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46

ADBEX III cruise west of the Prydz Bay region, 1985:  
nutrient data

S.E. Humphries

ANTARCTIC DIVISION  
DEPARTMENT OF SCIENCE

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ADBEX III CRUISE NUTRIENT DATA

by

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ABSTRACT

Nitrate, phosphate and silicate concentrations measured on the ADBEX III cruise to an area west of the Prydz Bay region (49° to 65°E and 55° to 66°S) from October to December 1985, are plotted with depth and the raw data are tabulated. Nitrite and manganese values are also tabulated. The cruise track, the location of the sampling stations and the average concentration of nitrate, phosphate and silicate in the top 100 m is mapped.



## 1. INTRODUCTION

The ADBEX III cruise between 6 October and 13 December 1985, to the area between 49° and 65°E and 55° and 66°S, west of the Prydz Bay region, is the fifth Antarctic Division cruise to contribute to the international BIOMASS (Biological Investigation of Marine Antarctic Systems and Stocks) program. The ship, MV Nella Dan, was beset on 27 October 1985 for forty-eight days and stations from thirty onwards were done during this time. The changes in ship's position were due solely to drift.

Nutrient data were collected at twenty-five of the fifty hydrographic stations (Table 1) to provide information for the interpretation of phytoplankton distribution and abundance. The sampling locations and depths were not therefore selected on the basis of nutrient-related considerations.

The concentration of nitrate, phosphate and silicate is plotted with depth for each station to a depth of 200 m and for deeper casts, a second plot is shown. The sigma-t profile, where available, is included on each plot to show the water column structure at the time of sampling. At a few stations (1, 9, 26, 34, 39), duplicate or triplicate samples were taken from the same depth. The replicate concentrations are shown on the plots and the line connecting the points between depths was drawn through the mean value. Nitrite and manganese values were too low to plot and these are shown only in the tables.

In addition to the depth profiles, the average concentration to 100 m of nitrate, phosphate and silicate is mapped to give a first-order approximation of the horizontal pattern of nutrient distribution in the upper layers.

## 2. METHODS

Water samples were collected in conjunction with the CTD unit, using a rosette sampler with 5 L Niskin bottles. Sub-samples of 250 mL were filtered through GF/F glass fibre filters, transferred to rinsed polyethylene bottles and immediately frozen for later analysis in Australia.

Analyses were carried out by the Australian Government Analytical Laboratories with the standard methods of Grasshoff, K., Ehrhardt, M., Kremling, K. (1983) Methods of Seawater Analysis (Second Edition); Verlag Chemie.





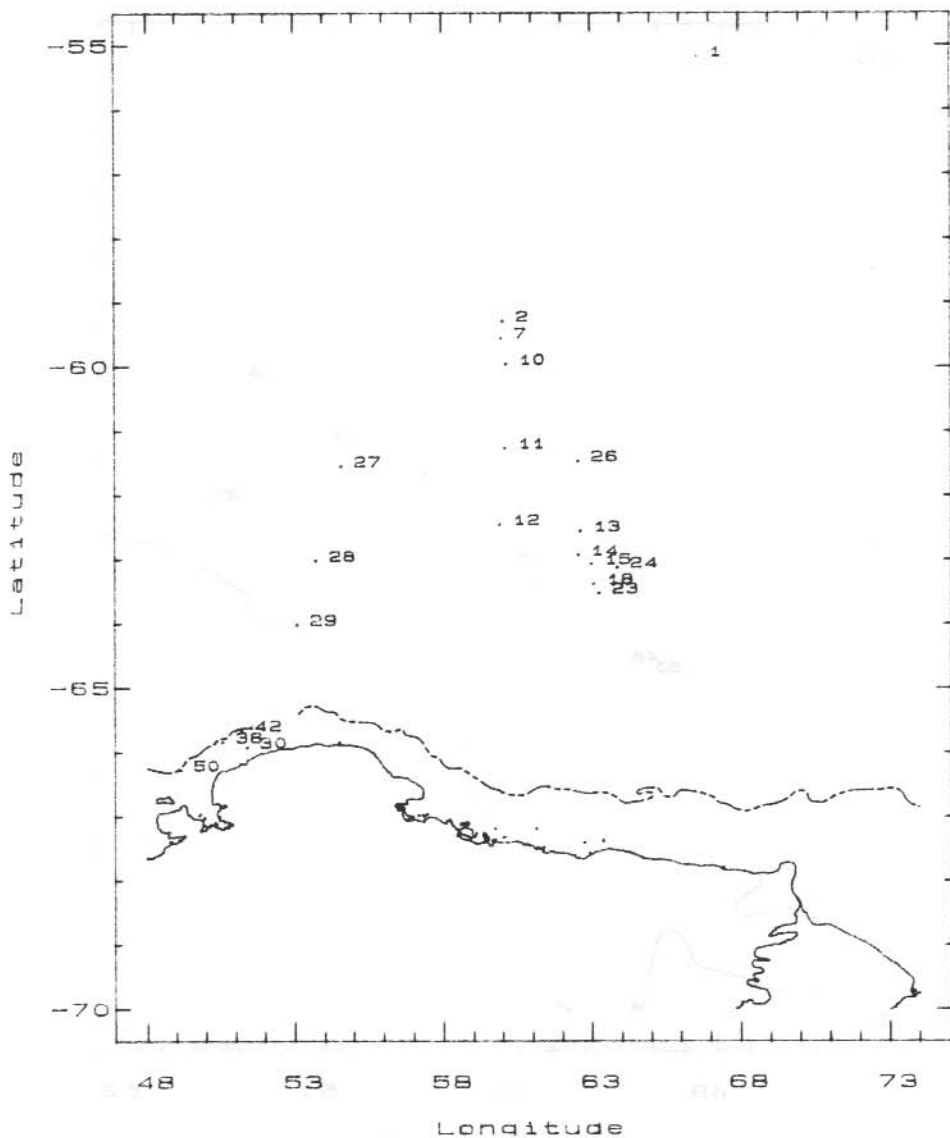


Figure 2a. Location of CTD stations. Due to the proximity of some stations to each other, it was not possible to show some stations on the map, but their exact locations are given in Table 1. The station numbers of the excluded stations are given here in brackets following the number of the proximate mapped station: 7(8), 10(9), 15(16, 17, 19 to 22), 26(25); details of stations 30 and following are shown in Figure 2b.

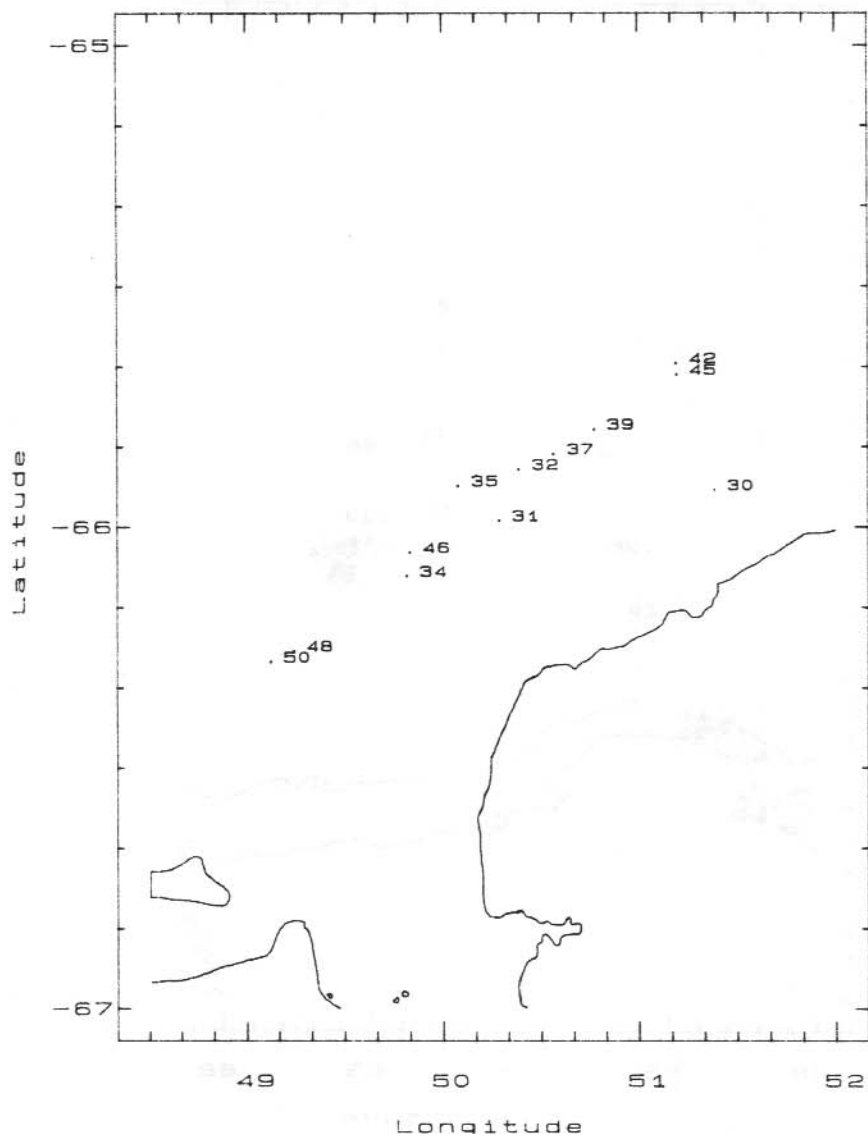


Figure 2b. Location of CTD stations in the region where Nella Dan was beset; the area within the triangle of stations marked by stations 30, 42 and 50 in Figure 2a. The excluded stations are given here following the format described for Figure 2a: 32(33), 35(36), 37(38), 39(41), 42(43, 44), 46(47), 48(49).

Table 1. List of CTD stations on ADBEX III. The stations at which nutrient samples were taken are marked with an asterisk (\*). Stations from 30 onwards were in the region where Nella Dan was beset.

CTD Station	Position		Date	Time (GMT)
* 1	55:10.07S	66:35.49E	06 OCT 1985	0417
* 2	59:17.35S	60:00.73E	08 OCT 1985	0022
3	59:19.15S	60:01.43E	08 OCT 1985	0121
4	59:19.29S	59:58.19E	08 OCT 1985	0525
* 5	59:27.79S	60:00.77E	08 OCT 1985	0644
6	59:31.54S	60:00.88E	08 OCT 1985	0746
7	59:33.16S	59:57.64E	08 OCT 1985	0830
8	59:34.88S	59:58.07E	08 OCT 1985	0914
* 9	59:39.61S	60:03.95E	08 OCT 1985	1019
* 10	59:57.66S	60:07.13E	08 OCT 1985	1339
* 11	61:15.87S	60:04.88E	09 OCT 1985	1045
* 12	62:27.14S	59:53.78E	10 OCT 1985	1239
* 13	62:33.36S	62:37.16E	12 OCT 1985	1455
14	62:56.05S	62:31.97E	13 OCT 1985	1443
* 15	63:04.03S	62:59.04E	14 OCT 1985	1117
* 16	63:25.51S	62:51.08E	15 OCT 1985	1034
17	63:22.69S	63:02.53E	16 OCT 1985	0509
* 18	63:22.81S	63:03.86E	16 OCT 1985	0703
19	63:22.78S	63:06.66E	16 OCT 1985	0959
20	63:22.64S	63:07.14E	16 OCT 1985	1037
21	63:21.63S	63:09.89E	16 OCT 1985	1321
22	63:21.52S	63:10.29E	16 OCT 1985	1344
* 23	63:31.64S	63:14.09E	18 OCT 1985	0356
* 24	63:07.41S	63:51.61E	18 OCT 1985	1746
25	61:27.75S	62:33.47E	20 OCT 1985	1528
* 26	61:27.95S	62:31.60E	20 OCT 1985	1622
* 27	61:32.93S	54:34.18E	22 OCT 1985	0317
* 28	63:01.20S	53:42.87E	23 OCT 1985	0457
* 29	64:00.77S	53:04.32E	24 OCT 1985	1346
* 30	65:55.41S	51:22.89E	27 OCT 1985	1442
31	65:59.21S	50:17.08E	30 OCT 1985	1310
* 32	65:52.80S	50:23.13E	04 NOV 1985	0538
33	65:53.62S	50:23.12E	04 NOV 1985	0713
* 34	66:06.09S	49:48.74E	06 NOV 1985	1648
35	65:54.87S	50:04.58E	09 NOV 1985	0723
* 36	65:54.80S	50:04.67E	09 NOV 1985	0737
* 37	65:50.88S	50:33.91E	19 NOV 1985	1313
38	65:50.49S	50:33.32E	19 NOV 1985	1421
* 39	65:47.80S	50:46.28E	22 NOV 1985	0702
41	65:47.75S	50:46.38E	22 NOV 1985	0800
* 42	65:39.55S	51:11.46E	25 NOV 1985	0905
43	65:40.61S	51:11.35E	25 NOV 1985	1308
44	65:40.64S	51:11.34E	25 NOV 1985	1315
45	65:40.99S	51:11.48E	25 NOV 1985	1442
46	66:03.15S	49:49.78E	29 NOV 1985	1310
47	66:03.13S	49:49.85E	29 NOV 1985	1356
* 48	66:15.41S	49:14.20E	06 DEC 1985	0939
49	66:15.45S	49:14.19E	06 DEC 1985	1110
50	66:16.79S	49:07.32E	13 DEC 1985	1023

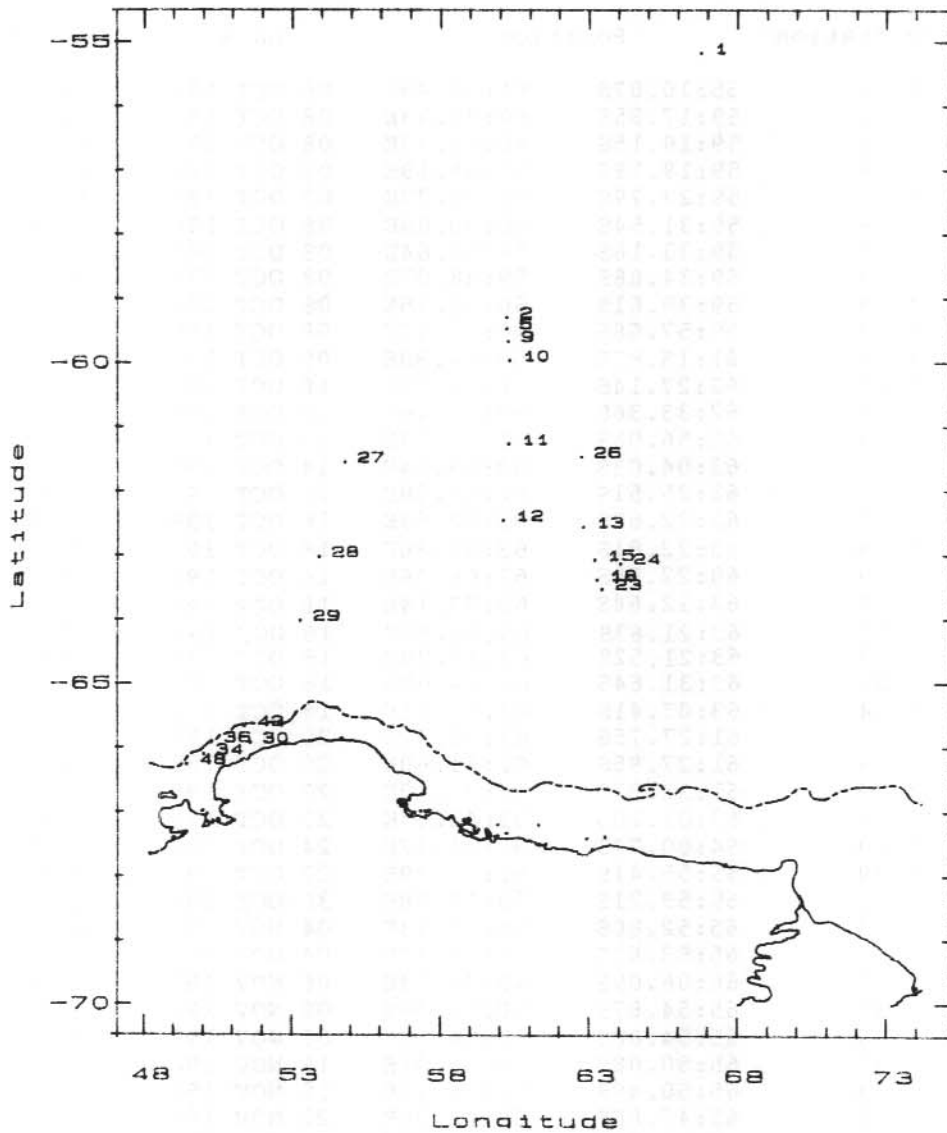


Figure 3a. Location of CTD stations at which nutrient samples were taken. Station 16, in close proximity to 15, is not shown. The locations of station 30 and following are detailed in Figure 3b.

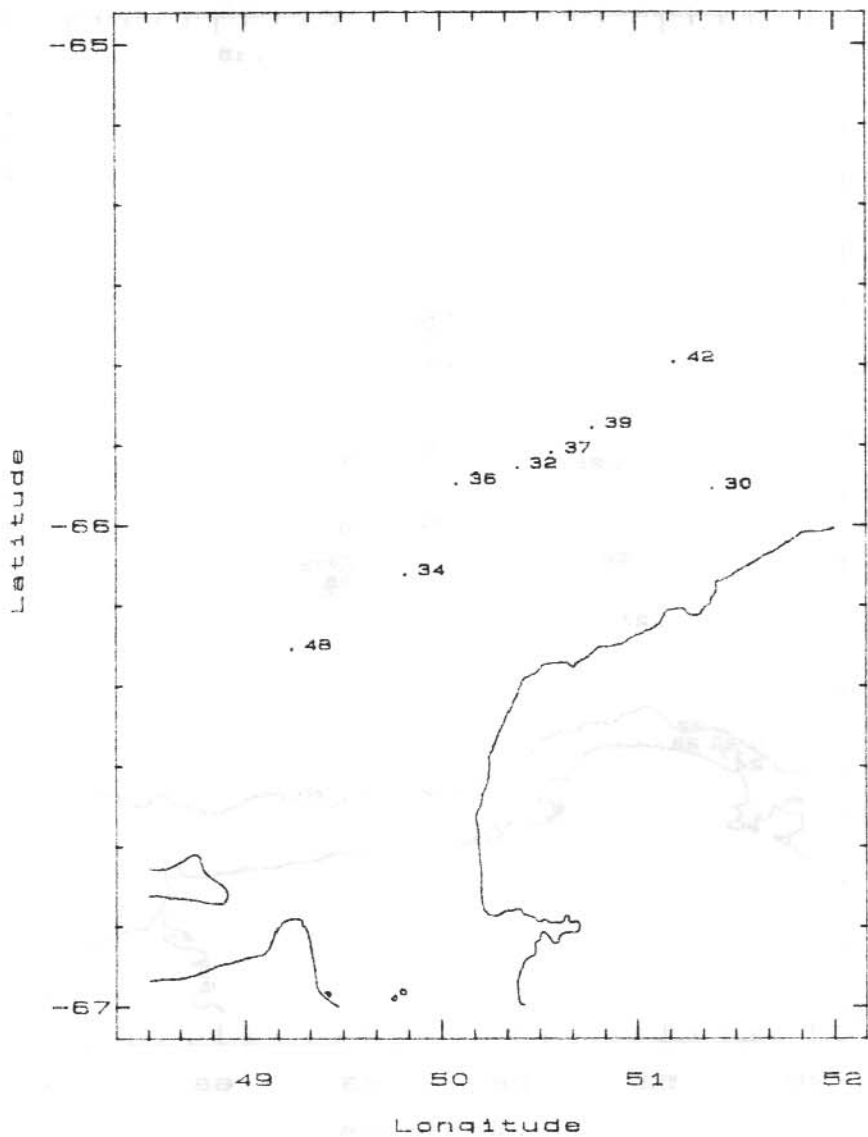


Figure 3b. Location of CTD stations at which nutrient samples were taken, in the region described for Figure 2b.

