

AUSTRALIAN NATIONAL ANTARCTIC RESEARCH EXPEDITIONS

ANARE  
RESEARCH  
NOTES

51

Oceanographic data: Prydz Bay region -  
geoscience cruise, MV Nella Dan, January-March 1982

E.J. Woehler, J. Shearer, K.R. Kerry

ANTARCTIC DIVISION  
DEPARTMENT OF SCIENCE

ANARE RESEARCH NOTES (ISSN 0729-6533)

This series allows rapid publication in a wide range of disciplines. Copies of this and other ANARE Research Notes are available from the Antarctic Division. Any person who has participated in Australian National Antarctic Research Expeditions is invited to publish through this series. Before submitting manuscripts authors should obtain a style guide from:

The Publications Office  
Antarctic Division  
Channel Highway  
Kingston  
Tasmania 7150  
Australia.

Since the summer season of 1980-81, six cruises have been undertaken by Australia to obtain data to contribute to the international BIOMASS (Biological Investigation of Marine Antarctic System and Stocks) program.

Cruise	Dates in study area	Principal objectives
FIBEX	20 Jan 1981 - 15 Mar 1981	Acoustic survey for krill
GEOSCIENCE	20 Jan 1982 - 3 Mar 1982	Seismic survey
ADBEX I	19 Nov 1982 - 17 Dec 1982	Krill biology, oceanography
ADBEX II (= SIBEX I)	7 Jan 1984 - 12 Feb 1984	Krill biology
SIBEX II	3 Jan 1985 - 26 Jan 1985	Krill distribution, phytoplankton
ADBEX III	21 Sep 1985 - 13 Dec 1985	Seal survey

This issue is one of a number of reports dealing with oceanographic data from these cruises that will appear in the ANARE Research Notes series.

Published July 1987  
ISBN: 062 11631 8





OCEANOGRAPHIC DATA: PRYDZ BAY REGION -  
GEOSCIENCE CRUISE, MV NELLA DAN, JANUARY-MARCH 1982

by

E.J. Woehler, J. Shearer, K.R. Kerry

Antarctic Division  
Department of Science  
Kingston, Tasmania, Australia

ABSTRACT

Seven CTD stations were taken during the geoscience cruise, January-March 1982 as a supplement to a seismic survey in the vicinity of Prydz Bay, Antarctica. Stations were taken on an opportunistic basis. In situ salinity, temperature and sigma-t are tabulated for standard depths, and shown graphically. T/S plots for each station are given.

E. J. Womack, U.S. Army, A.P. Barry

Department of Defense  
Kingsport, Tennessee, USA

APPENDIX

Tables were taken from the documents listed in the text and placed in a separate section in the vicinity of the text to which they refer. The tables were taken from the documents listed in the text and placed in a separate section in the vicinity of the text to which they refer. The tables were taken from the documents listed in the text and placed in a separate section in the vicinity of the text to which they refer.

## 1. INTRODUCTION

Oceanographic data were obtained during the geoscience cruise on MV Nella Dan, January-March 1982. The cruise covered the Southern Ocean from 66°S to the Antarctic coast and between 60°E and 78°E. The cruise track showing hydrographic stations is given in Figure 1 and CTD stations are shown in Figure 2. The cruise track was established for the primary task of a seismic survey (Stagg, Ramsay and Whitworth 1983; Stagg 1985) and oceanographic data were collected on an opportunistic basis. Some of the oceanographic data were published by Quilty, Kerry and Marchant (1985) and other related data by Quilty (1985) and Quilty et. al. (1984).

This Research Note is the second in the series presenting oceanographic data collected since 1980-81.

The oceanographic program was usually subordinate to other programs and so the location, timing and depth of stations was not always ideal for oceanographic purposes.



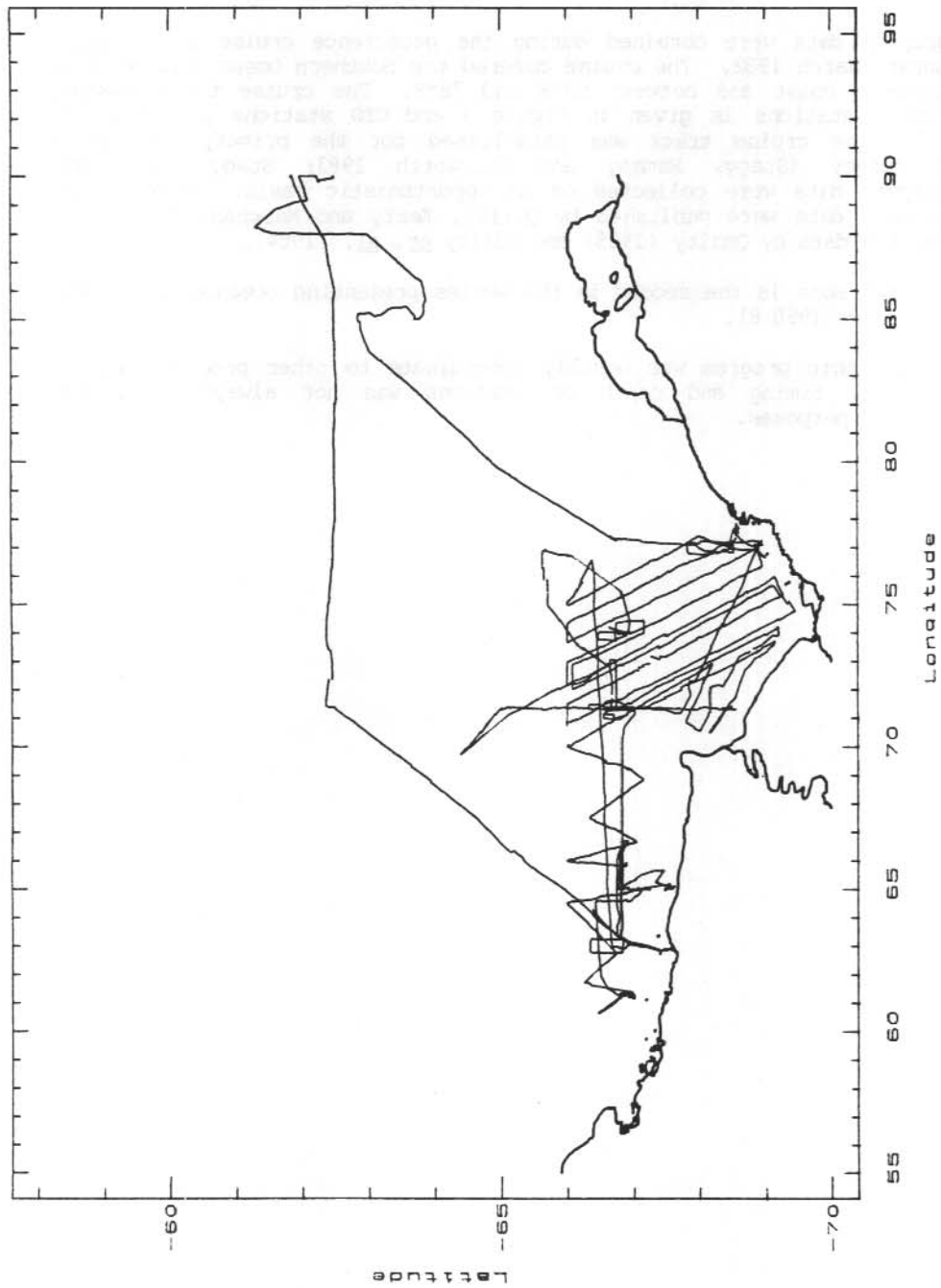


Figure 1. Geoscience cruise track.



