08-00	03° 29'	118° 26'	29.0	29.0	29.0	29.0	29.0	28.9	26.6	21.1	19.0	13.6	
17	4	10-00	18-00	05° 19'	117° 17'	28.8	28.8	28.8	28.7	28.5	28.2	26.6	23.4	18.5		
18	5	00-00	08-00	08° 00'	116° 04'	28.0	28.0	27.9	27.7	26.3	24.9	23.3	21.9	16.8		
19	5	10-00	18-00	09° 54'	115° 23'	28.8	28.9	28.4	27.7	26.5	25.0	20.6	16.4	15.1		
20	6	00-00	08-00	12° 57'	114° 43'	27.8	27.8	27.8	27.8	27.6	26.1	24.3	22.0	20.7		
21	6	10-00	18-00	14° 44'	114° 9'	28.2	28.3	28.4	28.4	28.3	26.4	25.2	23.0	20.4	17.7	14.6
22	7 December 1981	00-00	08-00	17° 22S	113° 52E	26.4	26.5	26.5	26.5	25.2	24.2	22.6	21.2	20.0	17.0	14.2
23	7	10-00	18-00	19° 32'	113° 28'	25.6	25.6	25.6	25.6	25.5	25.0	23.5	22.1	20.9	19.2	16.7
24	8	00-00	08-00	22° 29'	112° 52'	23.2	23.2	23.2	23.2	23.2	23.2	23.1	22.0	21.4	17.7	17.6
25	9	00-00	08-00	27° 06'	112° 45'	22.2	22.2	22.1	21.8	21.7	21.6	21.6	20.6	20.1		
26	9	10-00	18-00	29° 07'	113° 25'	22.8	21.4	21.3	21.3	21.0	19.3	18.7	18.1	17.4	15.9	
27	17 March 1982	14-00	18-00	19° 19'	58° 31'	27.2	27.2	27.2	27.2	26.5	25.3	23.7	22.8	22.1	21.0	19.3
28	18	04-00	08-00	18° 00'	60° 43'	27.6	27.7	27.7	27.8	27.7	26.1	24.2	22.7	21.6	20.3	17.2
29	18	14-00	18-00	17° 03'	62° 14'	28.4	28.5	28.5	28.5	27.0	25.2	24.3	21.8	20.2	17.6	16.0
30	19	04-00	08-00	15° 42'	64° 18'	27.8	27.8	27.8	27.9	25.9	23.6	20.9	19.8	18.5	15.5	14.0
31	19	14-00	18-00	14° 45'	66° 05'	27.7	27.7	27.4	27.4	26.3	24.1	22.0	21.0	20.1	17.4	14.6
32	20	03-00	08-00	12° 57'	68° 29'	28.0	28.1	28.1	25.3	22.0	19.5	18.1	17.7	17.1	14.2	11.9
33	20	13-00	18-00	11° 50'	70° 15'	28.6	28.6	28.6	28.4	23.6	19.7	17.9	15.3	14.5	12.7	11.5
34	21	03-00	08-00	10° 16'	72° 38'	28.4	28.5	28.6	28.1	25.1	22.6	20.2	16.7	14.3	12.7	10.8
35	21	13-00	18-00	09° 05'	74° 24'	28.8	28.8	28.8	28.9	23.5	20.2	17.1	14.5	13.3	12.3	
36	22	03-00	08-00	07° 20'	76° 56'	28.8	28.8	28.2	26.5	20.8	19.0	17.7	15.2	14.1	12.9	
37	22	13-00	18-00	06° 02'	78° 28'	29.1	28.9	27.5	25.4	20.6	18.4	16.7	16.2	14.9	13.0	
38	23	03-00	08-00	04° 22'	80° 43'	28.5	28.6	28.6	27.7	25.1	21.0	19.3	16.8	15.1	12.3	11.1
39	23	13-00	18-00	03° 28'	81° 49'	28.9	28.7	28.7	28.6	26.9	24.1	19.2	14.9	13.2	12.4	
40	24	03-00	08-00	01° 41'	84° 06'	28.8	28.8	28.9	28.8	28.8	22.4	18.8	15.6	14.1	12.5	11.3
41	24	13-00	18-00	00° 28'	85° 44'	29.1	28.9	28.8	28.8	28.8	24.3	19.1	16.4	14.1	13.2	
42	25	02-00	08-00	01° 06N	87° 59E	28.9	28.9	28.9	28.9	28.9	27.1	20.0	14.4	13.6	12.5	
43	25 March 1982	12-00	18-00	02° 11N	89° 42E	29.3	29.1	28.9	28.9	28.6	26.9	20.9	14.5	13.0	12.5	12.0
44	26	02-00	08-00	03° 48'	91° 55'	28.9	28.9	28.9	28.9	28.7	27.0	22.7	15.4	13.9	13.1	12.1
45	26	12-00	18-00	05° 01'	93° 29'	30.0	29.7	29.5	29.5	29.5	27.3	21.5	16.7	13.8		
46	27	02-00	08-00	06° 10'	95° 18'	29.4	29.4	29.2	28.8	28.9	26.5	18.3	15.5	14.0	13.1	12.3
47	10 April	00-00	08-00	06° 37'	110° 14'	28.6	28.6	28.7	27.5	25.5	22.7	20.4	18.9	17.4	15.2	12.6
48	10	10-00	18-00	08° 05'	111° 00'	28.4	28.4	28.4	28.4	27.0	22.8	20.1	18.9	17.3	15.0	12.5
49	11	00-00	08-00	10° 29'	112° 36'	28.1	28.2	28.2	28.2	27.6	23.2	19.3	17.7	16.5	14.2	12.3
50	11	10-00	18-00	12° 07'	113° 46'	27.6	27.6	27.6	27.6	25.6	23.5	21.6	18.7	16.2	14.1	12.1
51	12	00-00	08-00	14° 19'	115° 14'	27.2	27.3	27.3	25.9	23.0	19.9	18.3	16.3	15.3	13.8	12.1
52	12	10-00	18-00	16° 09'	116° 06'	26.3	26.3	26.3	25.6	23.4	22.7	21.8	19.0	17.6	14.9	12.8
53	13	00-00	08-00	18° 33'	118° 03'	25.0	25.0	25.1	25.1	22.1	19.5	18.0	16.2	15.2	13.3	11.4
54	13	10-00	18-00	19° 34'	120° 17'	24.7	24.7	24.4	24.3	24.2	24.0	21.0	18.9	17.2	14.8	11.9
55	14	00-00	08-00	21° 10'	123° 10'	23.9	23.9	23.9	23.9	23.9	22.5	21.5	20.6	19.6	17.2	14.6
56	14	10-00	18-00	22° 48'	124° 55'	23.7	23.7	23.7	23.7	23.7	23.5	23.0	22.4	22.1	21.5	19.1
57	15	23-00	08-00	24° 49'	127° 04'	22.0	22.0	22.0	22.0	22.0	21.6	21.2	20.9	20.8	19.4	17.8
58	15	09-00	18-00	26° 20'	128° 39'	22.4	22.4	22.4	22.4	22.4	22.4	21.9	21.3	20.9	20.1	18.3
59	16	23-00	08-00	28° 22'	130° 59'	21.4	21.5	21.7	21.7	21.6	21.2	20.6	20.1	19.8	19.2	17.9
60	16	09-00	18-00	29° 40'	131° 53'	21.2	21.2	21.2	21.2	21.0	20.5	19.6	19.1	19.0	18.5	17.1
61	17	23-00	08-00	32° 09'	133° 57'	19.6	19.6	19.6	19.7	19.6	19.2	19.0	19.0	19.0	18.7	18.0
62	17	09-00	18-00	33° 20'	136° 04'	15.8	15.8	15.8	15.8	15.7	15.2	14.7	14.1	13.8	12.0	

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

Table 3. Expendable bathythermograph data.

Station	1	2	3	4	5	6	7	8	9	10	11
Date	December 16, 1981	December 17		December 18					December 19		
Time(GMT)	10-00	00-15	10-00	18-45	01-00	06-00	11-00	16-00	01-00	06-00	11-00
(LMT)	18-00	08-15	18-00	01-45	08-00	13-00	18-00	23-00	08-00	13-00	18-00
Latitude	32° 32'S	33° 59'S	35° 00'S	35° 56'S	37° 09'S	38° 06'S	39° 04'S	40° 02'S	41° 47'S	42° 46'S	43° 45'S
Longitude	114° 22'E	111° 36'E	109° 46'E	108° 01'E	108° 02'E	108° 01'E	108° 01'E	107° 59'E	108° 00'E	107° 59'E	107° 59'E
0	18.5	17.7	14.4	15.0	15.4	13.0	12.1	11.8	11.4	10.7	10.2
10	18.5	17.7	14.4	14.8	15.4	13.4	12.2	11.7	11.6	11.0	10.3
20	18.5	17.6	14.4	14.8	15.3	13.4	12.2	11.7	11.6	11.0	10.3
30	18.4	17.6	13.9	14.8	15.3	13.4	12.1	11.7	11.6	11.0	10.2
50	18.0	16.8	13.8	14.5	15.3	13.4	12.1	11.7	11.6	11.0	10.2
75	14.6	14.9	13.6	13.3	14.4	13.2	12.3	11.9	11.6	11.0	10.2
100	13.7	14.4	12.9	13.0	12.9	11.8	12.3	11.7	10.7	10.7	10.2
125	13.2	13.7	12.7	12.9	12.4	11.2	11.9	11.4	10.2	10.3	10.1
150	12.7	13.3	12.6	12.7	12.3	11.2	11.4	11.1	10.2	10.3	10.1
200	11.8	12.6	12.1	12.4	11.7	10.7	10.8	10.3	10.1	10.2	10.0
250	11.0	11.9	11.7	12.1	11.4	10.4	10.5	10.1	10.0	10.2	10.0
300	10.5	11.0	11.3	11.7	11.0	10.2	10.3	10.1	9.7	10.0	9.9
400	9.7	9.7	10.3	10.8	10.6	9.9	10.0	10.0	9.6	10.0	9.9
500			9.9		10.4	9.6	9.8		9.5	10.0	9.6
600			9.4		9.9	9.1	9.6		9.3	9.6	9.3
700			9.0		9.4	8.6	9.2		8.6	8.8	8.4
800			8.4		8.8	7.7	8.4		7.7	8.0	8.0
1000			6.0		6.3	5.4	6.1		5.3	5.7	5.9
1200			4.0		4.7	3.9	4.3		3.8	4.3	4.2
1500			3.1		3.8	3.0	3.4		3.1	3.5	3.5
1800			2.8		3.4	2.7	2.9		2.7	3.1	3.0

Station	12	13	14	15	16	17	18	19	20	21	22
Date	December 19	December 20				December 21	December 23		December 24		December 25
Time(GMT)	16-00	01-00	06-00	11-00	16-00	01-00	23-45*	10-30	02-00	11-30	02-00
(LMT)	23-00	08-00	13-00	18-00	23-00	08-00	06-45	17-30	08-00	17-30	08-00
Latitude	44° 38' S	46° 26' S	47° 23' S	48° 22' S	49° 23' S	50° 50' S	56° 49' S	57° 41' S	58° 39' S	59° 17' S	60° 18' S
Longitude	107° 43' E	107° 47' E	107° 49' E	107° 52' E	107° 52' E	107° 45' E	108° 00' E	104° 50' E	99° 13' E	95° 47' E	90° 21' E
0	10.1	9.5	6.4	6.6	4.9	2.8	0.6	0.1	0.0	-0.2	0.0
10	10.0	9.4	6.4	6.6	4.8	3.0	1.1	0.0	-0.2	-0.3	-0.1
20	10.0	9.4	6.3	6.5	4.8	3.0	1.1	-0.2	-0.3	-0.3	-0.1
30	9.9	9.4	6.3	6.3	4.1	3.0	1.1	-0.2	-0.4	-0.4	-0.1
50	9.9	9.4	6.1	6.3	4.0	3.0	1.2	-0.2	-0.5	-0.5	-0.4
75	9.9	9.3	5.8	6.3	4.0	3.0	1.1	-0.3	-0.6	-0.7	-0.6
100	9.8	9.3	5.8	6.0	3.9	2.6	1.1	-0.8	-0.8	-0.9	-0.7
125	9.8	9.3	5.8	5.8	3.2	2.2	1.1	-0.5	0.2	-1.0	0.0
150	9.5	9.3	5.8	5.3	3.1	2.2	0.3	0.8	1.2	-0.4	0.2
200	9.5	9.3	6.1	5.1	2.7	1.8	1.0	1.7	1.4	0.9	1.2
250	9.5	9.3	6.4	4.9	3.1	2.0	2.2	1.8	1.4	1.7	1.4
300	9.5	8.7	6.3	4.2	2.7	2.4	2.3	1.8	1.5	1.8	1.7
400	9.5	8.5	5.3	4.0	2.7	2.6	2.5	1.8	1.6	1.9	1.6
500		8.1	4.1	3.5		2.8	2.5				
600		6.9	3.5	3.1		2.9	2.4				
700		5.6	3.3	3.0		2.8	2.4				
800		4.8	3.2	2.8		2.9	2.4				
1000		3.8	2.9	2.6		2.8	2.2				
1200		3.1	2.7	2.5		2.7	2.1				
1500		2.9	2.5	2.4		2.5	1.8				
1800		2.6	2.4	2.2		2.2					

*The time of the date of the preceding day.