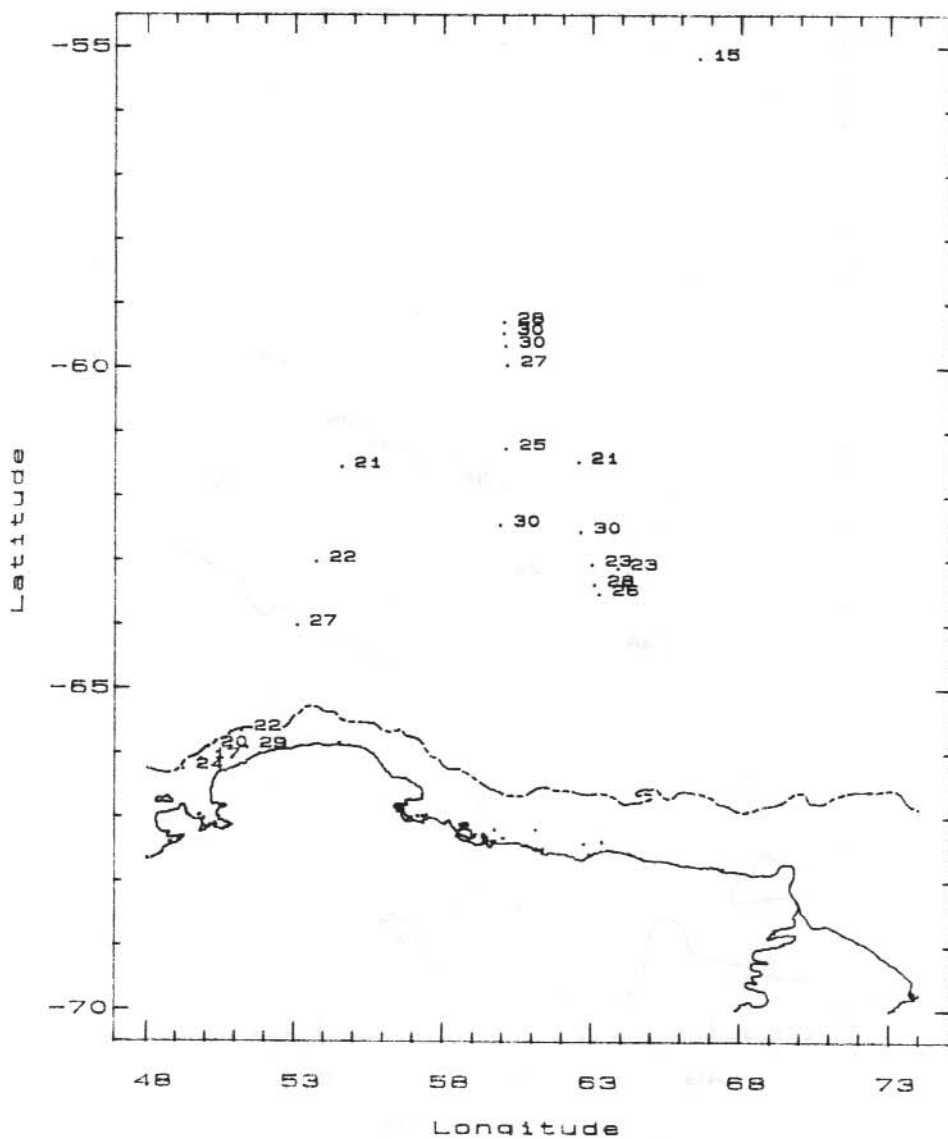


Figure 4a. Average concentration of  $\text{NO}_3^- \text{N}$  between 0 and 100 m at each station shown in Figure 3a, excepting those shown in Figure 3b. The value for station 16 is 22  $\mu\text{g-at/L}$ .

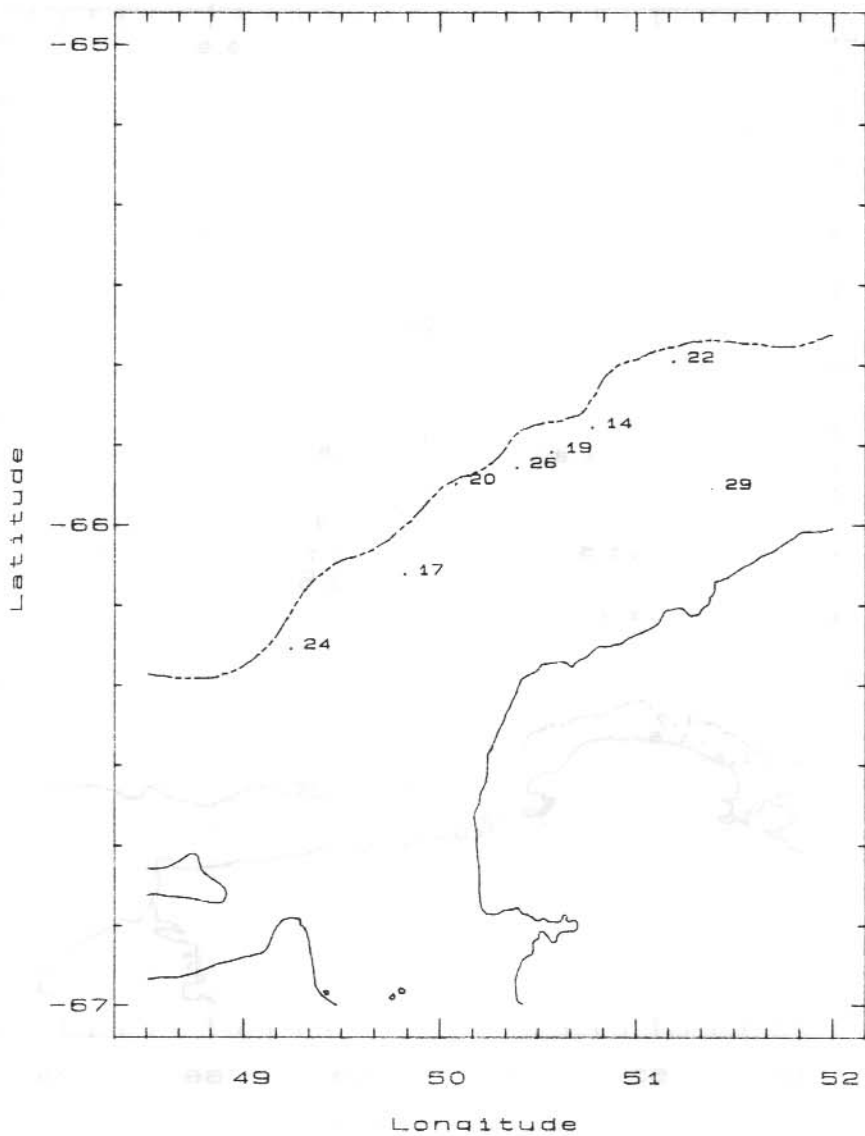


Figure 4b. Average concentration of  $\text{NO}_3^- \text{N}$  between 0 and 100 m at each station shown in Figure 3b.

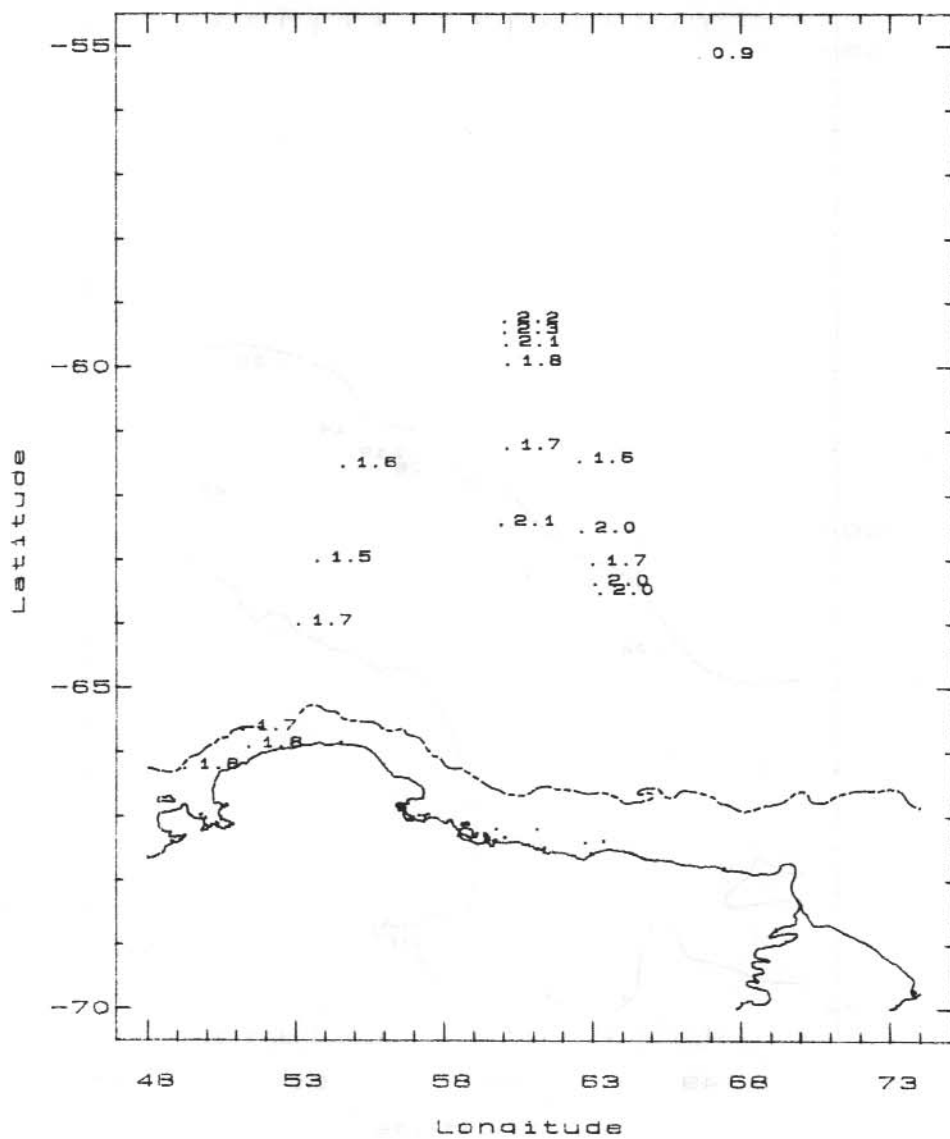


Figure 5a. Average concentration of  $PO_4-P$  between 0 and 100 m at each station shown in Figure 3a, excepting those shown in Figure 3b. The values for stations 16 and 24 are 1.7 and 1.9  $\mu g-at/L$  respectively.



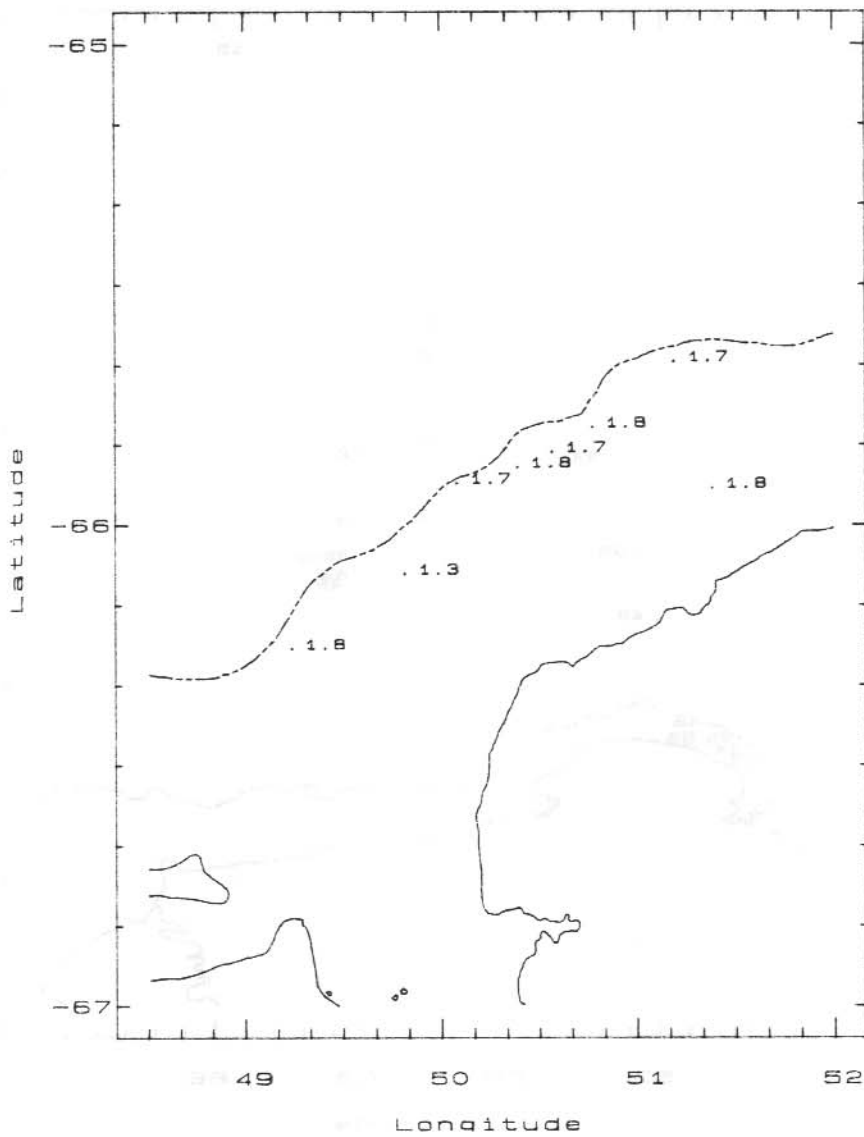


Figure 5b. Average concentration of  $\text{PO}_4\text{-P}$  between 0 and 100 m at each station shown in Figure 3b.



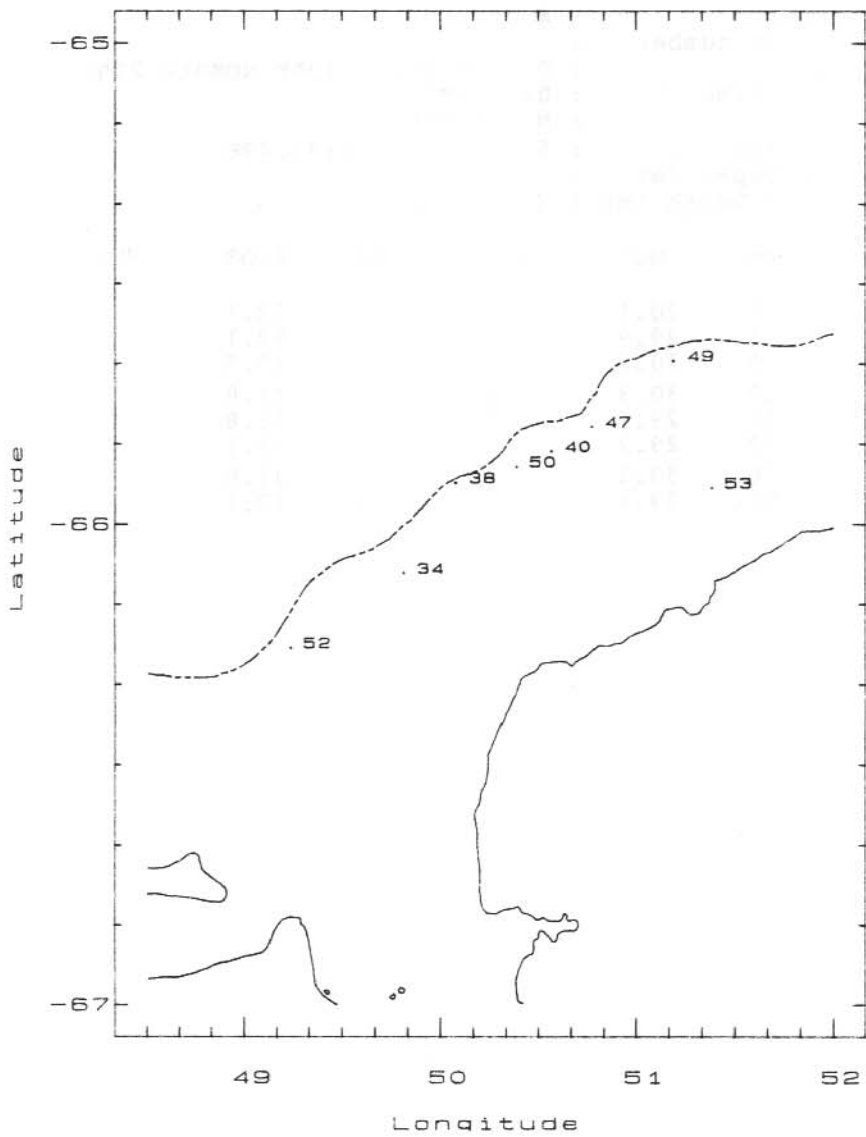


Figure 6b. Average concentration of  $\text{SiO}_3\text{-Si}$  between 0 and 100 m at each station shown in Figure 3b.

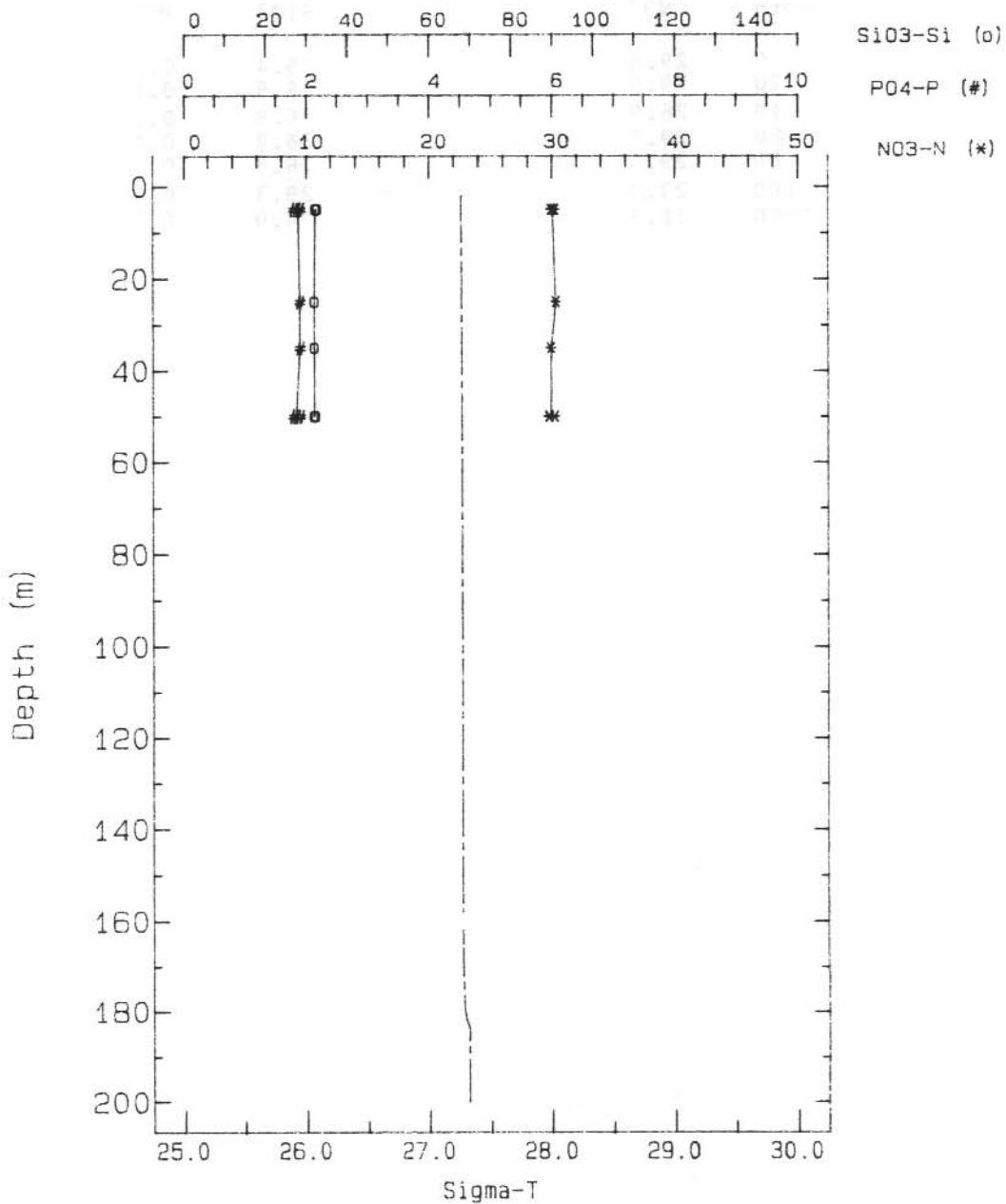
### 3. NUTRIENT DATA

Cruise : ADBEX3  
Station number : 1  
Date : 06-OCT-1985 (DAY NUMBER 279)  
Start Time : 0417 GMT  
Ship : NELLA DAN  
Position : 55:10.07S 66:35.49E  
Cast Depth (m) : 502  
Bottom Depth (m) : Not Recorded

Depth	NO3	NO2	PO4	SiO3	Mn
5	30.1	0.3	1.8	32.1	
5	29.9	0.2	1.9	32.1	
5	30.2	0.2	1.9	32.5	
25	30.3	0.2	1.9	31.8	
35	29.9	0.2	1.9	31.8	
50	29.7	0.2	1.8	32.1	
50	30.2	0.3	1.8	31.8	
50	29.8	0.2	1.9	32.1	

# ADBEX3 NUTRIENTS - SIGMA-T

Cruise: ADBEX3 Station: 1  
 06 OCT 1985 0417 GMT  
 Latitude : 55:10.07S  
 Longitude: 66:35.49E  
 Depth: CTD 502 m Bottom NR



Cruise : ADBEX3  
Station number : 2  
Date : 08-OCT-1985 (DAY NUMBER 281)  
Start Time : 0022 GMT  
Ship : NELLA DAN  
Position : 59:17.35S 60:00.73E  
Cast Depth (m) : 1002  
Bottom Depth (m) : Not Recorded

Depth	NO3	NO2	PO4	SiO3	Mn
0	29.5	0.2	2.4	35.4	0.1
20	29.5	0.2	2.3	36.8	0.1
40	28.8	0.2	2.2	36.8	0.1
60	29.8	0.2	2.2	36.8	0.1
80	29.5	0.2	2.3	36.8	0.1
100	23.9	0.2	1.8	29.3	0.1
1000	31.6	0.0	2.0	78.9	0.1

