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R.R.V. Charles Darwin

Report on Cruise 86/17

North-West Arabian Sea

October 15th - November 7th, 1986

University of Edinburgh, Department of Geology
University of Cambridge, Department of Earth Sciences
University of Nottingham, Department of Geology
University of Liverpool, Department of Oceanography

Dates

Departed Quaboos, Muscat	15.10.86
Arrived first station 1701-01	17.10.86
Completed last station 1742-02	6.11.86
Arrived Quaboos, Muscat	7.11.86

All times in this report are GMT.

Scientific Personnel

Principal Scientific Officer	- Dr. N.B. Price	- University of Edinburgh
Senior Scientist	- Dr. G.B. Shimmield	
	Ms. F. Lindsay	
	Ms. T. Watson	
	Ms. T. Williams	
	Mr. J. Smith	
	Mr. C. German	- University of Cambridge
	Mr. T. Lunel	
	Mr. I. Selby	- University of Nottingham
	Ms. A. Berry	- University of Liverpool

Research Vessel Services Technical Officers	R. Davies
	G. Knight
	K.G. Robertson
	W.K. Smith
	J. Taylor
	P. Taylor

Cruise Objectives

Sediments

Edinburgh and Nottingham Universities.

The principal objectives of the cruise were to obtain sediment cores from a variety of environments representing (a) shallow water sediments situated above the oxygen minimum layer (b) organic rich sediments situated with the oxygen minimum layer, that is at depths between 200-1800m and (c) hemipelagic/oceanic sediments. For this both box corers and piston corers were employed.

It is envisaged that this material can be used for the following study

(a) Facies variation of the sediment with respect to the oxygen minimum zone and to distance from likely sediment sources e.g. Indus River and deserts.

(b) Diagenetic reactions of sediments showing variation in organic matter content and accumulated rate. These will be realised by study of both the solid and pore waters of the sediments.

(c) History of sedimentation of piston cores represent about 200,000 years of accumulation. Here it is envisaged that changes in the accumulation of biogenic and terrigenous constituents will provide evidence for change of monzoonal conditions during glacial and interglacial periods.

(d) Changes in the input of man made radionuclides and the mixture of these into the sediments.

The following scientists were associated with these aims - N.B. Price, G.B. Shimmield, T. Watson, T. Williams, F. Lindsay and I Selby (representing Dr. D.A. Stow (Nottingham University).

Water

From CTD profiling and nutrient measurements to

(a) Sample the water colum for an investigation of dissolved trace elements. The examination of these is two-fold:

1. Cruise 86/17 allows for sampling of waters as an extension of Cruises 86/15 and 86/16. Here patterns of northward change in dissolved constituents will allow for an interpretation of the circulation and gain of metals to water up the western side of the Indian Ocean. Additionally, sampling within the Arabian Sea allows for a study of the changes of redox sensitive elements in the water column. In this water was collected for the following elements -

   1) Rare earth elements (C. German)

   2) Selenium (T. Lunel)

   3) Neodymium isotope ratios $^{144}Nd/^{143}Nd$ (C. German for H. Elderfied, Cambridge University).

   4) Nickel (for S. de Berg, Liverpool University).

   5) Iodine (for H. Kennedy, UCNW).

2. Additionally suspended particulate matter was collected, to determine changes in the input pattern of terrigenous constituents as well as for investigating the quantitative variations of the standing crop of biogenic constituents and organic matter in surface waters andtheir alteration during fallout (Edinburgh University).

Airborne dusts

Collections of airborne dusts were collected on certain cruise tracks using nets and pumping techniques (Liverpool University).

Sampling operations

The positions of forty-two stations and the work undertaken at each of these is given in Figs. 1 and 2 and also tabulated. Additional tables are presented, giving brief details of the core recovery and sediment characteristics at sediment sampling stations. Pore water nutrient analyses are also listed for seven stations.

Hydrographic data, dissolved oxygen and nutrients for a majority of the water stations are presented and include all stations where water was collected for dissolved metal investigations. The apportioning of this between different laboratories is listed. Tables are also included for the water volumes filtered during particulate matter sampling.

Sediment Recovery

Twenty-eight sediment cores collected by RVS box coring and eleven piston cores (generally 8-10m length) were collected during the cruise. Brief descriptions of these are recorded and their locations are given in Fig. 1. Attempts to collect fine grained sediments in water depths 200m/350m were largely unsuccessful due to occurrence of sands rather than muds at these depths. Further, the topography of the seabed between 200m/500m was most irregular, particularly on the extreme south-eastern coast and eastern coast of Oman. Here the seabed was either highly disected or appeared as a series of steep sided terraces with likely local sediment slumping. Because of these features, no simple transect of cores straddling the depths oxygen minimum zone could be achieved. However the cores recovered do represent a wide variety of sediment types. Recovery of the box cores represented most extremely good sediment water interfaces. Where this did not occur, it is indicated in the core descriptions. The piston cores also show good recovery. Subsampling of the box cores into 4-5, 2.5 inch polycarbonate liners was normally undertaken. One of these was subsampled on board at 1cm intervals to 10cm depth and thereafter at 2cm intervals for pore water extractions. A second subsample was also cut in a likewise manner and bagged for artificial radionuclide work. Except for these subcores and the piston core duplicate of 1715 all sediments were transported intact in 1m frozen lengths to the U.K. The sediments show considerable geographic variations in lithology as well as with sediment depths. However there is no consistent pattern of sediment type with depth of water.

Sediments shallower than 600m are of three lithologies. In the West fine silty sands predominate while in the shallow areas immediately to the west of Masirah Island there is a high content of diatomaceous remains. Sediments off the extreme south-east of the Arabian peninsular and in the shallower parts of the Gulf of Oman show high contents of wind-blown dust. Hemipelagic and pelagic sediments comprise fine grained carbonate rich silts and muds. The high organic loading and the general lack of a manganise-iron sediment is reflected in the intensity and thickness of the oxidised surface layer. Red/brown coloured surficial sediments are not encountered in coastal waters. In the hemipelagic/pelagic environments it is confied to the upper few centimetres and reaches a maximum thickness of 8cm in core 1715. Sediment subsamples as well as subsamples from piston cores extruded at Edinburgh have been examined for their mineralogy and chemistry. Cores 1715, 1721, 1730, 1739 and 1713 have been examined to date at Edinburgh with most attention being paid to Core 1715.

The mineralogy of these cores is dominated by calcite, with small amounts of dolomite, also ubiquitous. The dolomite rarely occurs as euhedral rhombs but mostly occurs as rounded grains or as highly corroded subhedral rhombs. Its content in most of the sediments rarely exceed 3-4% wt. but does show a substantal increase to >10% wt in several of the turbidite layers seen in the piston cores, particularly core 1715. It is tentatively concluded that thedolomite is mostly lithogenous rather than diagenetic. Variation in calcite, 20% to >50%, is caused by dilution from terrigenous minerals. Diatiom frustules are observed in all cores. The terrigenous component of the sediments is dominated by quartz, its grains often rounded, feldspars, illite and chlorite. Kaolinite and montmorillonite are either absent or rare.

Organic carbon contents are highly variable. They vary from >1% Corg in the hemipelagic sediments of cores 1715, 1730, 1738 to more than 4% in the more coastal sediments of core 1721. The variability of organic carbon at depth in cores is considerable and can be a factor of two over a distance of 10cm.

Major element composition variability of the cores is illustrated with reference to cores 1715 and 1721, hemipelegic and coastal sediments respectively. Silicon and Si/Al ratios are much higher in some coastal sediments, possibly reflecting higher contributions of biogenic silicon. Further, these sediments also contain higher phosphorous reflecting the increase in organic matter in these sediments. Phosphorite as semi-consolidated lumps is also seen in these sediments; overall they are rare. The high calcium content of 1715 reflects the lower level of dilution from terrigenous fallout in the hemipelagic/pelagic environment.

The variable nature of major element constituents is also seen in these figures. Higher Ca values near the base of the box cores indicate a change in climatic conditions associated with the last glacial episode. The variation in $CaCO_3$ in the piston cores e.g. 1715 from 40 to >55% may also be a reflection of biological productivity with high $CaCO_3$ contents at depth occuring at 3.5m.