Station	23	24	25	26	27	28	29	30	31	32	33
Date	December 25	December 26		December 27		December 28	December 30	December 31	January 3, 1982	January 9	February 18
Time(GMT)	12-00	03-00	13-00	03-00	13-00	03-00	04-00	04-00	04-00	07-00	14-45
(LMT)	18-00	08-00	18-00	08-00	18-00	08-00	08-00	07-00	08-00	10-00	17-45
Latitude	60°57'S	61°50'S	62°27'S	63°20'S	63°59'S	64°57'S	66°16'S	66°55'S	68°12'S	68°17'S	66°57'S
Longitude	86°27'E	80°50'E	76°58'E	71°09'E	66°49'E	60°23'E	45°11'E	40°29'E	39°17'E	38°55'E	49°54'E
0	-0.6	-0.6	-0.4	-0.6	0.3	-0.2	-1.6	-1.2	-1.7	-1.7	-0.8
10	-0.6	-0.7	-0.5	-0.7	0.1	-0.3	-1.6	-1.3	-1.7	-1.7	-0.8
30	-1.1	-0.7	-0.6	-0.7	0.1	-0.3	-1.6	-1.5	-1.7	-1.7	-0.7
50	-1.1	-0.7	-0.6	-0.8	-0.7	-0.4	-1.6	-1.7	-1.7	-1.7	-0.7
75	-1.2	-0.9	-1.7	-1.7	-1.2	-1.5	-1.6	-1.4	-1.7	-1.7	-0.7
100	-1.6	-1.2	-1.7	-1.7	1.1	-1.4	-1.7	-0.5	-1.7	-1.7	-0.7
125	-1.3	-1.2	-0.7	-1.6	1.4	0.7	-1.6	-0.5	-1.7	-1.7	-0.7
150	-0.9	-0.2	0.8	-0.1	1.5	1.5	-1.7	1.0	-1.7	-1.7	-0.7
200	-0.6	0.8	1.4	1.1	1.7	1.7	-1.4	1.4	-1.7	-1.7	-0.8
250	0.2	1.8	1.7	1.6	1.7	1.8	0.8	1.4	-1.7	-1.7	-0.9
300	0.5	2.1	1.8	1.7	1.8	1.8	0.2	1.4	-1.5	-1.7	-1.1
400	0.9	2.0	1.9	1.9	1.8	1.9	0.2	1.4	-1.2	-1.7	-1.4
500	1.2	1.9	1.9	1.7	1.8	1.9	0.5	1.4	0.2	-1.2	-1.6
600											
700											
800											
1000											
1200											
1500											
1800											

Station	34	35	36	37	38	39	40	41	42	43	44
Date	February 21	February 22		February 23		February 24		February 25		February 26	
Time (GMT)	15-00	05-00	20-00	14-00	19-00	14-00	19-00	04-00	14-00	04-00	14-00
(LMT)	18-00	18-00	23-00	18-00	23-00	18-00	23-00	08-00	18-00	08-00	18-00
Latitude	66° 09'S	63° 00'S	63° 00'S	62° 58'S	62° 59'S	62° 04'S	61° 18'S	60° 00'S	58° 55'S	59° 44'S	59° 29'S
Longitude	48° 50'E	49° 35'E	51° 12'E	56° 13'E	57° 45'E	60° 13'E	60° 14'E	60° 02'E	59° 59'E	60° 58'E	58° 08'E
0	-0.3	1.2	1.1	0.6	1.1	1.1	1.4	1.4	2.1	1.4	2.0
10	-0.5	1.2	1.1	0.6	1.1	1.1	1.9	1.4	2.1	1.4	2.0
20	-0.5	1.2	1.1	0.5	1.1	1.0	1.9	1.4	2.1	1.4	2.0
30	-0.5	1.2	1.1	0.4	1.1	1.0	2.0	1.4	2.1	1.4	2.0
50	-0.6	1.2	1.1	0.4	0.9	1.0	2.1	1.3	2.1	1.3	2.0
75	-0.7	-1.2	-0.3	0.3	-1.6	0.9	2.1	1.3	2.1	1.3	2.0
100	-0.7	-1.5	-1.3	-0.2	-1.4	-1.4	0.1	-0.1	2.1	-0.6	0.3
125	-1.1	-1.4	-0.4	0.8	-0.6	-1.0	-0.4	-1.3	1.3	-1.2	0.0
150	-1.6	-0.2	0.9	1.2	0.7	0.6	-0.1	-1.4	0.4	-0.8	-0.3
200	-1.8	1.2	1.6	1.4	1.4	1.4	2.0	0.5	0.8	1.1	1.2
250	-1.6	1.6	1.7	1.6	1.6	1.6	2.3	1.3	1.6	1.5	1.8
300	-0.7	1.5	1.8	1.6	1.7	1.7	2.3	1.6	1.8	1.8	1.9
400	0.3	1.7	1.9	1.6	1.9	1.8	2.5	1.9	2.0	1.9	
500		1.7	1.9	1.6	1.8	1.8	2.6	1.9	2.2		
600		1.6	1.9	1.6	1.7	1.8	2.6	1.9	2.2		
700		1.6	1.8	1.5	1.7	1.7	2.4	1.9	2.1		
800		1.5	1.7	1.4	1.6	1.6	2.4	1.9	2.1		
1000		1.3	1.5	1.2	1.5	1.5	2.2	1.7	2.0		
1200		1.1	1.3	1.0	1.3	1.3	2.0	1.6	2.0		
1500		0.8	1.1	0.8	1.0	1.0	1.8	1.3			
1800		0.7	0.9	0.6	0.8	0.8					

Station	45	46	47	48	49	50	51	52	53	54	55
Date	February 26	February 27		February 28	March 2		March 3		March 4		March 5
Time(GMT)	19-00	15-00	19-00	05-00	15-00	20-00	15-00	20-00	15-00	20-00	05-00
(LMT)	23-00	18-00	23-00	08-00	18-00	23-00	18-00	23-00	18-00	23-00	08-00
Latitude	59° 28' S	59° 32' S	59° 37' S	60° 17' S	54° 09' S	53° 04' S	49° 39' S	48° 33' S	45° 10' S	44° 06' S	42° 29' S
Longitude	56° 21' E	51° 41' E	50° 18' E	47° 59' E	49° 01' E	48° 27' E	48° 13' E	48° 12' E	48° 10' E	48° 12' E	48° 17' E
●	2.0	2.1	2.3	2.0	2.7	3.6	5.0	6.4	8.0	8.6	11.9
10	1.9	2.0	2.1	2.0	2.7	3.6	5.0	6.4	8.0	8.6	11.8
20	1.9	1.9	2.1	2.0	2.6	3.5	5.0	6.3	7.9	8.5	11.4
30	1.9	1.8	2.1	2.0	2.6	3.5	5.0	6.3	7.8	7.9	10.5
50	1.9	1.8	2.1	2.0	2.6	3.5	4.9	6.1	7.3	7.8	10.2
75	1.9	1.4	-0.2	0.5	2.6	3.4	4.3	5.9	6.7	7.5	8.7
100	-0.3	-0.9	-0.8	-1.0	2.6	2.4	2.5	4.0	4.1	6.6	6.5
125	-0.6	-1.3	-1.2	-0.9	2.4	1.4	1.9	2.9	3.4	4.1	5.8
150	-0.5	-1.1	-1.1	0.0	1.0	1.2	1.6	2.2	2.7	3.1	5.5
200	1.3	0.9	1.1	1.2	1.0	1.1	2.0	1.9	2.4	2.5	4.8
250	1.7	1.4	1.5	1.5	1.1	1.5	2.5	1.8	2.3	2.5	4.4
300	1.9	1.6	1.7	1.8	1.5	1.7	2.5	1.9	2.5	2.8	4.4
400	2.0	1.7	1.8	1.9	1.9	1.9	2.5	2.3	2.3	2.5	4.0
500				1.9	2.0	2.1	2.5	2.3	2.5	2.6	3.5
600				1.8	2.1	2.1	2.6	2.4	2.5	2.6	3.2
700				1.8	2.1	2.1	2.6	2.4	2.7	2.8	3.3
800				1.8	2.1	2.1	2.6	2.5	2.6	2.7	3.3
1000				1.6	2.0		2.5	2.5	2.6		3.1
1200				1.5							3.1
1500				1.2							2.8
1800											

Station	56	57	58	59	60	61	62	63	64	65	66
Date	March 5			March 6		March 7		March 8		March 9	
Time(GMT)	10-00	15-00	20-00	04-00	14-00	04-00	14-00	04-00	14-00	04-00	14-00
(LMT)	13-00	18-00	23-00	08-00	18-00	08-00	18-00	08-00	18-00	08-00	18-00
Latitude	41° 44'S	40° 42'S	39° 35'S	37° 55'S	35° 57'S	33° 05'S	31° 04'S	28° 37'S	26° 49'S	24° 11'S	22° 14'S
Longitude	48° 35'E	48° 53'E	49° 03'E	49° 36'E	50° 27'E	51° 39'E	52° 16'E	53° 14'E	54° 09'E	55° 20'E	55° 55'E
0	17.8	19.7	19.2	19.7	21.4	21.7	24.5	25.0	26.2	26.8	28.2
10	17.9	19.7	19.2	19.6	21.4	21.7	24.5	25.1	26.1	27.2	27.6
20	17.8	19.7	19.2	19.6	20.8	21.2	24.5	25.0	26.0	27.2	27.6
30	17.8	19.6	19.2	19.5	20.9	20.9	24.4	24.9	25.9	27.1	27.5
50	17.6	19.6	18.9	18.9	19.8	20.7	24.2	23.0	22.9	26.9	27.2
75	16.3	18.1	18.7	18.0	17.9	19.7	17.7	18.9	20.3	24.8	24.7
100	15.1	17.6	17.6	15.5	16.3	17.5	16.3	17.0	19.4	22.5	22.7
125	14.1	17.2	16.7	14.9	15.9	16.7	15.6	16.4	18.7	21.1	21.6
150	13.5	17.0	16.3	14.4	15.6	16.0	15.2	16.2	17.6	20.1	20.8
200	12.3	16.6	16.2	13.9	15.0	15.4	14.8	15.6	16.3	18.5	19.3
250	11.5	16.2	15.6	13.5	14.5	14.7	14.1	14.9	15.2	16.6	17.6
300	11.1	15.5	15.4	13.2	14.1	14.3	13.7	14.2	14.0	15.7	16.1
400	10.0	14.0	14.7	12.5	13.5	13.4	13.1	13.4	13.1	14.3	13.8
500	8.8	12.9	14.1	11.5	12.9	12.3	12.3	12.5	12.2	13.5	12.4
600	7.4	11.7	13.5	10.8	12.0	11.2	11.5	11.4	11.3	12.7	11.4
700	6.1	10.7	12.3	9.7	11.0	9.9	10.5	10.4	10.5	11.5	10.3
800	5.3	9.6	11.3	8.6	9.9	9.0	9.4	9.2	9.3	10.6	9.2
1000	4.2	7.2			7.9	6.6	6.7	6.5	6.5	7.8	6.3
1200	3.6				5.4	4.6	4.4	4.7	4.5	6.0	4.9
1500					3.6	3.3	3.4	3.5	3.3	4.7	3.9
1800					2.8		2.9	3.0	2.7	4.2	3.2

Table 4. Serial observation data.

Station 1			Meteorological observation		
Date : February 22, 1982	Time (GMT) : 0600	Time (GMT) : 0600-1000	Time (GMT) : 0600	Time (GMT) : 0900	Wind direction : SE
(LMT) : 0900-1300	Weather : Snow	(LMT) : 0900-1300	Weather : Snow	Humidity : 85%	velocity : 18 kn
Latitude : 63° 00'S	Air temperature : 0.2 °C	Latitude : 63° 00'S	Air temperature : 0.2 °C	Sea : 3	
Longitude : 47° 58'E	Atmospheric pressure : 973.1 mb	Longitude : 47° 58'E	Atmospheric pressure : 973.1 mb	Swell : E/3	
Depth : 4800 m		Depth : 4800 m			

Observed										Interpolated				
Depth (m)	T (°C)	S	pH	O ₂ (ml/l)	PO ₄ -P	SiO ₃ -Si	NO ₂ -N	NO ₃ -N	NH ₄ -N	Depth (m)	T (°C)	S	σ _t	ΔD
					(μg-atoms/l)									
0	1.10	33.892	8.12	7.80	1.83	44	0.42	25.	0.4	0	1.10	33.892	27.15	0.000
9	1.09	33.890	8.15	7.88	1.90	44	0.41	25.	0.5	10	1.09	33.890	27.15	0.009
18	1.07	33.892	8.17	7.79	1.90	45	0.37	25.	0.5	20	1.07	33.892	27.15	0.018
27	1.09	33.893	8.19	7.84	1.80	47	0.35	25.	0.5	30	1.12	33.890	27.15	0.027
45	1.03	33.893	8.18	7.76	1.83	46	0.35	25.	0.6	50	0.74	33.912	27.19	0.045
67	-0.43	34.018	8.18	7.91	1.92	48	0.26	26.	0.5	75	-0.93	34.088	27.41	0.064
89	-1.33	34.217	8.15	7.59	2.01	56	0.24	27.	0.9	100	-0.70	34.304	27.58	0.079
111	0.15	34.382	8.06	5.73	2.27	78	0.20	31.	0.7	125	0.75	34.466	27.63	0.090
132	0.96	34.501	8.01	4.91	2.43	86	0.03	32.	0.5	150	1.24	34.551	27.67	0.101
176	1.35	34.583	8.00	4.48	2.43	93	0.05	32.	0.4	200	1.47	34.610	27.70	0.121
219	1.52	34.625	8.00	4.37	2.46	96	0.05	32.	0.6	250	1.56	34.645	27.72	0.141
263	1.57	34.651	8.00	4.36	2.36	98	0.03	32.	0.6	300	1.58	34.667	27.74	0.159
352	1.58	34.683	8.03	4.40	2.36	98	0.03	31.	0.7	400	1.56	34.693	27.76	0.194
440	1.54	34.699	8.04	4.48	2.20	100	0.07	31.	0.6	500	1.49	34.708	27.78	0.228
530	1.46	34.712	8.03	4.54	2.22	103	0.03	30.	0.7	600	1.38	34.714	27.79	0.260
620	1.36	34.714	8.04	4.56	2.27	105	0.01	30.	0.7	700	1.26	34.723	27.81	0.292
714	1.24	34.725	8.01	4.62	2.15	109	0.05	30.	0.8	800	1.16	34.723	27.81	0.322
907	1.07	34.715	8.00	4.71	2.25	113	0.03	30.	0.9	900	1.08	34.716	27.81	0.352
1224	0.77	34.698	7.99	4.81	2.29	123	0.02	31.	0.8	1000	0.98	34.710	27.81	0.382
1524	0.61	34.691	7.99	4.78	2.29	129	0.03	31.	0.9	1250	0.75	34.697	27.82	0.456
2026	0.35	34.676	7.99	4.91	2.29	135	0.05	32.	0.9	1500	0.62	34.691	27.82	0.528
2518	0.10	34.661	7.96	5.20	2.34	133	0.05	31.	1.0	1750	0.49	34.685	27.82	0.599
3016	-0.06	34.658	7.98	5.39	2.25	133	****	31.	1.0	2000	0.36	34.677	27.83	0.669
3513	-0.19	34.653	7.95	5.48	2.34	135	0.02	31.	***	2250	0.23	34.668	27.83	0.736
4007	-0.26	34.642	7.96	5.54	2.18	136	0.05	31.	0.9	2500	0.11	34.661	27.83	0.802
4499	-0.31	34.647	7.93	5.61	2.27	144	0.02	28.	0.5	2750	0.02	34.659	27.83	0.866
										3000	-0.06	34.658	27.83	0.927
										3500	-0.19	34.653	27.84	1.042
										4000	-0.26	34.642	27.83	1.151