# ADBEX 3 NUTRIENTS - SIGMA-T

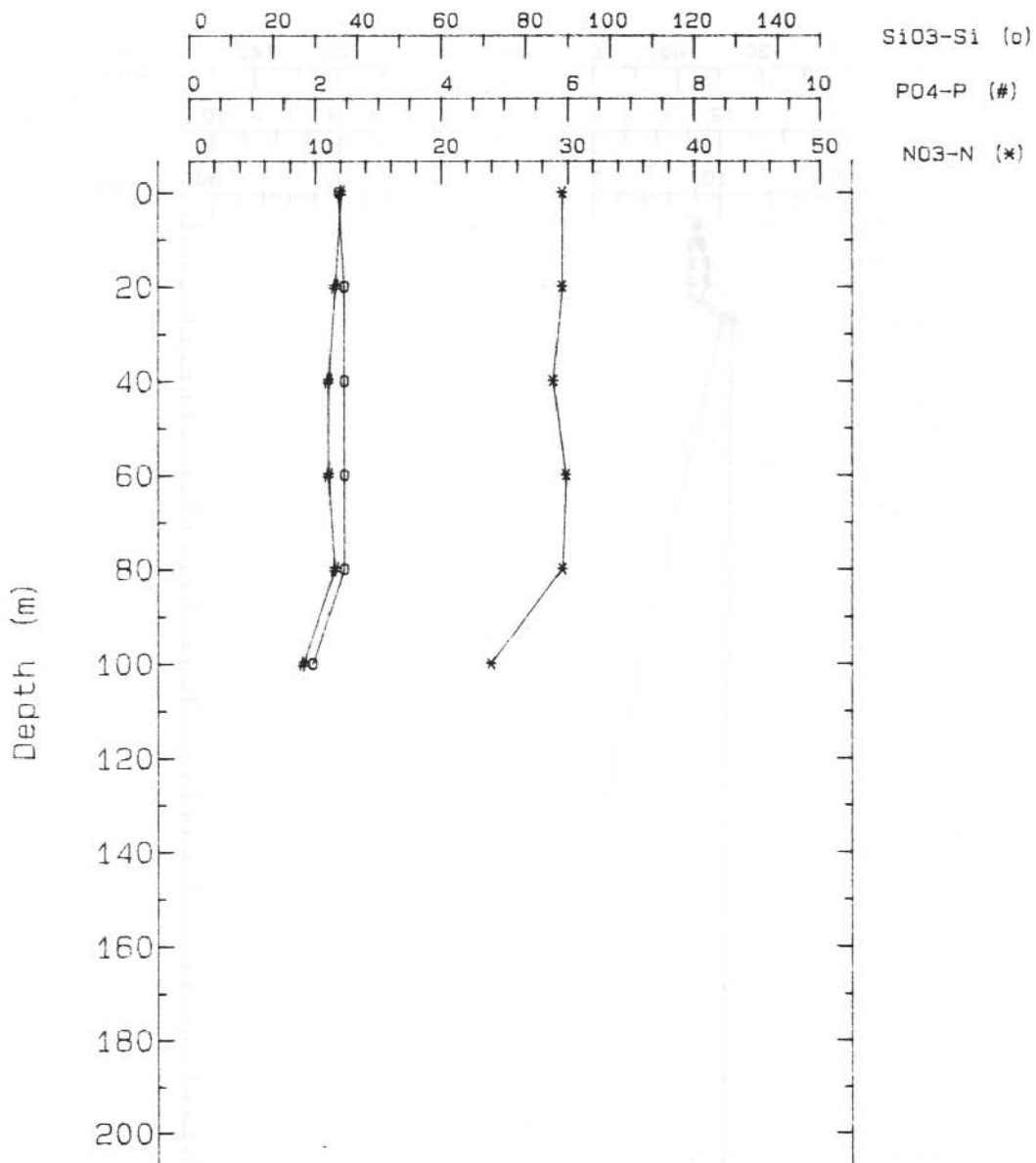
Cruise: ADBEX3 Station: 2

08 OCT 1985 0022 GMT

Latitude : 59: 17.35S

Longitude: 60: 00.73E

Depth: CTD 1002 m Bottom NR



# ADBEX 3 NUTRIENTS - SIGMA-T

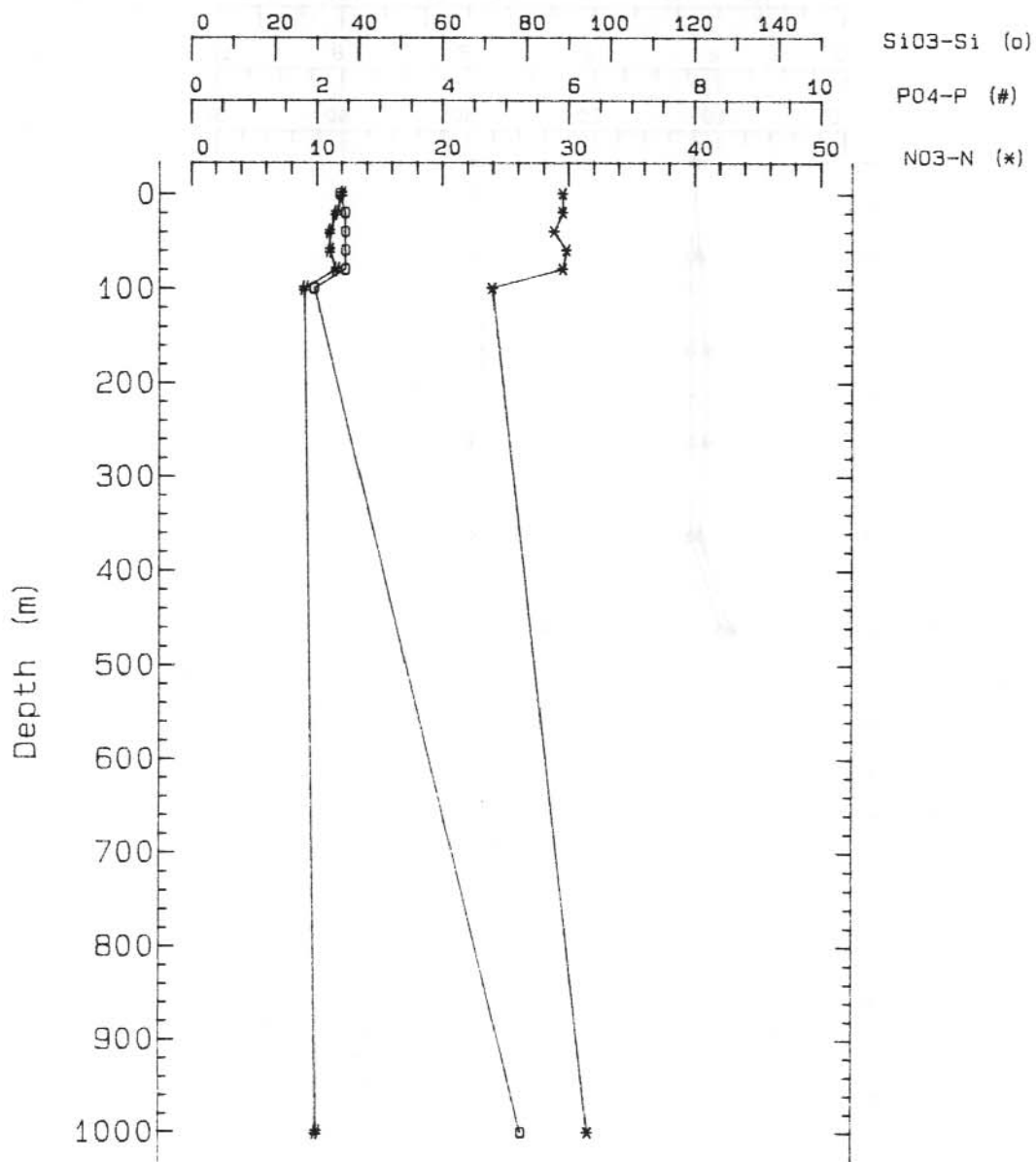
Cruise: ADBEX3 Station: 2

08 OCT 1985 0022 GMT

Latitude : 59:17.35S

Longitude: 60:00.73E

Depth: CTD 1002 m Bottom NR





Cruise : ADBEX3  
 Station number : 5  
 Date : 08-OCT-1985 (DAY NUMBER 281)  
 Start Time : 0644 GMT  
 Ship : NELLA DAN  
 Position : 59:27.79S 60:00.77E  
 Cast Depth (m) : 504  
 Bottom Depth (m) : Not Recorded

Depth	NO3	NO2	PO4	SiO3	Mn
0	29.9	0.2	2.4	36.1	0.1
20	30.1	0.3	2.2	33.2	
40	29.6	0.2	2.2	38.6	
60	30.0	0.2	2.2	39.3	
80	29.7	0.3	2.2	40.4	
100	34.9	0.0	2.5	30.7	
500	34.5	0.0	2.6	80.0	



# ADBEX 3 NUTRIENTS - SIGMA-T

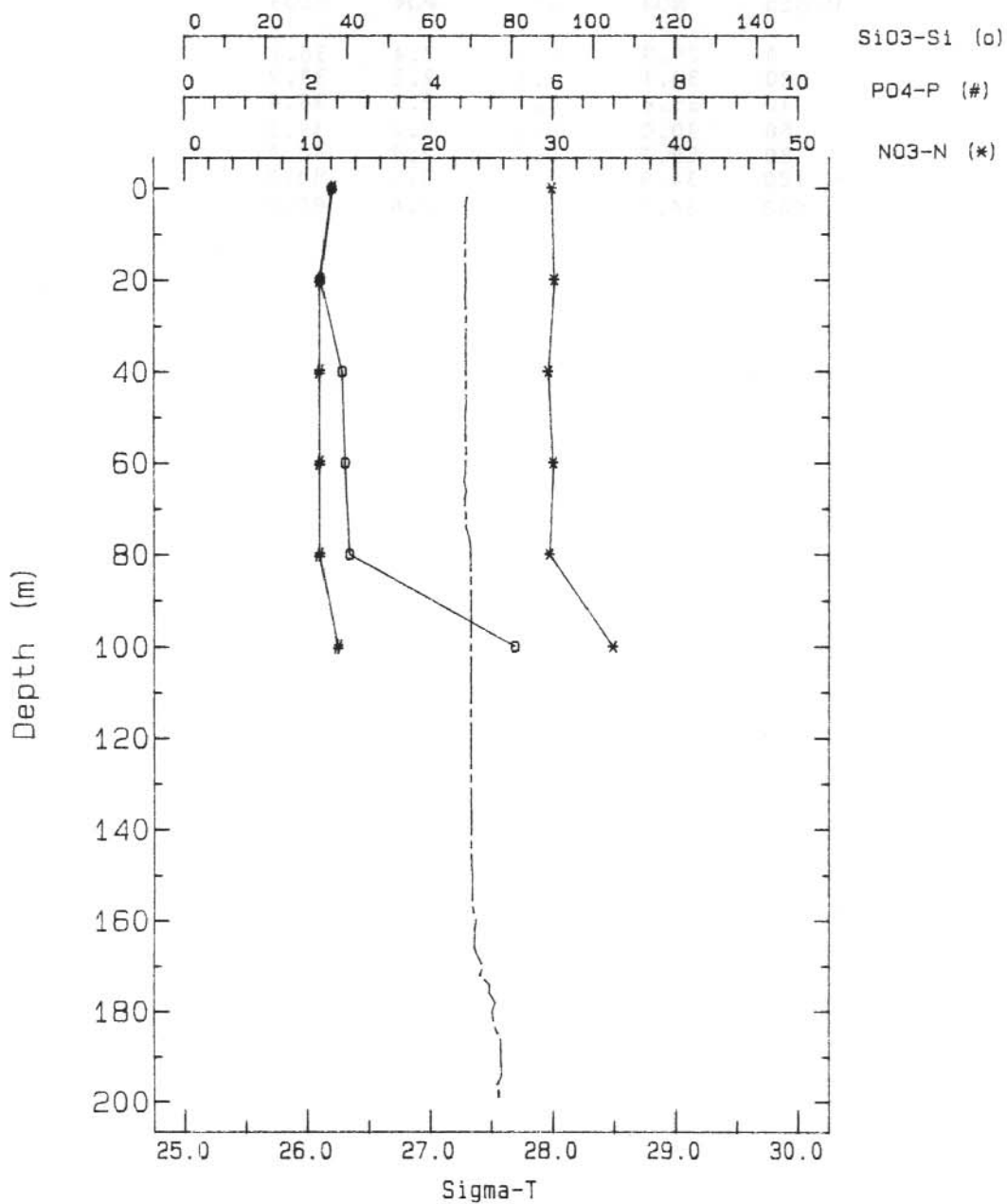
Cruise: ADBEX3 Station: 5

08 OCT 1985 0644 GMT

Latitude : 59: 27.79S

Longitude: 60: 00.77E

Depth: CTD 504 m Bottom NR



# ADBEX 3 NUTRIENTS - SIGMA-T

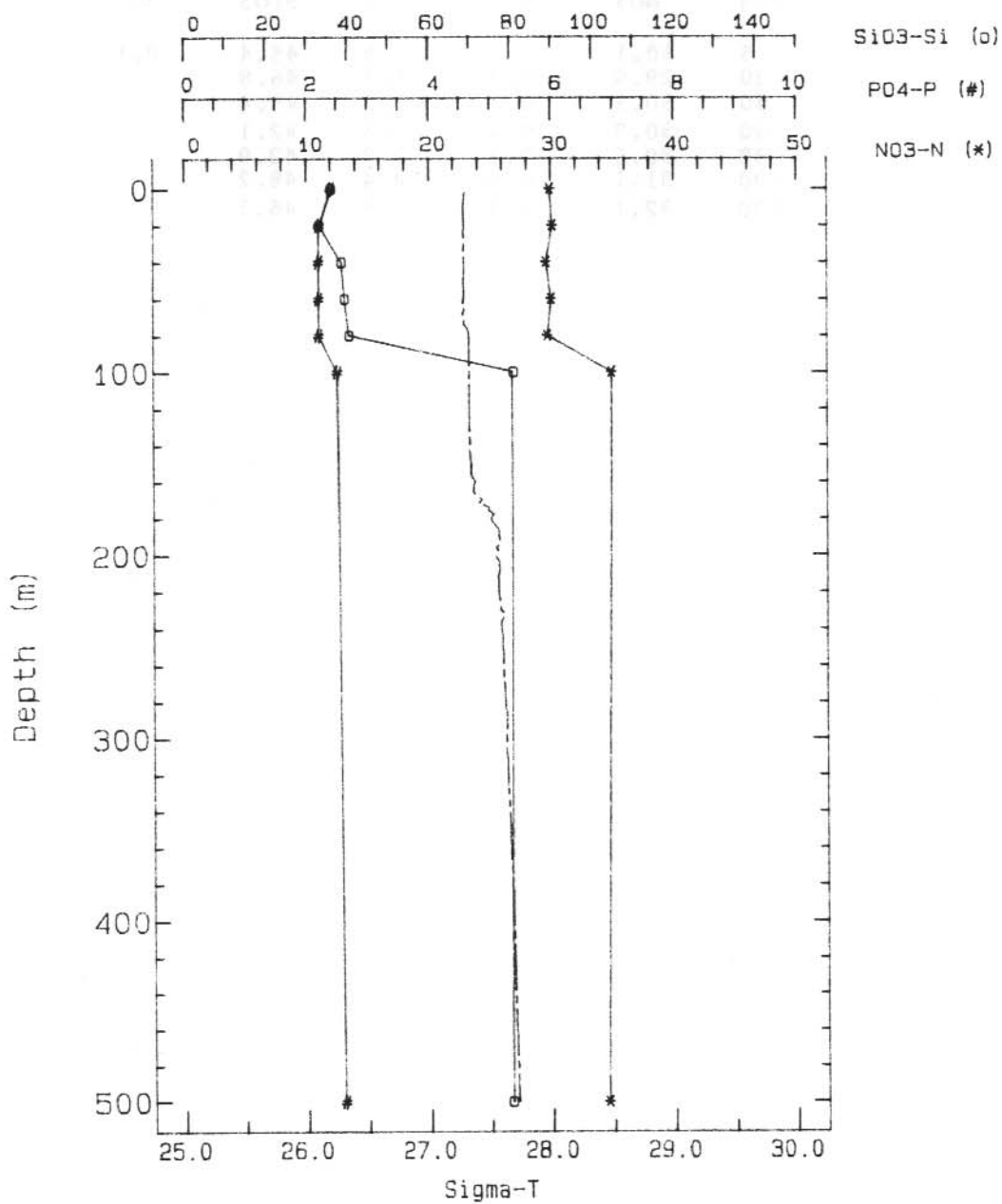
Cruise: ADBEX3 Station: 5

08 OCT 1985 0644 GMT

Latitude : 59:27.79S

Longitude: 60:00.77E

Depth: CTD 504 m Bottom NR

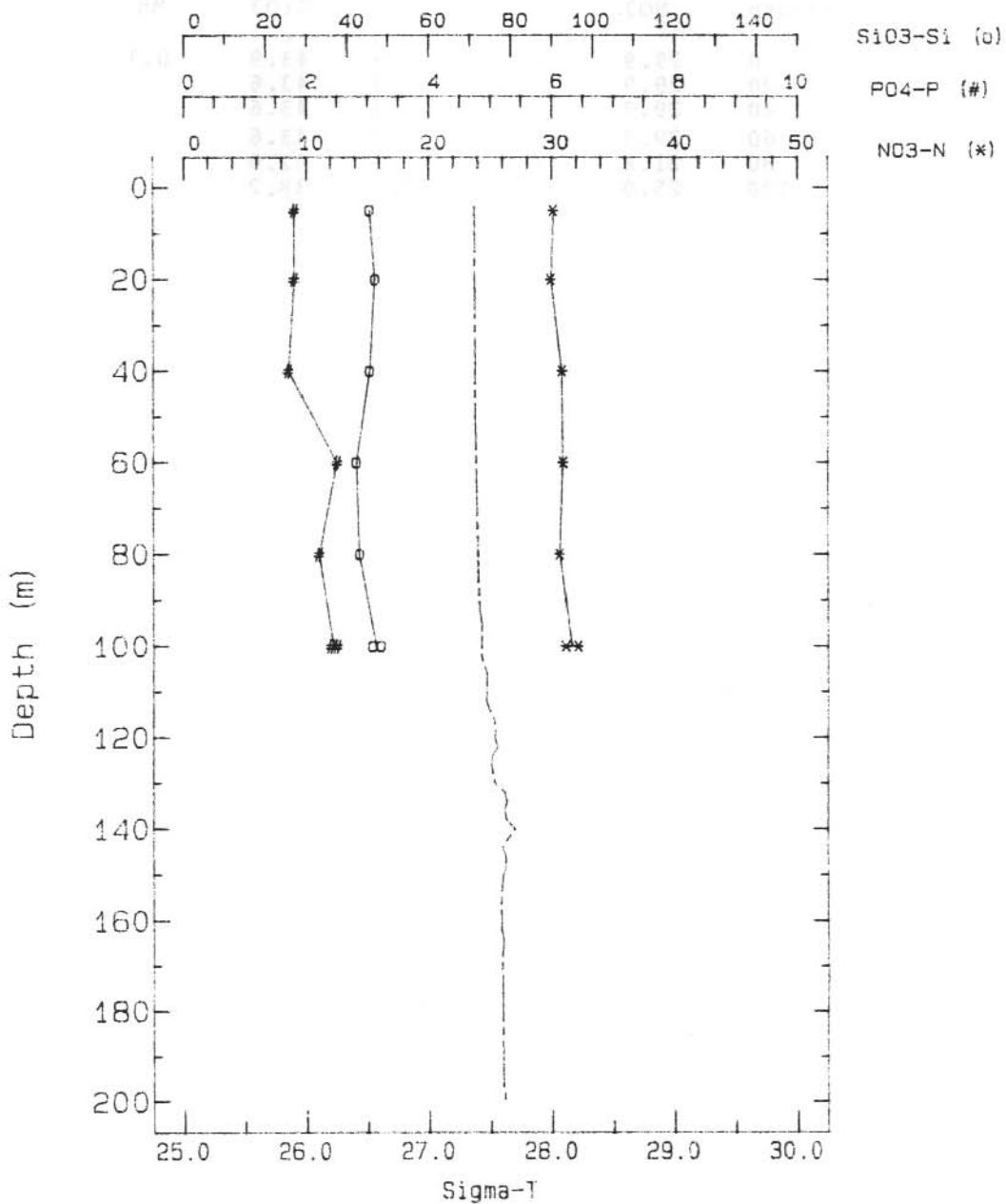


Cruise : ADBEX3  
Station number : 9  
Date : 08-OCT-1985 (DAY NUMBER 281)  
Start Time : 1019 GMT  
Ship : NELLA DAN  
Position : 59:39.61S 60:03.95E  
Cast Depth (m) : 500  
Bottom Depth (m) : Not Recorded

Depth	NO3	NO2	PO4	SiO3	Mn
5	30.1	0.2	1.8	45.4	0.1
20	29.9	0.2	1.8	46.8	
40	30.8	0.3	1.7	45.4	
60	30.9	0.4	2.5	42.1	
80	30.6	0.2	2.2	42.9	
100	31.1	0.2	2.4	48.2	
100	32.1	0.2	2.5	46.1	

ADBEX3 NUTRIENTS - SIGMA-T

Cruise: ADBEX3 Station: 9  
 08 OCT 1985 1019 GMT  
 Latitude : 59:39.61S  
 Longitude: 60:03.95E  
 Depth: CTD 500 m Bottom NR



Cruise : ADBEX3  
Station number : 10  
Date : 08-OCT-1985 (DAY NUMBER 281)  
Start Time : 1339 GMT  
Ship : NELLA DAN  
Position : 59:57.66S 60:07.13E  
Cast Depth (m) : 502  
Bottom Depth (m) : Not Recorded