The contrast in the amount and distribution of Mn in different cores is shown for cores 1715 and 1721. For the coastal sediments Mn occurs within detrital aluminosilicate. However, in the hemipelagic cores (1715) high Mn of 0.8

wt% is observed in the surface sediment. The rapid falloff in content below 4cm reflects reduction in the lower part of the oxidised layer. Below, in the reduced sediment, Mn is elevated especially with respect to core 1721 and near the base shows some enrichment, possibly indicating the presence of diagenetic carbonate.

Pore water chemistry

Pore water from seven box cores were collected and analysed for nutrients aboard ship. Subcores of the box cores were stored for short periods (<24 hrs) at 3-5°C and subsampled at either 1cm or 2cm intervals in a glove box in a nitrogen atmosphere. The resulting sediment was centrifuged to express the pore waters, filtered through Millipore filters under nitrogen and aliquots were taken aboard ship for nutrient analysis. The remaining pore waters were stored for transport to Edinburgh for metal analysis. The pore waters were analysed for nutrients by the same methods as used for seawater. The concentrations of nitrate, silicate, phosphate and sulphide are presented as tables and also illustrated as plots against depth from the sediment water-interface. The pore waters from box cores taken at stations 1712, 1713, 1715, 1721, and 1722 are plotted in this way. Cores 1713 and 1715, typical hemipelegic cores, show elevated NO_3 concentrations in the upper 4cm of the sediment. Below there is a well defined reduction and below 10cm nitrate is absent.

The distribution of silicate in the pore waters of these cores show typical profiles, that is low concentrations in surface sediments, although considerably elevated over bottom sea water, and increase with depth in the sediment. Surface concentrations are generally between 270 and 400 um/l but show increases at depth that are very variable. Coastal sediments 1721, 1722 with a high content of biogenic silica shows the most spectacular change and highest concentration at depth, indicating its dissolution during burial. Hemispheric cores 1713, 1715 show more modest increases probably reflecting the lower diatom content of these cores.

The distributions of PO_4^{3-} with depth of the pore waters from the same sediments again show very big differences between coastal organic sediments and hemi-pelagic sediments. Cores 1712 and especially 1715 show significant phosphate levels in the surface sediment, above that of bottom water. Immediately below, to about 10cm, phosphate shows its lowest concentrations, but in the deeper parts of these cores there is some increase in its concentration. Such profiles suggest a possible link of phosphate sorption by ferric iron in the oxic zone of the sediments and a release in zones of reduction. The concentrations of phosphate in the coastal zones 1721, 1722 are much higher but show very variable and different distributions with depth. These must relate to the release of PO_4^{3-} from degradation of organic matter during diagenesis and the possible depletion of pore water PO_4^{3-} about the locii of phosphorite precipitation for example at 4cm core 1722.

Hydrography

Hydrographic data for sixteen stations were collected, that is for stations 17: 01, 07, 12, 13, 15, 26, 30, 31, 32, 33, 37, 38, 39, 40, 41 and 42. These were obtained primarily for the interpretation of dissolved trace metals and particulate matter investigations. Data for T°c, S^{o}/oo, dissolved oxygen and sigmap were obtained using CTD - hydrobottle casts. Throughout the cruise S^{o}/oo on the CTD response output was calibrated by salinometer measurements on subsamples of water from Goflo bottle deployment as well as from independent Niskin bottle casts. Dissolved oxygen was measured titrimetrically on equipment loaned by Dr. D. Burton, Southampton. Data for Stations 1715 and 1739 are illustrated.

Nutrients

Subsamples of water for nutrient analysis were collected from all Goflo bottle collections and selected Niskin casts. Considerable difficulty was encountered in the analysis of nutrients. It was intended to analyse nutrients using an autoanalyser (supplied by Dr. M. Whitfield, MBA), that had achieved moderate/good success during leg 15 of the Western Indian Ocean cruise by C. German. Unfortunately during pre-cruise equipment trials the equipment showed serious malfunction on both channels which seemed to relate to optical alignment/response. Even after considerable perseverence it was found that analyses by this method was overall very unreliable and the cruise had to resort to manual analyses using methods following Strickland and Parsons. Even here there were difficulties concerning optical cells and spectrophotometer bulbs. It also took a considerable manpower to achieve results which must be considered tentative. Analysis of silicate, phosphate and nitrate (for some stations) from Goflo and Niskin bottle deployment are tabulated.

The results of hydrography and nutrients show the following -

1. An intense oxygen depletion zone extends from 100m to 1050m with lowest oxygen concentrations occuring between 600m and 800m. The patterns of oxygen minima indicate more intense depletion nearer the coasts and towards the Gulf of Oman.
2. There is a complicated structure of S°/oo and T°c in the upper 400m of the water column. In the eastern stations particularly in the Gulf of Oman this is caused by a lobe of high salinity water which increases northwards, it represents an incursion of Arabian Gulf water at 125-150m. Much of the T/S and dissolved O_2 in the western stations is a result of intrusion of Red Sea water at different depths and its general sinking to the south and east.
3. Antarctic Intermediate Water water can be recognised at 1Km and extends the depth of the oxygen minimum zone to this level at all stations.

Particulate matter sampling

Particulate matter for inorganic and organic matter analyses was collected by filtering aliquots of water from 301 Niskin bottle casts at the eleven stations.

For inorganic particulate investigations approximately 101 of sea water was filtered through 37mm 0.4mu Nuclepore membranes and then washed with pH adjusted membrane filtered distilled water. In the case of near surface water, lesser volumes of water were used because of the difficulty of filtering with fine membranes. The sea water was continually stirred during filtering under compressed air.

For organic matter recovery, approximately 151 of sea water was filtered through Whatman GFF 37mm diameter glass fibre discs. Depths reported in the tables are uncorrected except in cases where sea water from Goflo bottles was used. Salinity and nutrient determinations on water from Niskin bottles are also recorded.

Acknowledgements

Thanks must be given to the Master, Officers and Crew of the RV Charles Darwin for contributing to the success of this cruise. Their untiring efforts and patience throughout it was much appreciated.

Much of the science of this cruise could not have been achieved without the skill and dedication of the RVS Technical Staff. Being unused to such a professional facility on foreign cruises their presence was invaluable and considerably eased the burdens of the Principal Scientist. This is also equally true for the 'behind the scenes' work of the RVS Onshore Staff.

Nutrient results were a disappointment due to the reliance on obsolescent equipment. Priority should be to equip future cruises of this type with a reliable autoanalyser.

No	Date	TIME.GMT	POSITION Lat N	LONG E	Stn No	Ship Ident.	Description	
35		10.53	22°.36'.6	59°.37'.4	1735-01	17/86/35a	Box core 530m	
		12.57	22°.37'.0	59°.38'.6	1735-02	17/86/35b	Piston core 530m	
		16.19	22°.38'.0	59°.40'.2		17/86/36a	Box core 1120m unsuccessful	
36		19.48	22°.39'.5	59°.43'.2	1736	17/86/36a	Box core 1620m	
37		21.40	22°.36'.9	59°.37'.8	1737-01	17/86/37a	CTD 480m	1
38	3.11.86	07.41	22°.45'.0	61°.20'.2	1738-01	17/86/38a	CTD 3320m.	2
		11.22	22°.45'.0	61°.18'.9	1738-02	17/86/38b	Niskins 1st cast deep.	
		14.26	22°.44'.9	61°.18'.3	1738-02	17/86/38c	Niskins 2nd Cast.	
		16.22	22°.44'.9	61°.18'.3	1738-02	17/86/38d	Niskins 3rd Cast.	
		18.44	22°.44'.9	61°.16'.7	1738-03	17/86/38e	Box core unsuccessful	
		22.30	22°.45'.1	61°.15'.6	1738-04	17/86/38f	Piston core 3340m	
39	4.11.86	13.00	22°.10'.7	63°.08'.9	1739-01	17/86/39a	Box core 1570m	
		16.07	22°.15'.7	63°.12'.4	1739-02	17/86/39b	Piston core 1620m	
		17.29	22°.15'.7	63°.12'.4	1739-03	17/86/39c	CTD - 1680m	3
		19.55	22°.16'.3	63°.14.5	1739-04	17/86/39d	Niskin 1st deep 2110m	
		22.08	22°.17'.0	63.14'.3	1739-04	17/86/39e	Niskin 2nd cast.	
		23.20	22°.17'.6	63.15'.8	1739-04	17/86/39f	Niskin 3rd cast.	
40	5.11.86	18.00	23°.39'.7	59°.50'.1	1740-01	17/86/40a	CTD 3360m	4
		21.22	23°.39'.4	59°.50°.9	1740-02	17/86/40b	Niskin 1st cast 1200m	
		22.36	23°.38'.8	59°.51'.6	1740-02	17/86/40c	Niskin 2nd cast	
41	6.11.86	03.11	23°.54'.1	59°.11'.6	1741-01	17/86/41a	CTD 3335m	5
		11.56	24°.03'.5	58°.46'.8	1742-02	17/86/41	Box core 3240m	
		14.15	24°.03.0	58°.49'.8	1742-02	None	CTD 3167	6