Station 2

Date : February 23, 1982
 Time (GMT): 0425-0800
 (LMT): 0825-1200
 Latitude : 62° 59'S
 Longitude : 54° 05'E
 Depth : 4910 m

Time (GMT) : 0500
 (LMT) : 0900
 Weather : Cloudy
 Air temperature : 0.4 °C
 Atmospheric pressure : 979.6 mb

Meteorological observation

Wind direction : ENE
 velocity : 10 kn
 Humidity : 71%
 Sea : 3
 Swell : ESE/3

Depth (m)	Observed					Interpolated								
	T (°C)	S	pH	O ₂ (ml/l)	PO ₄ -P	SiO ₃ -Si	NO ₂ -N	NO ₃ -N	NH ₄ -N	Depth (m)	T (°C)	S	σ _t	ΔD
0	1.30	33.819	8.12	7.74	1.85	40	0.37	25.		0	1.30	33.819	27.08	0.000
10	1.27	33.801	8.15	7.83	1.85	40	0.35	25.		10	1.27	33.801	27.06	0.010
20	1.22	33.804	8.17	7.72	1.80	41	0.36	25.		20	1.22	33.804	27.07	0.020
29	1.26	33.801	8.17	7.83	1.73	40	0.36	25.		30	1.28	33.799	27.06	0.030
49	1.19	33.801	8.17	7.79	1.83	40	0.36	25.		50	1.09	33.808	27.08	0.049
73	-1.34	33.998	8.16	8.03	2.01	47	0.26	27.		75	-1.40	34.007	27.36	0.070
97	-1.39	34.071	8.15	7.92	2.06	56	0.29	28.		100	-1.41	34.077	27.42	0.087
121	-1.25	34.139	8.12	7.42	2.08	62	0.29	29.		125	-1.08	34.162	27.48	0.102
145	-0.11	34.288	8.06	6.27	2.25	74	0.04	31.		150	0.07	34.314	27.55	0.116
193	1.11	34.478	7.99	4.87	2.39	88	0.03	33.		200	1.22	34.496	27.63	0.141
241	1.62	34.567	7.97	4.33	2.46	92	0.02	33.		250	1.64	34.574	27.66	0.163
289	1.62	34.596	7.97	4.34	2.34	94	0.03	33.		300	1.64	34.608	27.69	0.184
386	1.78	34.689	7.99	4.22	2.36	95	0.03	32.		400	1.78	34.691	27.74	0.223
483	1.73	34.687	8.00	4.34	2.20	98	0.03	31.		500	1.71	34.689	27.74	0.259
581	1.63	34.701	8.00	4.44	2.22	99	0.02	30.		600	1.62	34.703	27.76	0.295
679	1.58	34.712	8.02	4.47	2.25	102	0.02	30.		700	1.57	34.713	27.78	0.329
777	1.52	34.717	8.00	4.55	2.20	103	0.03	30.		800	1.50	34.718	27.78	0.363
973	1.31	34.718	8.00	4.66	2.20	109	0.03	30.		900	1.39	34.719	27.79	0.396
1196	1.09	34.712	8.00	4.72	2.25	115	0.03	30.		1000	1.28	34.718	27.80	0.428
1496	0.83	34.702	7.98	4.75	2.29	123	0.03	30.		1250	1.04	34.710	27.81	0.507
1996	0.53	34.686	7.99	4.81	2.29	132	0.03	31.		1500	0.83	34.702	27.82	0.583
2495	0.31	34.670	7.97	4.96	2.39	138	0.02	32.		1750	0.66	34.694	27.82	0.657
2996	0.10	34.666	7.96	5.15	2.34	140	0.04	31.		2000	0.53	34.686	27.82	0.729
3495	-0.07	34.638	7.95	5.32	2.36	140	0.01	31.		2250	0.41	34.677	27.82	0.800
3994	-0.19	34.651	7.98	5.45	2.27	140	0.01	31.		2500	0.31	34.670	27.82	0.870
4454	-0.27	34.649	7.95	5.56	2.29	142	0.02	31.		2750	0.20	34.669	27.83	0.937
										3000	0.10	34.666	27.83	1.002
										3500	-0.07	34.638	27.82	1.127
										4000	-0.19	34.651	27.83	1.244

Station 3

Date : February 24, 1982
 Time (GMT): 0420-0800
 (LMT): 0820-1200
 Latitude : 62° 57'S
 Longitude : 60° 07'E
 Depth : 4580 m

Time (GMT) : 0500
 (LMT) : 0900
 Weather : Snow
 Air temperature : -1.6 °C
 Atmospheric pressure : 980.0 mb

Meteorological observation

Wind direction : SSW
 velocity : 14 kn
 Humidity : 72%
 Sea : 3
 Swell : S/3

Observed										Interpolated				
Depth (m)	T (°C)	S	pH	O ₂ (ml/l)	PO ₄ -P	SiO ₃ -Si	NO ₂ -N	NO ₃ -N	NH ₄ -N	Depth (m)	T (°C)	S	σ _t	ΔD
					(μg-atoms/l)									
0	0.80	33.922	8.16	7.80	1.80	39	0.33	25.	0.3	0	0.80	33.922	27.19	0.000
										10	0.79	33.913	27.18	0.009
13	0.78	33.913	8.15	7.93	1.75	38	0.34	25.	0.1	20	0.76	33.919	27.19	0.017
22	0.75	33.921	8.16	7.81	1.73	39	0.35	25.	0.2	30	0.76	33.919	27.19	0.026
32	0.76	33.918	8.17	7.89	1.73	39	0.33	25.	0.4	50	0.72	33.919	27.19	0.043
50	0.72	33.919	8.16	7.84	1.83	38	0.33	25.	0.3	75	-0.08	34.019	27.32	0.063
72	0.13	33.992	8.16	****	1.94	43	0.29	26.	0.6	100	-0.89	34.233	27.53	0.080
94	-1.05	34.198	8.11	7.20	2.20	57	0.22	29.	0.3	125	0.35	34.393	27.60	0.092
116	-0.06	34.321	8.05	6.06	2.22	72	0.11	29.	0.1	150	1.15	34.526	27.65	0.104
137	0.84	34.484	8.00	5.07	2.43	83	0.04	31.	0.3	200	1.54	34.576	27.67	0.125
181	1.48	34.557	7.96	4.36	2.43	91	0.01	33.	0.4	250	1.60	34.615	27.69	0.146
224	1.55	34.595	7.97	4.32	2.43	93	0.02	33.	0.4	300	1.66	34.644	27.71	0.165
268	1.63	34.628	7.97	4.32	2.43	95	0.01	33.	0.4	400	1.67	34.693	27.75	0.202
357	1.68	34.667	7.98	4.38	2.39	97	0.01	32.	0.3	500	1.62	34.714	27.77	0.237
448	1.65	34.716	8.00	4.45	2.27	97	0.02	32.	***	600	1.55	34.713	27.78	0.270
539	1.59	34.708	8.00	4.52	2.25	98	0.01	31.	0.5	700	1.47	34.719	27.79	0.303
631	1.53	34.717	8.02	4.52	2.22	100	0.01	31.	0.6	800	1.38	34.721	27.80	0.335
724	1.45	34.719	8.01	4.60	2.25	103	0.01	30.	0.6	900	1.28	34.722	27.80	0.367
917	1.26	34.722	8.00	4.68	2.27	109	0.01	30.	0.2	1000	1.17	34.716	27.81	0.398
1164	1.01	34.703	8.01	4.92	2.29	115	0.01	30.	0.8	1250	0.94	34.701	27.81	0.475
1455	0.78	34.701	8.01	4.78	2.32	123	0.01	31.	0.8	1500	0.75	34.700	27.82	0.550
										1750	0.61	34.695	27.83	0.623
										2000	0.48	34.690	27.83	0.693
										2250	0.37	34.684	27.83	0.762
2425	0.30	34.679	7.96	4.98	2.36	137	0.01	31.	0.9	2500	0.27	34.677	27.83	0.829
										2750	0.16	34.673	27.83	0.894
2909	0.10	34.671	7.96	5.16	2.32	137	0.03	32.	***	3000	0.07	34.672	27.84	0.957
3398	-0.06	34.675	7.95	5.33	2.36	138	0.01	32.	0.5	3500	-0.09	34.672	27.85	1.074
3895	-0.20	34.659	7.96	5.51	2.29	137	0.01	31.	***	4000	-0.22	34.657	27.84	1.181
4392	-0.29	34.655	7.97	5.58	2.29	142	0.00	31.	0.4					

Station 4

Date : February 27, 1982
 Time (GMT): 0420-0800
 (LMT): 0820-1200
 Latitude : 59° 26'S
 Longitude : 53° 26'E
 Depth : 5220 m

Time (GMT) : 0500
 (LMT) : 0900
 Weather : Snow
 Air temperature : 1.1 °C
 Atmospheric pressure : 989.5 mb

Meteorological observation

Wind direction : S
 velocity : 14 kn
 Humidity : 89%
 Sea : 3
 Swell : W/6

Observed										Interpolated				
Depth (m)	T (°C)	S	pH	O ₂ (ml/l)	PO ₄ -P	SiO ₃ -Si	NO ₂ -N	NO ₃ -N	NH ₄ -N	Depth (m)	T (°C)	S	σ _t	ΔD
					(μg-atoms/l)									
0	2.00	33.826	8.23	7.69	1.73	31	0.36	24.	0.4	0	2.00	33.826	27.03	0.000
9	1.59	33.829	8.21	7.84	1.64	29	0.37	23.	0.2	10	1.58	33.828	27.06	0.010
18	1.55	33.824	8.22	7.72	1.68	29	0.39	23.	0.4	20	1.55	33.825	27.06	0.020
28	1.57	33.831	8.23	7.80	1.68	29	0.35	24.	0.3	30	1.57	33.831	27.07	0.030
45	1.53	33.826	8.22	7.76	1.73	29	0.36	24.	0.4	50	1.58	33.821	27.06	0.050
68	1.24	33.834	8.22	7.74	1.78	31	0.32	24.	0.5	75	0.42	33.878	27.18	0.073
91	-1.38	33.988	8.19	****	2.01	42	0.27	27.	0.8	100	-1.56	34.012	27.37	0.093
114	-1.26	34.058	8.17	7.62	1.94	50	0.28	27.	0.6	125	-0.72	34.153	27.46	0.109
137	-0.04	34.264	8.09	6.22	2.27	67	0.02	31.	0.2	150	0.45	34.338	27.55	0.123
183	1.23	34.453	8.02	4.86	2.41	82	0.03	33.	0.3	200	1.40	34.487	27.61	0.148
229	1.53	34.524	8.01	4.46	2.41	87	0.02	33.	0.1	250	1.63	34.554	27.64	0.172
274	1.71	34.584	8.00	4.25	2.34	90	0.02	33.	0.2	300	1.76	34.606	27.67	0.193
366	1.83	34.647	8.01	4.16	2.41	95	0.01	32.	0.1	400	1.85	34.670	27.72	0.234
457	1.87	34.699	8.03	4.20	2.25	93	0.02	31.	0.1	500	1.85	34.700	27.74	0.271
550	1.82	34.699	8.03	4.36	2.22	95	0.02	31.	0.0	600	1.80	34.723	27.77	0.307
644	1.78	34.743	8.05	4.37	2.18	95	0.01	30.	0.2	700	1.75	34.737	27.78	0.341
737	1.73	34.728	8.04	4.48	2.18	96	0.01	30.	0.1	800	1.69	34.727	27.78	0.375
934	1.60	34.733	8.06	4.63	2.15	100	0.01	29.	0.3	900	1.63	34.730	27.78	0.409
1161	1.35	34.736	8.07	4.85	2.15	106	0.02	30.	0.3	1000	1.53	34.735	27.79	0.443
1453	1.08	34.726	8.07	4.76	2.18	115	0.01	30.	0.3	1250	1.26	34.734	27.81	0.523
1937	0.72	34.701	8.06	4.82	2.22	127	0.01	31.	0.2	1500	1.04	34.724	27.82	0.600
2578	0.40	34.684	8.02	4.94	2.29	137	0.01	31.	0.5	1750	0.85	34.711	27.82	0.676
3339	0.07	34.664	8.05	5.33	2.15	140	0.02	31.	0.3	2000	0.68	34.699	27.82	0.750
4071	-0.15	34.659	8.03	5.37	2.20	141	0.00	31.	0.2	2250	0.55	34.692	27.83	0.823
										2500	0.43	34.686	27.83	0.893
										2750	0.32	34.679	27.83	0.962
										3000	0.21	34.672	27.83	1.029
										3500	0.01	34.662	27.83	1.155
										4000	-0.13	34.659	27.84	1.272