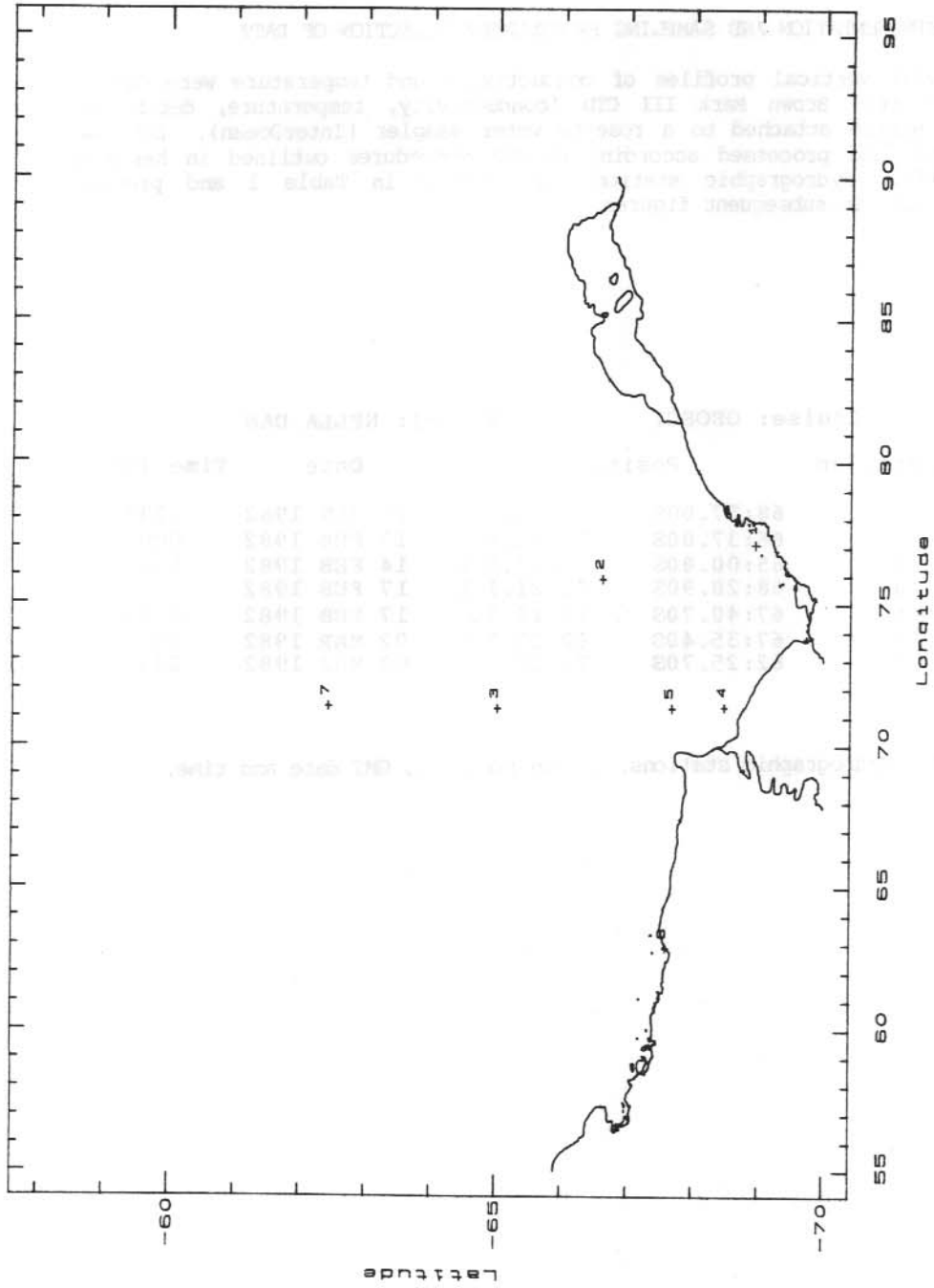


Figure 2. Geoscience CTD stations.

## 2. METHODS

### 2.1 INSTRUMENTATION AND SAMPLING PROCEDURES/COLLECTION OF DATA

Continuous vertical profiles of conductivity and temperature were obtained using a Neil Brown Mark III CTD (conductivity, temperature, depth probe #2568) system attached to a rosette water sampler (InterOcean). Data were collected and processed according to the procedures outlined in Kerry *et. al.* 1987. Hydrographic stations are listed in Table 1 and presented graphically in subsequent figures.

Cruise: GEOSCI		Vessel: NELLA DAN		
CTD Station	Position	Date	Time (GMT)	
1	68:57.00S 77:05.50E	20 JAN 1982	1730	
2	66:37.00S 75:52.00E	13 FEB 1982	0000	
3	65:00.80S 71:17.50E	14 FEB 1982	1050	
4	68:28.90S 71:21.10E	17 FEB 1982	0000	
5	67:40.70S 71:18.70E	17 FEB 1982	0000	
6	67:35.40S 62:51.70E	02 MAR 1982	0915	
7	62:25.70S 71:22.80E	03 MAR 1982	2330	

Table 1. Hydrographic stations, giving position, GMT date and time.

### 3. PRESENTATION OF RESULTS

The header information for all profile and data listings consists of cruise and station number, GMT date and time, position, CTD depth and bottom depth. The data listing for each station presents values for temperature, salinity and sigma-t at NODC standard depths and shallowest observed depth. A t/s profile for all stations is given in Figure 3, as well as individual stations. CTD profiles are presented in two sections, 0-600 m and 600 m - bottom.

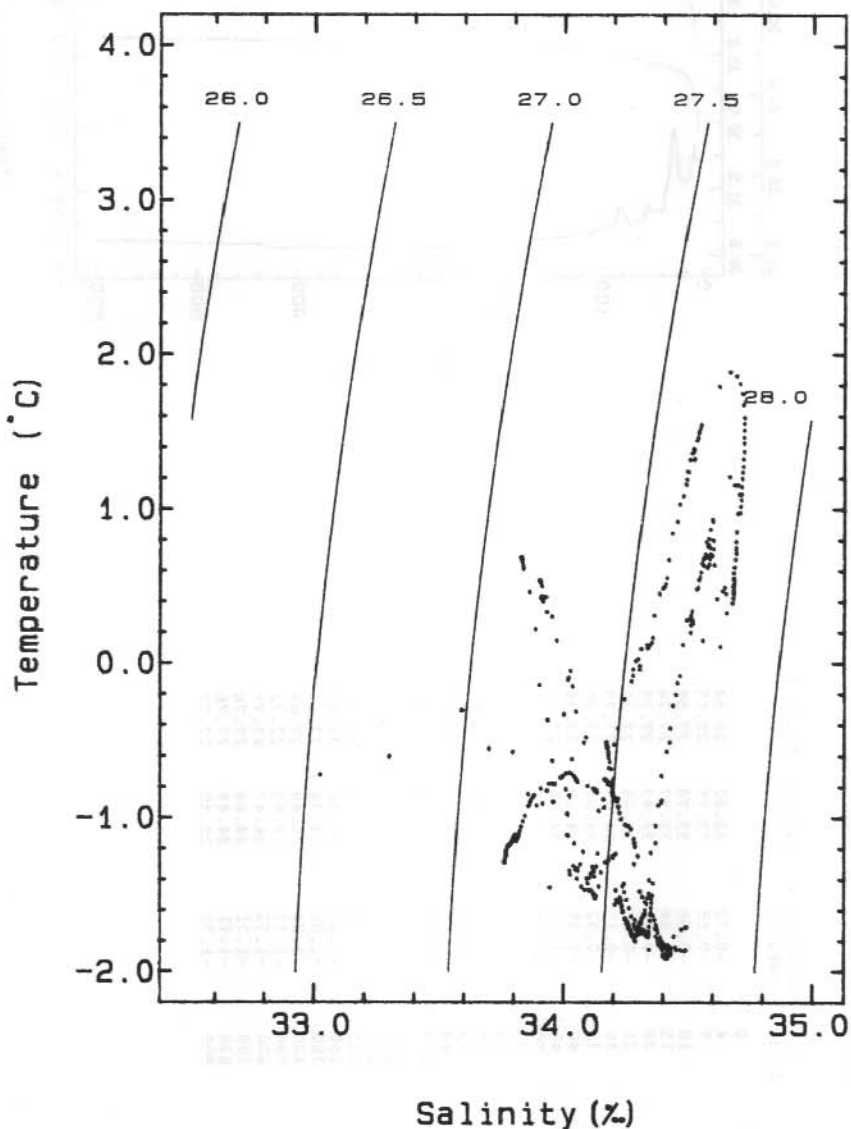
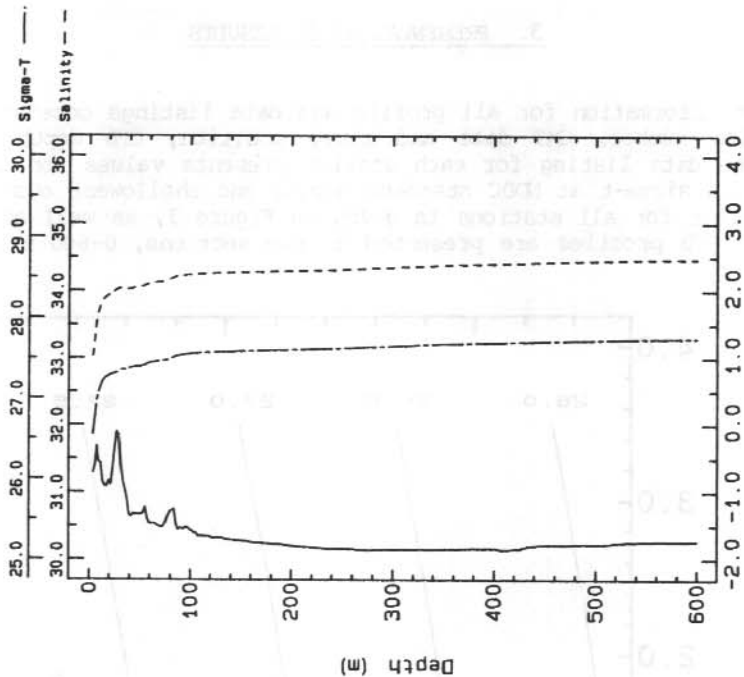