Sampling Operations Cruise 17/86

No	Date	TIME.GMT	POSITION Lat N	LONG E	Stn No	Ship Ident.	Description	
1	16.10.86	20.25	19° 09'.5	58° 29'.5	1701-01	17/86/1a	CTD^BB 1899m. Mufax 1950m	7
	17.10.86	01.47	19° 11'.7	58° 31'.2	-	17/86/1b	Box core,unsuccessful	
		03.46	19° 12'.4	58° 32'.2	-	17/86/1c	Box core, unsuccessful	
		06.09	19° 14'.0	58° 34'.0	1701-02	17/86/1d	Niskins 1st cast 2150m depth	
		09.33	19° 14'.1	58° 36'.0	1701-02	17/86/1e	Niskins 2nd cast.	
		11.35	19° 14'.6	58° 38'.0	1701-02	17/86.1f	Niskins 3rd cast.	
		13.00	19° 14'.9	58° 39'.1	1701-02	17/86/1g	Niskins 4th cast.	
		15.02	19° 15'.2	58° 38'.1	1701-03	17/86/1h	Box core 2948m.	
2	18.10.86	01.44	18° 10'.4	57° 19'.5	1702a	17/86/2a	Box core 166m surface sample.	
		04.00	18° 17'.8	57° 15'.7	1702b	17/86/2b	Box core 112m surface sample.	
3		06.35	17° 55'.2	57° 22'.4	1703	17/86/3a	Box core 275m surface sample.	
4		08.15	17° 45'.0	57° 22'.8	1704a	17/86/4a	Box core, unsuccessful.	
		09.18	17° 43'.2	57° 24'.0	1704b	17/86/4b	Box core 420m door sample.	
		10.11	17° 42'.5	57° 22'.7	1704c	17/86/4c	Box core, unsuccessful.	
		10.55	17° 41°.7	57° 22'.3	1704d	17/86/4d	Box core 400m.	
5		12.49	17° 36'.7	57° 21'.8	1705	17/86/5a	Box core 770m.	
6		14.25	17° 33'.3	57° 22'.3	1706	17/86/6a	Box core, unsuccessful.	
		17.24	17° 33'.9	57° 22'.5	1706	17/86/6b	Box core 1048m.	
7		18.15	17° 33'.0	57° 23'.2	1707-01	17/86/7a	CTD^BB 1417m Mufax 1450m.	8
		21.50	17° 32'.2	57° 25'.3	1707-02	17/86/7b	Niskins 1st cast. 1450m depth.	
	19.10.86	00.01	17° 32'.4	57° 26'.3	1707-02	17/86/7c	Niskins 2nd cast.	
		01.37	17° 31'.9	57° 26'.3	1707-02	17/86/7d	Niskins 3rd cast.	
8		05.48	17° 30'.1	57° 28'.1	1708	17/86/8a	Piston core 2089m.	
9		12.18	17° 36'.3	57° 21'.5	1709	17/86/9a	Piston core 805m.	

No	Date	TIME.GMT	POSITION Lat N	LONG E	Stn No	Ship Ident.	Description	
10		15.50	17° 32'.2	57° 21'.9	1710	17/86/10a	Box core 1295m.	
11		20.40	17° 16'.6	57° 26'.0	1711	17/86/11a	Box core 3684m.	
12	20.10.86	04.18	16° 41'.0	57° 23'.6	1712-01	17/86/12a	Box core 4030m	
		06.16	16° 41'.9	57° 24'.4	1712-02	17/86/12b	CTD.BB 3995m Mufax 4025m	9
13		20.38	14° 59'.6	57° 24'.6	1713-01	17/86/13a	CTD 1st cast BB 680m Mufax 3575m	
	21.10.86	01.23	15° 02'.7	57° 25'.9	1713-02	17/86/13b	CTD 2nd cast BB 3600m Mufax 3585m	10
		06.08	15° 04'.4	57° 24'.7	1713-03	17/86/13c	Box core 3650m	
		10.05	15° 06'.6	57° 23'.8	1713-04	17/86/13d	Niskins 1st cast.	
		13.37	15° 09'.3	57° 23'.4	1713-03	17/86/13e	Niskins 2nd cast.	
		16.05	15° 10'.2	57° 23'.3	1713-03	17/86/13f	Niskins 3rd cast.	
		17.48	15° 11'.1	57° 22'.5	1713-03	17/86/13g	Niskins 4th cast.	
		18.46	15° 11'.5	57° 22'.1	1713-08	17/86/13h	CTD BB 850m Mufax 5585m	11
14	22.10.86	05.20	13° 51'.8	57° 22'.1	1714	17/86/14a	Box core 2700m	
15		07.50	16° 37'.7	60° 40'.1	1715-01	17/86/15a	Piston core 4015m	
		11.20	16° 38'.6	60° 39'.9	1715-02	17/86/15b	CTD deep cast. BB 4059m	12
		18.00	16° 38'.5	60° 39'.8	1715-03	17/86/15c	Piston core 4012m.	
		20.56	16° 38'.6	60° 39'.5	1715-04	17/86/15d	CTD BB 4051m Mufax 4100m	13
	24.10.86	02.08	16° 39'.2	60° 37'.8	1715-05	17/86/15e	Niskins 1st cast.	
		06.39	16° 39'.9	60° 37'.5	1715-05	17/86/15f	Niskins 2nd cast.	
		09.55	16° 42'.4	60° 36'.1	1715-05	17/86/15g	Niskins 3rd cast.	
		11.20	16° 43'.0	60° 35'.7	1715-05	17/86/15h	Niskins 4th cast.	
		13.40	16° 44'.5	60° 34'.8	1715-06	17/86/15i	Box core 4040m.	
		15.47	16° 45'.4	60° 34'.8	1715-07	17/86/15j	CTD large vol.BB 261m Mufax 4110m	14
		20.11	16° 47'.6	60° 34'.8	1715-08	17/86/15k	CTD large vol.BB 1601m4070m.	15