Station 5

Date : March 2, 1982
 Time (GMT): 0510-0830
 (LMT): 0810-1130
 Latitude : 55° 17'S
 Longitude : 49° 32'E
 Depth : 5320 m

Meteorological observation

Time (GMT) : 0600
 (LMT) : 0900
 Weather : Cloudy
 Air temperature : 3.1 °C
 Atmospheric pressure : 997.4 mb
 Wind direction : WNW
 velocity : 19 kn
 Humidity : 86%
 Sea : 4
 Swell : WNW/4

Observed										Interpolated				
Depth (m)	T (°C)	S	pH	O ₂ (ml/l)	PO ₄ -P	SiO ₃ -Si	NO ₂ -N	NO ₃ -N	NH ₄ -N	Depth (m)	T (°C)	S	σ _t	ΔD
					(μg-atoms/l)									
0	2.90	33.982	8.30	7.51	1.80	32	0.30	24.	0.6	0	2.90	33.982	27.08	0.000
8	2.93	33.964	8.27	7.61	1.80	31	0.32	24.	0.6	10	2.92	33.964	27.07	0.010
16	2.88	33.968	8.27	7.55	1.83	30	0.32	24.	0.6	20	2.89	33.967	27.07	0.020
23	2.90	33.966	8.29	7.57	1.83	31	0.31	24.	0.5	30	2.87	33.971	27.08	0.029
39	2.82	33.977	8.29	7.56	0.32	24	0.32	24.	0.5	50	2.84	33.972	27.08	0.049
57	2.86	33.967	8.28	7.46	1.83	31	0.31	24.	0.8	75	2.83	33.968	27.08	0.073
76	2.83	33.968	8.29	7.56	1.83	31	0.32	24.	0.6	100	2.31	33.981	27.13	0.097
95	2.62	33.973	8.28	7.44	1.83	32	0.32	25.	0.8	125	1.15	34.025	27.25	0.119
113	1.46	34.007	8.25	7.46	1.99	40	0.26	27.	0.5	150	1.04	34.071	27.30	0.139
148	1.04	34.065	8.23	7.20	2.04	45	0.09	28.	0.1	200	1.26	34.217	27.40	0.175
183	1.19	34.173	8.20	6.44	2.20	52	0.04	30.	0.1	250	1.48	34.317	27.46	0.207
217	1.33	34.256	8.16	5.79	2.32	62	0.03	31.	0.1	300	1.70	34.401	27.51	0.237
281	1.62	34.366	8.12	4.99	2.48	71	0.02	32.	0.0	400	1.90	34.517	27.59	0.291
344	1.84	34.472	8.10	4.46	2.41	80	0.02	33.	0.4	500	2.08	34.602	27.65	0.339
408	1.91	34.522	8.09	4.27	2.41	83	0.01	32.	***	600	2.10	34.651	27.68	0.383
471	2.06	34.584	8.09	4.12	2.41	85	0.02	32.	0.3	700	2.10	34.690	27.72	0.425
544	2.09	34.623	8.10	4.14	2.32	87	0.02	32.	0.4	800	2.07	34.714	27.74	0.465
689	2.10	34.687	8.12	4.20	2.34	87	0.02	31.	***	900	2.03	34.730	27.75	0.503
874	2.04	34.726	8.13	4.38	2.22	90	0.02	31.	0.4	1000	1.96	34.742	27.77	0.540
1200	1.81	34.754	8.16	4.67	2.06	94	0.01	28.	0.2	1250	1.78	34.754	27.79	0.630
1527	1.55	34.746	8.14	4.79	2.15	100	0.01	29.	0.4	1500	1.57	34.748	27.80	0.716
1873	1.11	34.728	8.14	4.82	2.15	114	0.03	29.	0.4	1750	1.27	34.735	27.81	0.800
2252	0.79	34.712	8.12	4.88	2.29	125	0.02	30.	0.3	2000	0.99	34.722	27.82	0.879
2651	0.46	34.694	8.12	4.93	2.25	134	0.01	31.	0.5	2250	0.79	34.712	27.83	0.956
3079	0.26	34.678	8.11	5.05	2.27	141	0.01	31.	0.5	2500	0.58	34.701	27.83	1.029
										2750	0.40	34.690	27.83	1.099
										3000	0.28	34.681	27.83	1.166
										3500	0.01	34.662	27.83	1.155

Station 6

Date : March 3, 1982
 Time (GMT): 0510-0830
 (LMT): 0810-1130
 Latitude : 51° 03S
 Longitude : 48° 07E
 Depth : 4500 m

Time (GMT) : 0600
 (LMT) : 0900
 Weather : Rain
 Air temperature : 4.7°C
 Atmospheric pressure : 1001.0 mb

Meteorological observation

Wind direction : SE
 velocity : 14 kn
 Humidity : 93
 Sea : 2
 Swell : WNW/4

Observed										Interpolated				
Depth (m)	T (°C)	S	pH	O ₂ (ml/l)	PO ₄ -P	SiO ₃ -Si	NO ₂ -N	NO ₃ -N	NH ₄ -N	Depth (m)	T (°C)	S	σ _t	ΔD
					(μg-atoms/l)									
0	4.80	33.736	8.26	7.25	1.61	12	0.29	22.	0.6	0	4.80	33.736	26.70	0.000
10	4.69	33.834	8.28	7.40	1.59	11	0.29	22.	0.4	10	4.69	33.834	26.79	0.013
20	4.66	33.834	8.29	7.27	1.54	11	0.30	22.	0.5	20	4.66	33.834	26.79	0.025
30	4.68	33.837	8.29	7.35	1.50	11	0.28	22.	0.6	30	4.68	33.837	26.79	0.038
49	4.65	33.827	8.29	7.27	1.59	11	0.29	22.	0.5	50	4.65	33.827	26.78	0.063
74	4.64	33.836	8.29	7.26	1.59	12	0.28	22.	1.0	75	4.65	33.835	26.79	0.094
98	4.57	33.821	8.30	7.32	1.61	12	0.28	22.	1.1	100	4.51	33.826	26.80	0.126
122	3.53	33.896	8.29	7.29	1.71	18	0.28	23.	1.1	125	3.31	33.901	26.98	0.155
146	1.86	33.927	8.27	7.52	1.90	28	0.34	25.	***	150	1.73	33.931	27.14	0.180
194	1.32	33.979	8.25	7.46	1.92	35	0.09	27.	0.1	200	1.29	33.987	27.21	0.224
243	1.25	34.055	8.23	6.98	2.06	41	0.01	29.	0.2	250	1.29	34.070	27.28	0.265
291	1.61	34.161	8.17	6.07	2.18	46	0.01	30.	0.2	300	1.66	34.180	27.34	0.303
387	2.02	34.335	8.11	4.86	2.46	62	0.01	32.	0.1	400	2.04	34.348	27.45	0.372
483	2.08	34.410	8.10	4.48	2.43	70	0.01	33.	0.3	500	2.09	34.426	27.50	0.434
581	2.14	34.503	8.08	4.19	2.39	78	0.01	33.	0.4	600	2.16	34.519	27.57	0.490
680	2.22	34.575	8.08	4.11	2.36	82	0.01	32.	0.1	700	2.22	34.584	27.62	0.542
779	2.19	34.613	8.10	4.10	2.32	85	0.00	32.	0.2	800	2.20	34.623	27.65	0.590
										900	2.23	34.669	27.69	0.635
978	2.26	34.701	8.11	4.30	2.15	84	0.01	30.	0.2	1000	2.25	34.706	27.72	0.679
1161	2.16	34.727	8.11	4.45	2.18	87	0.01	30.	0.4	1250	2.13	34.739	27.75	0.781
1461	2.06	34.763	8.15	4.68	2.08	86	0.01	28.	0.5	1500	2.03	34.764	27.78	0.879
										1750	1.83	34.768	27.80	0.972
										2000	1.60	34.763	27.81	1.062
										2250	1.35	34.749	27.82	1.148
2452	1.13	34.732	8.12	4.88	2.20	115	0.00	29.	0.5	2500	1.09	34.729	27.82	1.231
										2750	0.89	34.715	27.82	1.312
2945	0.73	34.702	8.11	4.92	2.22	129	0.00	30.	0.7	3000	0.68	34.697	27.82	1.390
3449	0.33	34.666	8.10	5.11	2.29	141	0.00	31.	0.8	3500	0.30	34.666	27.82	1.537
3944	0.08	34.670	8.10	5.33	2.25	151	0.00	31.	***	4000	0.06	34.670	27.84	1.667
4443	-0.11	34.665	8.09	5.42	2.27	158	0.00	31.	0.7					

Station 7

Date : March 4, 1982
 Time (GMT): 0515-0800
 (LMT): 0815-1100
 Latitude : 46° 38'S
 Longitude : 48° 13'E
 Depth : 3300 m

Time (GMT) : 0600
 (LMT) : 0900
 Weather : Rain
 Air temperature : 6.9°C
 Atmospheric pressure : 1013.2 mb

Meteorological observation

Wind direction : ESE
 velocity : 23 kn
 Humidity : 93%
 Sea : 4
 Swell : SE/3

Observed										Interpolated				
Depth (m)	T (°C)	S	pH	O ₂ (ml/l)	PO ₄ -P	SiO ₃ -Si	NO ₂ -N	NO ₃ -N	NH ₄ -N	Depth (m)	T (°C)	S	σt	ΔD
					(μg-atoms/l)									
0	7.30	33.761	8.27	6.95	1.38	6	0.27	19.	0.2	0	7.30	33.761	26.40	0.000
8	7.13	33.760	8.30	7.05	1.33	4	0.27	19.	0.2	10	7.12	33.760	26.43	0.016
16	7.11	33.759	8.30	6.95	1.29	4	0.27	19.	0.2	20	7.11	33.759	26.43	0.032
23	7.11	33.760	8.32	7.03	1.26	4	0.26	19.	0.1	30	7.09	33.764	26.43	0.048
38	7.07	33.769	8.31	6.99	1.36	5	0.27	19.	0.2	50	7.04	33.774	26.45	0.080
53	7.03	33.774	8.31	6.97	1.33	4	0.26	19.	0.2	75	6.79	33.757	26.47	0.119
68	6.96	33.770	8.31	7.04	1.33	4	0.27	19.	0.3	100	4.56	33.841	26.81	0.154
82	6.43	33.754	8.31	6.95	1.33	4	0.27	19.	0.5	125	3.48	33.914	26.97	0.183
95	4.93	33.828	8.29	7.21	1.47	6	0.32	21.	0.6	150	3.10	34.052	27.12	0.208
121	3.61	33.892	8.27	7.25	1.54	11	0.48	22.	0.1	200	3.49	34.156	27.17	0.255
147	3.09	34.042	8.26	7.07	1.64	15	0.04	24.	0.4	250	3.47	34.156	27.17	0.300
176	3.38	*****	8.25	6.79	1.64	25	0.01	25.	0.4	300	3.27	34.153	27.18	0.345
232	3.51	34.156	8.23	6.37	1.75	17	0.01	26.	0.2	400	2.93	34.187	27.24	0.432
288	3.33	34.149	8.21	6.20	1.83	20	0.01	27.	0.0	500	2.73	34.225	27.29	0.514
344	3.06	34.171	8.20	6.04	1.85	24	0.01	28.	0.0	600	2.60	34.280	27.35	0.592
405	2.92	34.188	8.18	5.88	1.92	28	0.01	28.	0.1	700	2.57	34.353	27.41	0.665
470	2.78	*****	8.16	5.62	1.99	33	0.01	29.	0.1	800	2.56	34.428	27.47	0.732
632	2.58	34.301	8.12	4.99	2.13	48	0.01	31.	0.2	900	2.52	34.492	27.52	0.795
749	2.57	34.392	8.10	4.51	2.22	60	0.01	32.	0.2	1000	2.50	34.546	27.57	0.854
971	2.50	34.532	8.08	4.15	2.20	71	0.01	32.	0.2	1250	2.46	34.649	27.65	0.987
1375	2.43	34.685	8.10	4.25	2.04	79	0.01	30.	0.4	1500	2.37	34.715	27.71	1.106
										1750	2.21	34.756	27.76	1.215
1805	2.17	34.762	8.11	4.65	1.94	82	0.00	28.	0.2	2000	2.04	34.775	27.79	1.317
										2250	1.85	34.776	27.80	1.414
2279	1.83	34.775	8.14	4.83	1.83	90	0.01	27.	0.2	2500	1.63	34.766	27.81	1.508
2729	1.39	34.746	8.12	4.87	1.99	105	0.01	29.	***	2750	1.37	34.744	27.81	1.312

Table 5. Harmonic constants of tidal stream.

Latitude : 69° 00' 00" S
 Longitude : 39° 35' 00" E
 Time zone : -03^h00^m
 Duration : January 15 - February 1, 1982
 Layer : 5 m
 Direction : Magnet north

Symbols	North component		East component		Main direction (278.1°)	
	Velocity (cm/s)	Kappa (deg.)	Velocity (cm/s)	Kappa (deg.)	Velocity (cm/s)	Kappa (deg.)
M2	1.0	286.5	6.5	118.6	6.6	298.4
S2	0.9	295.8	6.2	126.6	6.3	306.4
K2	0.3	295.8	1.7	126.6	1.0	306.4
N2	0.1	317.1	1.0	106.0	1.0	286.4
K1	0.4	23.7	2.3	198.7	2.3	18.8
O1	0.0	-	1.0	38.0	1.0	217.9
P1	0.1	23.7	0.8	198.7	0.8	18.8
Q1	0.0	-	0.6	336.9	0.6	156.5
M4	0.1	237.9	0.4	61.2	0.4	241.0
MS4	0.1	97.7	0.6	69.7	0.6	248.8
Constant	-0.5		-0.8		0.7	

Table 6. Hourly tidal observation data.