Depth	NO3	NO2	PO4	SiO3	Mn
0	29.9	0.3	1.9	43.9	0.1
20	29.9	0.3	1.8	43.6	
40	29.7	0.3	1.9	43.6	
60	29.9	0.3	1.8	43.6	
80	21.8	0.1	1.6	32.9	
100	25.0	0.2	1.7	38.2	

# ADBEX 3 NUTRIENTS SIGMA-T

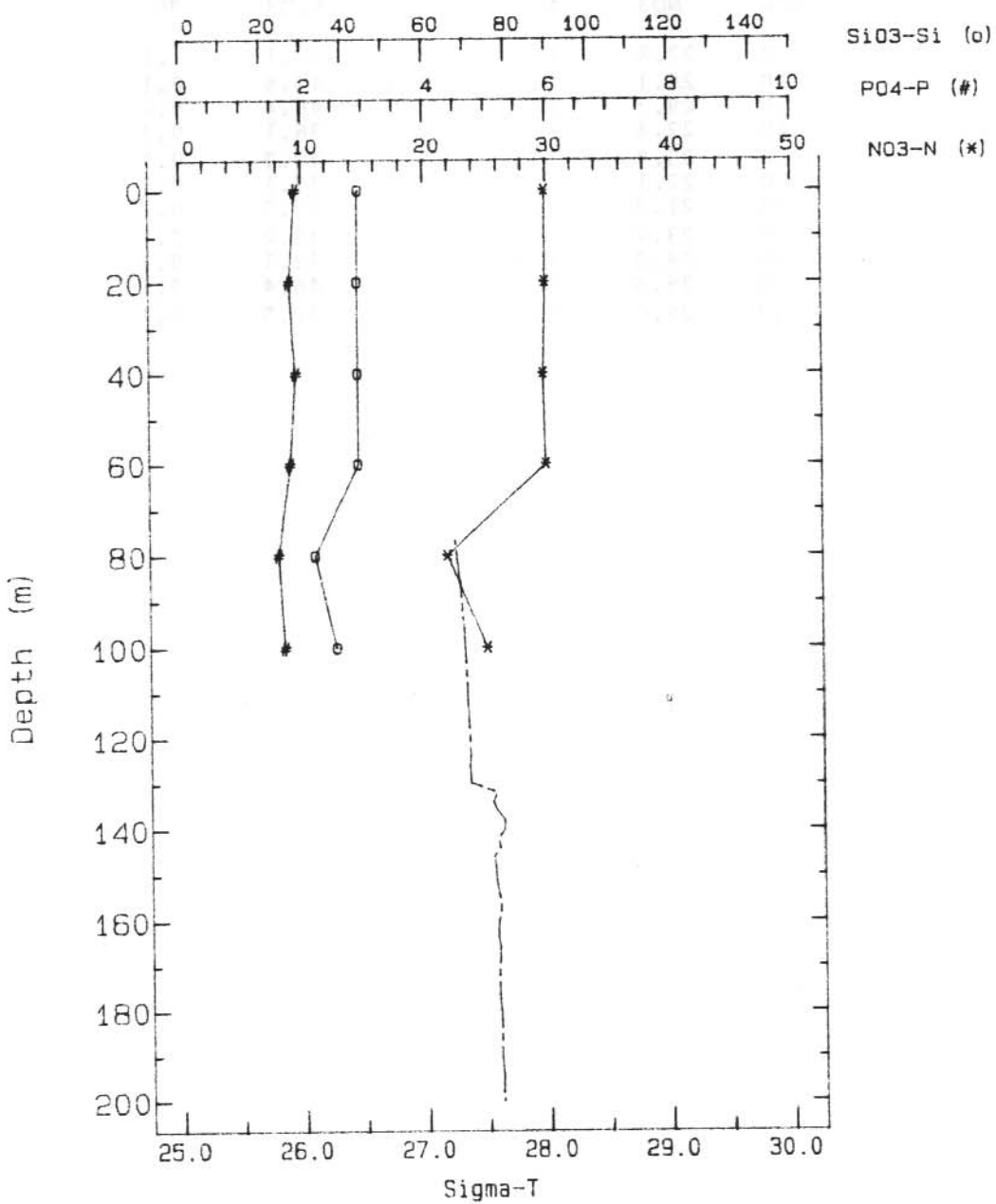
Cruise: ADBEX3 Station: 10

08 OCT 1985 1339 GMT

Latitude : 59: 57.66S

Longitude: 60: 07.13E

Depth: CTD 502 m Bottom NR



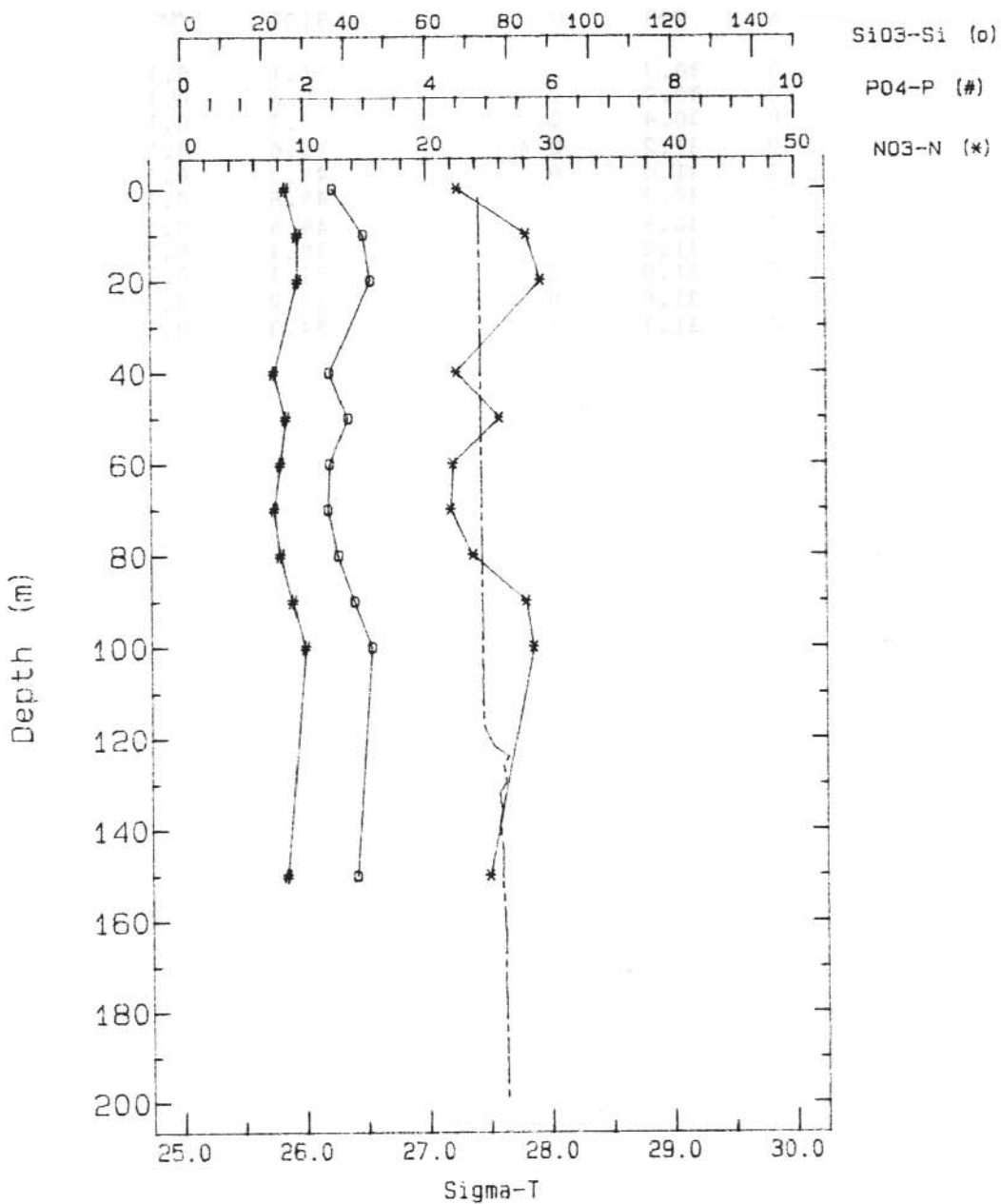
Cruise : ADBEX3  
Station number : 11  
Date : 09-OCT-1985 (DAY NUMBER 282)  
Start Time : 1045 GMT  
Ship : NELLA DAN  
Position : 61:15.87S 60:04.88E  
Cast Depth (m) : 1002  
Bottom Depth (m) : Not Recorded

Depth	NO3	NO2	PO4	SiO3	Mn
0	22.5	0.2	1.7	37.1	0.1
10	28.1	0.1	1.9	44.6	0.1
20	29.3	0.2	1.9	46.4	0.1
40	22.4	0.2	1.5	36.1	0.1
50	25.9	0.1	1.7	40.7	0.1
60	22.1	0.1	1.6	36.1	0.1
70	21.9	0.1	1.5	35.7	0.1
80	23.7	0.1	1.6	38.2	0.1
90	28.0	0.4	1.8	42.1	0.1
100	28.6	0.1	2.0	46.4	0.1
150	25.0	0.2	1.7	42.5	0.1



# ADBEX 3 NUTRIENTS - SIGMA-T

Cruise: ADBEX3 Station: 11  
 09 OCT 1985 1045 GMT  
 Latitude : 61: 15.87S  
 Longitude: 60: 04.88E  
 Depth: CTD 1002 m Bottom NR



Cruise : ADBEX3  
 Station number : 12  
 Date : 10-OCT-1985 (DAY NUMBER 283)  
 Start Time : 1239 GMT  
 Ship : NELLA DAN  
 Position : 62:27.14S 59:53.78E  
 Cast Depth (m) : 1002  
 Bottom Depth (m) : Not Recorded

Depth	NO3	NO2	PO4	SiO3	Mn
0	30.7	0.2	2.0	51.1	0.1
10	30.7	0.3	2.1	49.6	0.1
20	30.4	0.3	2.0	49.3	0.1
30	31.2	0.4	2.0	49.6	0.1
40	31.0	0.2	2.0	49.3	0.1
50	30.9	0.2	2.1	49.6	0.1
60	30.6	0.2	2.1	49.6	0.1
70	31.2	0.2	2.1	50.4	0.1
80	31.0	0.2	2.0	51.1	0.1
90	31.6	0.3	2.1	53.2	0.1
100	31.1	0.1	2.2	54.3	0.1

# ADBEX 3 NUTRIENTS - SIGMA-T

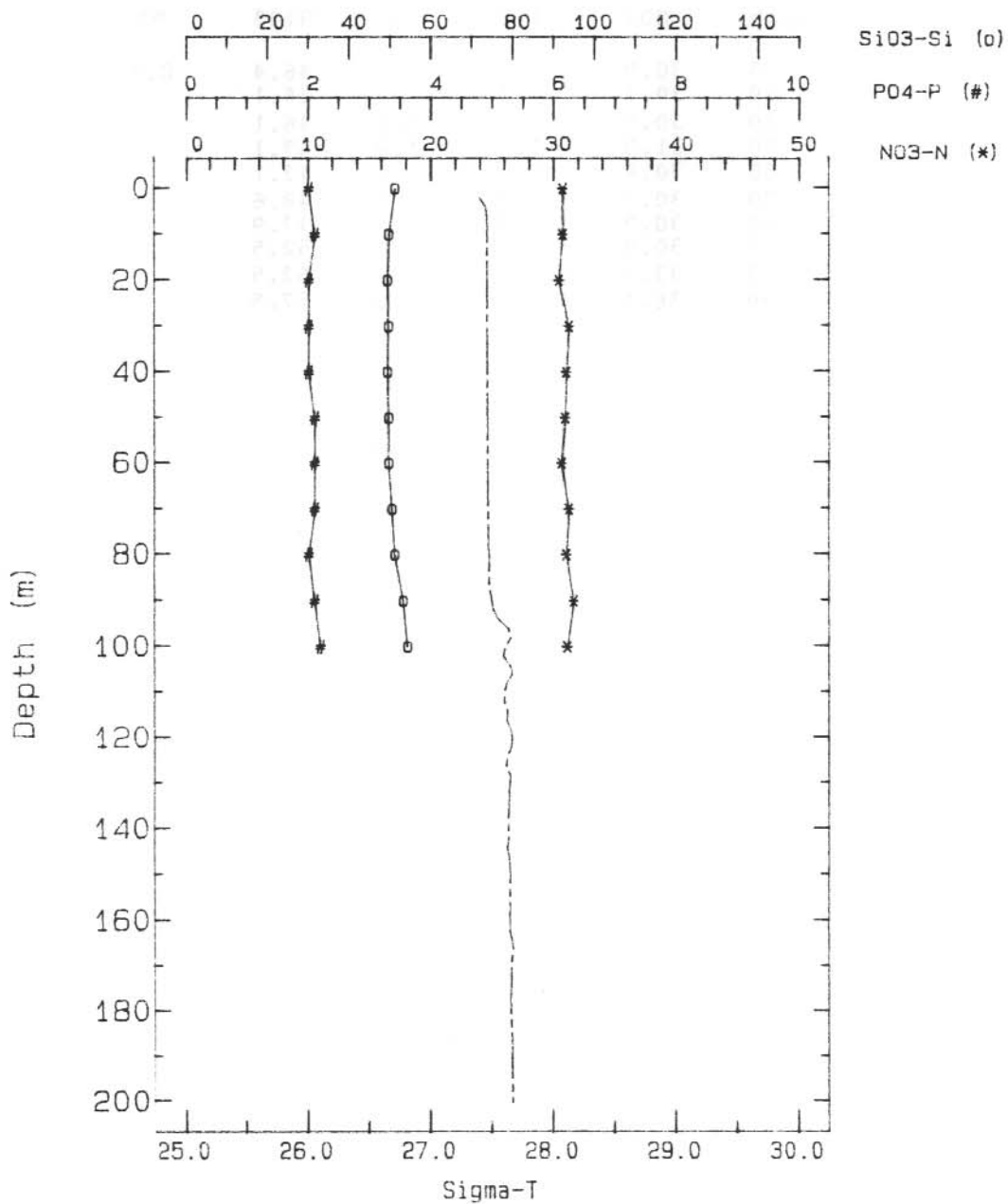
Cruise: ADBEX3 Station: 12

10 OCT 1985 1239 GMT

Latitude : 62:27.14S

Longitude: 59:53.78E

Depth: CTD 1002 m Bottom NR



Cruise : ADBEX3  
 Station number : 13  
 Date : 12-OCT-1985 (DAY NUMBER 285)  
 Start Time : 1455 GMT  
 Ship : NELLA DAN  
 Position : 62:33.36S 62:37.16E  
 Cast Depth (m) : 1002  
 Bottom Depth (m) : Not Recorded

Depth	NO3	NO2	PO4	SiO3	Mn
5	30.9	0.2	1.9	46.4	0.1
20	30.5	0.2	1.9	46.1	
30	30.5	0.3	1.8	46.1	
50	31.0	0.3	1.9	47.1	
60	30.8	0.2	1.9	47.1	
70	30.7	0.3	2.8	48.6	
80	30.9	0.2	2.1	47.9	
110	30.8	0.2	2.0	52.5	
130	33.2	0.1	2.2	62.5	
150	36.4	0.0	2.5	77.5	

# ADBEX 3 NUTRIENTS - SIGMA-T

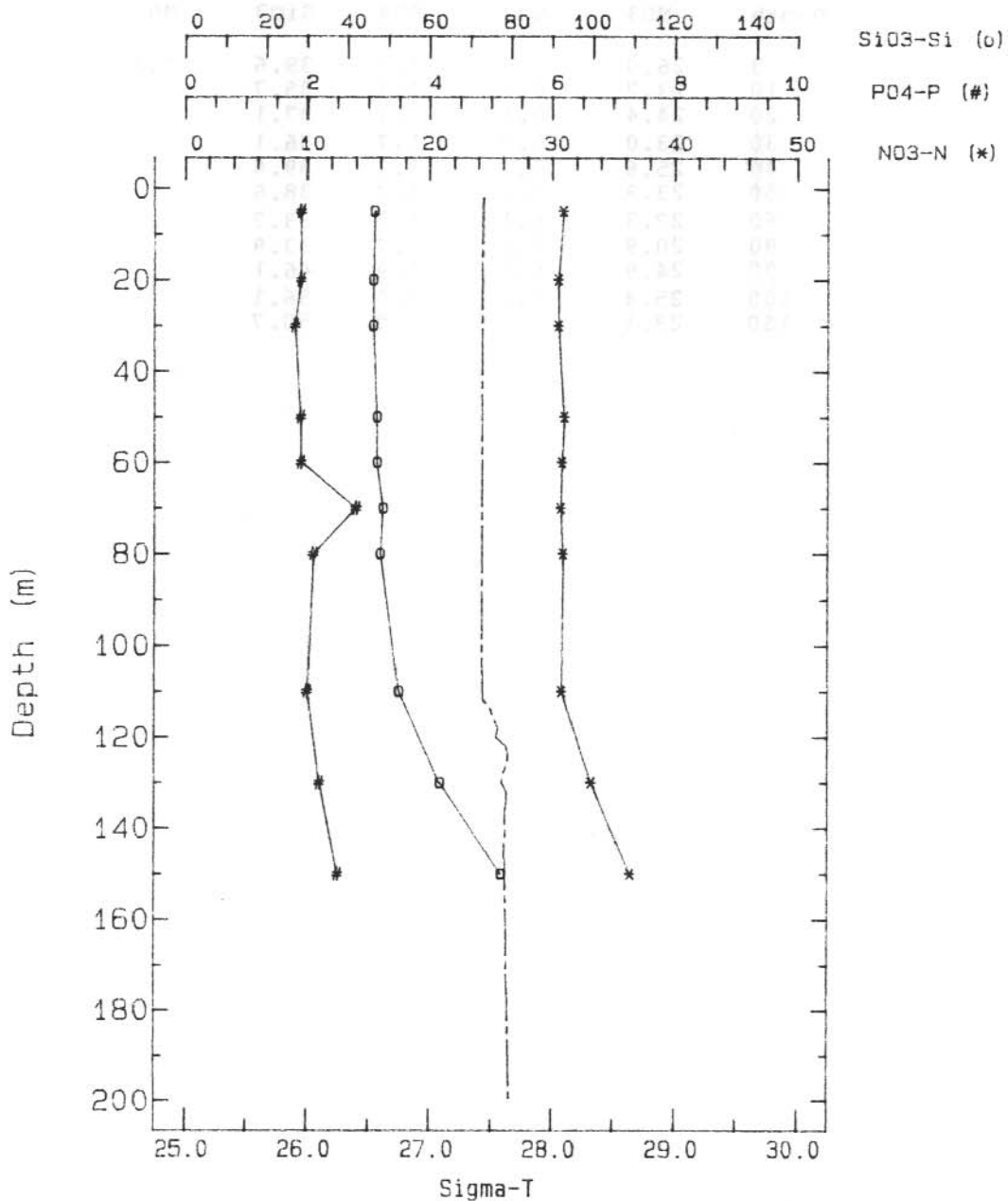
Cruise: ADBEX3 Station: 13

12 OCT 1985 1455 GMT

Latitude : 62: 33.36S

Longitude: 62: 37.16E

Depth: CTD 1002 m Bottom NR



Cruise : ADBEX3  
Station number : 15  
Date : 14-OCT-1985 (DAY NUMBER 287)  
Start Time : 1117 GMT  
Ship : NELLA DAN  
Position : 63:04.03S 62:59.04E  
Cast Depth (m) : 1002  
Bottom Depth (m) : Not Recorded

Depth	NO3	NO2	PO4	SiO3	Mn
3	26.0	0.1	1.8	39.6	0.1
10	23.2	0.1	1.7	35.7	
20	24.4	0.1	1.7	37.1	
30	23.0	0.2	1.7	36.1	
40	25.6	0.1	1.7	39.6	
50	23.8	0.1	1.7	38.6	
60	22.3	0.1	1.7	33.2	
80	20.9	0.1	1.7	33.9	
90	24.9	0.1	1.9	46.1	
100	25.4	0.0	2.0	56.1	
150	23.1	0.0	1.9	50.7	