No	Date	TIME.GMT	POSITION Lat N	LONG E	Stn No	Ship Ident.	Description
16	25.10.86	14.00	19° 04'.9	58° 21'.2	1716	17/86/16a	Box core 2555m
17		15.55	19° 09'.2	58° 19'.9	1717	17/86/17a	Box core 955m.
18		18.45	19° 20'.6	58° 14'.4	1718	17/86/18a	Box core 440m.
19		22.16	19° 49'.0	58° 26'.1	1719	17/86/19a	Box core, surface sample 92m.
20	26.10.86	03.40	19° 47'.4	58°.36'.7	1720	17/86/20a	Box core 880m
21		05.08	19°.46'.3	58°.36'.0	1721	17/86/21a	Box core 645m
22		07.00	19°.34'.5	58°.31'3	1722	17/86/22a	Box core 780m
23		12.08	19°.42'.3	58°.59'.1	1723-01	17/86/23a	Box core 2780m
		15.14	19°.42'.2	58°.58'.7	1723-02	17/86/23b	Piston core 2780m
24	27.10.86	01.58	21°.06'.2	59°.34'.9	1724	17/86/24a	Box core, poor recovery 1340m
25		09.54	21°.45'.0	59°.44'.2	1725	17/86/25a	Box core 620m
26		11.30	21°.38'.3	59°.52'.1	1726-01	17/86/26a	CTD BB 1702m Mufax 1750m 16
		15.00	21°.39'.8	59°.51'.4	1726-02	17/86/26b	Niskin 1st Cast 1900m
		17.43	21°.42'.0	59°.52'.8	1726-02	17/86/26c	Niskin 2nd Cast.
		19.21	21°.42'.0	59°.52'.8	1726-02	17/86/26d	Niskin 3rd Cast.
		21.04	21°.45'.4	59°.54'.4	1726-03	17/86/26e	Box core 1600m.
27	28.10.86	05.30	20°.44'.9	60°.10'.7	1727	17/86/27a	Box core 3395m
28		13.57	19°.59'.6	60° 37'.4	1728	17/86/28a	Box core 3540m
29		18.07	19°.33'.0	60°.45'.0	1729	17/86/29a	Box core 2495m
30	29.19.86	04.17	19°.55'.6	61°.42'.9	1730-01	17/86/30a	Box core 3580m
		08.20	19°.56'.0	61°.41'.1	1730-02	17/86/30b	Piston core 3580m
		10.30	19°.56'.4	61°.40'.8	1730-03	17/86/30c	CTD 3621m Mufax 3585m 17
		14.47	19°.57'.1	61°.39'.9	1730-04	17/86/30d	Niskin 1st Cast.
		18.25	19°.57'.0	61°.38'.3	1730-04	17/86/30e	Niskin 2nd Cast.
		20.14	19°.57'.1	61°.38'.0	1730-04	17/86/30f	Niskin 3rd Cast.

No	Date	TIME.GMT	POSITION Lat N	LONG E	Stn No	Ship Ident. Description
		21.50	19°.57'.0	61°.38'.0	1730-04	17/86/30g Niskin 4th Cast.
31	30.10.86	09.19	21°.41'.2	61°.53'.5	1731	17/86/31a Box core 395m door sample
			21°.41'.1	61°.52'.8	1731-02	17/86/31b CTD wire test 388m.
32		17.26	21°.45'.1	60°.48'.5	1732-01	17/86/32a Box core 3150m
		21.36	21°.43'.1	60°.49'.5	1732-02	17/86/32b Piston core 3150m
		23.56	21°.43'.1	60°.49'.5	1732-03	17/86/32c CTD wire test 3180m
	31.10.86	08.36	21°.43'.1	59°.43'.0	commenced Sci Survey to has Al Hadd, complete.	
		15.00	22°.31'.8	59°.56'.0		
33		18.02	22°.40'.8	60°.09'.0	1733-01	17/86/33a Box core 2680m
		21.48	22°.39'.0	60°.10'.8	1733-02	17/86/33b Piston core 2809m
		23.52	22°.38'.2	60°.12'.2	1733-03	17/86/33c CTD BB 2849m,Mufax 2835m 18
	1.11.86	04.20	22°.37'.5	60°.15'.7	1733-04	17/86/33d Niskin 1st Cast deep.
		07.19	22°.37'.5	60°.15'.7	1733-04	17/86/33e Niskin 2nd Cast.
		10.00	22°.34'.5	60°.17'.7	1733-04	17/86/33f Niskin 3rd Cast.
		11.29	22°.34'.5	60°.17'.7	1733-04	17/86/33g Niskin 4th Cast.
34		16.17	22°.41'.1	59°.45'.2	1734	17/86/34a Box core 1540m
		18.08	22°.41'.6	59°.46'.0	commencing Sci survey 7 knots	
	2.11.86	02.30	23°.21.0	59°.07'.5	Arrive Has Abu Daud	
		03.35	23°.16'.0	59°.01'.0	Dep " " "	
		09.00	22°.40'.0	59°.35'.0	End of Survey.	

CORE RECOVERY

DATE	STATION	LAT N	LONG E	WATER DEPTH m	TYPE OF CORER	LENGTH OF CORE	CORE DESCRIPTION
17.10.86	17.01.03	19°15'.2	58°38'.1	2984	Box	42 cm	Core may represent base of shallow canyon towards distal end 0-5 cm dk yellowisn brn. 10 YR 4/2 clayey silt, 5% diatoms abundant sponge spicules, OCC radiolarian fragment, Occ planktonic foram. v. soft. ? zeolites. 5-20 lcm uniform clayey silt 20-25 cm dk yellowish brn 10 YR 3/2, abundant diatoms, soft. 25-38 cm massive indurated. 38-42 cm dk yellowish brown 1) YR 4/2, silt becoming coarser, diatoms common. ? zeolite 10%. slight indurations.
18.10.86	17.02a	~~1~~18°10'.4	57°19'.5	166	Box	Surface	0-5 cm slightly silty, very fine grained sandstone, moderate sphaericity, subrounded, fish scales, rare mud fragments; massive, soft, common macro bivalves, common low O_2 foraminiferids includiyy Bolivina sp. Vingerina sp. Light olive brown. 5Y5/6.
18.10.86	17.03	17°55'.2	57°22'.4	275	Box	Surface	0-5 cm On slope at edge of shelf, leak in side covers. Dk olive brown 5Y3/4. v. fine sdst. with fine silt matrix, common planktonic forams. occ. ?radiolarian fragments, sponge spicules, rare diatoms. sdst/siltstone mod. sphaericity, subrounded-rounded. Shell fragments.
18.10.86	17.04a	17°43'.2	57°.24'.0	420	Box	from doors	?Fine silt.
18.10.86	17.04b	17°41'.7	57°22'.3	400	Box		?25 cm Dk olive brown SY 3/4. Fine silt, with layering of coarse silt, rare ? glauconite, common planktonic forams, and sponge spicules, rare diatoms and fish scales. Silt mod sphaericity, subrounded-rounded sandgrains mostly biogenic. Bored ?carbonate (lithified) from surface to 8cm. rare heavy minerals.

CORE RECOVERY

DATE	STATION	LAT N	LONG E	WATER DEPTH m	TYPE OF CORER	LENGTH OF CORE	CORE DESCRIPTION
18.10.86	17.05	17°41'.7	57°21'.8	770	Box	55 cm	In shallow basin on continental slope. Three subsamples inspected. 0-5 cm. sandy silt, all sandgrains biogenic. planktonic forams, occ. fishscales, common sponge spicules, bivalve fragments (?ostracods). Common macro shells. organic matter binding silts.Soft dk olive brown 5Y 3/4. 0-25 cm as above with v rare rad. fragments, slightly less sandgrains, increasing induration with depth. 50-55 cm. indurated. v rare diatom fragments.
18.10.86	17.06	17°33'.9	57°22'.5	1048	Box	50 cm	Overbank on slope edge. 0-5 cm dark olive brown 5Y 2/4 sandy silt, all sand fraction biogenic with planktonic forams up to fine sand including Bolivina sp. coarse silts are subrounded to rounded, mod. sphaericity, common diatoms, sponge spicules, v. rare radiolaria fragments, organic matter binding silts, occ. fish scales and ? zeolites.
19.10.86	17.08	17°.30'.1	57°28'.1	2089	Piston	475 cm	0-100 cm dk olive brown 5Y 3/4 silt, common forams planktonic common diatoms, sponge spicules, ?zeolites, sl. organic v. rare rad. frag,ments and fish scales. 95 cm. foram rich v.f. sdst/slt. 100-200 cm contorted 220-475 cm obscured, possibly more muddy sediment, description as above except occ. forams, no diatoms, more fine grained clays banding in silts. Catcher, cream laminae in olive green mud and sulphide black with pyrite lenses. occ.? nodules relatively hard within lens and pyrite. ?H_2S smell.