Station : Syowa Station
 Latitude : 69° 0' 28" S
 Longitude : 39° 34' 13" E
 Duration : Feb. 1 -Feb. 28, 1981
 Unit : Centimetre

DATE	HOUR																							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	188	192	194	195	193	183	166	146	126	110	98	93	98	112	135	159	178	193	199	199	195	187	183	180	3902	163
2	183	187	194	199	199	193	180	155	131	111	92	82	85	99	125	150	174	194	206	207	201	191	182	174	3894	162
3	177	182	192	204	211	209	194	171	143	115	89	71	66	79	103	131	160	186	201	206	201	190	180	172	3833	160
4	170	178	188	202	214	218	209	191	164	133	100	77	65	68	91	117	146	174	195	205	205	198	186	173	3867	161
5	167	170	180	194	210	221	221	211	188	157	125	98	80	77	92	119	147	173	197	211	211	201	186	169	4005	167
6	159	158	166	183	201	216	223	220	203	173	139	105	81	71	77	99	128	154	182	200	204	198	181	166	3887	162
7	153	143	148	163	183	204	218	222	215	197	169	134	101	85	83	92	119	150	175	194	203	200	190	176	3917	163
8	160	147	146	155	173	193	207	213	213	201	182	155	129	109	96	99	113	134	159	181	194	195	187	173	3914	163
9	158	145	134	135	149	170	185	196	203	203	190	167	149	130	119	117	129	143	160	180	191	194	192	180	3919	163
10	165	151	138	133	141	153	167	180	189	194	191	180	165	153	144	140	145	153	167	184	193	195	196	186	4003	167
11	173	162	149	139	135	140	148	155	163	171	173	173	174	172	168	171	175	178	185	194	201	202	201	195	4097	171
12	186	173	164	152	139	139	139	141	146	153	156	160	164	166	171	178	183	186	188	194	198	201	201	196	4074	170
13	193	182	173	164	153	147	139	135	134	136	136	143	151	164	177	190	196	196	201	203	201	199	199	195	4107	171
14	194	193	187	180	174	162	147	133	125	119	120	123	135	150	167	185	200	207	210	209	205	199	195	194	4113	171
15	195	197	197	195	191	182	164	145	128	114	102	104	112	128	152	177	196	211	218	216	209	201	194	189	4117	172
16	192	196	203	207	207	202	190	168	141	120	105	96	98	109	133	159	184	201	211	215	210	198	188	184	4117	172
17	184	189	201	210	217	220	208	187	162	133	109	94	91	99	122	151	177	200	214	217	212	200	185	176	4158	173
18	173	177	191	206	216	226	221	204	181	150	119	98	85	90	112	137	165	190	207	214	210	198	183	169	4122	172
19	164	167	180	196	218	230	233	220	203	173	141	117	101	95	106	132	159	182	201	210	210	199	185	171	4193	175
20	159	157	167	188	207	226	234	228	214	188	160	133	112	104	113	137	161	186	207	214	213	201	187	168	4264	178
21	153	147	151	167	190	210	221	226	218	199	174	149	127	117	116	127	152	176	194	207	208	199	187	166	4176	174
22	151	140	140	152	171	192	207	214	211	200	181	159	136	124	121	132	151	172	190	201	205	199	183	166	4098	171
23	151	139	135	141	155	175	192	201	204	199	185	166	148	134	129	133	146	165	182	195	199	195	183	167	4019	167
24	149	137	130	129	139	156	172	184	191	192	184	171	159	147	143	145	153	166	180	190	194	194	184	168	3957	165
25	153	139	131	127	131	142	155	165	172	176	177	169	160	153	150	151	155	166	176	185	190	190	185	173	3871	161
26	159	147	139	133	133	139	146	153	160	165	167	166	162	160	160	163	166	173	182	189	192	190	188	181	3913	163
27	169	160	152	144	140	141	143	145	149	153	156	158	160	162	166	172	177	182	189	194	194	192	187	185	3970	165
28	177	167	163	155	149	146	143	140	137	138	139	143	151	159	169	180	187	192	195	197	195	193	190	187	3992	166
SUM	4755	4622	4633	4748	4939	5135	5172	5049	4814	4473	4059	3684	3416	3445	3640	4043	4522	4983	5371	5611	5664	5499	5263	4979	112499	TOTAL
MEAN	170	165	165	170	176	183	185	180	172	160	145	132	123	122	130	144	162	178	192	200	202	196	188	178		MONTHLY MEAN 167.4 CM

Station : Syowa Station
 Latitude : 69° 0' 28" S
 Longitude : 39° 34' 13" E
 Duration : Mar. 1 -Mar. 31, 1981
 Unit : Centimetre

DATE	HOUR																							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	182	180	176	173	167	160	152	142	134	129	129	133	142	155	170	186	199	203	206	206	200	193	188	187	4092	171
2	185	187	187	187	183	176	164	148	133	122	115	119	127	141	166	187	201	213	214	212	204	194	183	180	4128	172
3	181	185	190	194	197	191	178	156	134	113	101	92	99	115	137	162	185	201	207	206	197	185	173	167	3946	164
4	167	174	186	195	202	202	190	171	146	119	99	88	89	102	124	151	180	200	211	212	202	185	169	160	3924	164
5	160	169	182	197	211	216	211	192	164	133	106	85	78	86	105	136	166	189	204	211	201	183	166	153	3904	163
6	148	155	172	192	212	224	228	215	190	157	126	101	85	85	102	129	159	185	204	211	204	187	165	148	3984	166
7	137	141	157	179	204	223	234	230	211	185	153	121	99	92	101	124	153	178	199	211	207	191	167	145	4042	168
8	130	125	136	160	185	211	226	231	225	202	176	148	122	109	112	126	149	173	195	208	208	194	173	148	4072	170
9	131	119	120	139	164	191	211	224	227	214	193	167	145	129	124	133	153	175	194	207	210	201	178	157	4106	171
10	136	118	112	121	141	165	189	204	212	214	201	185	167	154	147	153	163	180	196	207	211	205	189	168	4138	172
11	148	128	116	114	124	142	163	180	190	196	195	186	176	168	164	166	176	187	202	211	214	209	197	181	4133	172
12	161	146	133	122	120	129	141	153	164	173	181	180	180	178	179	182	186	194	205	211	214	210	202	189	4133	172
13	174	160	147	136	131	133	134	142	146	153	159	160	166	173	180	188	194	198	204	208	209	207	202	194	4098	171
14	185	177	167	157	150	145	139	136	134	138	143	148	159	169	180	194	201	207	209	210	209	206	200	195	4158	173
15	192	189	186	182	176	167	154	143	133	126	126	130	139	156	173	188	203	211	213	212	208	200	193	192	4192	175
16	191	190	194	196	193	187	174	157	139	126	118	119	126	140	162	185	201	212	215	211	201	192	181	178	4188	175
17	180	186	196	205	207	206	193	173	153	136	120	115	121	136	156	181	198	212	217	215	205	191	178	173	4253	177
18	172	180	194	205	214	218	209	192	169	146	126	113	113	126	146	170	194	211	216	214	204	185	169	160	4246	177
19	159	167	186	202	218	228	226	211	188	162	136	119	116	120	142	168	191	207	216	217	203	185	168	153	4288	179
20	147	153	173	194	214	229	232	221	202	178	151	130	118	122	139	166	187	206	217	219	207	187	167	151	4310	180
21	139	145	161	181	208	226	233	232	216	192	166	143	127	123	136	160	183	203	217	219	207	188	167	146	4318	180
22	135	133	143	167	194	214	228	230	221	204	179	157	142	133	141	160	184	202	215	220	214	196	172	152	4336	181
23	136	128	135	153	173	199	218	226	227	216	194	173	156	145	147	164	183	204	218	223	218	201	180	160	4377	182
24	140	130	133	144	165	190	208	221	222	217	203	185	169	158	161	172	187	205	218	222	220	209	187	165	4431	185
25	147	135	131	138	156	174	195	208	214	214	206	193	181	173	169	177	188	202	214	221	221	209	191	173	4430	185
26	154	141	135	135	145	160	179	192	200	205	203	195	187	183	181	184	194	204	215	221	221	212	199	183	4428	185
27	165	153	146	139	145	156	170	182	189	195	201	197	195	195	194	197	202	210	219	223	224	220	207	194	4518	188
28	180	168	159	155	153	159	164	171	176	183	188	191	193	194	198	205	207	214	221	223	223	218	210	201	4554	190
29	192	183	176	171	167	165	163	164	166	169	175	180	186	195	205	213	219	222	225	224	220	215	207	202	4604	192
30	197	192	187	183	178	172	165	158	153	153	156	162	172	185	198	212	218	224	227	223	218	210	203	201	4547	189
31	201	201	201	201	196	187	174	162	150	143	139	143	155	171	189	208	221	228	232	224	213	203	195	192	4529	189
SUM	5052	4938	5017	5217	5493	5745	5845	5767	5528	5213	4864	4558	4430	4511	4828	5327	5825	6260	6565	6662	6517	6171	5726	5348	131407	TOTAL
MEAN	163	159	162	168	177	185	189	186	178	168	157	147	143	146	156	172	188	202	212	215	210	199	185	173		MONTHLY MEAN 176.6 CM

Station : Syowa Station
 Latitude : 69° 0' 28'' S
 Longitude : 39° 34' 13'' E
 Duration : May 1 - May 31, 1981
 Unit : Centimetre

DATE	HOUR																							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	190	206	219	225	222	212	196	174	159	151	152	161	178	198	215	228	230	221	205	185	165	154	152	4574	191	
2	164	181	202	224	239	244	240	223	199	178	164	156	160	174	194	211	225	230	222	207	185	160	144	139	4665	194	
3	144	161	183	205	225	240	248	243	224	199	178	168	168	182	200	215	228	235	234	219	193	165	139	127	4723	197	
4	126	141	164	189	207	226	241	250	241	221	201	183	179	186	201	216	229	239	241	229	209	179	148	125	4767	199	
5	116	121	139	165	187	207	228	241	247	239	220	205	194	194	204	218	231	243	247	241	221	194	163	133	4798	200	
6	111	107	119	142	166	191	212	228	237	238	228	220	207	202	210	219	234	247	252	246	234	208	176	147	4781	199	
7	122	106	105	120	146	171	196	214	228	232	228	223	215	208	209	221	231	243	252	253	242	224	200	170	4759	198	
8	145	128	119	122	137	159	178	193	205	214	220	218	217	213	211	215	225	235	243	243	241	231	213	190	4717	197	
9	171	152	134	132	133	146	161	179	187	200	205	207	210	210	212	213	216	226	231	235	234	226	214	199	4633	193	
10	191	185	178	173	169	164	162	163	168	178	190	195	201	207	209	209	210	213	214	214	214	208	203	198	4616	192	
11	189	181	174	170	166	163	165	164	166	167	173	184	191	199	207	208	210	208	207	203	199	195	195	193	4477	187	
12	192	189	188	186	176	170	166	158	156	160	164	173	188	195	203	212	216	207	201	197	190	181	180	181	4427	184	
13	184	191	194	194	193	186	178	169	160	160	159	167	178	190	201	208	214	210	201	194	182	172	168	170	4423	184	
14	177	188	201	209	211	209	202	187	176	169	165	168	177	188	201	210	215	214	205	193	178	162	157	158	4520	188	
15	165	179	196	210	216	219	214	199	187	172	167	169	178	190	202	217	221	220	212	198	176	156	148	144	4555	190	
16	151	168	188	207	221	227	225	215	201	186	173	171	175	185	200	212	218	219	209	194	173	151	134	128	4531	189	
17	133	151	172	194	213	224	227	219	206	191	176	170	172	180	195	208	218	221	214	200	174	153	136	123	4470	186	
18	122	138	161	186	207	224	233	228	216	203	187	180	178	185	200	213	224	230	228	215	189	167	144	126	4584	191	
19	125	134	154	182	207	228	241	245	237	224	211	201	195	196	209	225	235	242	242	228	204	178	153	131	4827	201	
20	122	126	139	165	191	213	232	238	238	227	214	204	198	194	203	219	232	239	241	234	214	189	163	139	4774	199	
21	124	120	129	149	174	201	219	232	236	231	221	213	204	201	206	217	229	240	242	238	224	202	175	150	4777	199	
22	131	123	126	142	161	189	208	224	234	232	225	218	212	206	207	214	226	236	241	241	229	213	190	161	4789	200	
23	146	133	129	137	153	175	196	210	224	228	226	221	217	213	213	215	223	235	240	243	236	223	204	182	4822	201	
24	163	146	139	141	149	164	181	197	210	219	221	222	219	215	214	214	219	226	232	235	232	223	209	192	4782	199	
25	175	160	151	148	150	157	167	181	194	207	213	217	220	221	217	218	220	221	227	227	225	221	214	201	4752	198	
26	191	180	167	163	160	160	166	175	184	193	206	214	217	221	223	220	219	218	218	219	214	214	212	207	4761	198	
27	203	198	190	182	175	171	169	170	173	182	189	203	211	218	221	223	220	214	209	203	200	199	198	201	4722	197	
28	204	203	204	201	194	185	177	171	169	169	176	187	200	210	218	221	218	212	202	194	185	179	178	181	4638	193	
29	187	204	214	218	214	206	196	187	179	175	175	179	189	201	212	216	217	207	194	182	165	157	156	163	4593	191	
30	176	192	208	221	223	225	219	200	187	175	173	177	187	197	209	222	220	209	197	180	155	140	134	138	4560	190	
31	151	170	194	214	228	236	233	218	206	190	181	180	186	195	207	216	221	216	201	178	152	129	113	111	4526	189	
SUM	4877	5167	5816	6288	6249	5980	6004	6416	6890	6920	6254	5315	4946	5506	6102	6317	6118	5945	6154	6680	6985	6690	5764	4960	144343	TOTAL	
MEAN	157	160	167	178	188	197	203	204	202	197	193	192	194	199	207	215	222	225	223	216	202	186	171	160		MONTHLY MEAN	194.0 CM