# ADBEX 3 NUTRIENTS SIGMA-T

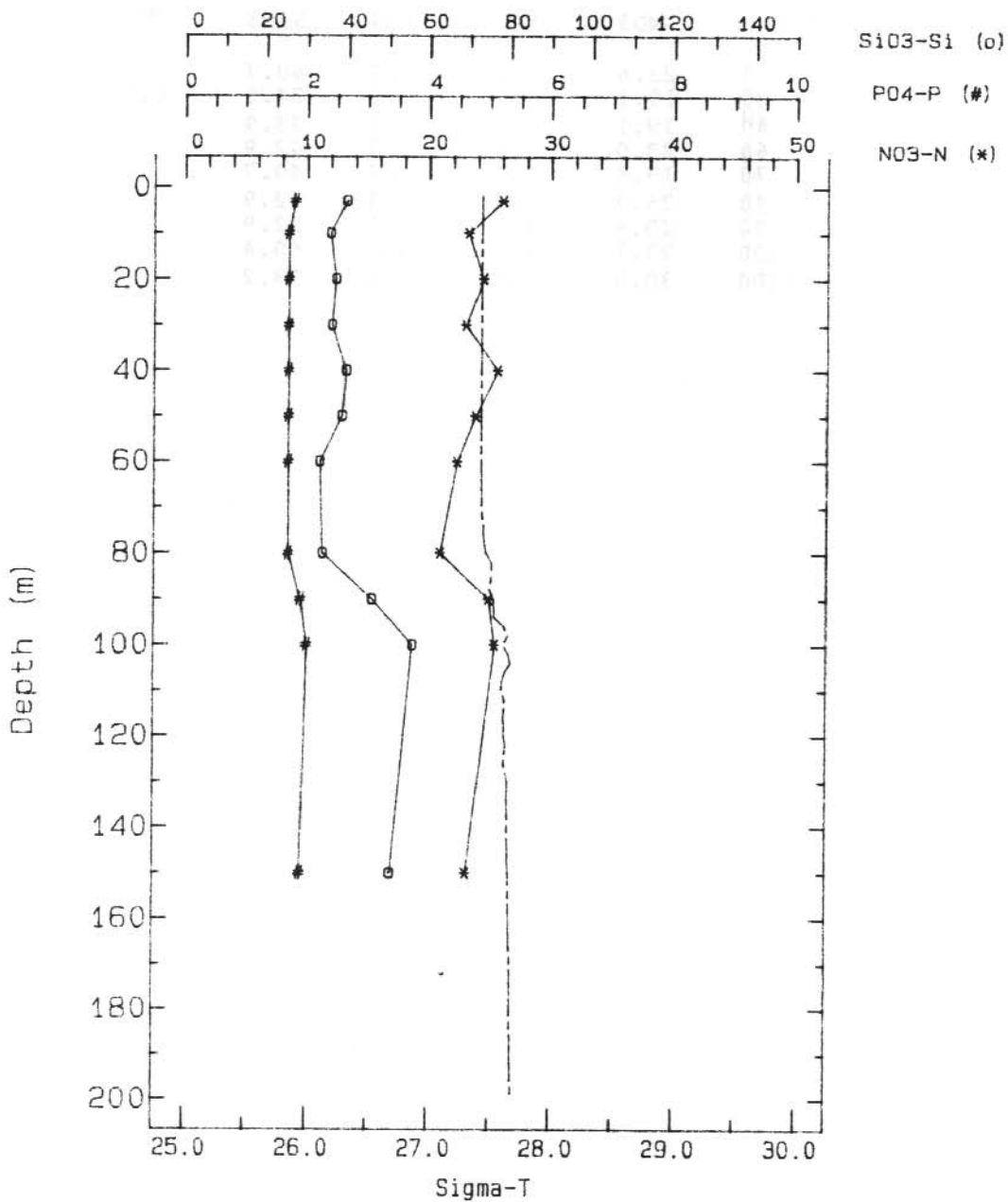
Cruise: ADBEX3 Station: 15

14 OCT 1985 1117 GMT

Latitude : 63:04.03S

Longitude: 62:59.04E

Depth: CTD 1002 m Bottom NR



Cruise : ADBEX3  
 Station number : 16  
 Date : 15-OCT-1985 (DAY NUMBER 288)  
 Start Time : 1034 GMT  
 Ship : NELLA DAN  
 Position : 63:25.51S 62:51.08E  
 Cast Depth (m) : 1002  
 Bottom Depth (m) : Not Recorded

Depth	NO3	NO2	PO4	SiO3	Mn
5	23.6	0.2	1.7	40.7	
20	19.1	0.2	1.6	34.6	0.1
40	19.1	0.3	1.5	33.9	
60	23.0	0.1	1.7	42.9	
70	19.8	0.1	1.6	40.7	
80	25.7	0.1	1.8	52.9	
90	25.6	0.0	2.1	52.9	
100	27.1	0.0	2.1	60.4	
1000	30.8	0.0	1.6	73.2	



# ADBEX3 NUTRIENTS - SIGMA-T

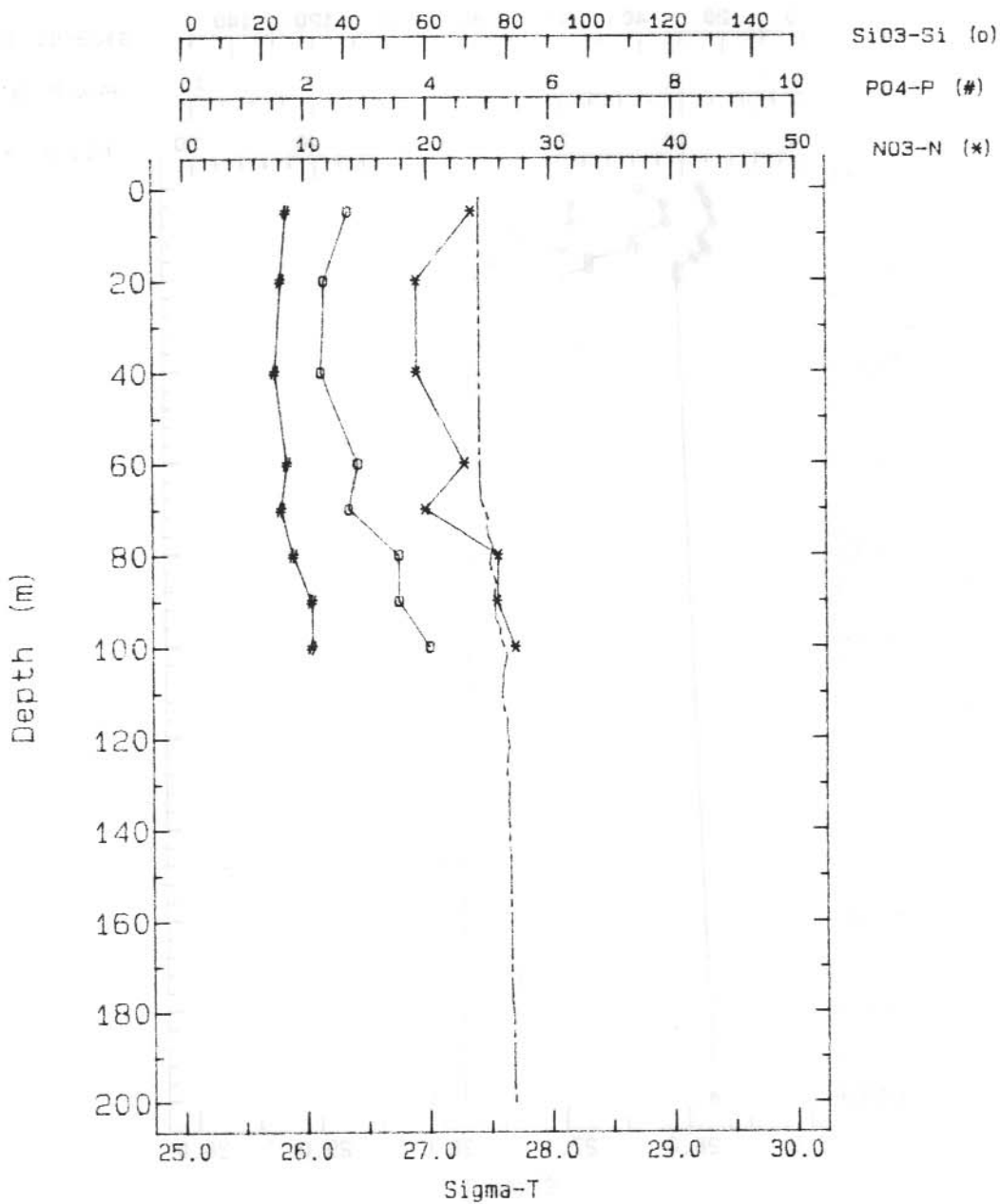
Cruise: ADBEX3 Station: 16

15 OCT 1985 1034 GMT

Latitude : 63: 25.51S

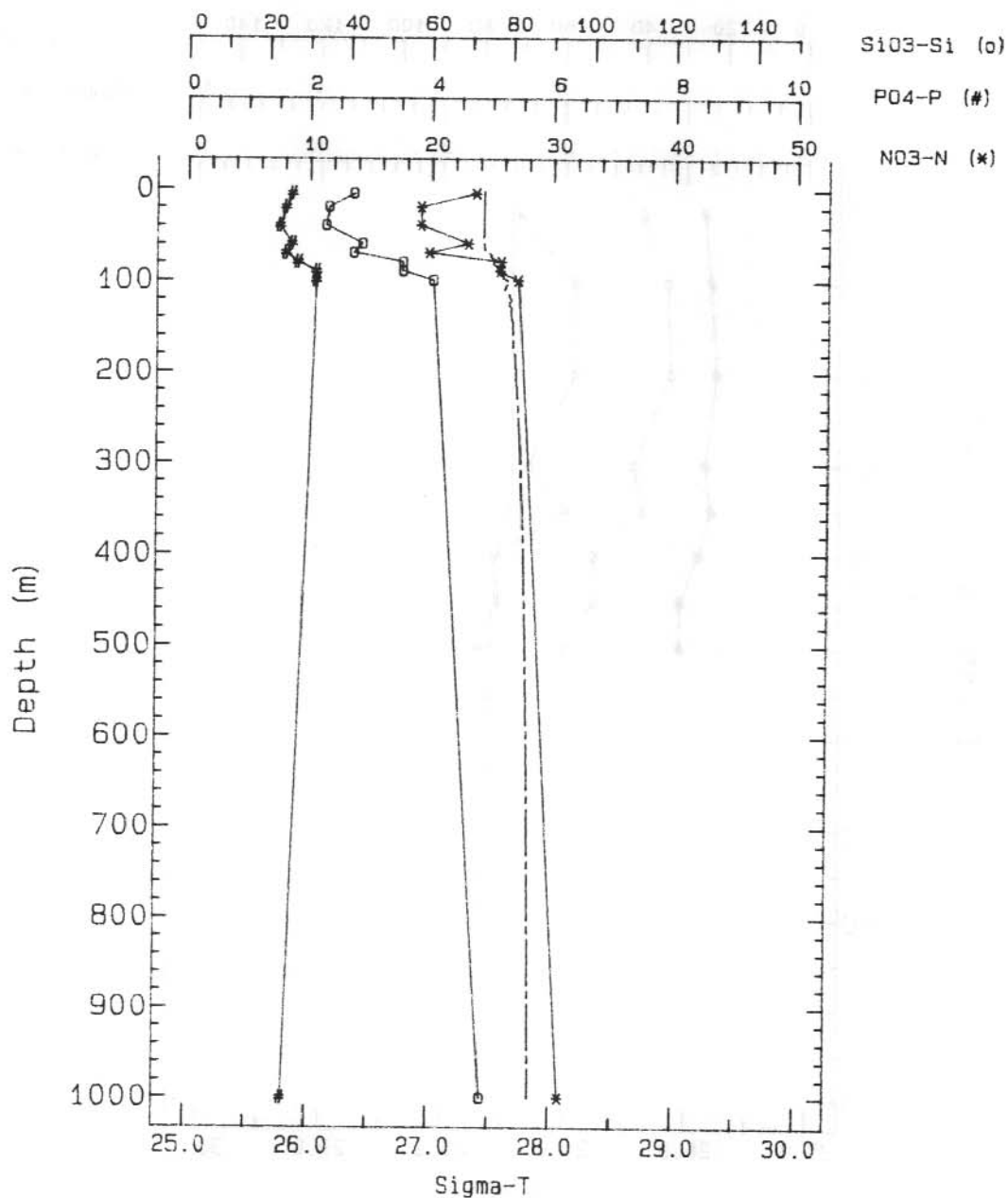
Longitude: 62: 51.08E

Depth: CTD 1002 m Bottom NR



# ADBEX3 NUTRIENTS - SIGMA-T

Cruise: ADBEX3 Station: 16  
 15 OCT 1985 1034 GMT  
 Latitude : 63: 25.51S  
 Longitude: 62: 51.08E  
 Depth: CTD 1002 m Bottom NR



Cruise : ADBEX3  
 Station number : 18  
 Date : 16-OCT-1985 (DAY NUMBER 289)  
 Start Time : 0703 GMT  
 Ship : NELLA DAN  
 Position : 63:22.81S 63:03.86E  
 Cast Depth (m) : 870  
 Bottom Depth (m) : Not Recorded

Depth	NO3	NO2	PO4	SiO3	Mn
5	31.4	0.3	2.1	57.1	0.1
10	31.8	0.3	2.0	57.1	
20	23.4	0.4	2.2	41.1	
30	32.1	0.3	2.0	57.5	
50	31.2	0.3	2.1	58.2	
60	32.5	0.3	2.1	61.4	
70	22.7	0.1	1.7	56.8	
80	20.2	0.1	1.6	43.2	
90	26.0	0.1	1.9	54.3	
100	26.8	0.1	1.9	61.1	
110	23.2	0.1	1.8	58.2	

# ADBEX 3 NUTRIENTS - SIGMA-T

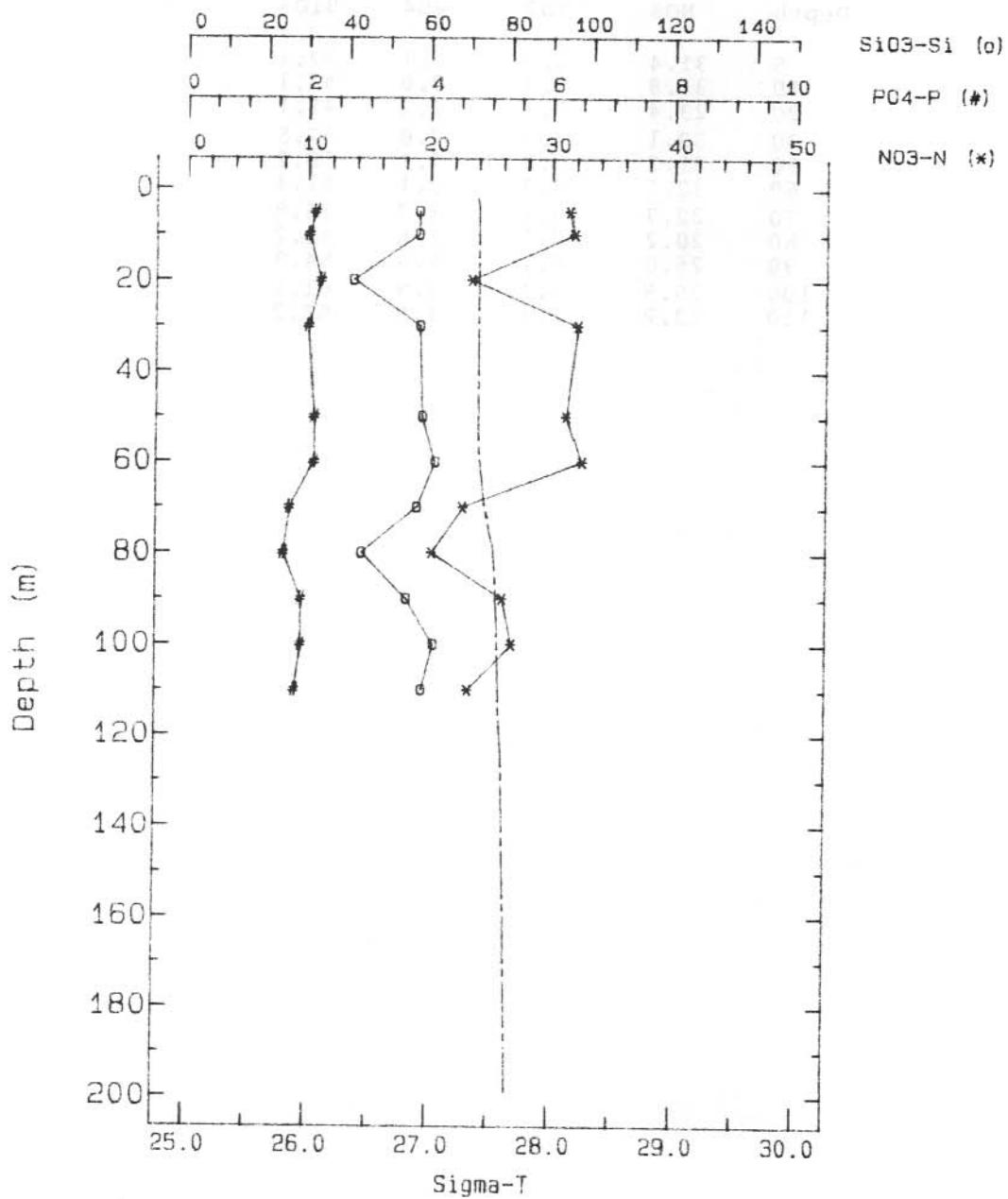
Cruise: ADBEX3 Station: 18

16 OCT 1985 0703 GMT

Latitude : 63:22.81S

Longitude: 63:03.86E

Depth: CTD 870 m Bottom NR



Cruise : ADBEX3  
 Station number : 23  
 Date : 18-OCT-1985 (DAY NUMBER 291)  
 Start Time : 0356 GMT  
 Ship : NELLA DAN  
 Position : 63:31.64S 63:14.09E  
 Cast Depth (m) : 1002  
 Bottom Depth (m) : Not Recorded

Depth	NO3	NO2	PO4	SiO3	Mn
20	28.6	0.1	2.0	50.7	0.1
30	27.4	0.2	1.9	48.5	
50	24.3	0.1	2.0	43.9	
60	24.9	0.1	1.9	46.1	
70	22.1	0.1	1.9	42.5	
80	23.9	0.1	1.9	48.6	
90	24.9	0.0	2.1	50.0	
100	32.1	0.1	2.3	67.9	

# ADBEX 3 NUTRIENTS - SIGMA-T

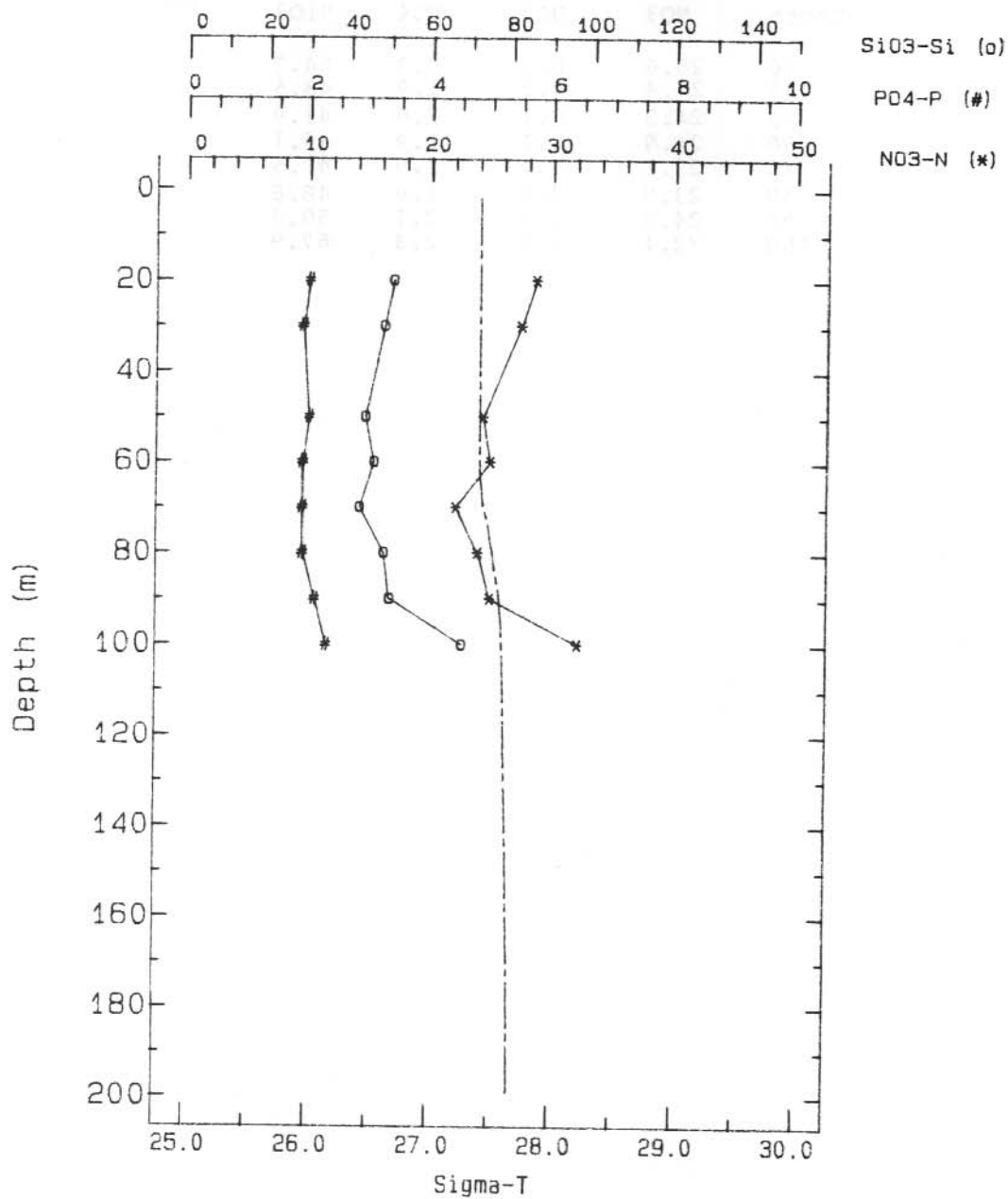
Cruise: ADBEX3 Station: 23

18 OCT 1985 0356 GMT

Latitude : 63: 31.64S

Longitude: 63: 14.09E

Depth: CTD 1002 m Bottom NR



Cruise : ADBEX3  
 Station number : 24  
 Date : 18-OCT-1985 (DAY NUMBER 291)  
 Start Time : 1746 GMT  
 Ship : NELLA DAN  
 Position : 63:07.41S 63:51.61E  
 Cast Depth (m) : 1002  
 Bottom Depth (m) : Not Recorded