CORE RECOVERY

DATE	STATION	LAT N	LONG E	WATER DEPTH m	TYPE OF CORER	LENGTH OF CORE	CORE DESCRIPTION
19.10.86	1709	17°36'.3	57°21'.5	805	Piston	475	Within shallow basin, similer to 170-5 possibly fault controlled, possible slumping. Two subsamples examined. 0 cm dk olive brown 5Y 3/4 organic matter binding silts, dominantly a silt, common sponge spicules, common foraminifera (planktonic), v rare diatoms, ? zeolites, rare ?radiolarian fragments. Middle section of core homogenous, sl. indurated. 475 cm as above. still organic rich 5Y 4/4
19.10.86	1710	17°32'.2	57°21'.9	1295	Box	45	Slope environment. Dk olive brown 5Y 3/4, common forams up to sand grade. 0 cm. common sponge spicules, v. common radiolaria fragments ?zeolites, v rare diatroms. Worm traces on surface. 45 cm mod. olive brown 5Y 4/4, slightly indurated infauna as pipe worms.
19.10.86	1711	17°16'.66	57°26'.0	3684	Box	53	Good surface, continental rise. 0-8 cm. oxidised top at least for 5 cm, some striking to 8 cm. 5YR 3/4 common diatoms, common planktonic forams and sponge spicules, possible radiolarian fragments, organic bindings, ?zeolites. 53 cm. 10Y 6/2. biogenics as above.
20.10.86	1712	16°41'.0	57°23".6	4030	Box	40	Slight slope at base of ris. Good surface 0-3 cm. brown mud 5YR 3/4 3-8 cm yellow brown 10YR 2/2 nanno ooze, common sponge spicules, common diatoms, occasional planktonic forams. Could be diatom rich. 40 cm light olive grey 5Y 6/1, possibly more silty than above, diatoms less common.
21.10.86	1713	15°04'.4	57°24'.5	3650	Box	33	0 cm dark yellow brown. 10YR 4/4 nanno ooze, common diatoms, common forams (planktonic), rare rads, common sponge spicules, soft. 33 cm 10Y 6/6 pale olive, as above except occ. forams and diatoms.

CORE RECOVERY

DATE	STATION	LAT N	LONG E	WATER DEPTH m	TYPE OF CORER	LENGTH OF CORE	CORE DESCRIPTION
22.10.86	1714	13°51.8	57°22'.1	2700	Box	45 cm	On small ridge at base of rise - much hummocky reflectors. Upper 6cm. mod brown 5Y R4/4 with slight induration, increase at depth. 40-45 cm Pale olive 10y 6/2. High percentage of forams.
23.10.86	1715.01	16°37'.7	60°40'.1	4015	Piston	785	Flat plain on distal edge of Indus cone. Upper 1m disturbed. pale olive 10Y 6/2 to light grey 545/2. Turbidite layers.
	1715.03	16°38'.5	60°39'.8	4012	Piston	650	Second piston core - see appendix for logging description. Sampled by A Sarkar for magnetics, O_2 isotopes remaining half sampled at 5 cm intervals for archive.
24.10.86	1715.06	16°44'.5	50°34'.8	4040	Box	?	One subcore sampled by A Arkar. 5Y 5/2 to 10Y 6/2.
25.10.86	1716	19°04'.9	58°21'.2	2555	Box	Poor recovery	Diatomaceous, slightly sandy mud. Highly indurated recovered from box core jaws, - old sediment. Occasional forams., some burrowing.
25.10.86	1717	19°09'.2	58°19'.9	955	Box	45 cm	Continental slope, small ridges, brittle stars on surface. 0-5 cm. foram silt, dark olive brown 5Y 3/4 little clay - possible turbidite. 40-45 cm organic matter binding silt, grey-/olive 10Y 4/2 modstly mud, abundant planktonic forams. Bolivina?, Uvigerina sp. sponge spicules, quartz shows mod. sphericity. Subangular to rounded, occasional diatoms.
	1718	19°20'.6	58°.14'.4	440	Box	?75	Good core of diatomaceous ooze with organic filiments binding silt particules. H 0-5 cm dark olive brown 5Y 3/4 possible radiolaria?? fragments, up to 50% diatoms. Bottom of core. 5Y 3/4, about 30% diatoms, occasional planktonic forams. ?Bolivina sp, occasional sponge spicules, coarse silt -subrounded, mod. sphaericity.

CORE RECOVERY

DATE	STATION	LAT N	LONG E	WATER DEPTH m	TYPE OF CORER	LENGTH OF CORE	CORE DESCRIPTION
25.10.86	1719	19°49'.0	58°26'.1	92	Box	-	0-5 cm. clean sandy silt, moderate olive brown 5Y 4/4 silt angular to rounded, poor to good sphaericity, abundant forams (planktonic and benthonic) including ?Bolivina sp, ?Uvigerina sp., coral frag?, possible ostracod, common sponge spicules, echinoid spines.
26.20.86	1720	19°47'.4	58°36'.7	880	Box	None	In valley between hills - hig bedrock softish marly limestone, burrowed starfish. Evidence of slumping on recorder. Sample from inside cores.
	1721	19°.46'3	58°36'.0	645	Box	75 cm	In area of consid. topographic relief. High water content H_2S smell. diatomaceous mud, with up to 50% diatoms. v. few forams, organic banding silt and clay and diatoms rare. ?Bolivina sp. Silt subangular to subrounded moderate sphaericity.
	1722	19°34'.5	58°31'.3	780	Box	85 cm	On slope - wide zone, diatomaceous mud up to 50% diatoms, occasional forams. ?Bolivina sp. ? Buliminella sp. common sponge spicules, possible ?radiolarian fragments occasional organic bindings.
	1723.01	19°42'.3	58°59'.1	2780	Box	35 cm	At base of slope/rise 0-5 cm dark olive brown 5Y 3/4. Silty mud, organics binding silt particles, up to 10% diatoms, common sponge spicules, rare forams. Increase in consideration to 30-35 cm light olive grey 5Y 5/2. as above but perhaps more clayey.
	1723.02	19°42'.2	58°.58'.7	2780	Piston	+820 cm	Description as for 1723-01 - relatively undisturbed top, some banding.

CORE RECOVERY

DATE	STATION	LAT N	LONG E	WATER DEPTH m	TYPE OF CORER	LENGTH OF CORE	CORE DESCRIPTION
26.10.86	1724	21°0'.48	59°.35'.7	1340	Box	20cm	Poor recovery on slope on small plateau between valleys. 0-5 cm dark olive brown, 5Y 3/4 muddy silt with some organic binding, occasional forams, and diatoms, possible ?radiolarian fragments and fish scales, coarse silt poor-mod. sphaericity, subangular, subrounded, occasional sponge spicules.
27.10.86	1725	21°45'.0	59°.44'.2	620 m	Box	60 cm	On shelf/slope with high relief. High content mud at surface with an underlying stiff mud. 0-5 cm dark olive brown 5Y 3/4, silty clay common diatoms (5-10%), rare radiolaria, common sponge spicules, organic matter binding silts. occasional forams including ?Bolvina sp, rare coarse silts. 55-60 cm medium olive 5Y 4/2, silty clay, possibly more silt than above, no radiolaria; coarser silts show mod-good sphaericity subrounded. No diatoms are present.
27.10.86	1726.03	21°45'.4	59°54'.5	1600 m	Box	30 cm	On smooth topography on continental slope. 0-5 cm. dark green? common macroforams (planktonic) moderately sorted clay/silt with medium sand sized forams, common diatoms and sponge spicules, possible ? mica flakes, ?worm tube casts; coarse silts are subangular to round, moderate sphaericity ?pellets (faecal). 25-30 cm More indurated light olive grey, as above except occasional silt sized forams. No diatoms or radiolaria.