Station : Syowa Station
 Latitude : 69° 0' 28"S
 Longitude : 39° 34' 13"E
 Duration : June 1 - June 30, 1981
 Unit : Centimetre

DATE	HOUR																							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	123	164	171	202	222	239	244	236	225	207	195	190	192	201	211	224	230	226	216	193	162	134	110	96	4593	191
2	102	118	144	175	203	227	241	243	232	220	207	199	196	203	213	226	236	235	231	213	183	153	124	99	4623	193
3	94	104	123	155	187	214	234	243	244	235	224	214	208	211	217	231	243	245	246	234	207	175	145	114	4747	198
4	98	94	107	131	160	187	210	230	237	234	228	220	211	212	218	228	242	250	254	248	230	206	173	145	4753	198
5	121	107	108	122	145	172	194	212	225	227	226	221	212	211	209	219	232	238	247	246	235	217	192	163	4701	196
6	141	122	113	119	131	153	173	191	204	212	214	214	212	207	204	210	216	225	235	238	235	226	208	187	4590	191
7	167	148	134	130	138	150	165	180	194	204	212	213	212	209	206	202	207	210	219	225	222	218	208	194	4567	190
8	180	162	152	141	139	144	153	165	174	186	192	197	201	198	194	192	191	192	197	201	201	201	197	190	4340	181
9	182	174	162	152	147	146	152	157	165	172	180	187	191	195	192	191	187	183	184	186	185	185	186	185	4226	176
10	184	180	177	173	168	165	162	162	167	174	179	189	198	200	201	204	197	188	187	183	178	178	178	179	4351	181
11	184	188	190	188	188	184	179	176	177	176	180	189	194	201	202	201	192	181	174	167	165	167	170	4414	184	
12	180	190	197	204	207	206	197	190	185	180	183	187	195	201	207	208	205	199	187	176	162	158	152	159	4515	188
13	171	181	194	207	214	216	214	207	199	188	191	194	199	207	216	219	216	210	201	183	164	150	145	144	4630	193
14	198	173	189	206	222	227	225	221	210	199	195	194	200	207	217	222	226	218	208	191	171	150	137	136	4702	196
15	145	159	181	206	222	232	235	230	221	207	201	198	202	211	221	228	232	230	218	201	177	156	138	131	4782	199
16	136	150	173	200	220	238	244	242	237	223	213	208	207	215	228	235	243	239	235	215	189	165	140	125	4920	205
17	122	136	158	182	207	226	238	241	235	223	212	204	202	207	216	228	238	239	234	221	194	166	140	120	4789	200
18	113	117	134	160	187	208	227	235	234	221	214	204	201	199	209	227	233	237	237	227	205	179	152	128	4683	195
19	116	114	125	147	173	198	219	232	235	231	222	212	208	205	210	221	231	240	244	238	221	197	169	145	4753	198
20	127	119	120	141	165	188	209	226	234	232	228	220	213	206	207	215	228	238	244	247	230	210	188	156	4786	199
21	138	123	119	128	146	168	190	210	223	225	223	219	212	206	201	207	218	228	235	239	231	218	200	176	4683	195
22	156	139	131	131	143	164	183	200	216	225	228	225	220	213	207	209	213	221	231	235	235	227	214	196	4762	198
23	178	163	152	149	151	164	176	194	207	217	223	220	216	213	206	202	202	207	214	220	221	221	215	202	4733	197
24	193	180	167	159	154	160	167	178	188	199	207	213	214	214	205	200	196	194	200	207	207	208	208	204	4622	193
25	201	194	185	178	173	173	171	177	182	194	199	209	211	211	205	199	192	186	181	182	186	188	190	195	4562	190
26	199	201	201	195	190	186	182	181	184	185	193	201	206	207	206	202	194	181	173	166	164	167	171	180	4515	188
27	192	201	207	210	211	207	199	193	188	187	193	201	206	209	209	206	198	183	170	157	146	142	145	155	4515	188
28	171	187	201	214	222	222	217	208	201	194	194	194	201	210	208	207	201	187	170	150	129	122	118	126	4454	186
29	140	160	182	204	220	227	226	219	207	200	195	195	201	208	212	216	214	203	185	161	137	114	100	101	4427	184
30	112	133	155	183	209	223	228	226	216	208	196	194	198	206	211	218	221	214	199	174	146	119	98	87	4374	182
SUM	4524	4752	5464	6054	6246	6147	6139	6268	6483	6363	5720	4908													TOTAL	138112
MFAN	151	152	158	170	182	194	202	207	208	206	205	204	205	207	209	213	216	215	212	204	191	177	164	153	MONTHLY MEAN	191.8 CM

Station : Syowa Station
 Latitude : 69° 0' 28" S
 Longitude : 39° 34' 13" E
 Duration : July 1 - July 31, 1981
 Unit : Centimetre

DATE	HOUR																							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	97	106	133	162	189	212	227	230	224	215	204	197	199	204	214	223	228	227	218	199	167	138	109	91	4408	184																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
2	81	91	110	139	170	197	214	225	227	220	212	203	201	201	211	223	234	235	234	223	198	166	135	109	4459	186																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
3	92	89	99	123	150	176	200	214	218	217	211	202	193	194	201	213	222	229	235	229	213	187	152	126	4385	183																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
4	105	91	92	108	131	157	180	199	209	209	207	201	192	185	187	194	209	220	227	228	221	204	178	147	4281	178																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
5	126	108	100	106	124	146	167	187	197	202	201	194	183	180	175	183	195	207	218	223	224	217	199	174	4236	177																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
6	153	131	119	122	134	150	169	183	195	203	204	201	196	190	180	180	188	196	205	216	215	212	204	189	4335	181																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
7	173	157	147	142	143	153	167	183	194	202	207	206	201	195	187	183	181	187	195	201	205	207	201	194	4411	184																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
8	184	173	164	157	157	162	171	181	192	198	201	198	193	185	180	178	173	173	181	187	192	193	190	186	4349	181																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
9	184	180	175	169	171	169	171	179	185	190	194	197	196	192	188	182	176	172	173	172	173	177	176	179	4319	180																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
10	183	181	181	183	180	179	178	179	180	185	191	195	196	199	194	188	180	171	164	161	159	159	159	165	4290	179																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
11	174	180	186	192	194	193	190	188	189	190	192	197	198	199	195	192	183	173	162	154	146	143	143	148	4301	179																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
12	158	169	185	193	199	201	201	195	192	190	191	195	197	200	202	199	194	186	171	159	143	133	129	137	4319	180																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
13	146	161	180	193	206	210	208	204	197	192	190	191	196	197	202	202	197	190	178	159	139	124	113	115	4290	179																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
14	128	142	160	184	199	209	211	207	201	193	188	187	189	195	202	207	206	199	187	167	145	124	110	105	4245	177																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
15	110	126	148	169	193	207	214	212	205	194	185	180	183	187	196	204	206	205	194	175	152	129	107	98	4179	174																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
16	99	110	132	159	185	203	219	221	216	206	194	188	187	190	201	212	220	220	214	199	174	146	120	103	4318	180																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
17	96	104	124	150	178	201	219	227	223	217	204	194	191	192	200	213	223	228	225	213	190	162	131	107	4412	184																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
18	92	93	105	128	155	181	201	213	216	207	197	186	176	174	183	194	207	216	220	214	195	171	141	116	4181	174																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
19	98	90	96	114	139	165	187	202	209	206	195	185	174	169	173	185	200	211	220	220	210	190	162	137	4137	172																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
20	115	102	101	113	133	158	178	195	208	207	199	193	180	172	173	180	194	208	221	227	222	208	188	163	4238	177																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
21	141	126	119	124	139	159	179	196	209	214	208	201	190	177	171	173	180	194	210	217	219	217	201	183	4347	181																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
22	164	148	139	136	142	158	173	188	202	209	207	201	193	180	169	167	169	176	193	204	207	210	206	192	4333	181																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
23	181	169	157	150	153	160	173	185	196	202	207	202	193	185	174	164	160	166	172	181	191	194	195	194	4304	179																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
24	189	182	176	169	169	172	176	185	192	197	201	199	194	187	175	165	158	152	154	159	167	174	180	183	4255	177																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
25	188	190	190	190	187	188	191	191	196	199	202	204	199	194	185	174	164	152	146	145	146	150	157	168	4296	179																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
26	178	186	194	199	200	201	200	195	197	198	201	202	202	201	194	188	178	162	150	141	134	133	135	145	4314	180																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
27	160	174	192	208	214	218	218	214	207	207	204	205	207	209	207	203	194	179	162	148	133	123	121	126	4433	185																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
28	142	162	185	205	223	232	233	231	225	216	215	214	214	220	221	223	219	205	190	167	145	125	113	112	4637	193																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
29	122	139	160	188	215	231	236	234	227	219	211	209	211	214	219	225	223	220	206	180	153	127	106	92	4567	190																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
30	97	110	133	160	188	210	223	228	223	212	202	196	194	201	209	219	226	227	220	200	171	144	112	92	4397	183																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
31	87	95	115	141	171	195	211	222	221	209	197	189	181	187	196	210	221	227	227	217	193	162	131	103	4308	180																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
SUM	4238	4497	4876	5331	5753	6084	6372	6622	6999	7364	7729	8094	8459	8824	9189	9554	9919	10284	10649	11014	11379	11744	12109	12474	12839	13204	13569	13934	14299	14664	15029	15394	15759	16124	16489	16854	17219	17584	17949	18314	18679	19044	19409	19774	20139	20504	20869	21234	21599	21964	22329	22694	23059	23424	23789	24154	24519	24884	25249	25614	25979	26344	26709	27074	27439	27804	28169	28534	28899	29264	29629	30004	30369	30734	31099	31464	31829	32194	32559	32924	33289	33654	34019	34384	34749	35114	35479	35844	36209	36574	36939	37304	37669	38034	38399	38764	39129	39494	39859	40224	40589	40954	41319	41684	42049	42414	42779	43144	43509	43874	44239	44604	44969	45334	45699	46064	46429	46794	47159	47524	47889	48254	48619	48984	49349	49714	50079	50444	50809	51174	51539	51904	52269	52634	52999	53364	53729	54094	54459	54824	55189	55554	55919	56284	56649	57014	57379	57744	58109	58474	58839	59204	59569	59934	60299	60664	61029	61394	61759	62124	62489	62854	63219	63584	63949	64314	64679	65044	65409	65774	66139	66504	66869	67234	67599	67964	68329	68694	69059	69424	69789	70154	70519	70884	71249	71614	71979	72344	72709	73074	73439	73804	74169	74534	74899	75264	75629	75994	76359	76724	77089	77454	77819	78184	78549	78914	79279	79644	80009	80374	80739	81104	81469	81834	82199	82564	82929	83294	83659	84024	84389	84754	85119	85484	85849	86214	86579	86944	87309	87674	88039	88404	88769	89134	89499	89864	90229	90594	90959	91324	91689	92054	92419	92784	93149	93514	93879	94244	94609	94974	95339	95704	96069	96434	96799	97164	97529	97894	98259	98624	98989	99354	99719	100084	100449	100814	101179	101544	101909	102274	102639	102994	103359	103724	104089	104454	104819	105184	105549	105914	106279	106644	107009	107374	107739	108104	108469	108834	109199	109564	109929	110294	110659	111024	111389	111754	112119	112484	112849	113214	113579	113944	114309	114674	115039	115404	115769	116134	116499	116864	117229	117594	117959	118324	118689	119054	119419	119784	120149	120514	120879	121244	121609	121974	122339	122704	123069	123434	123799	124164	124529	124894	125259	125624	125989	126354	126719	127084	127449	127814	128179	128544	128909	129274	129639	130004	130369	130734	131099	131464	131829	132194	132559	132924	133289	133654	134019	134384	134749	135114	135479	135844	136209	136574	136939	137304	137669	138034	138399	138764	139129	139494	139859	140224	140589	140954	141319	141684	142049	142414	142779	143144	143509	143874	144239	144604	144969	145334	145699	146064	146429	146794	147159	147524	147889	148254	148619	148984	149349	149714	150079	150444	150809	151174	151539	151904	152269	152634	152999	153364	153729	154094	154459	154824	155189	155554	155919	156284	156649	157014	157379	157744	158109	158474	158839	159204	159569	159934	160299	160664	161029	161394	161759	162124	162489	162854	163219	163584	163949	164314	164679	165044	165409	165774	166139	166504	166869	167234	167599	167964	168329	168694	169059	169424	169789	170154	170519	170884	171249	171614	171979	172344	172709	173074	173439	173804	174169	174534	174899	175264	175629	175994	176359	176724	177089	177454	177819	178184	178549	178914	179279	179644	180009	180374	180739	181104	181469	181834	182199	182564	182929	183294	183659	184024	184389	184754	185119

Station : Syowa Station
 Latitude : 69° 0' 28" S
 Longitude : 39° 34' 13" E
 Duration : Aug. 1 -Aug. 31, 1981
 Unit : Centimetre