Depth	NO3	NO2	PO4	SiO3	Mn
5	22.9	0.1	1.8	37.1	0.1
10	23.2	0.1	1.8	36.8	
20	20.1	0.2	1.9	32.9	
30	17.4	0.1	1.6	28.6	
40	24.3	0.1	1.8	40.4	
50	25.6	0.1	2.0	42.1	
70	22.4	0.1	2.2	37.5	
80	24.6	0.1	1.9	41.8	
90	26.8	0.1	2.0	47.1	
100	25.2	0.1	1.9	47.5	
110	24.6	0.0	1.9	47.9	

# ADBEX 3 NUTRIENTS - SIGMA-T

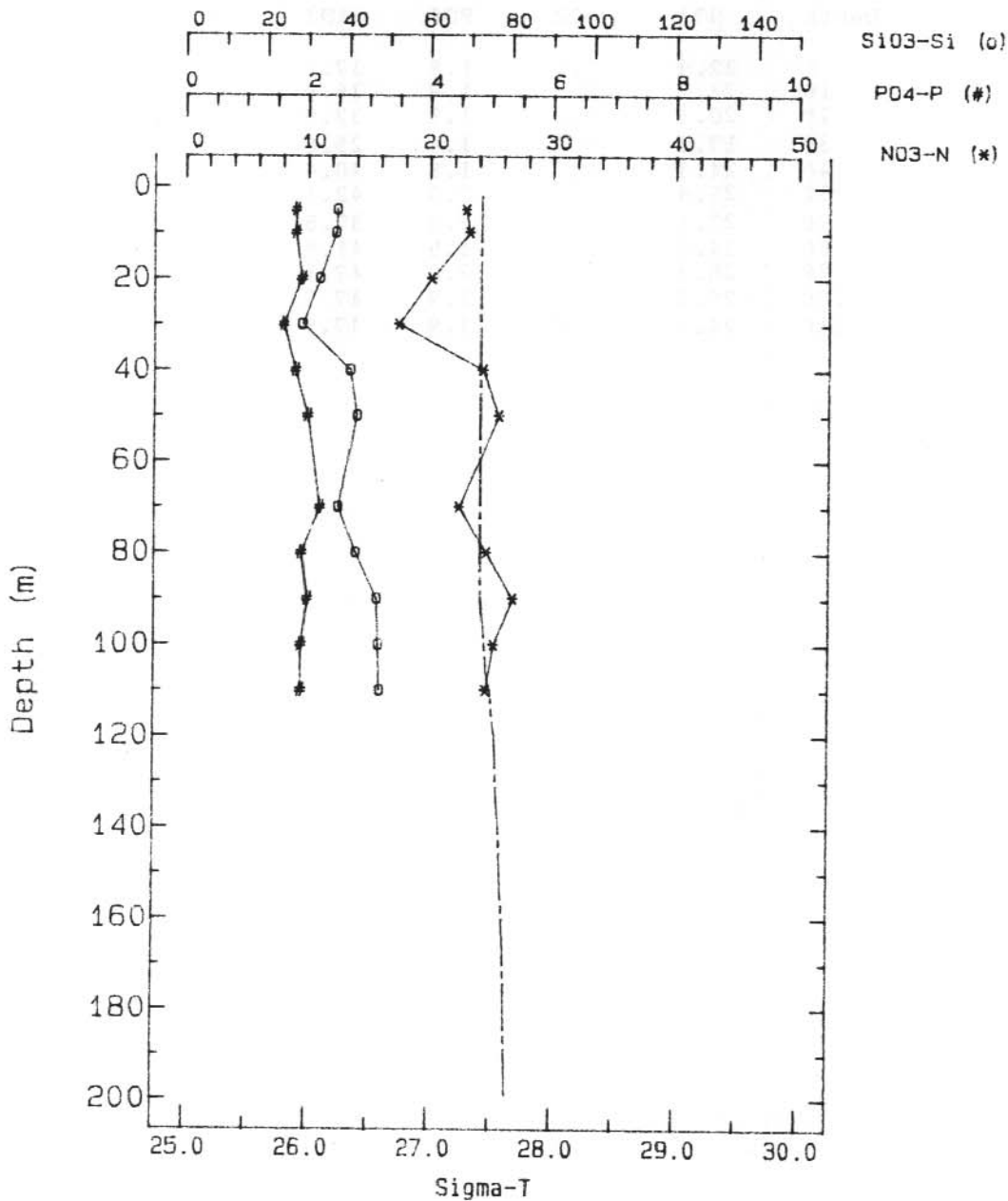
Cruise: ADBEX3 Station: 24

18 OCT 1985 1746 GMT

Latitude : 63:07.41S

Longitude: 63:51.61E

Depth: CTD 1002 m Bottom NR





Cruise : ADBEX3  
 Station number : 26  
 Date : 20-OCT-1985 (DAY NUMBER 293)  
 Start Time : 1622 GMT  
 Ship : NELLA DAN  
 Position : 61:27.95S 62:31.60E  
 Cast Depth (m) : 502  
 Bottom Depth (m) : Not Recorded

Depth	NO3	NO2	PO4	SiO3	Mn
20	24.8	0.2	1.8	37.1	
30	21.3	0.1	1.6	32.5	
40	22.4	0.2	1.7	35.0	
50	19.3	0.1	1.5	29.3	
60	20.8	0.1	1.6	31.8	
70	18.4	0.1	1.6	27.9	
70	17.8	0.1	1.6	26.1	
70	21.9	0.2	1.6	32.5	
80	18.0	0.1	1.5	27.1	
90	22.1	0.1	1.6	33.2	
100	21.8	0.2	1.7	32.9	

# ADBEX3 NUTRIENTS - SIGMA-T

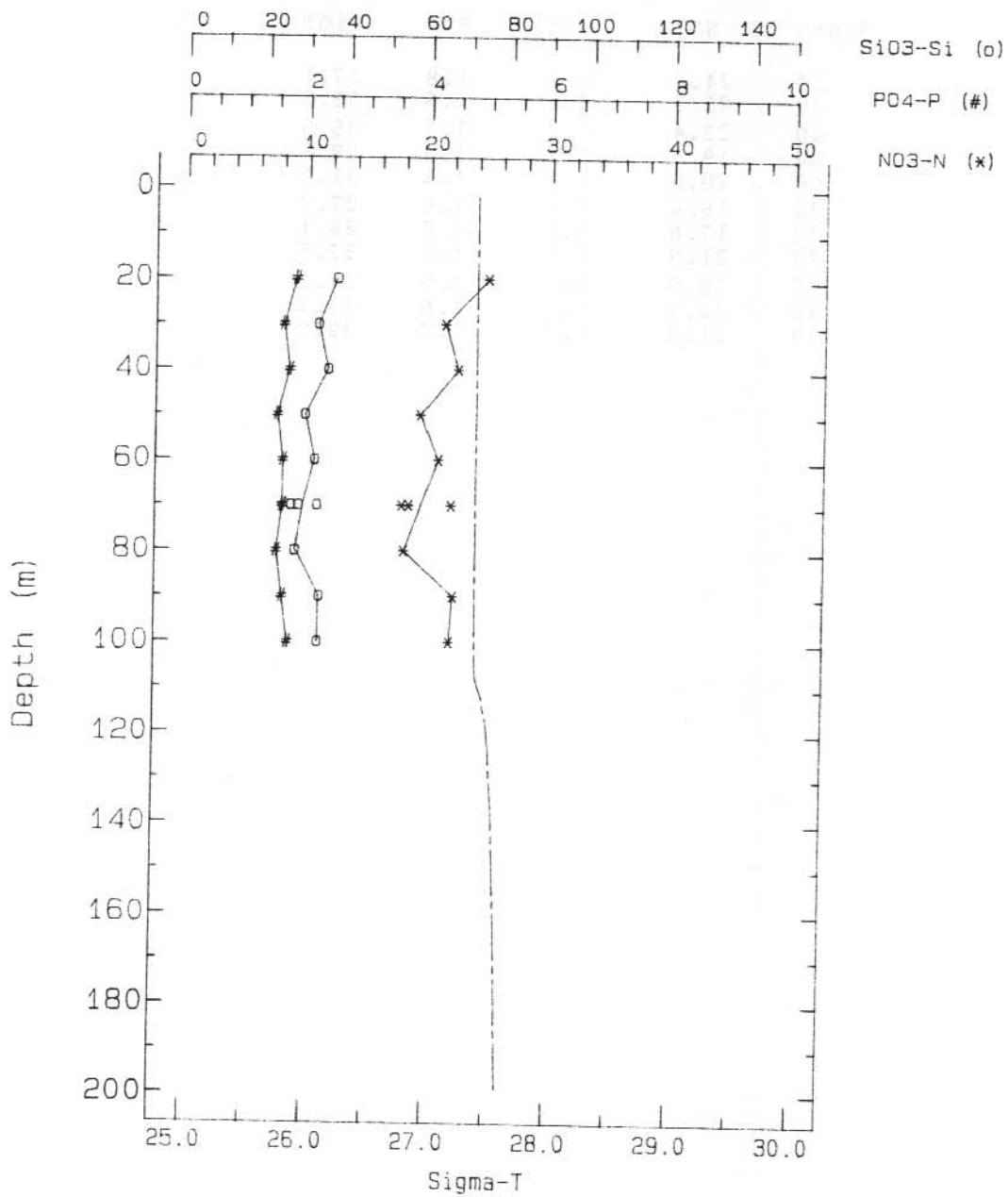
Cruise: ADBEX3 Station: 26

20 OCT 1985 1622 GMT

Latitude : 61:27.95S

Longitude: 62:31.60E

Depth: CTD 502 m Bottom NR



Cruise : ADBEX3  
 Station number : 27  
 Date : 22-OCT-1985 (DAY NUMBER 295)  
 Start Time : 0317 GMT  
 Ship : NELLA DAN  
 Position : 61:32.93S 54:34.18E  
 Cast Depth (m) : 824  
 Bottom Depth (m) : Not Recorded

Depth	NO3	NO2	PO4	SiO3	Mn
0	21.5	0.2	1.6	32.9	0.1
5	19.4	0.1	1.5	28.2	
10	25.3	0.2	1.6	37.1	
20	20.9	0.1	1.5	31.1	
30	20.6	0.3	1.6	32.5	
40	22.2	0.1	1.6	35.0	
50	23.9	0.2	1.7	37.9	
60	24.6	0.2	1.8	37.9	
70	20.2	0.1	1.6	31.1	
80	19.3	0.1	1.6	30.0	
90	19.2	0.1	1.7	31.1	
100	19.6	0.1	1.6	31.1	

# ADBEX 3 NUTRIENTS - SIGMA-T

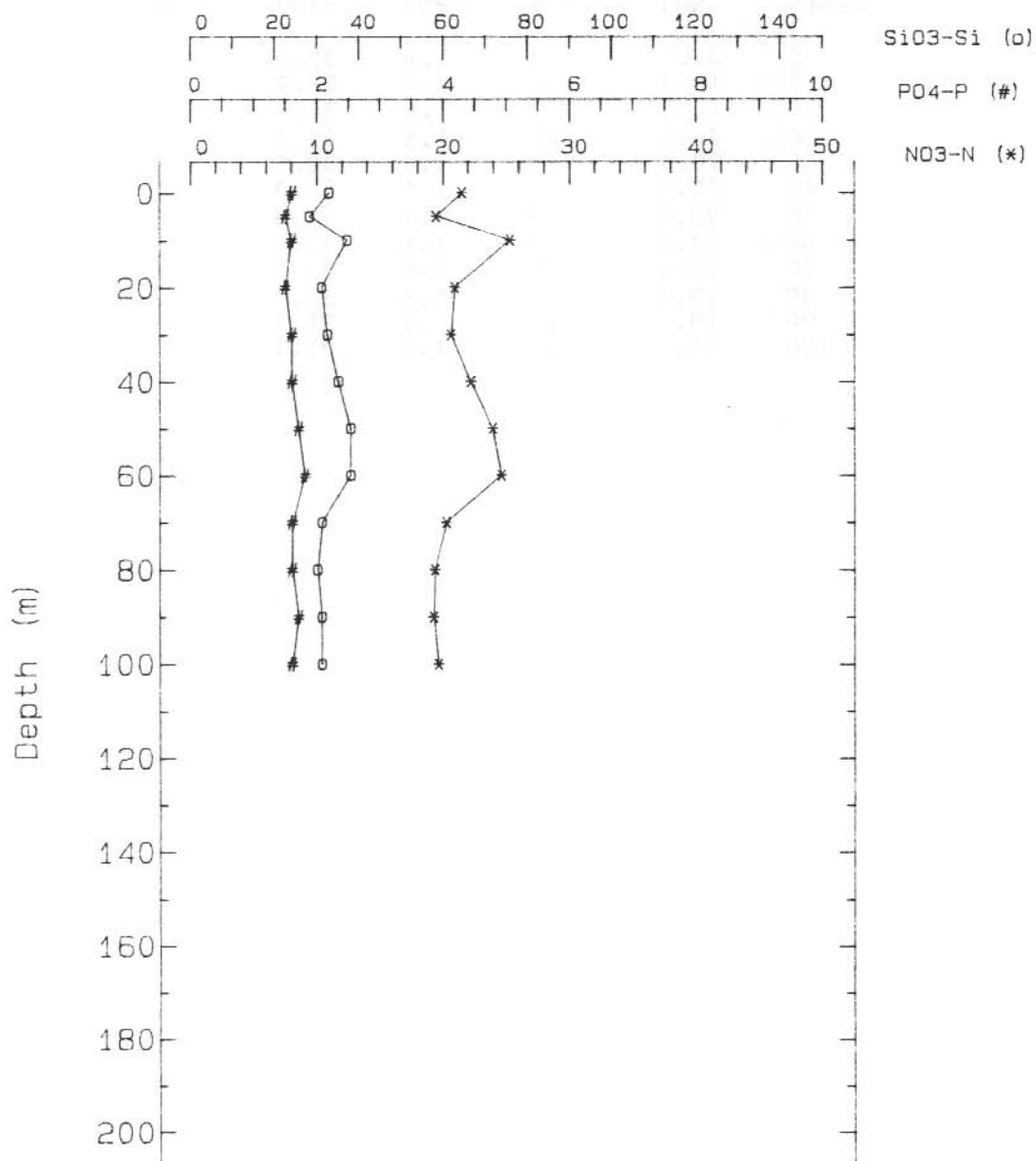
Cruise: ADBEX3 Station: 27

22 OCT 1985 0317 GMT

Latitude : 61:32.93S

Longitude: 54:34.18E

Depth: CTD 824 m Bottom NR



Cruise : ADBEX3  
Station number : 28  
Date : 23-OCT-1985 (DAY NUMBER 296)  
Start Time : 0457 GMT  
Ship : NELLA DAN  
Position : 63:01.20S 53:42.87E  
Cast Depth (m) : 1002  
Bottom Depth (m) : Not Recorded

Depth	NO3	NO2	PO4	SiO3	Mn
5	20.4	0.2	1.5	32.1	0.1
10	29.7	0.5	1.4	46.1	0.1
20	20.1	0.1	1.4	30.7	0.1
30	22.9	0.2	1.5	37.1	0.1
40	19.6	0.1	1.5	31.1	0.1
50	22.9	0.1	1.6	36.4	0.1
60	24.2	0.1	1.6	38.2	0.1
70	21.1	0.1	1.5	34.6	0.1
80	21.4	0.1	1.5	33.9	0.1
90	20.8	0.1	1.5	35.0	0.1
100	20.6	0.1	1.5	35.0	0.1

# ADBEX 3 NUTRIENTS - SIGMA-T

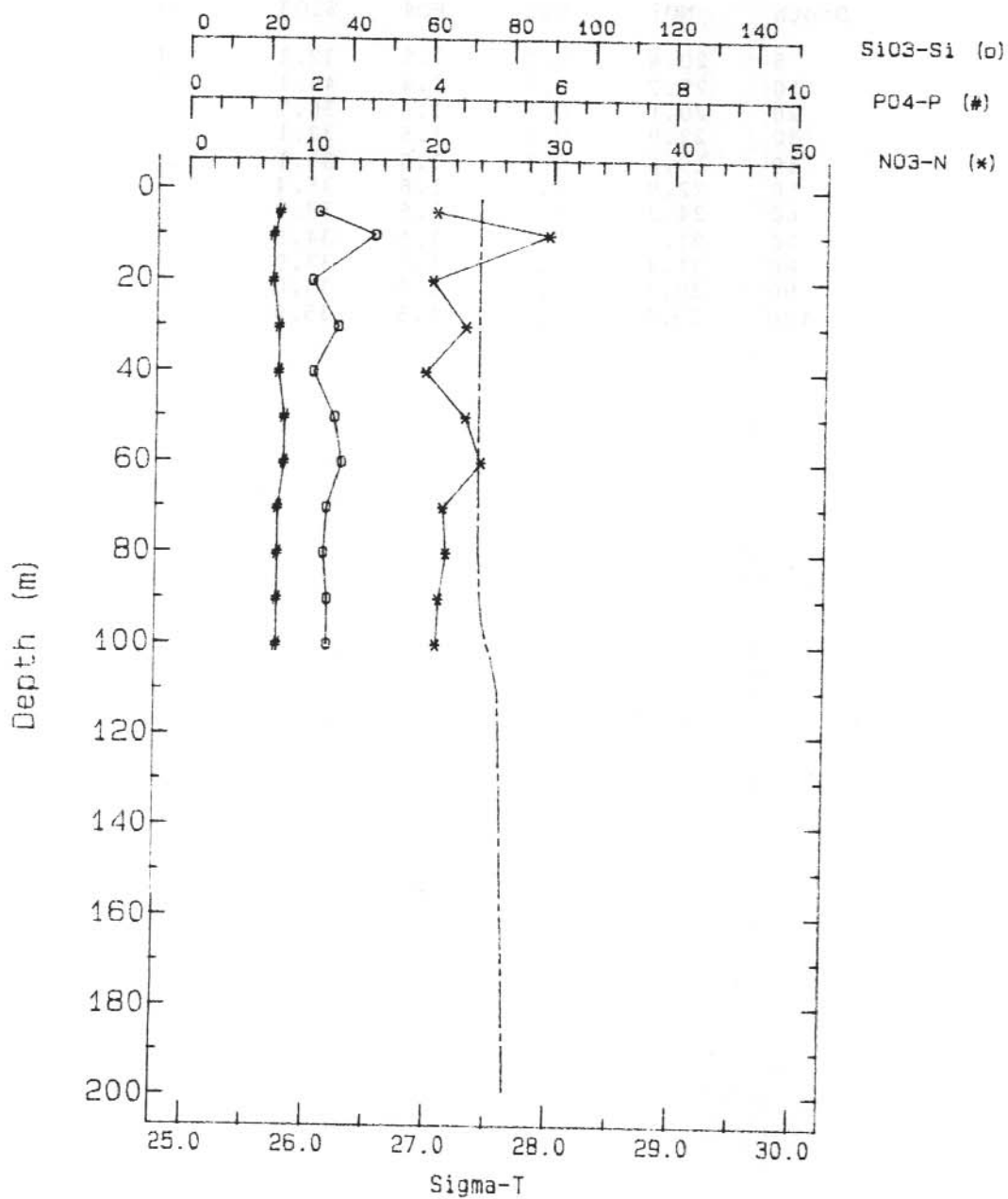
Cruise: ADBEX3 Station: 28

23 OCT 1985 0457 GMT

Latitude : 63:01.20S

Longitude: 53:42.87E

Depth: CTD 1002 m Bottom NR



Cruise : ADBEX3  
 Station number : 29  
 Date : 24-OCT-1985 (DAY NUMBER 297)  
 Start Time : 1346 GMT  
 Ship : NELLA DAN  
 Position : 64:00.77S 53:04.32E  
 Cast Depth (m) : 1002  
 Bottom Depth (m) : Not Recorded

Depth	NO3	NO2	PO4	SiO3	Mn
1	21.4	0.1	1.6	36.1	0.1
10	28.5	0.1	1.7	46.4	
20	31.0	0.1	1.5	43.6	
30	28.7	0.1	1.8	47.5	
40	30.5	0.2	1.9	51.1	
50	30.9	0.2	1.9	51.1	
60	31.5	0.2	1.8	50.7	
70	24.0	0.2	1.6	41.1	
80	25.2	0.0	1.7	55.4	
90	20.7	0.0	1.6	48.9	
100	23.0	0.0	1.7	56.1	