CORE RECOVERY

DATE	STATION	LAT N	LONG E	WATER DEPTH m	TYPE OF CORER	LENGTH OF CORE	CORE DESCRIPTION
28.10.86	1727	20°44'.9	60°10'.7	3395 m	Box	60 cm	On rise. 3-5 cm oxidised red/brown layer at top. 0-5 cm. dark yellow/brown 10YR 3/2, 5-10% diatoms, slightly silty clay, common sponge spicules, planktonic forams, poss. radiolaria, nanno ooze. 55-60 cm Light olive grey 5Y 4/2 as above except more clayey.
	1728	19°59'.6	60°37'.4	3540	Box	65 cm	0-5 cm. Nanno ooze 3-4 cm of oxidised red/brown surface sed. 10YR 4/2, slightly silty clay common diatoms, common planktonic forams. common sponge spicules. 60-65 cm. more indurated olive grey 5Y 6/1 as above except finer grained, occasional diatoms, rare forams.
	1729	19°33'.0	60°45'.0	2495	Box	40 cm	On flat top of ridge bordering Arabian Sea affected by Indus core. 0-5 cm. mod. yellowish brown 10YR 5/4, slightly silty clay with high water content, rare diatoms, occasional forams, rare sponge spicules. Nanno ooze. 35-40 cm. pale olive 10Y 6/2, as above with more forams.
29.10.86	1730.01	19°55'6	61°42'.9	3580	Box	40 cm	On plain affected by Indus core. 0-5 cm. moderate brown 5YR 3/4 (but showing a 9 cm red brown top). v slightly silty clay ooze, rare macro forams, occasional forams and diatoms common sponge spicules. Slightly indurated, nanno ooze. 35-40 cm. greenish grey, 5GY 6/1, No diatoms, ?sulphide disseminated.
29.10.86	1730.02	19°56'.0	61°41'.1	3580	Piston	835 cm	

CORE RECOVERY

DATE	STATION	LAT N	LONG E	WATER DEPTH m	TYPE OF CORER	LENGTH OF CORE	CORE DESCRIPTION
30.10.86	1731	21°41'.2	61°53'.5	395	Box	-	Door sample, muddy carbonate ooze, planktonic forams, 60% siliceous forams?, possible radiolaria, slight organic binding, qtz, fine to medium gr.
30.10.86	1732.01	21°45'.1	60°.48'.5	3150	Box	40 cm	On continental rise N.W. of ridge. 5-10 cm. 5% forams, medium-coarse silt, moderate to good sphaericity, subangular to rounded qtz, very rare organic fragments, rare diatoms, occasional sponge spicules. 35-40, nanno ooze, microforams, 30-40%, occasional diatoms, common sponge spicules, very rare medium to coarse silt with quartz moderate to good sphaericity, subrounded to rounded quartz.
30.10.86	1732.02	21°43'.1	60°49'.5	3150	Piston	800 cm	as above, good recovery.
31.10.86	1733.01	22°40'.8	60°09'.0	2680	Box	50+ cm	On cont. slope of Oman Basin. Surface - dark yellow brown 10YR 4/2 common diatoms, possible rdiolarian fragments. 50 cm, light olive grey 5Y 5/2 nanno ooze, above, very rare coarse-medium silt, moderate to good sphaericity, subrounded to round.
	1733.02	22°39'.0	60°10'.8	2809	Piston	820 cm	as above, good recovery.
1.11.86	1734	22°41'.1	59°.45'.2	1540	Box	40 cm	On continental slope of Oman Basin, ?7cm of red top. 0-5 cm. dark yellow/brown 10YR 4/2, common diatoms, occ. sponge spicules, macro abundant, forams (planktonic), med-fine silt, good sphaericity, subrounded-rounded quartz. 35-40 light olive grey 5Y5/2 as above occasional macro forams rare diatoms, rare sponges, mid-coarse silts poor-good sphaericity, subangular to rounded.

CORE RECOVERY

DATE	STATION	LAT N	LONG E	WATER DEPTH m	TYPE OF CORER	LENGTH OF CORE	CORE DESCRIPTION
2.11.86	1735.01	22°36'.6	59°37'.4	530	Box	75+ cm	On steeply sloping shelf close to Oman coast. Light bands up to 1.5 cm thick representing ? dust inputs below 40 cm more cohesive than surrounding sediment (sub sample). 0-5 cm dark olive brown 5Y 3/4, silty clay, very soft organics binding sediments, very rare diatoms, occas. sponge spicules, rare forams (?Bolinvina sp). Abundnce of medium coarse silts, mod-good sphaericity subrounded to rounded. 75 cm slightly lighter dark olive brown 5Y 3/4 as above possible radiolaria fragments. No diatoms. White banding - soft white ?biogenic/detrital silts, mod-good sphaercity, subrounded-round.
	1735.02	22°37'0	59°38'.6	530	Piston	750 cm	as above with dust banding - little biomixing.
	1736	22°38'.0	59°43'.2	1620	Box	50+ cm	Second attempt. 1st at 1120 unsuccessful due to escarpment. Location at base of cliff, increasing induration common scaphopods.
3.11.86	1738.04	22°45'.1	61°16'.7	3340	Piston	750 cm	Following Box corer which pretripped with sample. Sample collected from frame. Piston core at an accompanying 1 m pivot core which was retained with brown/red surface. This core is olive grey 5Y 4/1, silty clay occasional sponge spicules, occasional forams (planktonic). v. rare diatoms, very fine grained silt, moderate sphaericity, subangular.

CORE RECOVERY

DATE	STATION	LAT N	LONG E	WATER DEPTH m	TYPE OF CORER	LENGTH OF CORE	CORE DESCRIPTION
4.11.86	1739.01	22°10'.7	63°08'.9	1570	Box	70 cm	On Murray ridge on slightly topographic high, 2-3 cm red top. 0-5 cm. dark yellowish brown 10YR 4/2, planktonic forams very abundant, 60-70%. Muddy sandstone (biogenic), rare organic fragments, rare diatoms, occasional sponge spicules. Common medium silt grains, mod. sphaericity, subangular/subrounded some quartz. Common carbonate debris. 65-70 cm olive grey 5Y 5/2 as above possible bone fragments.
	1739.02	22°15'.7	63°12'.4	1620	Piston	800 cm	no description
6.11.86	1742.01	24°03'.7	58°46'.8	3240	Box	75 cm	Thin red top. no further description. in Gulf of Oman.

20.10.86 | Core Length 41cm. (Box core) | Stn 1712

Pore water nutrient analyses

Depth cm	Silicate µM/l	Nitrate µM/l	Phosphate µM/l
0-1	317.67	41.80	4.44
1-2	398.45	16.22	3.86
2-3	423.10	6.86	3.86
3-4	424.47	3.12	5.57
4-5	451.86	1.56	4.35
5-6	451.86	1.87	4.20
6-7	454.60	0.31	4.49
7-8	465.55	1.25	4.25
8-9	464.18	ND	4.83
9-10	449.12	ND	4.64
10-12	508.00	ND	5.22
12-14	503.89	ND	5.03
14-16	513.48	ND	4.64
16-18	549.08	ND	4.49
18-20	494.31	ND	4.15
20-22	-	-	-
22-24	488.83	ND	4.10
24-26	480.61	ND	4.49
26-28	461.44	ND	4.00
28-30	477.87	ND	4.44
20-32	406.67	ND	4.25
32-34	-	-	-
34-36	424.47	ND	3.81
36-38	-	-	-

ND = Not detected.

21.10.86 Core Length 41cm. (Box core) Stn 1713

Pore water nutrient analyses

Depth cm	Silicate µM/l	Nitrate µM/l	Phosphate µM/l
0-1	288.63	45.50	2.43
1-2	271.33	61.85	4.44
2-3	293.18	63.77	4.02
3-4	316.85	46.47	4.00
4-5	234.16	34.90	4.65
5-6	349.64	6.08	4.37
6-7	363.29	4.17	3.82
7-8	368.76	1.92	4.51
8-9	402.45	3.85	4.44
9-10	396.07	ND	4.37
10-12	420.66	ND	4.86
12-14	427.03	ND	5.27
14-16	443.42	ND	4.79
16-18	427.03	ND	5.07
18-20	417.92	ND	5.76
20-22	443.42	ND	5.76
22-24	464.36	ND	5.83
24-26	430.67	ND	5.69
26-28	417.01	ND	5.97
28-30	448.88	ND	6.60
30-32	-	-	-

ND = not detected.