Figure 3. T/S data from all stations.

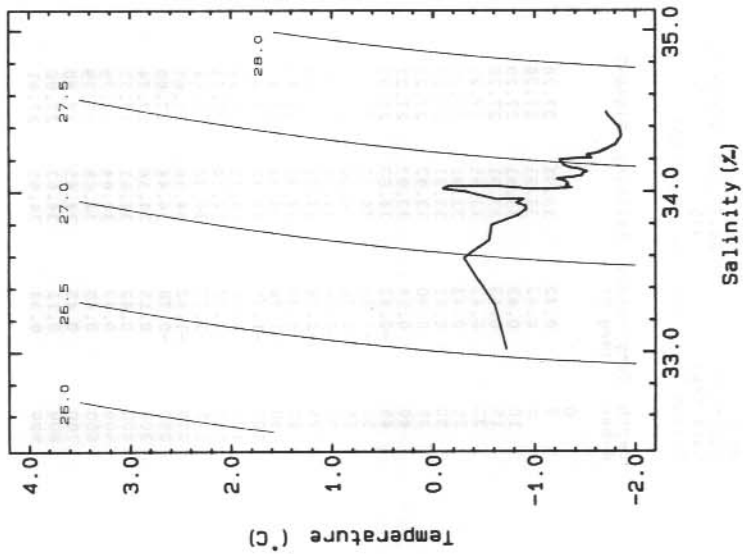
Cruise : GEOSCI  
 Station number : 1  
 Date : 20 JAN 1982  
 Start Time : 1730 GMT  
 Ship : NELLA DAN  
 Position : 68:57.00S 77:05.50E  
 Cast Depth (m) : 904  
 Bottom Depth (m) : Not Recorded

Cruise : GEOSCI Station 1  
 20 JAN 1982 1730 GMT  
 Latitude 68:57.00S  
 Longitude 77:05.50E  
 Depth: CTD 904 m Bottom NR

Depth d bar	Temperature (deg C)	Salinity	Sigma-T
0	-0.72	33.02	26.54
4	-0.66	33.16	26.65
5	-0.56	33.70	27.08
10	-0.88	33.87	27.24
15	-0.82	33.93	27.28
20	-0.48	33.98	27.30
25	-0.15	34.03	27.33
30	-0.92	34.02	27.35
35	-1.35	34.02	27.38
40	-1.33	34.04	27.39
45	-1.33	34.05	27.40
50	-1.47	34.10	27.44
60	-1.52	34.13	27.46
70	-1.48	34.13	27.47
80	-1.29	34.17	27.49
90	-1.53	34.21	27.53
100	-1.57	34.24	27.55
125	-1.68	34.26	27.57
150	-1.73	34.27	27.58
175	-1.77	34.28	27.59
200	-1.80	34.29	27.60
250	-1.85	34.31	27.62
300	-1.86	34.34	27.65
400	-1.84	34.40	27.69
500	-1.77	34.44	27.73
600	-1.72	34.47	27.75
700	-1.71	34.49	27.76
800	-1.71	34.49	27.76
900	-1.71	34.49	27.77

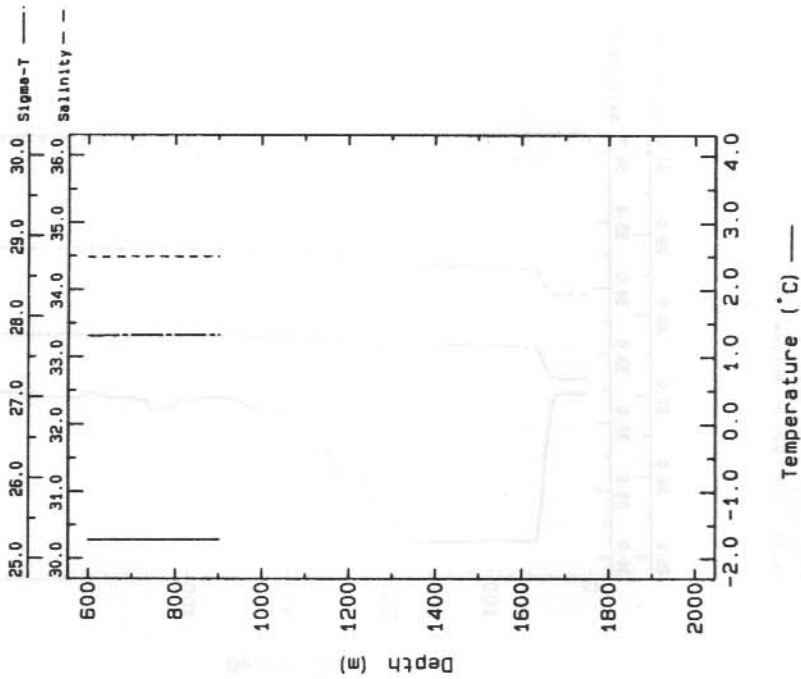


Cruise: GEOSCI Station: 1  
 20 JAN 1982 1730 GMT  
 Latitude : 68:57.00S  
 Longitude: 77:05.50E  
 Depth: CTD 904 m Bottom NR