# ADBEX 3 NUTRIENTS - SIGMA-T

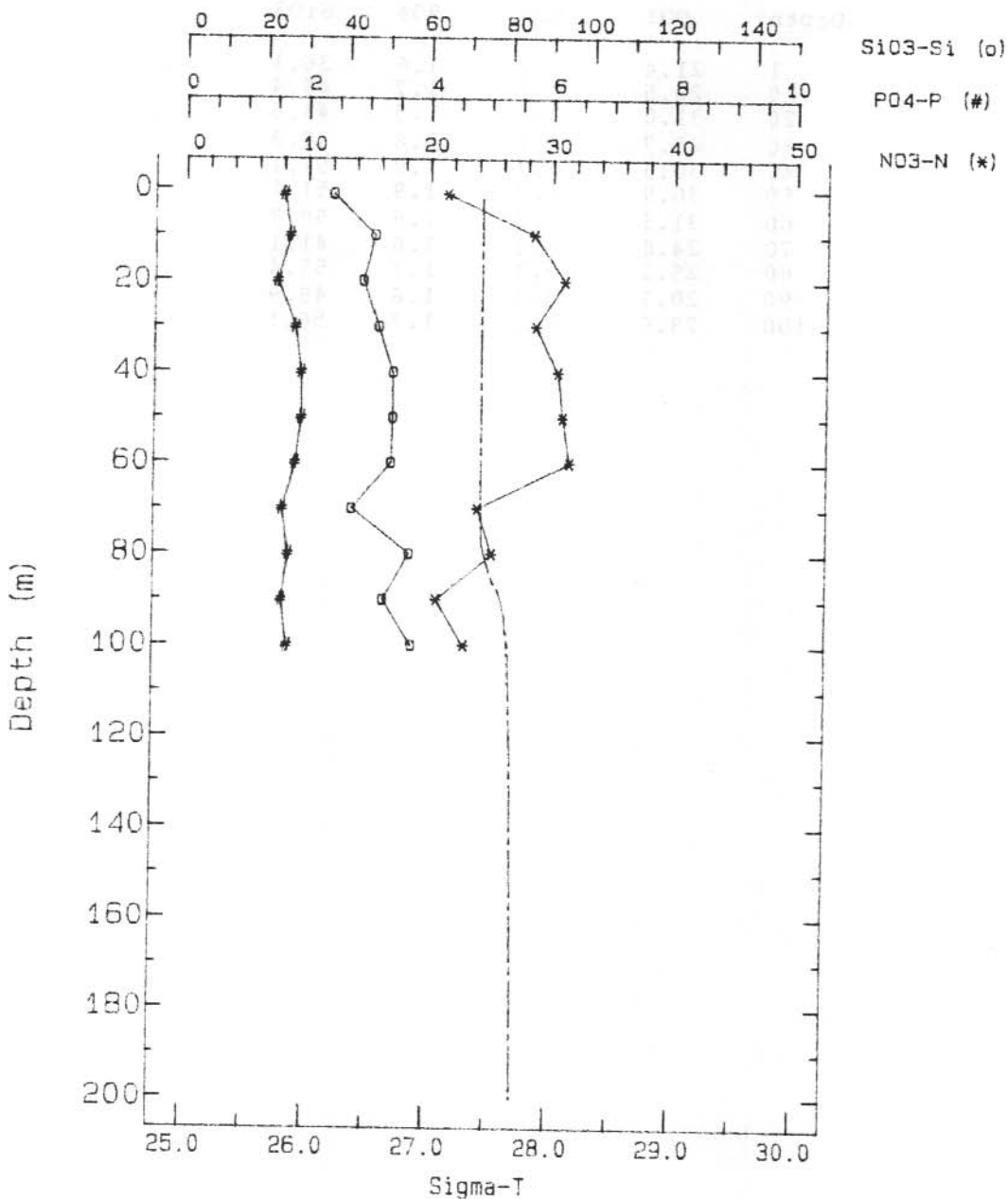
Cruise: ADBEX3 Station: 29

24 OCT 1985 1346 GMT

Latitude : 64: 00.77S

Longitude: 53: 04.32E

Depth: CTD 1002 m Bottom NR





Cruise : ADBEX3  
 Station number : 30  
 Date : 27-OCT-1985 (DAY NUMBER 300)  
 Start Time : 1442 GMT  
 Ship : NELLA DAN  
 Position : 65:55.41S 51:22.89E  
 Cast Depth (m) : 232  
 Bottom Depth (m) : Not Recorded

Depth	NO3	NO2	PO4	SiO3	Mn
5	29.6	0.2	1.9	54.3	0.1
10	24.7	0.1	1.5	45.4	0.1
20	28.1	0.1	1.8	51.8	0.1
30	31.0	0.1	2.1	57.5	0.1
40	31.7	0.1	2.1	57.9	0.1
50	33.1	0.1	1.6	58.6	0.1
60	32.7	0.1	1.8	57.9	0.1
70	31.0	0.1	2.0	56.1	0.1
80	31.5	0.2	2.0	57.5	0.1
90	21.6	0.1	1.5	39.3	0.1
100	24.0	0.1	1.6	43.6	0.1

# ADBEX 3 NUTRIENTS - SIGMA-T

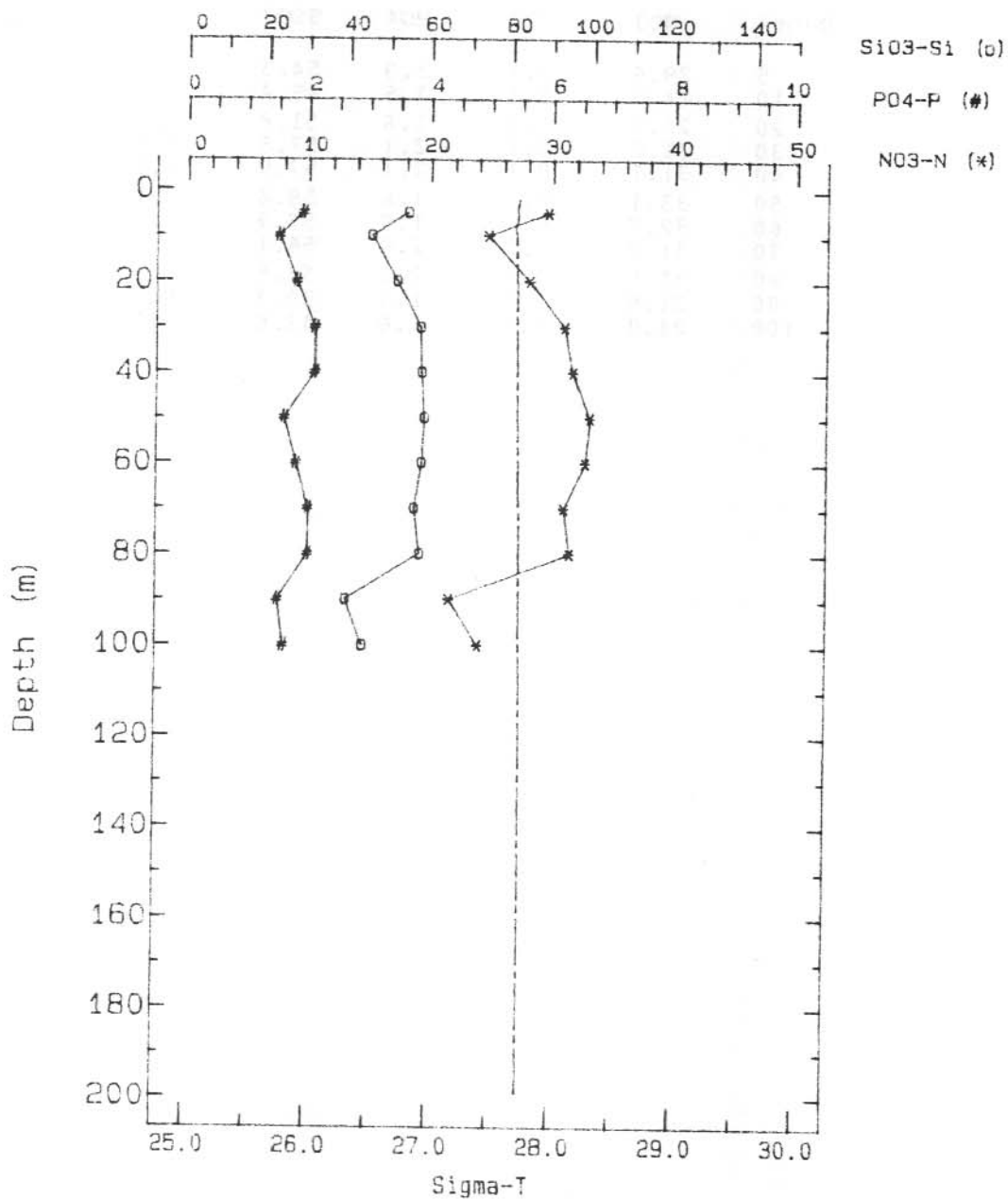
Cruise: ADBEX3 Station: 30

27 OCT 1985 1442 GMT

Latitude : 65:55.41S

Longitude: 51:22.89E

Depth: CTD 232 m Bottom NR



Cruise : ADBEX3  
 Station number : 32  
 Date : 04-NOV-1985 (DAY NUMBER 308)  
 Start Time : 0538 GMT  
 Ship : NELLA DAN  
 Position : 65:52.80S 50:23.13E  
 Cast Depth (m) : 564  
 Bottom Depth (m) : Not Recorded

Depth	NO3	NO2	PO4	SiO3	Mn
0	32.0	0.1	1.5	60.4	0.1
10	27.3	0.1	1.9	52.5	
20	22.1	0.0	1.8	44.3	
20	24.0	0.0	1.7	46.4	
30	22.5	0.0	1.7	43.6	
30	25.2	0.1	1.6	49.3	
40	30.4	0.0	2.5	60.0	
50	31.4	0.1	2.0	60.7	
60	30.2	0.1	3.1	57.5	
70	33.8	0.1	1.6	60.7	
80	31.0	0.1	2.0	61.1	
90	31.9	0.1	1.9	61.1	
100	31.5	0.1	2.0	61.1	

# ADBEX 3 NUTRIENTS - SIGMA-T

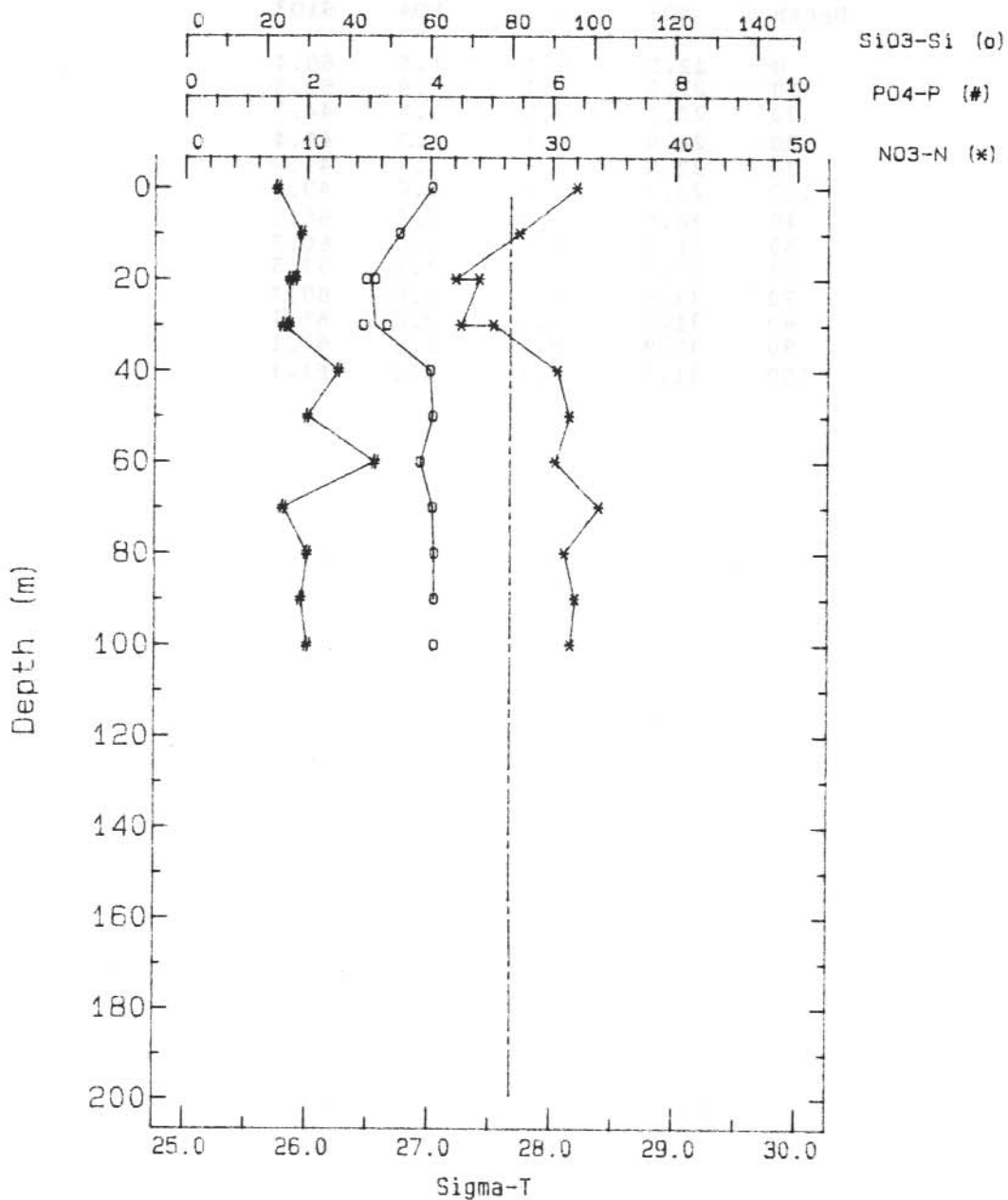
Cruise: ADBEX3 Station: 32

04 NOV 1985 0538 GMT

Latitude : 65: 52.80S

Longitude: 50: 23.13E

Depth: CTD 564 m Bottom NR



Cruise : ADBEX3  
 Station number : 34  
 Date : 06-NOV-1985 (DAY NUMBER 310)  
 Start Time : 1648 GMT  
 Ship : NELLA DAN  
 Position : 66:06.09S 49:48.74E  
 Cast Depth (m) : 280  
 Bottom Depth (m) : Not Recorded

Depth	NO3	NO2	PO4	SiO3	Mn
10	24.4	0.0	1.7	46.4	0.1
20	25.1	0.0	1.9	47.9	
30	22.1	0.0	1.8	42.9	
40	27.3	0.2	2.0	52.1	
50	23.5	0.0	1.7	45.4	
50	18.3	0.1	1.6	36.4	
75	21.9	0.1	1.6	42.5	
75	26.6	0.1	1.9	52.1	
80	27.9	0.0	1.6	48.9	
80	22.3	0.0	1.5	42.9	
90	26.5	0.1	1.5	47.5	
90	25.9	0.0	1.3	48.6	

# ADBEX3 NUTRIENTS - SIGMA-T

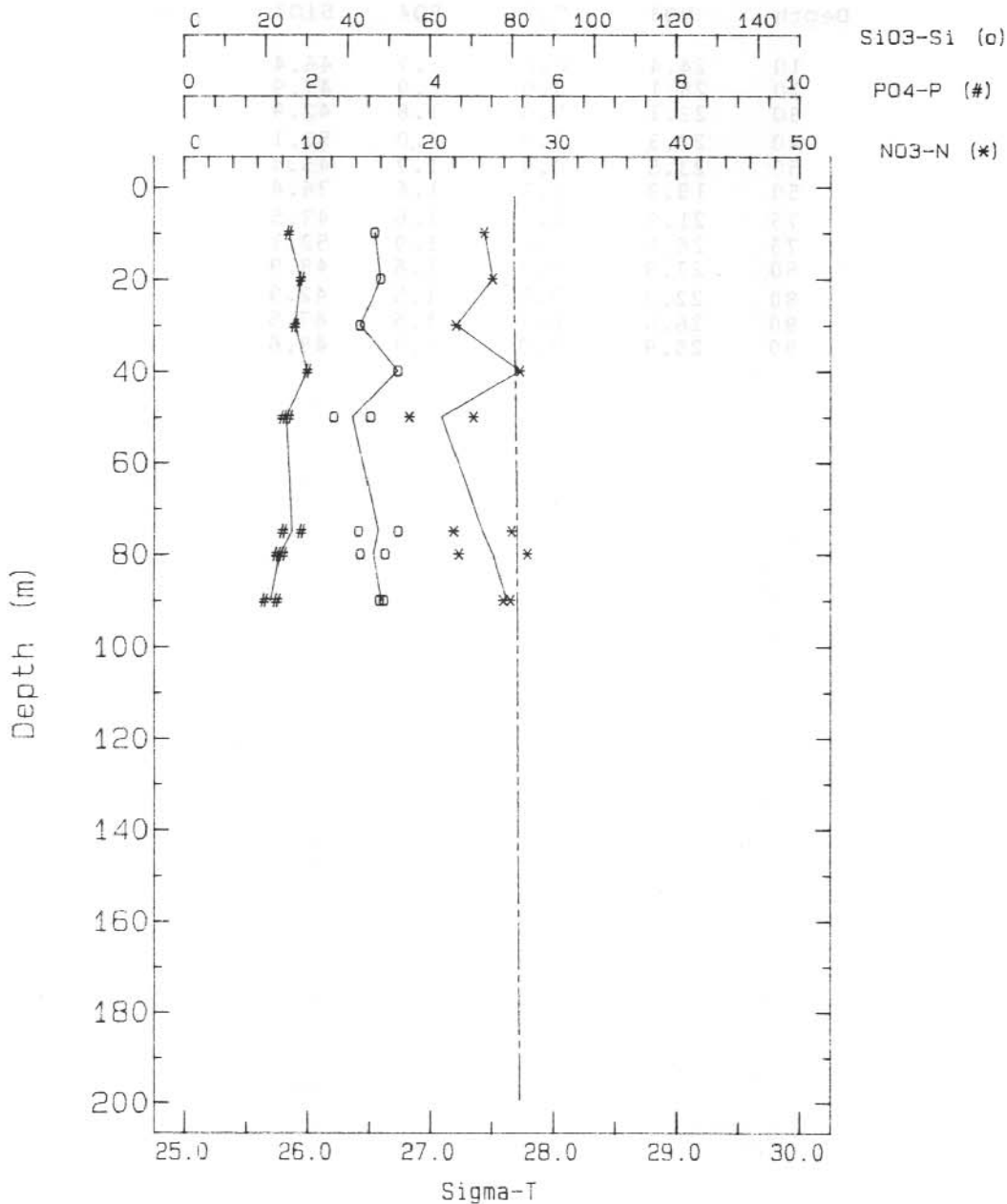
Cruise: ADBEX3 Station: 34

06 NOV 1985 1648 GMT

Latitude : 66: 06.09S

Longitude: 49: 48.74E

Depth: CTD 280 m Bottom NR



Cruise : ADBEX3  
 Station number : 36  
 Date : 09-NOV-1985 (DAY NUMBER 313)  
 Start Time : 0737 GMT  
 Ship : NELLA DAN  
 Position : 65:54.80S 50:04.67E  
 Cast Depth (m) : 1640  
 Bottom Depth (m) : Not Recorded

Depth	NO3	NO2	PO4	SiO3	Mn
0	20.0	0.0	1.7	37.1	0.1
10	21.8	0.0	1.8	41.1	
20	23.4	0.1	1.7	42.9	
30	19.1	0.0	1.7	35.0	
40	20.4	0.1	1.7	36.1	
50	18.9	0.0	1.7	35.4	
60	20.7	0.1	1.7	38.2	
70	21.5	0.1	1.7	39.3	
80	21.8	0.2	1.7	39.3	
90	21.4	0.1	1.7	40.4	
100	21.1	0.0	1.8	41.8	
110	22.4	0.0	1.8	42.1	
150	27.7	0.0	2.1	52.5	

# ADBEX 3 NUTRIENTS - SIGMA-T

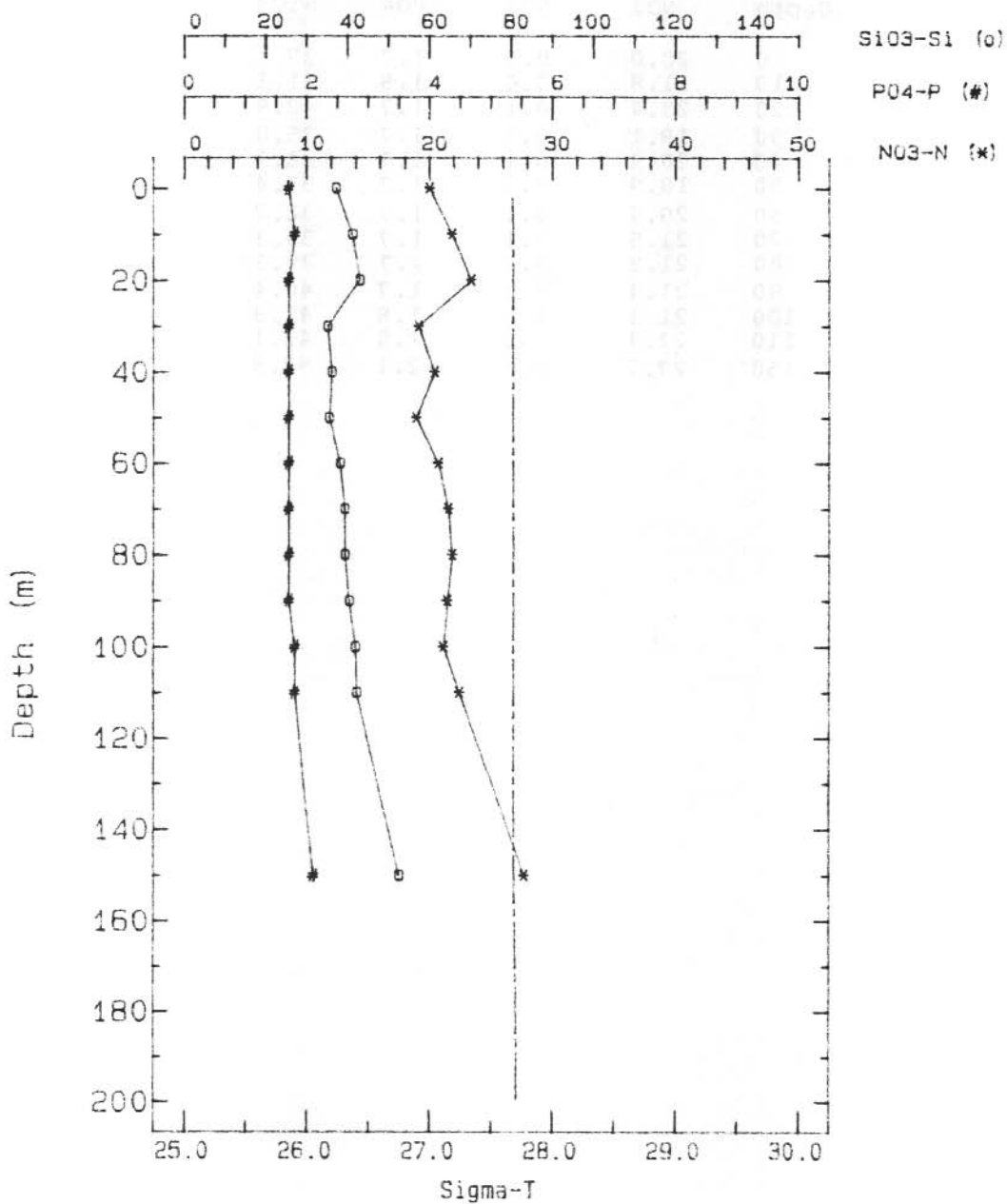
Cruise: ADBEX3 Station: 36

09 NOV 1985 0737 GMT

Latitude : 65:54.80S

Longitude: 50:04.67E

Depth: CTD 1640 m Bottom NR





Cruise : ADBEX3  
 Station number : 37  
 Date : 19-NOV-1985 (DAY NUMBER 323)  
 Start Time : 1313 GMT  
 Ship : NELLA DAN  
 Position : 65:50.88S 50:33.91E  
 Cast Depth (m) : 862  
 Bottom Depth (m) : Not Recorded