23.10.86 Core Length 41cm. (Box core) Stn 1715

Pore water nutrient analyses

Depth cm	Silicate µM/l	Nitrate µM/l	Phosphate µM/l
0-1	276.20	47.97	6.01
1-2	286.96	20.67	4.00
2-3	295.03	20.41	3.47
3-4	303.10	7.95	3.13
4-5	287.86	5.30	2.88
5-6	291.44	1.06	2.98
6-7	323.73	ND	3.27
7-8	331.88	ND	4.05
8-9	342.56	ND	4.69
9.10	356.91	ND	6.98
10-12	375.74	ND	7.81
12-14	399.05	ND	8.64
14-16	385.60	ND	8.89
16-18	401.74	ND	9.96
18-20	420.58	ND	10.25
20-22	417.89	ND	10.25
22-24	418.78	ND	10.25
24-26	405.33	ND	10.40
26-28	439.41	ND	10.64
28-30	-	-	-
30-32	412.51	ND	9.72
32-34	437.61	ND	9.86
34-36	434.03	ND	9.47
36-38	444.79	ND	10.25

ND = not detected

26.10.86

Core Length 52cm. (Box core)
Pore water nutrient analyses

Stn 1721

Depth cm	Silicate µM/l	Nitrate µM/l	Phosphate µM/l
0-1	322.77	3.15	29.20
1-2	382.25	0.86	47.72
2-3	488.09	ND	47.34
3-4	418.11	4.01	46.38
4-5	415.82	1.01	-
5-6	396.83	5.04	42.76
6-7	463.29	1.68	43.90
7-8	461.39	1.01	42.18
8-9	500.31	2.01	38.56
9-10	471.83	2.69	36.27
10-12	509.81	5.04	35.50
12-14	518.35	ND	33.98
14-16	527.84	1.34	32.45
16-18	518.35	ND	31.11
18-20	563.92	0.34	32.26
20-22	563.92	0.34	32.26
22-24	581.01	0.67	31.69
24-26	581.01	ND	30.73
26-28	582.91	1.34	29.20
28-30	584.81	ND	28.44
30-32	552.53	0.67	29.01
32-34	601.89	4.36	27.10
34-36	563.92	ND	26.91
36-38	590.50	ND	27.10

ND= not detected

26.10.86 Core Length 38cm. (Box core) Stn 1722

Pore water nutrient analyses

Depth cm	Silicate µM/l	Nitrate µM/l	Phosphate µM/l	Sulphide µM/l (approx value)
0-1	395.86	ND	5.397	ND
1-2	443.68	ND	19.60	ND
2-3	510.10	1.43	18.18	ND
3-4	547.30	-	19.32	ND
4-5	541.99	8.31	17.04	ND
5-6	571.21	1.43	19.60	ND
6-7	597.78	3.73	-	ND
7-8	576.52	1.72	65.34	5.3
8-9	600.43	1.43	32.95	15.9
9-10	579.18	1.72	31.82	2.0
10-12	605.75	1.15	39.20	4.7
12-14	629.66	0.29	48.29	4.7
14-16	634.97	2.01	56.25	4.7
16-18	632.32	ND	57.10	8.9
18-20	-	-	-	15.3
20-22	709.36	ND	61.95	18.7
22-24	637.53	ND	63.35	15.6
24-26	701.39	ND	65.05	11.7
26-28	704.05	ND	66.19	16.7
28-30	658.88	ND	67.61	19.8
30-32	722.65	ND	68.18	15.9
32-34	709.36	ND	66.47	27.0
34-36	709.36	ND	66.76	94.0
36-38	658.88	ND	63.69	17.8

ND = Not detected

1.11.86 Core Length . (Box core) Stn 1733

Pore water nutrient analyses

Depth cm	Silicate μM/kg	Nitrate μM/kg	Phosphate μM/kg
0-1	252.6		9.96
1-2	298.4		9.67
2-3	320.4		9.37
3-4	323.8		9.52
4-5	332.8		18.29
5-6	362.8		8.60
6-7	318.7		7.20
7-8	308.5		6.54
8-9	322.1		7.58
9-10	313.6		6.99
10-12	335.6		7.14
12-14	328.9		7.14
14-16	335.6		6.69
16-18	-		8.18
18-20	335.6		-
30-32	389.9		-

2.11.86 Core Length . (Box core) Stn 1734

Pore water nutrient analyses

Depth cm	Silicate µM/kg	Nitrate µM/kg	Phosphate µM/kg
0-1	181.5	-	4.93
1-2	200.2	-	5.40
2-3	206.4	-	5.45
3-4	209.5	-	3.82
4-5	206.5	-	3.82
5-6	191.5	-	3.14
6-7	194.2	-	3.25
7-8	194.0	-	3.62
8-9	191.0	-	3.90
9-10	188.0	-	3.40
10-12	206.5	-	4.26
12-14	237.0	-	5.45
14-16	240.7	-	5.45
16-18	243.5	-	5.55
18-20	243.5	-	4.95
20-22	231.0	-	4.95
22-24	240.5	-	4.95
24-26	240.5	-	5.10
26-28	215.5	-	4.30
28.30	215.5	-	4.75
30-32	223.5	-	4.72
32-34	225.0	-	4.95
34-36	221.8	-	5.05
36-38	178.5	-	4.12

3.11.86 | Core Length . (Box core) | Stn 1735

Pore water nutrient analyses

Depth cm	Silicate* µM/l	Nitrate µM/l	Phosphate µM/l
0-1	91.37		16.17
1-2	112.73		28.15
2-3	136.47		46.71
3-4	147.15		59.89
4-5	160.20		65.87
5-6	164.95		59.89
6-7	170.88		55.69
7-8	176.81		57.49
8-9	183.93		53.90
9-10	178.00		54.49
10-12	188.68		59.89
12-14	182.75		55.69
14-16	194.61		56.29
16-18	189.87		51.50
18-20	193.43		44.91
20-22	200.55		40.72
22-24	185.12		45.51
24-26	200.55		42.52
26-28	194.61		41.92
28-30	199.36		40.12
30-32	200.55		38.33
32-34	201.73		41.32
34-36	201.73		40.72
36-38	206.48		41.92

* 10w Bulb.

5.11.86 Core Length . (Box core) Stn 1736

Pore water nutrient analyses

Depth cm	Silicate µM/l	Nitrate µM/l	Phosphate µM/l
0-1	252.4		7.60
1-2	253.6		17.10
2-3	278.0		13.80
3-4	302.5		17.30
4-5	310.6		20.70
5-6	319.9		19.00
6-7	313.0		15.80
7-8	317.6		15.65
8-9	311.8		15.60
9-10	332.7		14.60
10-12	336.2		16.80
12-14	337.4		16.10
14-16	324.6		16.10
16-18	330.4		16.70
18-20	394.4		16.20
20-22	347.8		16.70
22-24	338.5		15.90
24-26	343.2		18.00
26-28	344.4		15.90
28-30	339.7		16.70
30-32	324.6		15.30
32-34	315.3		16.80
34-36	289.7		17.00
36-38	289.7		18.20

10w Bulb

5.11.86 | Core Length . (Box core) | Stn 1739

Pore water nutrient analyses

Depth cm	Silicate µM/l	Nitrate µM/l	Phosphate µM/l
0-1	230.4		19.33
1-2	234.3		6.70
2-3	242.1		5.24
3-4	260.5		6.00
4-5	260.5		7.05
5-6	248.7		3.90
6-7	267.0		4.19
7-8	263.1		4.72
8-9	251.3		5.01
9-10	252.6		3.90
10-12	269.6		5.01
12-14	265.6		6.52
14-16	273.6		6.99
16-18	260.5		4.31
18.20	272.3		4.08
20-22	255.2		3.84
22-24	252.6		3.61
24-26	260.5		3.90
26-28	257.9		4.19
28-30	256.5		8.79
30-32	246.1		4.19
32-34	244.8		4.02
34-36	234.3		4.02
36-38	234.3		3.78

17.10.86 Sample Collections from CTD - rosette casts Stn 1701-01

Go Flow No	PCTD(D/G)	Wire out m.	UCNW I_2	Filtered Samples Cambridge Univ REE	Se	Southampton Univ Trans Met.
1	1925.9	1899	1701/01-01	C1701-01-01	T1701-01-01	Not sampled
2	1749.0	1725	-02	-02	-02	-
3	1498.3	1480	-03	-03	-03	-
4	1249.5	1235	-	-	-	-
5	1001.0	989	-05	-05	-05	-
6	774.6	762	-06	-06	-06	-
7	600.1	591	-07	-07	-07	-
8	424.4	418	-08	-08	-08	-
9	314.2	307	-09	-09	-09	-
*10	199.7	193	-10	-10	-10	-
11	159.3	153	-11	-11	-11	-
12	19.6	15	-12	-12	-12	-

* bottle leaked into $N_2(g)$ samples taken by gravity flow.