6

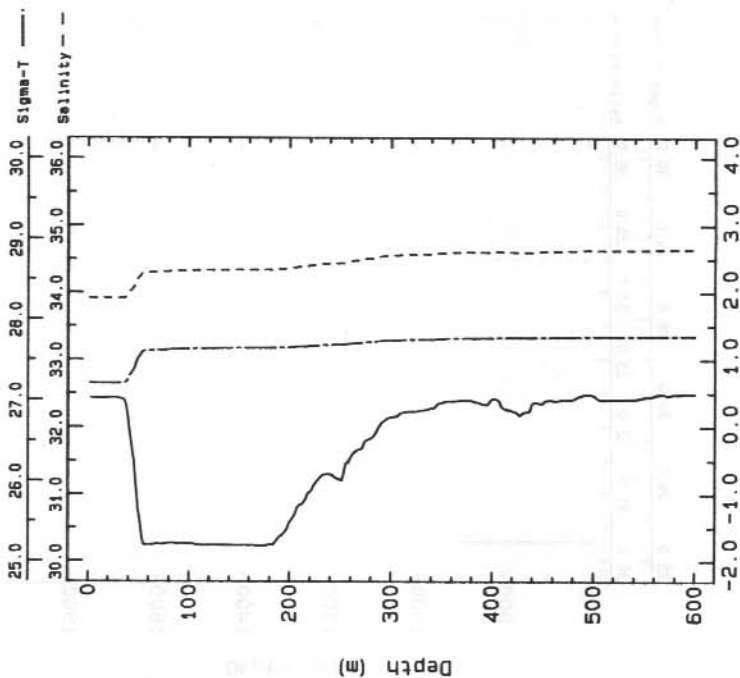
Cruise : GEOSCI Station 1  
 20 JAN 1982 1730 GMT  
 Latitude 68:57.00S  
 Longitude 77:05.50E  
 Depth: CTD 904 m Bottom NR



Cruise : GEOSCI  
 Station number : 2  
 Date : 13 FEB 1982  
 Start Time : 0000 GMT  
 Ship : NELLA DAN  
 Position : 66:37.00S 75:52.00E  
 Cast Depth (m) : 920  
 Bottom Depth (m) : Not Recorded

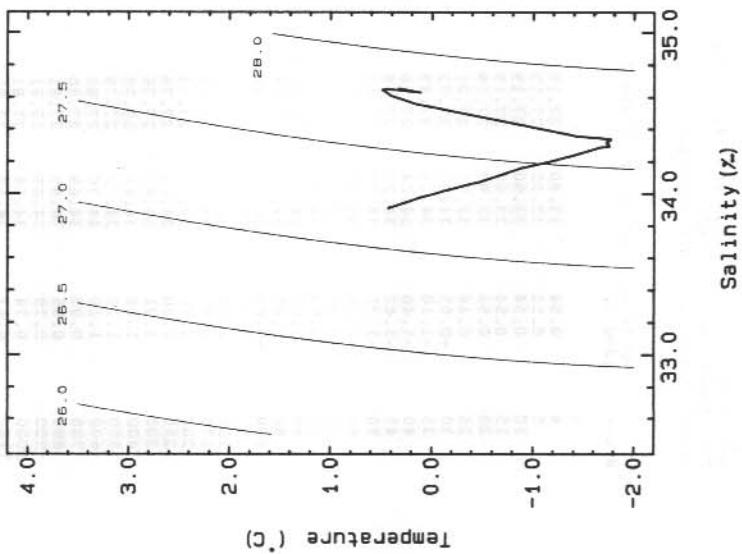
Cruise : GEOSCI Station 2  
 13 FEB 1982 0000 GMT  
 Latitude 66:37.00S  
 Longitude 75:52.00E  
 Depth: CTD 920 m Bottom NA

Depth d bar	Temperature (deg C)	Salinity	Sigma-T
0			
2	0.42	33.91	27.20
5	0.43	33.91	27.20
10	0.43	33.91	27.20
15	0.43	33.91	27.20
20	0.43	33.91	27.20
25	0.43	33.91	27.20
30	0.42	33.91	27.21
35	0.40	33.92	27.21
40	0.14	33.97	27.27
45	-0.42	34.07	27.37
50	-1.24	34.21	27.52
60	-1.76	34.30	27.61
70	-1.74	34.31	27.61
75	-1.74	34.31	27.62
80	-1.73	34.31	27.62
90	-1.74	34.32	27.63
100	-1.75	34.33	27.63
125	-1.76	34.33	27.64
150	-1.77	34.34	27.64
175	-1.77	34.34	27.64
200	-1.42	34.36	27.65
250	-0.78	34.44	27.69
300	0.15	34.56	27.74
400	0.42	34.61	27.77
500	0.47	34.64	27.79
600	0.49	34.65	27.79
700	0.45	34.65	27.80
800	0.11	34.63	27.80
900	0.33	34.65	27.81

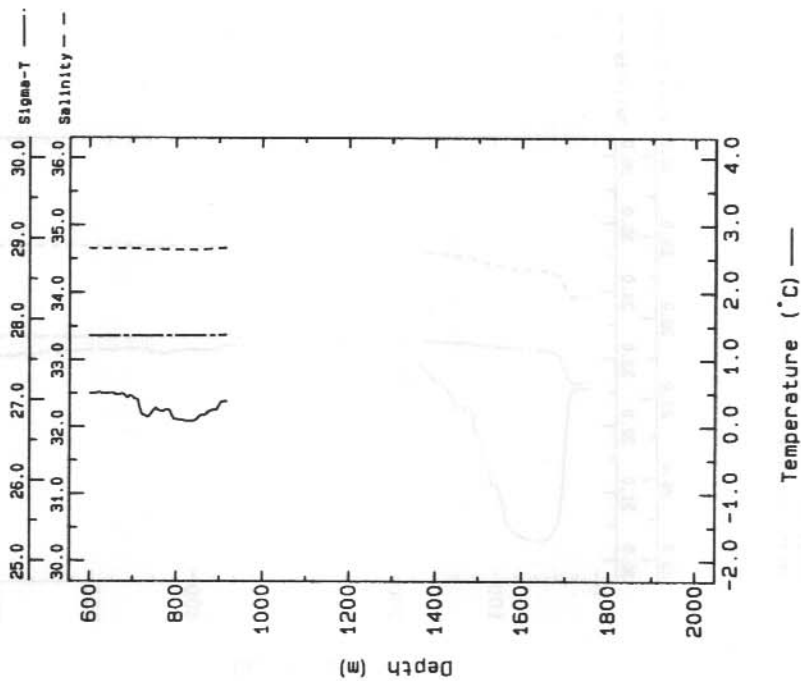


Temperature (°C) —

Cruise: GEOSCI Station: 2  
 13 FEB 1982 0000 GMT  
 Latitude : 66:37.00S  
 Longitude: 75:52.00E  
 Depth: CTD 920 m Bottom NR



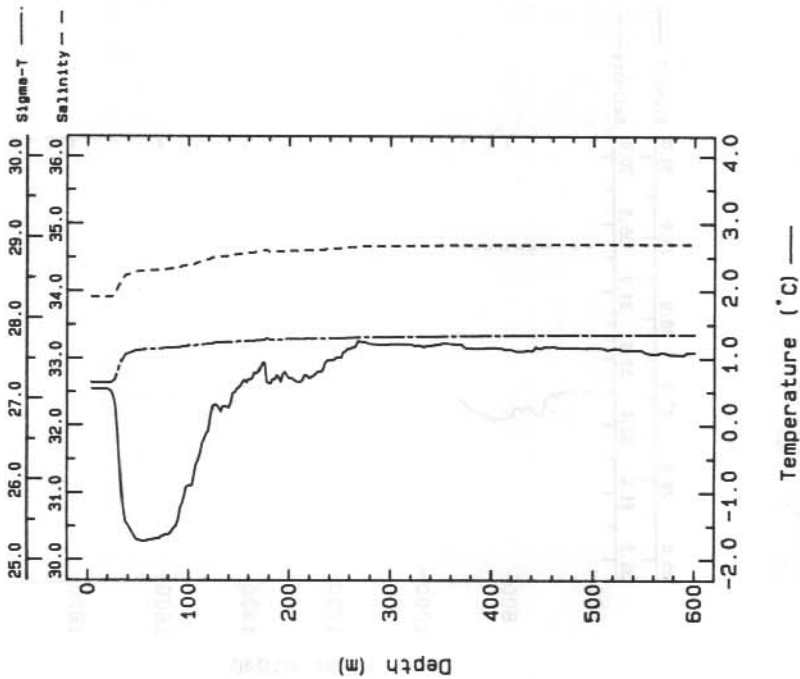
Cruise : GEOSCI Station 2  
 13 FEB 1982 0000 GMT  
 Latitude 66.37.00S  
 Longitude 75.52.00E  
 Depth: CTD 920 m Bottom NR