Depth	NO3	NO2	PO4	SiO3	Mn
10	12.1	0.1	1.7	43.9	
20	25.7	0.0	1.8	46.4	
30	19.0	0.0	1.5	35.0	
40	19.4	0.0	1.6	35.4	
50	9.5	0.0	1.6	33.6	
60	21.1	0.0	1.7	39.3	
70	24.1	0.0	1.7	44.3	
80	21.0	0.0	1.7	37.9	
100	24.3	0.0	1.8	45.0	



# ADBEX 3 NUTRIENTS - SIGMA-T

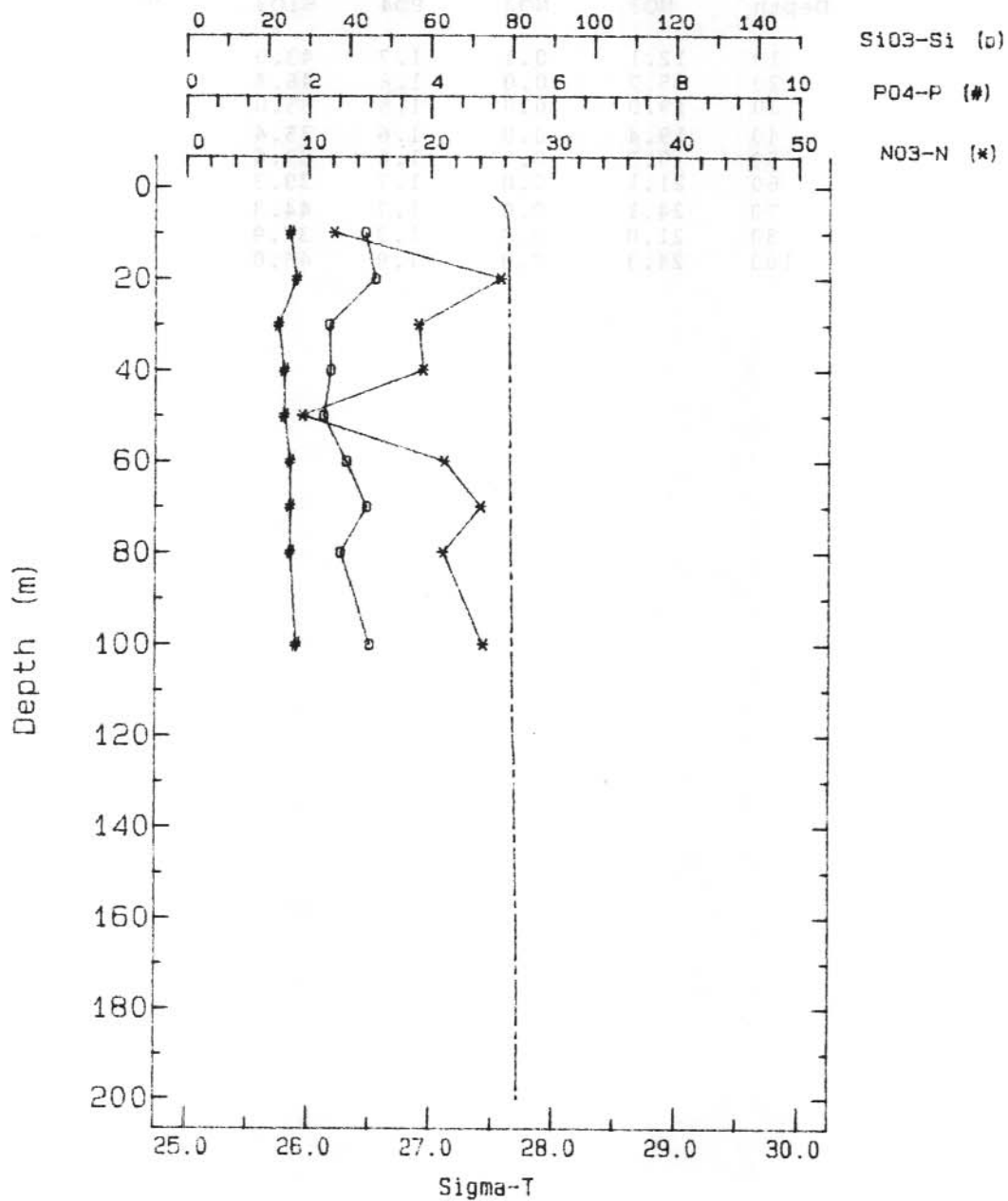
Cruise: ADBEX3 Station: 37

19 NOV 1985 1313 GMT

Latitude : 65: 50.88S

Longitude: 50: 33.91E

Depth: CTD 862 m Bottom NR



Cruise : ADBEX3  
 Station number : 39  
 Date : 22-NOV-1985 (DAY NUMBER 326)  
 Start Time : 0702 GMT  
 Ship : NELLA DAN  
 Position : 65:47.80S 50:46.28E  
 Cast Depth (m) : 690  
 Bottom Depth (m) : Not Recorded

Depth	NO3	NO2	PO4	SiO3	Mn
5	27.6	0.0	1.9	52.9	
10	20.4	0.1	1.7	40.4	
10	13.3	0.1	1.8	48.2	
25	13.1	0.1	1.8	48.2	
55	13.1	0.1	1.8	48.9	
75	12.1	0.1	1.7	45.0	

# ADBEX3 NUTRIENTS - SIGMA-T

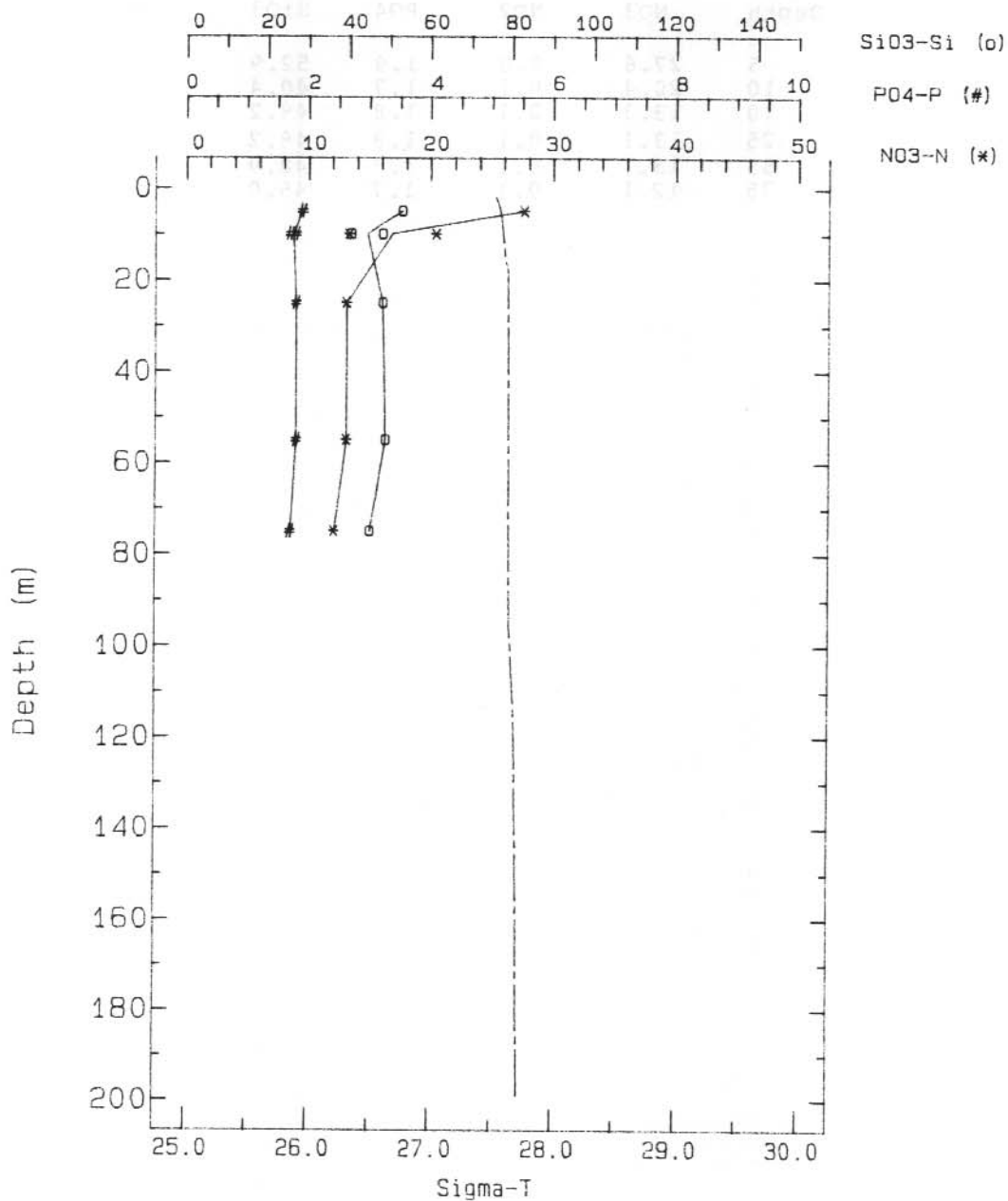
Cruise: ADBEX3 Station: 39

22 NOV 1985 0702 GMT

Latitude : 65: 47.80S

Longitude: 50: 46.28E

Depth: CTD 690 m Bottom NR



Cruise : ADBEX3  
 Station number : 42  
 Date : 25-NOV-1985 (DAY NUMBER 329)  
 Start Time : 0905 GMT  
 Ship : NELLA DAN  
 Position : 65:39.55S 51:11.46E  
 Cast Depth (m) : 1640  
 Bottom Depth (m) : Not Recorded

Depth	NO3	NO2	PO4	SiO3	Mn
10	25.4	0.0	1.6	51.4	
20	19.9	0.0	1.4	41.1	
30	22.2	0.0	1.5	46.4	
40	21.1	0.0	1.6	52.9	
50	23.3	0.0	1.5	48.9	
60	24.6	0.0	1.6	51.8	
70	20.1	0.0	2.0	46.8	
100	26.8	0.0	2.2	53.2	

# ADBEX 3 NUTRIENTS - SIGMA-T

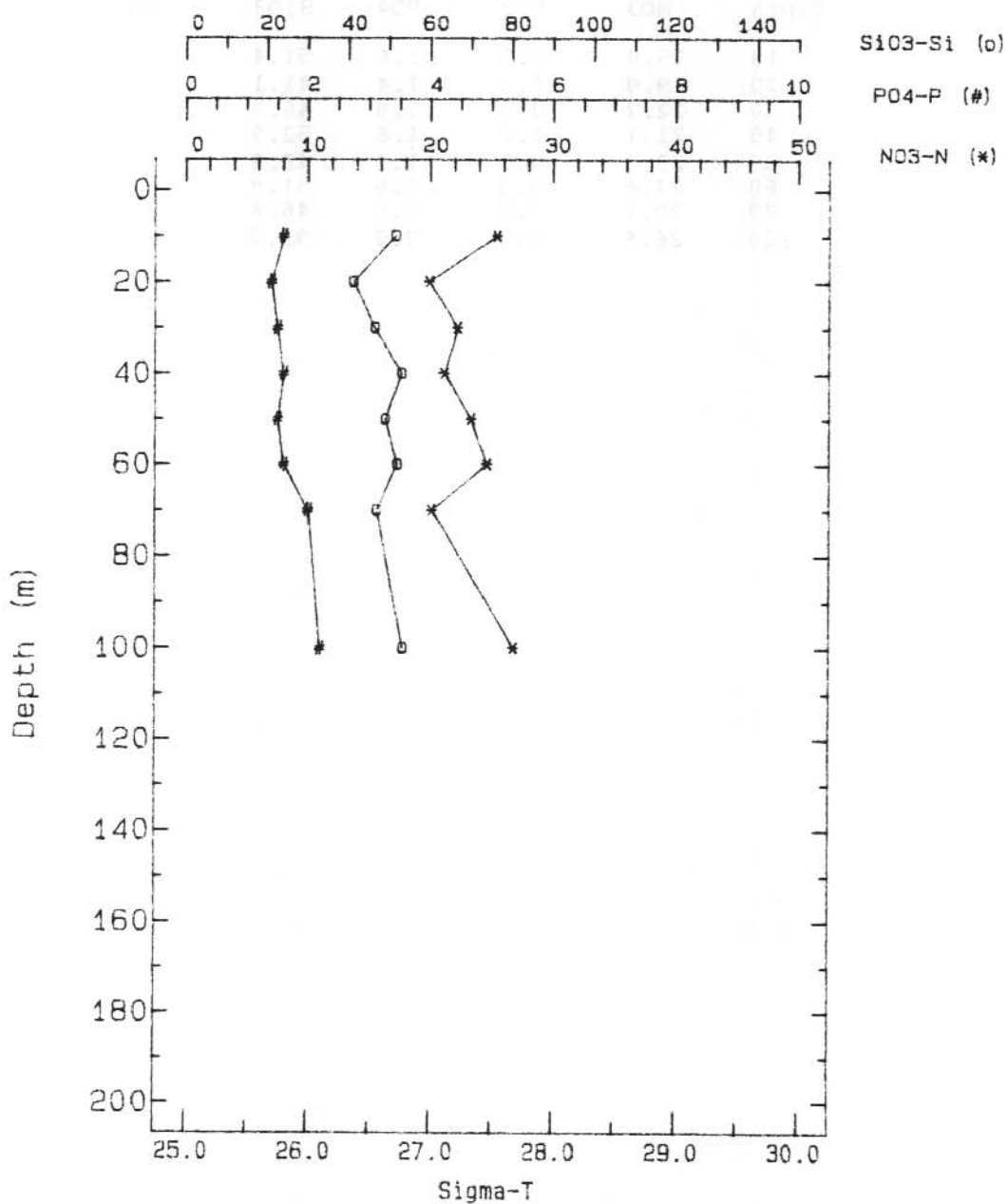
Cruise: ADBEX3 Station: 42

25 NOV 1985 0905 GMT

Latitude : 65: 39.55S

Longitude: 51: 11.46E

Depth: CTD 1640 m Bottom NR



Cruise : ADBEX3  
Station number : 48  
Date : 06-DEC-1985 (DAY NUMBER 340)  
Start Time : 0939 GMT  
Ship : NELLA DAN  
Position : 66:15.41S 49:14.20E  
Cast Depth (m) : 1640  
Bottom Depth (m) : Not Recorded

Depth	NO3	NO2	PO4	SiO3	Mn
5	29.5	0.1	2.1	58.6	
10	24.6	0.0	1.7	50.0	
20	26.7	0.0	1.7	51.4	
30	24.9	0.0	1.6	48.2	
40	23.6	0.0	1.8	53.6	
50	26.9	0.0	1.8	55.4	
60	25.3	0.0	1.6	49.3	
70	26.4	0.0	1.8	52.1	
80	27.1	0.0	1.8	52.1	
90	13.9	0.1	1.8	52.1	
100	13.6	0.1	1.8	51.4	
120	13.2	0.1	1.7	49.6	

# ADBEX3 NUTRIENTS - SIGMA-T

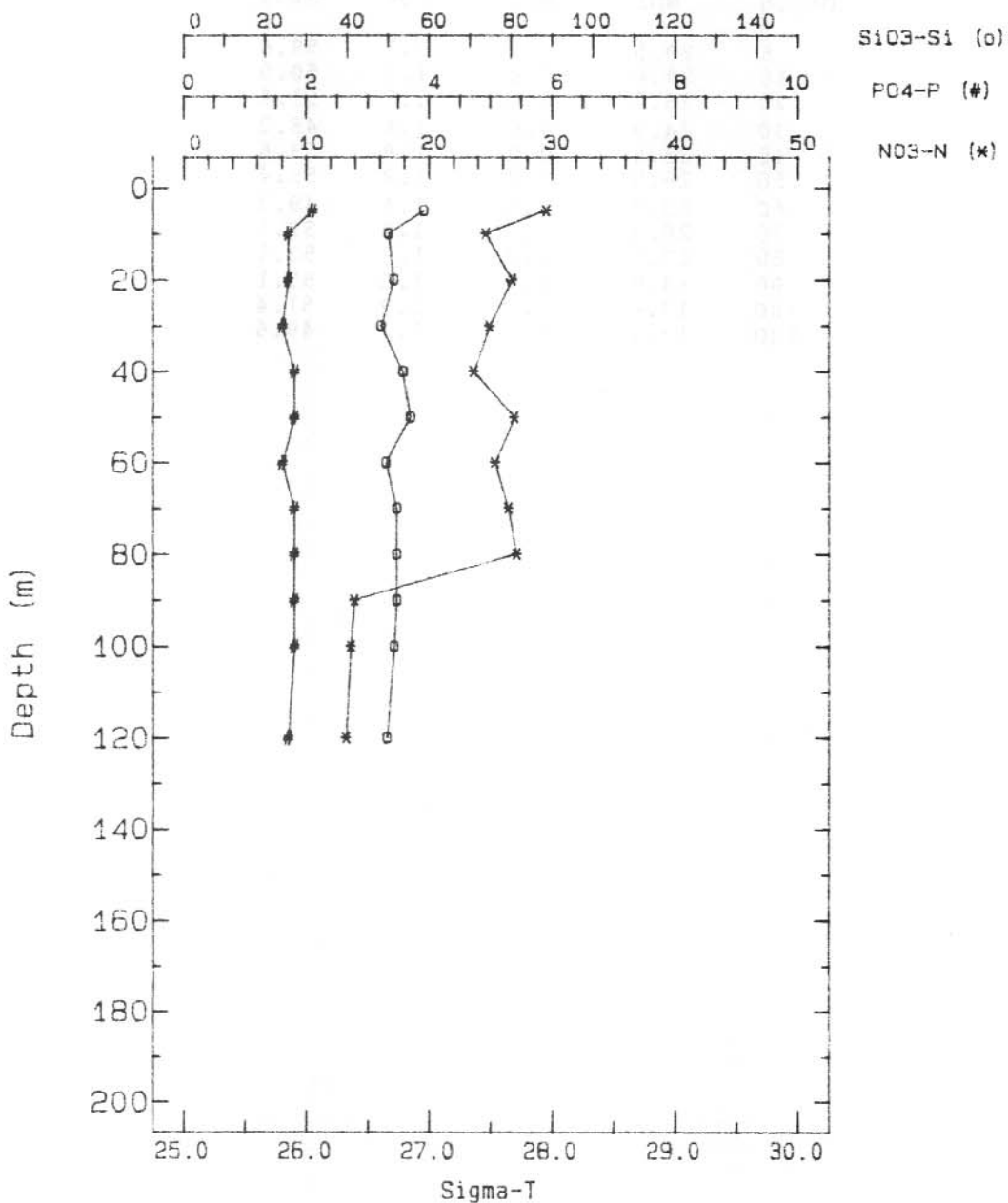
Cruise: ADBEX3 Station: 48

06 DEC 1985 0939 GMT

Latitude : 66: 15.41S

Longitude: 49: 14.20E

Depth: CTD 1640 m Bottom NR





#### ACKNOWLEDGMENTS

The water samples were collected and processed by Andrew Davidson, Patricia Richers, Malcolm Robb and Dr Stella Humphries. Tony Chaffey carried out the chemical analyses. Eric Woehler processed the CTD data. Dr David Watts developed the plotting software.

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1. The first part of the document  
describes the general situation  
of the project and the  
main objectives to be achieved.