DATE	HOUR																							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	91	89	101	124	152	179	199	210	213	204	194	183	174	174	183	196	213	226	229	225	213	185	155	127	4239	177
2	106	97	103	121	146	169	190	205	207	203	194	183	171	162	166	180	196	214	225	228	220	202	178	151	4217	176
3	127	113	113	122	142	164	186	198	207	204	194	183	172	159	155	165	180	195	207	218	223	218	194	171	4210	175
4	144	131	126	131	146	164	180	194	201	201	191	180	168	157	153	154	163	175	191	201	204	201	190	173	4119	172
5	157	144	136	134	143	161	174	189	197	200	195	187	174	164	155	153	156	166	178	189	195	195	191	181	4114	171
6	169	159	153	150	154	164	177	187	193	197	194	188	177	167	159	153	151	155	164	173	180	184	183	180	4111	171
7	173	169	166	163	167	173	180	187	194	196	197	192	182	173	165	157	154	153	155	163	167	170	173	173	4142	173
8	174	173	174	177	176	180	185	190	193	195	197	193	187	180	173	164	158	153	150	152	153	155	157	164	4193	173
9	167	172	178	184	186	189	190	193	194	194	194	195	191	187	184	179	169	162	157	153	149	148	152	154	4221	176
10	165	176	185	194	201	205	205	203	201	199	197	197	195	194	192	188	181	171	162	152	143	138	135	139	4318	180
11	151	164	181	194	204	214	214	209	207	201	195	196	195	196	200	197	193	185	169	153	141	126	120	124	4329	180
12	133	149	171	190	205	214	217	214	207	197	192	191	192	198	202	204	202	195	183	167	148	127	115	112	4325	180
13	119	136	158	181	204	218	224	222	211	199	191	189	188	194	204	211	216	209	199	180	158	132	112	104	4357	182
14	105	120	143	171	194	214	225	224	214	201	190	183	180	187	197	208	216	216	210	194	168	139	113	96	4308	180
15	91	104	122	148	180	201	214	220	212	200	186	174	171	175	187	203	216	221	220	207	185	155	125	103	4218	176
16	91	92	112	136	164	192	208	214	211	201	185	172	163	162	174	193	209	220	227	220	206	178	146	119	4195	175
17	103	96	105	127	153	180	199	209	210	201	185	168	155	152	157	173	194	210	220	221	213	192	162	138	4123	172
18	115	102	102	119	141	165	185	200	202	195	180	162	149	138	138	152	173	193	207	217	218	203	180	159	3995	166
19	139	119	116	125	142	162	180	195	200	197	185	165	150	137	132	138	157	176	194	207	214	209	196	180	4015	167
20	161	145	138	141	153	168	185	197	204	203	194	177	159	145	136	131	141	159	176	191	201	207	202	191	4103	171
21	180	168	160	159	165	174	185	195	201	201	197	181	165	151	139	129	130	138	152	166	177	184	186	185	4068	170
22	182	174	173	171	173	180	187	194	199	197	194	188	173	159	148	133	126	126	134	144	153	160	168	174	4010	167
23	177	182	186	189	191	194	199	203	204	205	203	194	186	178	166	154	145	137	131	134	138	142	147	157	4142	173
24	168	177	190	198	205	208	211	211	210	209	208	204	201	194	187	181	172	160	149	140	134	132	137	146	4332	181
25	157	173	192	208	220	225	224	223	221	214	212	211	207	207	207	201	196	187	168	153	139	129	126	129	4529	189
26	140	162	183	203	221	232	234	231	226	216	211	208	208	211	214	217	217	209	195	173	152	133	121	117	4634	193
27	127	145	169	195	213	230	236	233	227	212	204	200	201	206	214	223	228	225	212	194	166	141	121	109	4631	193
28	112	128	151	180	202	221	232	231	223	209	197	187	185	194	206	219	233	237	228	214	187	155	129	113	4573	191
29	106	119	137	162	193	210	225	227	218	203	189	174	168	175	190	207	227	235	235	227	206	173	145	120	4471	186
30	107	112	129	150	177	199	213	216	211	196	180	164	153	155	171	187	209	225	229	231	216	188	162	139	4319	180
31	122	117	128	150	174	196	214	218	214	201	183	165	150	146	155	174	198	216	228	235	227	206	181	157	4355	181
SUM	4259	4307	4581	4997	5487	5945	6277	6442	6432	6251	6008	5734	5377	5490	5407	5524	5715	5849	5884	5822	5594	5207	4802	4485	131876	TOTAL
MEAN	137	139	148	161	177	192	202	208	207	202	194	185	177	173	174	178	184	189	190	188	180	168	155	145	177.3	MONTHLY MEAN 177.3 CM

Station : Syowa Station
 Latitude : 69° 0' 28" S
 Longitude : 39° 34' 13" E
 Duration : Sep. 1 -Sep. 30, 1981
 Unit : Centimetre

DATE	HOUR																								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	138	129	133	150	173	195	212	220	220	207	190	170	152	143	146	162	185	207	221	233	232	217	198	178	4411	184
2	158	147	146	158	175	194	210	220	218	210	194	174	157	145	141	151	169	193	209	220	225	220	204	187	4425	184
3	173	160	159	164	178	195	209	216	217	211	197	177	160	148	141	141	156	173	187	203	208	207	201	189	4370	182
4	176	167	167	170	179	193	204	211	211	207	198	182	162	150	143	139	147	159	173	185	192	192	191	186	4282	178
5	176	173	173	172	181	192	201	208	211	207	199	188	169	160	152	143	145	152	159	170	179	180	186	184	4258	177
6	180	181	185	186	191	200	203	207	211	207	202	193	179	169	163	157	154	154	159	163	167	173	175	178	4337	181
7	183	187	194	199	203	207	210	211	211	207	204	197	191	184	175	169	166	161	157	157	158	160	162	169	4422	184
8	179	186	195	207	211	215	218	218	215	209	207	202	194	192	189	183	178	171	164	156	152	147	148	155	4491	187
9	166	179	195	208	218	222	222	220	210	205	203	197	195	197	197	194	192	184	173	160	147	136	135	139	4494	187
10	151	169	190	207	222	229	228	222	212	202	197	194	191	197	201	204	203	198	183	167	147	133	119	119	4485	187
11	131	150	173	197	215	226	228	221	209	195	187	180	180	189	200	208	213	209	201	180	156	133	115	108	4404	184
12	116	134	156	183	208	223	228	221	207	193	178	170	171	180	194	211	221	224	218	203	176	148	124	112	4399	183
13	112	126	150	175	201	220	228	225	210	191	174	160	156	167	184	205	221	230	232	217	197	167	136	119	4403	183
14	110	117	138	162	190	211	222	222	210	190	171	153	145	149	169	194	213	228	239	235	216	191	160	137	4372	182
15	120	122	136	158	184	207	221	226	214	194	172	151	136	135	152	176	203	226	242	246	236	214	187	162	4420	184
16	145	137	143	160	184	202	216	223	214	195	173	151	134	126	133	154	178	204	228	236	237	225	205	185	4392	183
17	167	157	157	168	190	208	219	227	221	207	188	162	142	127	126	139	161	187	208	223	232	228	214	201	4459	186
18	187	174	173	179	192	207	221	225	222	214	193	167	146	129	120	124	138	160	183	199	212	216	212	205	4398	183
19	196	187	187	187	196	210	220	223	222	217	204	182	164	144	128	126	133	143	162	175	189	197	201	202	4395	183
20	200	200	200	201	207	216	225	228	228	222	213	198	179	164	149	142	137	140	149	157	166	173	182	187	4463	186
21	192	199	205	208	217	221	225	228	226	222	217	207	194	184	174	164	155	152	149	147	152	154	160	170	4522	188
22	179	191	202	214	220	223	227	225	221	215	211	207	201	195	189	184	176	164	156	148	143	139	141	154	4523	188
23	161	180	197	211	222	226	226	221	214	206	199	198	194	195	200	199	191	182	169	155	162	130	126	130	4474	186
24	141	160	181	198	214	221	220	214	202	194	187	182	185	190	198	204	204	198	191	168	148	132	122	119	4373	182
25	128	151	173	190	208	219	218	211	198	186	176	167	174	185	198	210	216	215	206	187	165	140	121	117	4359	182
26	119	135	158	176	202	214	215	208	193	175	163	154	155	173	187	202	216	224	219	204	180	152	130	119	4273	178
27	118	131	151	174	197	210	214	208	190	173	153	143	139	151	173	192	210	223	224	214	195	169	142	126	4220	176
28	119	127	147	171	193	207	214	209	193	173	149	134	126	132	153	179	202	219	228	226	209	186	161	141	4198	175
29	131	132	146	169	190	205	214	210	194	173	152	132	119	123	137	163	189	210	221	224	214	195	173	152	4168	174
30	139	136	145	165	186	202	210	208	195	175	153	129	114	106	121	145	169	193	207	216	217	202	183	167	4081	170
SUM	4591	4724	5057	5467	5947	6320	6528	6338	6319	5982	5604	5201	4904	4829	4933	5162	5439	5683	5817	5774	5589	5256	4912	4695	131271	TOTAL
MFAN	153	157	169	182	198	211	218	218	211	199	187	173	163	161	164	172	181	189	194	192	186	175	164	157	182.3	MONTHLY MEAN 182.3 CM

Station : Syowa Station
 Latitude : 69° 0' 28" S
 Longitude : 39° 34' 13" E
 Duration : Oct. 1 - Oct. 31, 1981
 Unit : Centimetre

DATE	HOUR																							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	152	143	151	164	186	201	208	211	201	182	158	136	117	111	112	131	152	178	198	208	213	206	191	175	4087	170
2	164	156	159	164	184	200	210	210	203	190	167	145	124	117	113	121	143	164	176	194	202	201	190	180	4077	170
3	170	165	160	172	185	197	207	209	204	193	174	153	134	123	119	122	132	152	167	177	191	194	189	185	4074	170
4	180	176	173	180	190	199	208	211	208	199	185	167	150	137	131	130	134	145	158	168	179	183	183	184	4160	173
5	181	182	184	187	194	202	207	207	203	199	187	170	155	146	138	132	134	139	145	153	163	167	172	177	4124	172
6	179	184	188	192	198	207	205	205	201	194	187	173	164	155	148	142	139	139	139	139	144	148	153	161	4084	170
7	169	178	185	195	199	205	203	199	193	188	182	174	168	164	161	157	151	145	140	134	132	133	137	147	4039	168
8	159	173	187	199	208	207	205	200	192	186	180	174	175	173	173	172	169	158	150	139	129	122	123	133	4086	170
9	146	161	179	194	205	207	202	194	183	173	167	162	167	171	175	182	182	174	162	146	131	119	112	116	4010	167
10	127	148	170	188	204	206	201	189	173	159	152	149	153	164	180	190	195	192	180	161	141	121	108	106	3957	165
11	118	135	158	182	201	208	205	188	171	154	141	137	142	158	178	196	208	211	204	184	160	139	117	108	3999	167
12	112	129	153	176	196	206	207	193	172	153	134	123	127	144	166	193	213	222	224	211	187	160	135	120	4056	169
13	118	128	149	173	194	207	207	195	173	147	125	108	107	124	147	177	203	223	231	226	210	187	161	142	4062	169
14	133	138	158	179	200	210	214	206	183	154	127	104	95	100	124	156	185	211	228	234	226	208	187	172	4132	172
15	155	153	165	184	204	217	221	215	195	167	138	111	92	89	104	130	160	189	213	228	230	220	204	188	4172	174
16	177	171	176	190	208	221	225	221	207	183	155	124	100	88	94	113	140	167	192	212	223	221	213	203	4224	176
17	193	187	188	198	213	225	231	228	221	200	173	143	120	103	95	103	123	144	169	188	201	207	206	204	4263	178
18	201	197	197	203	214	228	231	231	226	211	192	167	144	126	112	110	117	129	146	163	177	187	192	194	4295	179
19	195	197	201	205	212	221	225	228	221	212	201	182	164	150	138	131	128	132	142	153	162	172	180	187	4339	181
20	193	201	207	213	216	221	223	222	219	211	204	195	182	172	163	154	147	142	144	145	148	153	160	172	4407	184
21	180	192	205	211	214	218	216	212	209	205	199	196	193	188	186	182	173	165	157	151	146	146	150	160	4454	186
22	171	185	200	209	216	217	211	205	197	190	185	184	186	190	193	196	194	184	172	161	150	141	142	147	4426	184
23	160	178	194	207	215	217	208	198	187	174	168	169	174	182	193	202	203	197	185	170	154	144	137	140	4356	182
24	152	169	188	204	215	220	212	197	183	169	160	159	166	179	197	211	218	218	208	194	173	154	147	144	4437	185
25	154	167	185	201	215	220	211	196	178	160	147	143	148	163	184	205	221	227	222	210	189	171	156	148	4421	184
26	153	169	188	205	220	225	218	202	181	157	140	132	134	150	173	198	219	230	233	222	206	188	169	157	4469	186
27	158	169	188	205	220	228	222	207	186	160	139	126	123	135	159	184	210	227	232	229	213	195	178	161	4454	186
28	158	162	178	198	212	223	220	207	187	160	138	121	115	121	142	172	196	214	228	231	223	206	189	174	4375	182
29	166	167	180	199	213	225	225	214	194	169	143	122	110	110	126	153	180	202	220	228	225	213	196	183	4363	182
30	173	171	181	198	212	223	225	217	202	175	168	127	111	105	116	139	164	187	209	221	222	217	205	193	4341	181
31	184	178	187	200	214	226	228	225	211	190	170	139	121	112	119	132	156	177	198	210	219	217	209	200	4422	184
SUM	5031	5211	5564	5975	6377	6637	6641	6442	6064	5564	5066	4615	4350	4361	4559	4916	5289	5584	5772	5790	5669	5436	5191	5061	TOTAL 131165	
MFAN	162	168	179	193	206	214	214	208	196	179	163	149	141	140	147	159	171	180	186	187	183	175	167	163	MONTHLY MEAN 176.3 CM	

Station : Syowa Station
 Latitude : 69° 0' 28" S
 Longitude : 39° 34' 13" E
 Duration : Nov. 1 -Nov. 30, 1981
 Unit : Centimetre