Cruise : GEOSCI  
 Station number : 3  
 Date : 14 FEB 1982  
 Start Time : 1050 GMT  
 Ship : NELLA DAN  
 Position : 65:00.80S 71:17.50E  
 Cast Depth (m) : 1640  
 Bottom Depth (m) : Not Recorded

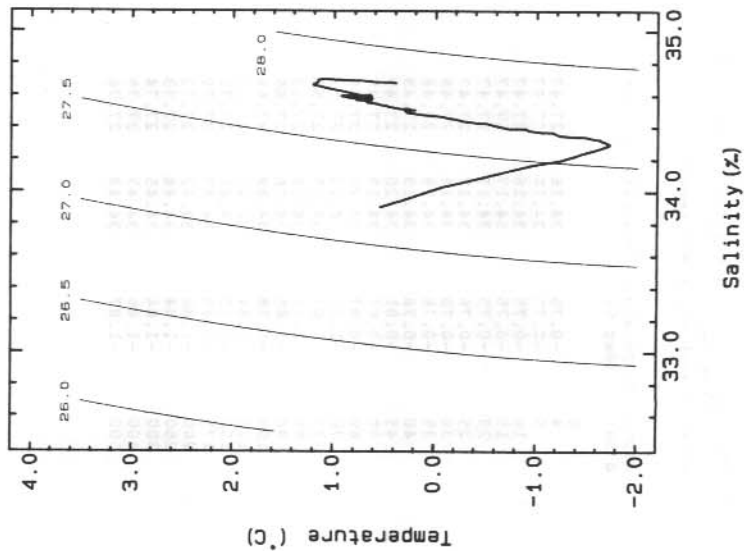
Cruise : GEOSCI Station 3  
 14 FEB 1982 1050 GMT  
 Latitude 65:00.80S  
 Longitude 71:17.50E  
 Depth: CTD 1640 m Bottom NR

Depth d bar	Temperature (deg C)	Salinity	Sigma-T
0			
4	0.54	33.90	27.19
5	0.54	33.90	27.19
10	0.54	33.90	27.19
15	0.54	33.90	27.19
20	0.53	33.90	27.19
25	0.46	33.92	27.21
30	-0.05	34.03	27.32
35	-1.10	34.18	27.49
40	-1.48	34.24	27.56
45	-1.62	34.27	27.58
50	-1.71	34.29	27.60
60	-1.71	34.30	27.61
70	-1.68	34.31	27.62
75	-1.65	34.32	27.62
80	-1.63	34.33	27.63
90	-1.40	34.34	27.64
100	-0.89	34.39	27.66
125	0.30	34.50	27.69
150	0.56	34.55	27.71
175	0.93	34.60	27.73
200	0.70	34.59	27.74
250	1.00	34.63	27.75
300	1.21	34.67	27.76
400	1.16	34.68	27.78
500	1.16	34.70	27.79
600	1.10	34.70	27.80
700	0.97	34.69	27.80
800	0.85	34.69	27.81
900	0.79	34.69	27.81
1000	0.74	34.69	27.81
1100	0.67	34.69	27.81
1200	0.59	34.68	27.81
1300	0.54	34.68	27.82
1400	0.50	34.68	27.82
1500	0.45	34.68	27.82

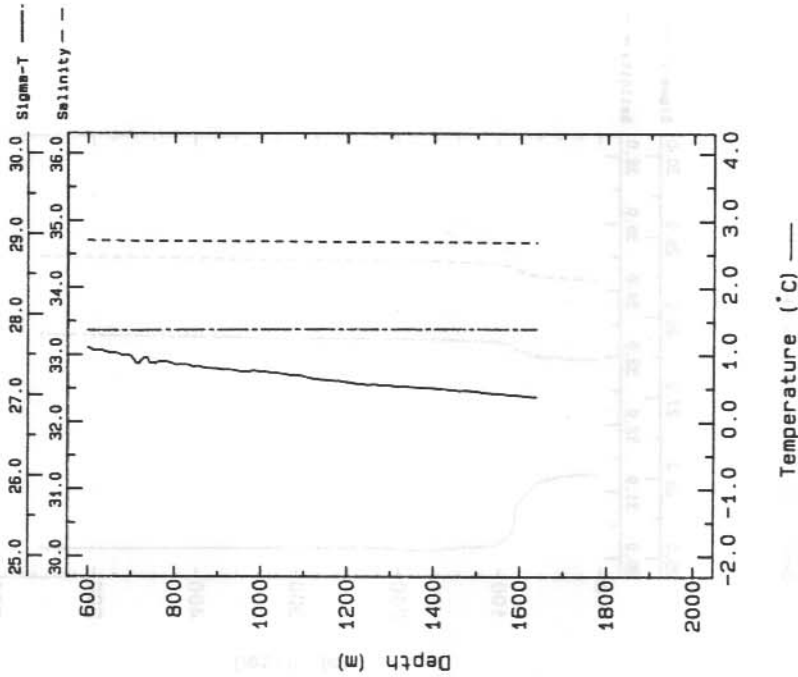




Cruise: GEOSCI Station: 3  
 14 FEB 1982 1050 GMT  
 Latitude: 65:00.80S  
 Longitude: 71:17.50E  
 Depth: CTD 1640 m Bottom NR



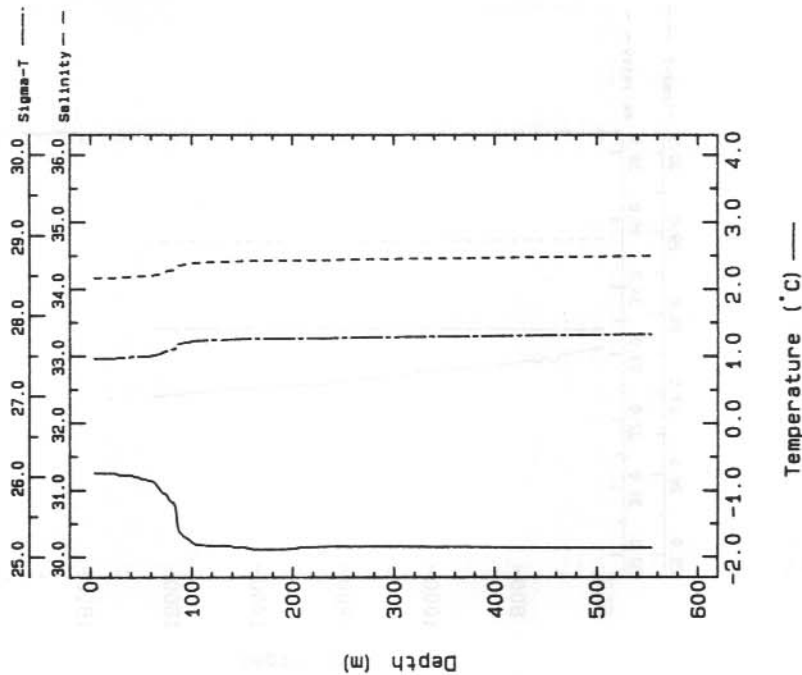
Cruise: GEOSCI Station: 3  
 14 FEB 1982 1050 GMT  
 Latitude: 65:00.80S  
 Longitude: 71:17.50E  
 Depth: CTD 1640 m Bottom NR



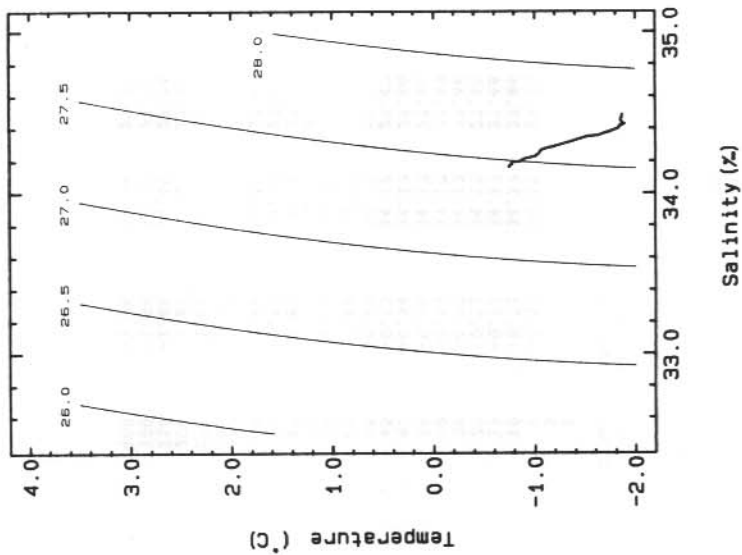
Cruise : GEOSCI  
 Station number : 4  
 Date : 17 FEB 1982  
 Start Time : 0000 GMT  
 Ship : NELLA DAN  
 Position : 68:28.90S 71:21.10E  
 Cast Depth (m) : 556  
 Bottom Depth (m) : Not Recorded

Cruise : GEOSCI Station 4  
 17 FEB 1982 0000 GMT  
 Latitude 68:28.90S  
 Longitude 71:21.10E  
 Depth: CTD 556 m Bottom NR

Depth d bar	Temperature (deg C)	Salinity	Sigma-T
0	-0.75	34.16	27.47
4	-0.75	34.16	27.47
5	-0.75	34.16	27.47
10	-0.75	34.17	27.47
15	-0.75	34.17	27.47
20	-0.75	34.17	27.47
25	-0.76	34.17	27.47
30	-0.78	34.18	27.48
35	-0.78	34.18	27.48
40	-0.78	34.19	27.49
45	-0.81	34.20	27.49
50	-0.83	34.19	27.49
60	-0.87	34.20	27.50
70	-1.01	34.23	27.53
75	-1.07	34.27	27.56
80	-1.17	34.29	27.58
90	-1.66	34.36	27.66
100	-1.78	34.39	27.68
125	-1.84	34.41	27.70
150	-1.85	34.42	27.71
175	-1.89	34.43	27.72
200	-1.88	34.43	27.72
250	-1.84	34.44	27.73
300	-1.84	34.45	27.74
400	-1.86	34.47	27.75
500	-1.87	34.49	27.76



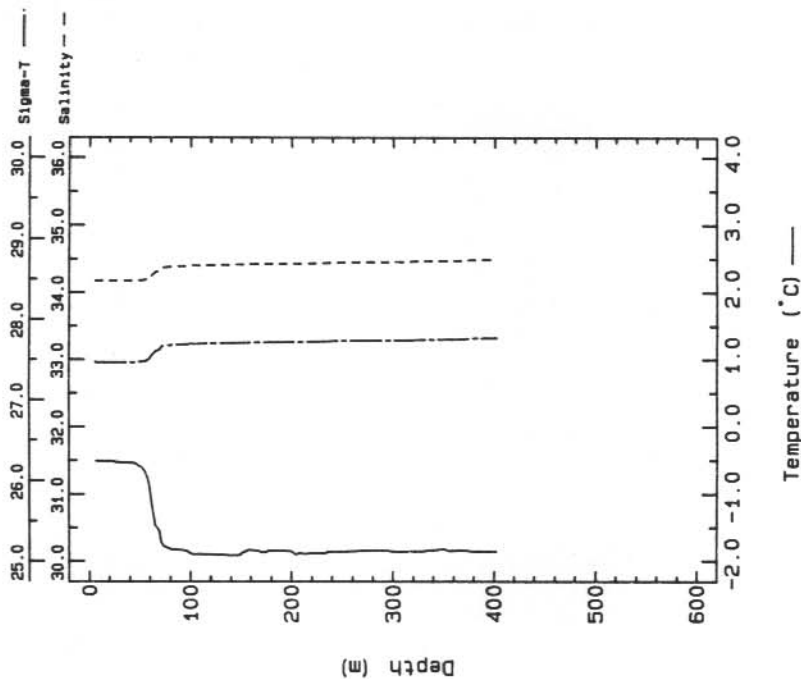
Cruise: GEOSCI Station: 4  
 17 FEB 1982 0000 GMT  
 Latitude : 68:28.90S  
 Longitude: 71:21.10E  
 Depth: CTD 556 m Bottom NR



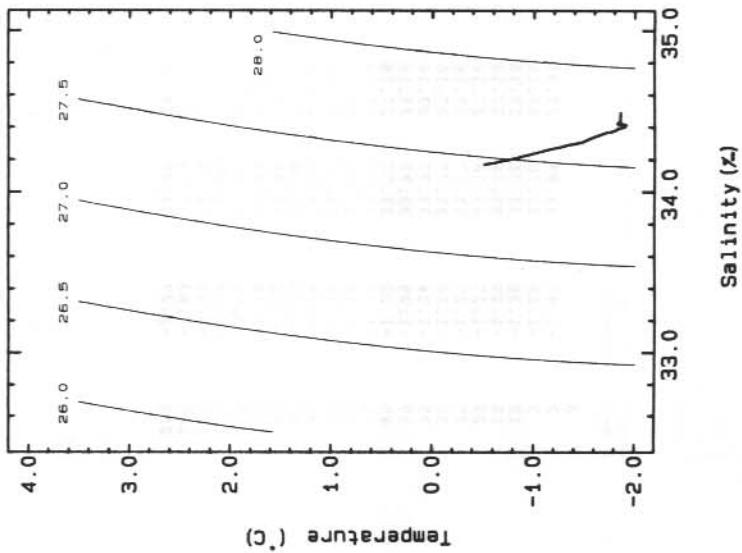
Cruise : GEOSCI  
 Station number : 5  
 Date : 17 FEB 1982  
 Start Time : 0000 GMT  
 Ship : NELLA DAN  
 Position : 67:40.70S 71:18.70E  
 Cast Depth (m) : 404  
 Bottom Depth (m) : Not Recorded

Cruise : GEOSCI Station 5  
 17 FEB 1982 0000 GMT  
 Latitude 67:40.70S  
 Longitude 71:18.70E  
 Depth: CTD 404 m Bottom NR

Depth d bar	Temperature (deg C)	Salinity	Sigma-T
0			
5			
6	-0.51	34.17	27.46
10	-0.51	34.17	27.46
15	-0.51	34.17	27.46
20	-0.51	34.17	27.46
25	-0.52	34.17	27.46
30	-0.54	34.17	27.47
35	-0.54	34.17	27.46
40	-0.54	34.17	27.46
45	-0.55	34.17	27.47
50	-0.60	34.18	27.47
60	-0.88	34.22	27.51
70	-1.55	34.33	27.63
75	-1.78	34.37	27.67
80	-1.82	34.38	27.68
90	-1.84	34.39	27.69
100	-1.89	34.40	27.69
125	-1.91	34.41	27.70
150	-1.90	34.42	27.71
175	-1.86	34.42	27.71
200	-1.85	34.43	27.72
250	-1.86	34.45	27.74
300	-1.86	34.45	27.74
400	-1.86	34.49	27.77