DATE	HOUR																							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	193	191	192	200	214	226	228	225	215	199	173	152	132	119	117	126	144	163	182	200	210	212	209	204	4426	184
2	201	198	199	204	214	223	228	226	219	204	187	166	145	131	128	130	139	154	172	185	196	205	206	205	4465	186
3	205	204	205	209	214	220	224	223	219	204	190	173	156	146	137	133	139	146	157	169	180	191	196	199	4439	185
4	203	205	207	209	211	214	217	215	211	202	193	180	168	158	153	148	146	147	150	155	166	173	180	188	4399	183
5	194	203	207	211	213	214	211	210	205	197	194	187	181	173	169	166	160	155	154	154	154	160	170	177	4419	184
6	190	201	208	214	219	216	210	203	194	189	185	180	180	180	180	179	173	167	159	155	151	151	157	166	4407	184
7	180	195	207	214	218	216	206	194	185	176	171	172	174	181	187	192	193	183	173	164	152	145	145	152	4375	182
8	168	183	201	213	216	214	202	186	169	160	154	154	160	176	192	201	207	204	191	179	162	149	146	146	4333	181
9	158	175	194	209	216	214	202	181	162	145	135	138	148	167	188	206	222	223	216	199	179	162	148	146	4333	181
10	155	171	189	205	214	215	201	180	157	131	115	110	119	141	167	194	218	228	228	218	197	178	165	156	4252	177
11	158	173	187	205	216	218	206	182	155	126	104	90	91	112	141	173	202	222	232	230	216	198	181	168	4186	174
12	164	174	189	201	214	220	209	188	159	125	98	76	71	82	108	140	172	197	216	224	217	207	192	179	4022	168
13	173	176	188	201	213	220	215	199	173	139	107	79	64	64	80	112	145	173	199	212	214	210	206	191	3953	165
14	183	182	192	207	216	223	221	211	193	160	127	98	72	63	71	92	119	150	175	194	205	206	201	196	3957	165
15	189	187	190	200	214	224	227	223	211	187	159	129	104	89	83	92	111	133	153	173	192	195	196	194	4055	169
16	193	190	189	197	209	218	220	219	212	196	177	152	127	111	100	99	106	119	135	153	165	177	184	187	4035	168
17	188	191	191	192	201	208	210	211	208	199	187	171	152	137	126	117	115	119	130	141	153	163	173	179	4062	169
18	185	191	193	194	194	199	201	201	200	195	187	180	169	160	152	143	138	134	134	140	146	152	161	170	4119	172
19	180	188	192	194	194	194	190	187	184	180	178	175	173	173	168	166	159	151	147	144	141	147	153	162	4120	172
20	174	183	189	194	194	189	181	173	165	163	163	164	165	171	173	175	173	166	158	152	146	145	147	156	4059	169
21	167	178	187	192	192	190	176	167	155	146	145	147	154	167	179	185	187	186	175	165	158	153	150	158	4059	169
22	168	180	194	201	201	200	186	167	156	141	135	138	146	158	175	193	200	203	195	183	173	161	156	158	4168	174
23	167	180	193	201	207	201	187	169	150	133	121	120	130	149	168	190	202	207	206	194	180	168	160	160	4143	173
24	167	180	194	205	210	207	194	173	153	129	115	106	113	133	153	178	200	210	212	205	193	180	168	162	4140	173
25	170	177	193	203	212	212	199	178	155	131	111	99	99	114	140	167	190	207	216	214	204	191	180	171	4133	172
26	172	179	196	207	213	216	209	188	163	138	115	98	95	105	126	157	182	201	214	218	213	201	189	180	4173	174
27	178	181	194	207	217	220	214	198	173	146	122	100	92	97	114	143	171	194	210	220	216	207	196	187	4197	175
28	181	181	190	201	214	222	218	206	186	157	130	108	92	91	102	126	156	180	199	210	213	206	197	189	4155	173
29	183	180	186	197	209	218	217	207	192	167	139	113	96	89	94	112	137	161	184	198	207	207	198	192	4083	170
30	187	181	183	194	205	214	217	215	201	180	154	129	110	99	95	105	126	148	169	187	199	204	201	196	4099	171
SUM	5374	5558	5817	6081	6294	6385	6226	5905	5480	4945	4471	4084	3936	4166	4540	4932	5231	5441	5535	5498	5404	5311	5274		TOTAL 125766	
MFAN	179	185	194	203	210	213	208	197	183	165	149	136	129	131	139	151	164	174	181	185	183	180	177	176	MONTHLY MEAN 174.7 CM	

Station : Syowa Station
 Latitude : 69° 0' 28" S
 Longitude : 39° 34' 13" E
 Duration : Dec. 1 -Dec. 31, 1981
 Unit : Centimetre

DATE	HOUR																								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	193	187	189	192	202	214	216	216	207	192	173	148	130	117	110	113	126	143	159	178	190	197	199	198	4189	175
2	196	191	190	191	197	205	208	210	205	194	178	159	141	127	118	115	119	130	146	157	170	178	186	188	4099	171
3	189	187	187	185	189	194	195	195	193	186	178	165	148	139	131	126	124	126	135	143	156	163	173	178	3987	166
4	182	184	185	183	183	183	183	182	181	178	173	167	161	155	150	146	141	139	139	141	146	156	164	173	3975	166
5	179	186	188	185	182	178	173	168	166	165	163	162	163	163	162	159	154	150	145	143	144	148	155	164	3945	164
6	176	182	189	188	184	176	167	159	153	147	147	152	159	165	171	174	174	168	160	153	148	146	149	158	3945	164
7	167	178	186	189	187	177	163	149	137	130	129	134	146	159	174	185	189	186	178	168	158	153	150	155	3927	164
8	161	175	185	191	190	180	162	143	126	112	105	110	122	142	166	185	196	201	199	190	174	166	160	159	3900	163
9	167	178	188	196	195	187	167	143	118	98	85	83	94	119	145	174	197	207	211	207	193	180	171	167	3870	161
10	171	181	193	201	204	201	180	153	126	96	77	65	70	92	119	152	180	202	212	214	208	195	183	177	3852	161
11	177	186	196	205	211	211	197	172	142	108	77	59	57	68	97	129	160	188	208	214	215	207	195	188	3867	161
12	185	190	199	209	216	221	213	195	167	134	99	71	58	56	76	103	138	169	193	209	214	211	203	194	3923	163
13	187	190	197	207	218	226	225	214	192	160	126	96	72	62	66	89	114	142	167	189	201	202	201	195	3938	164
14	188	187	190	199	213	221	225	218	206	182	153	123	95	78	74	82	102	125	149	171	187	194	195	194	3951	165
15	192	187	187	192	201	214	217	218	213	200	179	153	130	112	101	101	110	129	143	161	178	188	191	192	4089	170
16	192	187	183	183	188	197	205	208	207	200	188	170	153	134	124	119	119	126	139	153	168	178	184	187	4092	171
17	188	187	184	178	180	185	187	191	194	190	185	177	166	155	147	139	133	136	141	148	160	170	177	183	4081	170
18	188	188	187	182	178	178	177	177	178	179	177	174	171	167	161	156	153	151	150	151	159	167	172	177	4098	171
19	183	186	187	183	179	173	167	164	162	160	160	161	164	165	167	168	164	160	159	156	157	162	166	173	4026	168
20	180	183	185	184	179	169	162	150	145	139	139	140	146	155	164	171	175	176	170	167	166	166	169	173	3953	165
21	180	187	191	190	188	180	160	147	139	129	126	127	138	153	165	178	186	187	187	180	173	171	169	171	4002	167
22	178	184	190	192	190	181	166	148	133	119	110	111	120	136	153	172	183	191	192	186	179	173	169	171	3923	163
23	177	183	193	197	197	187	174	154	133	114	101	97	105	121	141	167	185	196	201	199	191	181	174	173	3941	164
24	176	183	195	201	202	200	185	165	142	118	99	90	93	110	133	160	182	199	208	207	201	191	180	173	3993	166
25	174	180	191	200	206	207	195	177	152	126	106	92	86	99	124	148	174	195	206	209	204	194	185	176	4006	167
26	174	180	189	201	209	211	201	185	161	131	105	85	79	84	104	131	160	184	202	210	207	201	191	182	3967	165
27	179	178	188	201	211	215	209	197	174	146	119	95	80	79	93	119	144	168	190	202	204	201	192	183	3967	165
28	177	176	182	194	206	214	214	204	184	158	124	99	80	74	78	94	124	152	174	194	202	201	194	187	3886	162
29	180	176	180	190	202	212	214	212	199	176	148	119	97	84	83	93	119	141	164	188	196	202	199	193	3967	165
30	187	181	180	185	196	207	214	214	207	189	166	141	119	101	96	99	112	138	158	178	192	200	198	194	4052	169
31	190	181	179	181	188	199	205	208	208	199	180	159	141	125	116	113	119	136	153	171	185	194	197	196	4123	172
SUM	5613	5833	6071	6071	6103	5926	5636	5250	4751	3884	3696	4275	3684	3909	4260	4656	5041	5338	5537	5626	5638	5591	5572	5572	TOTAL 123534	
MEAN	181	184	188	192	196	197	191	182	169	153	138	125	119	119	126	137	150	163	172	179	181	182	180	180	MONTHLY MEAN 166.0 CM	

Station : Syowa Station
 Latitude : 69° 0' 28" S
 Longitude : 39° 34' 13" E
 Duration : Jan. 1 -Jan. 31, 1982
 Unit : Centimetre

DATE	HOUR																							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	193	186	180	178	180	187	192	197	196	192	179	169	153	139	126	120	127	138	148	162	177	187	193	194	4093	171
2	193	187	181	175	174	177	180	184	188	188	182	174	167	159	149	146	143	145	150	160	170	178	183	189	4122	172
3	190	186	180	172	167	165	164	165	166	166	166	164	160	157	153	152	150	150	151	156	160	167	173	178	3958	165
4	181	182	179	172	163	154	145	141	141	142	146	151	157	160	162	169	168	164	162	161	162	164	169	174	3869	161
5	178	180	180	172	164	152	138	126	119	115	120	127	139	153	166	176	183	186	181	176	174	171	172	175	3823	159
6	180	183	185	182	173	160	143	126	112	104	105	111	125	145	165	183	194	201	203	198	190	184	180	180	3912	163
7	183	187	191	190	185	173	152	127	103	85	74	71	85	103	127	156	180	194	200	201	194	187	182	182	3712	155
8	188	193	197	201	202	192	173	147	117	91	72	64	65	85	112	145	172	192	205	206	204	197	188	185	3793	158
9	186	193	199	206	211	209	193	171	139	105	77	58	52	59	83	117	148	174	194	205	205	201	191	184	3760	157
10	184	187	196	208	214	217	210	191	162	127	93	65	50	52	70	96	126	157	180	197	203	201	193	185	3764	157
11	180	180	187	201	211	218	220	207	187	155	119	85	62	53	62	79	109	139	166	188	196	195	194	186	3779	157
12	178	173	175	189	202	214	221	215	204	181	147	113	88	71	67	77	105	129	155	174	187	192	190	185	3832	160
13	173	165	164	172	187	200	209	211	208	192	171	143	118	103	94	96	109	127	152	170	183	190	187	182	3906	163
14	173	164	157	157	167	183	191	198	203	195	183	162	138	121	113	111	115	129	147	162	176	184	185	181	3895	162
15	176	167	160	156	157	167	175	180	186	186	178	165	150	138	129	122	122	130	143	157	171	177	180	182	3854	161
16	178	170	163	157	153	155	146	161	172	167	164	160	150	145	137	134	136	136	145	157	165	173	180	183	3797	158
17	180	173	169	163	156	152	149	148	151	154	154	153	153	152	150	146	150	150	152	160	166	171	175	179	3806	159
18	180	176	170	167	160	153	143	139	139	139	141	142	146	147	153	159	162	164	167	169	171	173	176	179	3815	159
19	180	180	178	173	167	157	143	135	127	121	120	121	125	134	145	155	164	168	172	176	173	173	173	178	3738	156
20	180	180	179	177	172	164	151	136	121	111	101	104	114	122	138	155	167	175	179	180	178	176	173	173	3706	154
21	179	180	185	185	180	173	158	140	124	105	94	95	101	115	136	155	170	185	186	188	183	177	173	173	3740	156
22	175	181	188	191	192	182	167	149	126	105	92	85	85	101	122	147	169	183	193	199	192	184	177	173	3758	157
23	173	180	188	196	201	198	185	167	141	113	93	78	71	83	103	126	155	176	190	196	194	186	175	170	3738	156
24	171	175	185	195	205	206	194	175	150	121	92	71	63	68	86	115	142	167	187	194	194	185	176	169	3686	154
25	165	166	178	191	201	207	202	187	166	134	103	84	70	68	85	112	139	167	188	201	199	189	180	167	3749	156
26	160	160	170	183	196	206	207	197	178	152	118	89	69	64	69	92	122	148	173	192	196	190	181	173	3685	154
27	160	157	162	176	194	206	213	209	192	169	139	107	85	76	75	92	117	144	169	185	195	193	183	173	3771	157
28	164	157	156	164	181	197	205	207	201	182	154	123	96	79	74	81	99	126	150	169	181	187	182	173	3688	154
29	162	152	149	153	169	186	196	202	204	194	173	148	123	106	94	92	106	126	147	167	177	183	183	174	3766	157
30	162	152	144	141	150	166	176	186	194	187	177	159	139	125	114	106	115	128	146	161	173	181	184	177	3743	156
31	167	155	146	141	143	150	157	166	173	174	170	160	148	136	131	127	129	136	148	160	173	178	181	180	3729	155
SUM	5472	5407	5421	5484	5577	5626	5508	5290	4990	4552	4097	3701	3419	3447	3590	3939	4393	4834	5229	5527	5662	5674	5612	5536	TOTAL 117987	
MFAN	177	174	175	177	180	181	178	171	161	147	132	119	111	110	116	127	142	156	169	178	183	183	181	179	MONTHLY MEAN 158.6 CM	