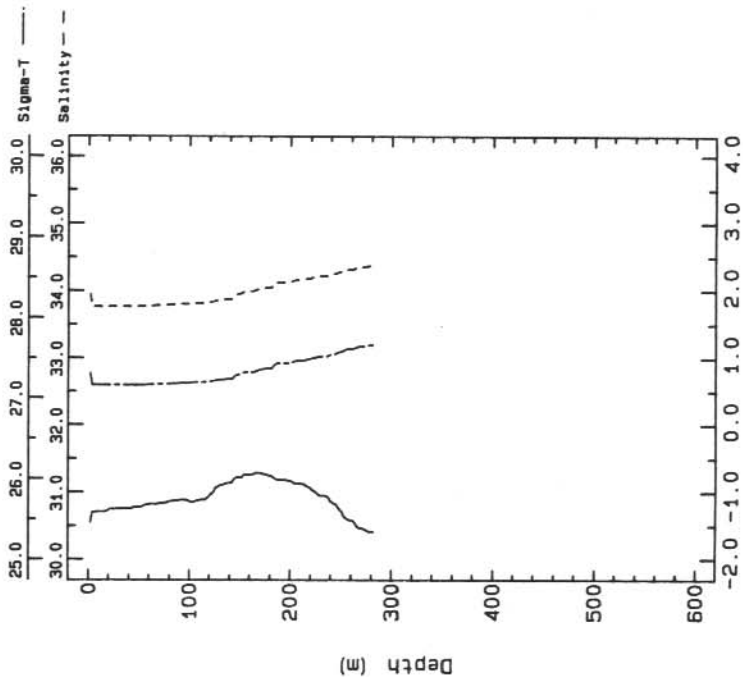
Cruise: GEOSCI Station: 5  
 17 FEB 1982 0000 GMT  
 Latitude : 67: 40.70S  
 Longitude: 71: 18.70E  
 Depth: CTD 404 m Bottom NR



Cruise : GEOSCI  
 Station number : 6  
 Date : 2 MAR 1982  
 Start Time : 0915 GMT  
 Ship : NELLA DAN  
 Position : 67:35.40S 62:51.70E  
 Cast Depth (m) : 284  
 Bottom Depth (m) : Not Recorded

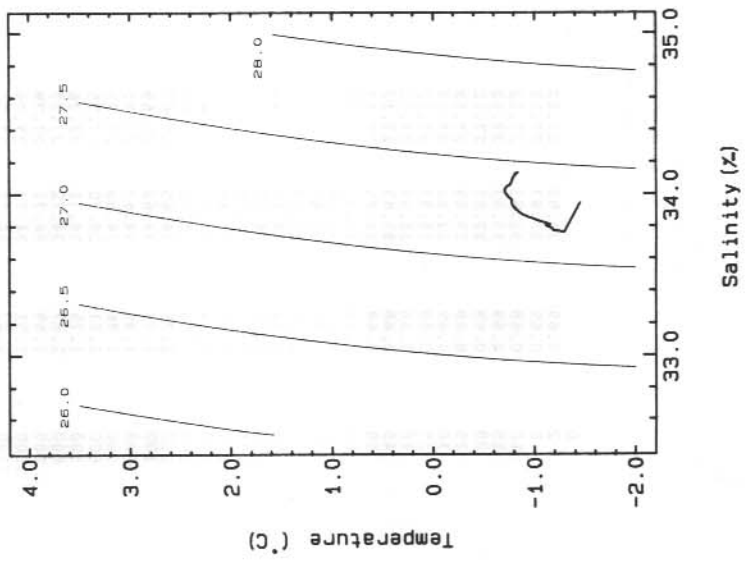
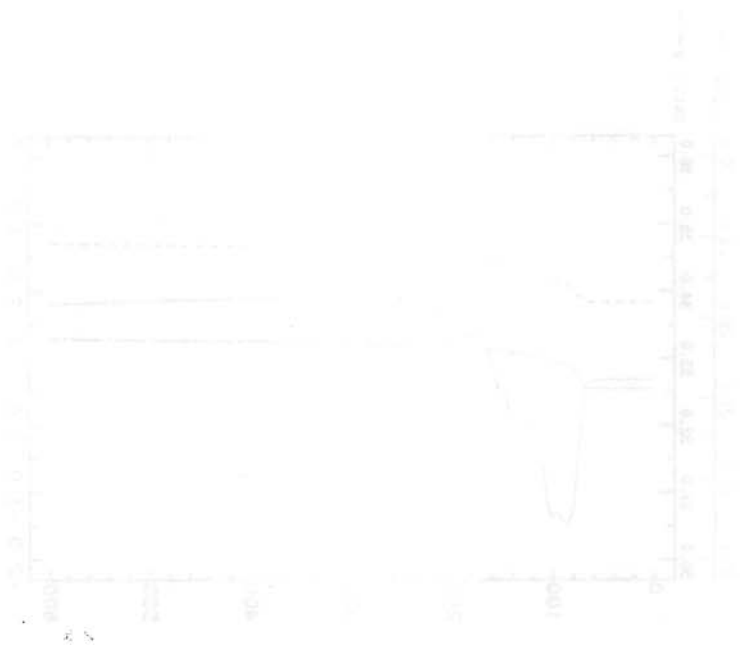
Cruise : GEOSCI Station 6  
 02 MAR 1982 0915 GMT  
 Latitude 67:35.40S  
 Longitude 62:51.70E  
 Depth: CTD 284 m Bottom NR

Depth d bar	Temperature (deg C)	Salinity	Sigma-T
0			
2	-1.45	33.94	27.31
5	-1.29	33.76	27.16
10	-1.29	33.76	27.16
15	-1.29	33.76	27.16
20	-1.27	33.76	27.16
25	-1.25	33.77	27.16
30	-1.24	33.77	27.16
35	-1.24	33.77	27.16
40	-1.25	33.77	27.16
45	-1.22	33.77	27.16
50	-1.22	33.77	27.16
60	-1.18	33.78	27.17
70	-1.16	33.79	27.18
75	-1.16	33.79	27.18
80	-1.13	33.79	27.18
90	-1.12	33.80	27.19
100	-1.14	33.81	27.19
125	-0.96	33.85	27.22
150	-0.78	33.96	27.30
175	-0.73	34.04	27.37
200	-0.83	34.13	27.44
250	-1.27	34.28	27.58



Temperature (°C) —

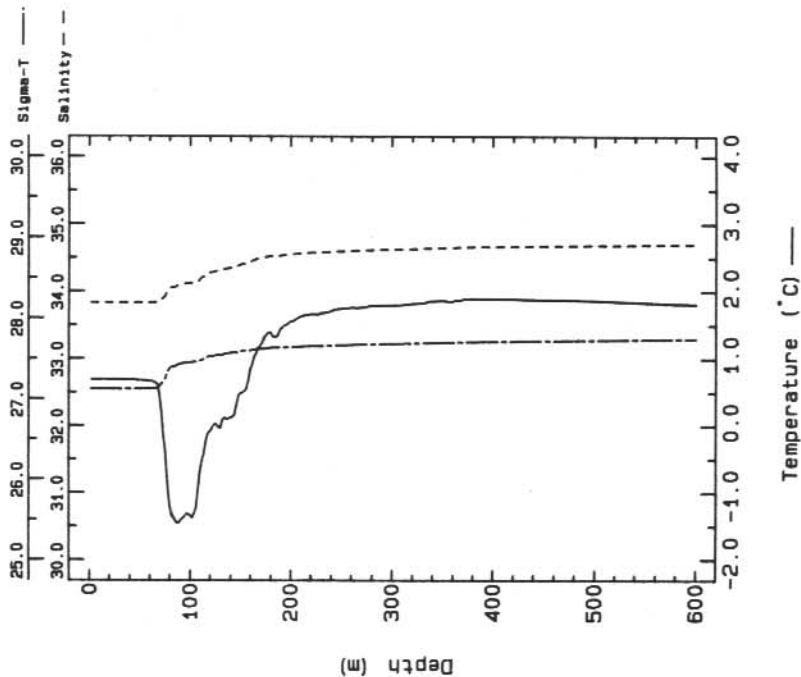
Cruise: GEOSCI Station: 6  
 02 MAR 1982 0915 GMT  
 Latitude : 67:35.40S  
 Longitude: 62:51.70E  
 Depth: CTD 284 m Bottom NR



Cruise : GEOSCI  
 Station number : 7  
 Date : 3 MAR 1982  
 Start Time : 2330 GMT  
 Ship : NELLA DAN  
 Position : 62:25.70S 71:22.80E  
 Cast Depth (m) : 1640  
 Bottom Depth (m) : Not Recorded

Cruise : GEOSCI Station 7  
 03 MAR 1982 2330 GMT  
 Latitude 62:25.70S  
 Longitude 71:22.80E  
 Depth: CTD 1640 m Bottom NR

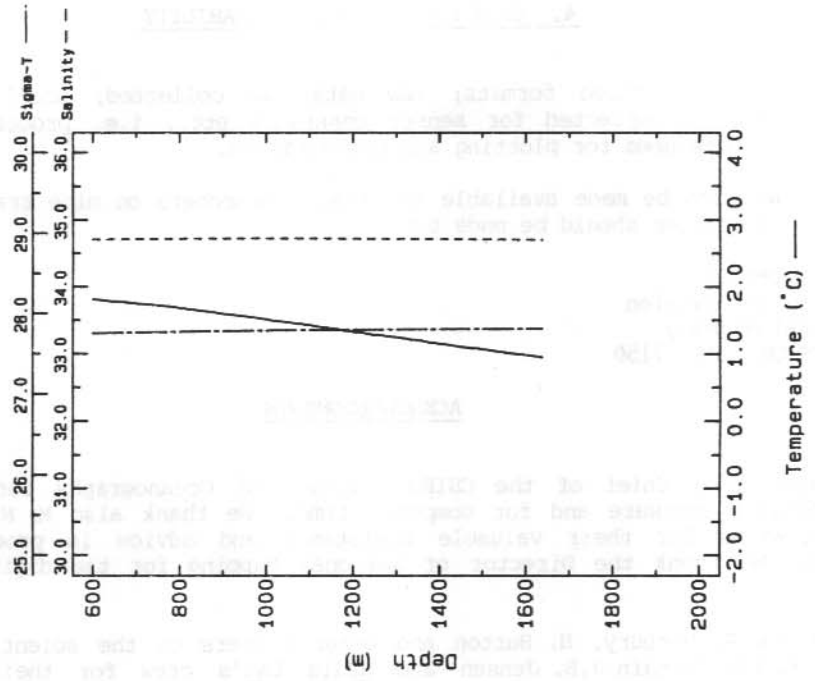
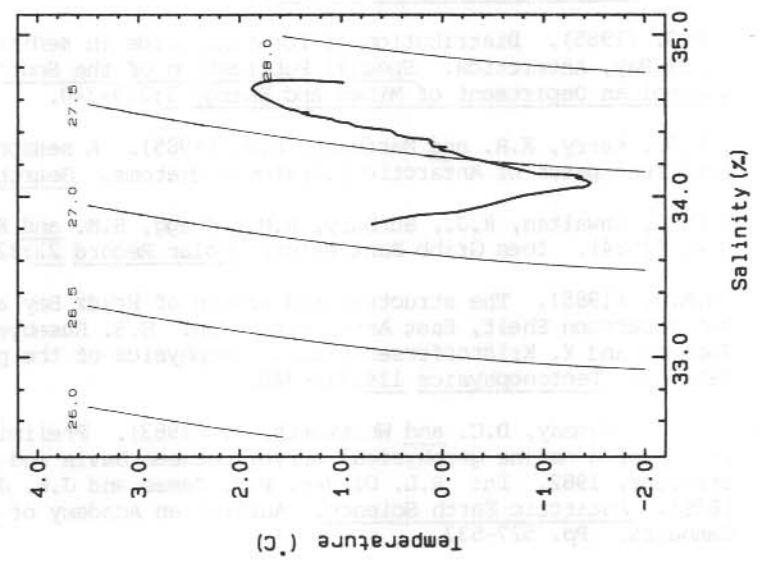
Depth d bar	Temperature (Deg C)	Salinity	Sigma-T
0			
2	0.69	33.82	27.12
5	0.69	33.83	27.12
10	0.68	33.83	27.12
15	0.69	33.83	27.12
20	0.69	33.83	27.12
25	0.69	33.83	27.12
30	0.69	33.83	27.12
35	0.68	33.83	27.12
40	0.68	33.83	27.12
45	0.68	33.83	27.12
50	0.68	33.83	27.12
60	0.66	33.83	27.13
70	0.46	33.86	27.16
75	-0.26	33.92	27.25
80	-1.17	34.04	27.38
90	-1.42	34.10	27.44
100	-1.35	34.12	27.45
125	0.02	34.30	27.54
150	0.49	34.40	27.59
175	1.34	34.51	27.63
200	1.55	34.55	27.65
250	1.75	34.60	27.67
300	1.79	34.62	27.69
400	1.89	34.67	27.71
500	1.86	34.69	27.73
600	1.81	34.70	27.75
700	1.75	34.71	27.76
800	1.67	34.72	27.77
900	1.59	34.72	27.78
1000	1.51	34.72	27.79
1100	1.42	34.72	27.79
1200	1.32	34.72	27.80
1300	1.24	34.71	27.80
1400	1.14	34.71	27.80
1500	1.06	34.71	27.81





Cruise: GEOSCI Station: 7  
 03 MAR 1982 2330 GMT  
 Latitude : 62:25.70S  
 Longitude: 71:22.80E  
 Depth: CTD 1640 m Bottom NR

Cruise: GEOSCI Station 7  
 03 MAR 1982 2330 GMT  
 Latitude : 62:25.70S  
 Longitude: 71:22.80E  
 Depth: CTD 1640 m Bottom NR



#### 4. DATA STORAGE AND AVAILABILITY

Data exist in three formats; raw data, as collected; uncalibrated and de-spiked but corrected for sensor constants etc., i.e. processed; and 2 dbar averages used for plotting and presentation.

Data can also be made available to other researchers on nine track magnetic tape. Enquiries should be made to:

The Director  
Antarctic Division  
Channel Highway  
KINGSTON TAS 7150

#### ACKNOWLEDGMENTS

We thank the Chief of the CSIRO Division of Oceanography for access to processing software and for computer time. We thank also Mr N. White and Dr D. Watts for their valuable assistance and advice in processing the data. We thank the Director of National Mapping for the digital mapping data.

We thank R. Burbury, H. Burton and other members of the scientific staff, the Master Captain J.B. Jensen and Nella Dan's crew for their help and cooperation.

#### REFERENCES

- Kerry, K., Woehler, E.J., Wright, S. and Dong, Z. (1987). Oceanographic data: Prydz Bay region - FIBEX, MV Nella Dan, January-March 1981. ANARE Research Notes Number 49.
- Quilty, P.G. (1985). Distribution of foraminiferids in sediments of Prydz Bay, Antarctica. Special Publication of the South Australian Department of Mines and Energy 5:329-340.
- Quilty, P.G., Kerry, K.R. and Marchant, H.J. (1985). A seasonally recurrent patch of Antarctic planktonic diatoms. Search 16:48.
- Quilty, P.G., Thwaites, R.J., Burbury, R.M., Stagg, H.M. and Krummel, R.W. (1984). Does Gribb Bank exist? Polar Record 22:325-326.
- Stagg, H.M.J. (1985). The structure and origin of Prydz Bay and Mac.Robertson Shelf, East Antarctica. In: E.S. Husebye, G.L. Johnson and Y. Kristoffersen (Eds). Geophysics of the polar regions. Tectonophysics 114:315-340.
- Stagg, H.M.J., Ramsay, D.C. and Whitworth, R. (1983). Preliminary report of a marine geophysical survey between Davis and Mawson stations, 1982. In: R.L. Oliver, P.R. James and J.B. Jago (Eds). Antarctic Earth Science. Australian Academy of Science, Canberra. Pp. 527-532.