18.10.86 Sample Collections from CTD - rosette casts Stn 1707-01a

Go Flow No	PCTD(D/G)	Wire out m.	UCNW I_2	Filtered Samples Cambridge Univ REE	Se	Southampton Univ Trans Met.
1	1416.7	1400	1701/01-01	1701-01-01	-	1545
2	1201.7	1187	-02	-02	-	1546
3	1001.0	984	-03	-03	-	1547
4	885.3	869	-04	-04	-	1548
5	709.2	697	-05	-05	-	1549
6	531.6	522	-06	-06	-	1550
7	373.8	366	-07	-07	-	1551
8	-	-	-	-	-	-
9	199.8	193	-09	-09	-	1553
10	149.0	143	-10	-10	-	1554
11	109.5	104	-11	-11	-	1555
12	24.5	20	-12	-12	-	1556

21.10.86 **Sample Collections from CTD - rosette casts** Stn 1713/02/08

	Go Flow No	PCTD(D/G)	Wire out m.	UCNW I_2	Filtered Samples Cambridge Univ REE	Se	Southampton Univ Trans Met.
1713/08	1	850.3	845	1713-08-01	1713-08-01	-	1452
	2	649.7	647	-02	-02	-	1453
	3	459.6	453	-03	-03	-	1454
	4	347.3	341	-4	-04	-	1455
	5	336.6	330	-05	-05	-	1456
	6	272.3	265	-06	-06	-	1457
	7	225.0	218	-07	-07	-	1458
	8	180.91	174	-08	-08	-	1459
	9	123.2	117	-09	-09	-	1460
	10	106.2	101	-10	-10	-	1461
	11	88.9	83	-11	-11	-	1462
	12	24.9	20	-12	-12	-	1463
1713/02	1	3600.6	3552	1713-02-01	1713-02-01	-	1464
	2	2399.6	2262	-02	-02	-	1465
	3	2000.8	1969	-03	-03	-	1466
	4	1948.5	1919	-04	-04	-	1467
	5	1701.6	1676	-05	-05	-	1468
	6	1601.0	1579	-06	-06	-	1469
	7	1379.3	1368	-07	-07	-	1470

21.10.86 Sample Collections from CTD - rosette casts Stn 1713/02/08 contd.

	Go Flow No	PCTD(D/G)	Wire out m.	UCNW I_2	Filtered Samples Cambridge Univ REE	Se	$^{143}Nd/^{144}Nd$	Southampton Univ Trans Met.
1713/02	8	1320.1	1313	1713-02-08	1713-02-08	-		1471
	9	1198.8	1192	-09	-09	-		1472
	10	1038.0	1042	-10	-10	-		1473
	12	197.0	190	-12	-12	-		1475
Large volume								
	1-6	679.8	674	None taken	None taken	None taken	60	None taken
	7-12	150.3	147	"	"	"	62	"

21-23/10/86 Sample Collections from CTD - rosette casts Stn 1715/02/04/07/08

	Go Flow No	PCTD(D/G)	Wire out m.	UCNW I_2	Filtered Samples Cambridge Univ REE	Se	Southampton Univ Trans Met.	Liverpool Univ
1715/04	1	4051.1	3975	1715-04-01	1715-04-01	1715-04-01	Not taken	Stan 1
	2	-.	-	-	-	-	-	-
	3	3600.3	3534	-03	-03	-03	-	3
	4	3399.9	3339	-04	-04	-04	-	4
	5	3200.0	3143	-05	-05	-05	-	5
	6	2997.7	2947	-06	-06	-06	-	6
	7	2800.0	2752	-07	-07	-07	-	7
	8	2599.5	2556	-08	-08	-08	-	8
	9	2399.9	2359	-09	-09	-09	-	9
	10	2199.4	2162	-10	-10	-10	-	10
	11	1999.7	1965	-11	-11	-11	-	11
	12	1799.2	1768	-12	-12	-12	-	12

21-23/10/86 Sample Collections from CTD - rosette casts Stn 1715/02/04/07/08

	Go Flow No	PCTD(D/G)	Wire out m.	UCNW I_2	Filtered Samples Cambridge Univ REE	Se	Southampton Univ Trans Met.	Liverpool Univ
1715/08	1	1600.9	1582	1715-08-01	1715-08-01	1715-08-01	Not taken	Stan 13
	2	1399.8	1383	-02	-02	-02	-	14
	3	1199.9	1186	-03	-03	-03	-	15
	4	1000.2	989	-04	-04	-04	-	16
	5	9845.7	835	-5	-05	-05	-	17
	6	845.7	789	-06	-06	-06	-	18
	7	501.8	491	-07	-07	-07	-	19
	8	304.0	295	-08	-08	-08	-	20
	9	240.4	233	-09	-09	-09	-	21
	10	198.2	191	-10	-10	-10	-	22
	11	130.7	125	-11	-11	-11	-	23
	12	14.7	11	-12	-12	-12	-	24

21-23/10/86 Sample Collections from CTD - rosette casts Stn 1715/02/04/07/08

Go Flow No	PCTD(D/G)	Wire out m.	UCNW	Filtered Samples Cambridge Univ			Southampton Univ	Liverpool Univ
			I_2	REE	Se	$^{143}Nd/^{144}Nd$	Trans Met.	Ni
Large Vol. 1715-07								
1-5	260.9	259	-	-	-	69	-	-
Large Vol. 1715-02								
1-6*	4059.1	3981	-	-	-	63	-	-
7-12	439.7	429	-	-	-	67	-	-

* Bottles did not fire.

27/10/86 **Sample Collections from CTD - rosette casts** Stn 1726/01

Go Flow No	PCTD(D/G)	Wire out m.	UCNW I_2	Filtered Samples Cambridge Univ REE	Se
1	1702.0	1684		1726-01-01	1726-01-01
2	1702.0	1684		-02	-
3	1449.5	1434		-03	-03
4	1203.1	1188		-04	-04
5	1000.0	987		-05	-05
6	873.8	862		-06	-06
7	749.0	737		-07	-07
8	626.1	615		-08,-08B	-08
9	499.3	494		-09	-09
10	300.3	291		-10	-10
11	199.5	192		-11	-11
12	148.6	142		-12	-12

29/10/86 Sample Collections from CTD - rosette casts Stn 1730/01

Go Flow No	PCTD(D/G)	Wire out m.	UCNW I_2	Filtered Samples Cambridge Univ REE
*1	3620.0	-	-	1730-03-01
*2	3620.0	-		-02
3	3499.1	3439	-	-03
5	2001.2	1968	-	-05
6	1200.7	1180	-	-06
7	800.2	786	-	-07
8	600.1	588	-	-08
9	399.2	389	-	-09
10	225.0	217	-	-10
11	60.1	55	-	-11
12	8.2	5	-	-12

*10m off bottom

Mufax bottom 3,580.

1/11/86 Sample Collections from CTD - rosette casts Stn 1733/03

Go Flow No	PCTD(D/G)	Wire out m.	UCNW I_2	Filtered Samples Cambridge Univ REE
1	2848.5	2814	-	
2	2848.5	2814	-	1733-03-02
3	2102.2	2073	-	-03
4	1500.0	1474	-	-04
5	999.4	975	-	-05
6	849.6	829	-	-06
7	700.1	680	-	-07
8	550.0	532	-	-08
9	399.4	383	-	-09
10	251.4	238	-	-10
11	69.5	58	-	-11
12	15.3	5	-	-12

2/1186 Sample Collections from CTD - rosette casts Stn 1737/01

Go Flow No	PCTD(D/G)	Wire out m.	UCNW I_2	Filtered Samples Cambridge Univ REE
1	459.0	450		
2	459.0	450	-	1737-01-02
3	449.0	440	-	-
4	449.0	440	-	1737-01-04
5	375.0	365	-	-
6	374.8	365	-	1737-01-06
7	250.1	241	-	-
8	250.1	241	-	1737-01-08
9	96.0	88	-	-
10	96.0	88	-	1737-01-10
11	20.0	12	-	-11
12	11.6	4	-	-12

17.10.86 Small Volume CTD rosette Station 17/86/1/a (1701/01)

Go-Flo No	P CTD(db)	Wire	Temp °C	Salinity S °/°°	Alkalinity meq/l Total	Carb	Diss O_2 uM/kg	Diss H_2S	Silicate uM/kg	Nitrate uM/kg	Phosphate uM/kg
12	19.6	15	26.610	35.9677	2.2199	2.13	207.9	-	0.13	-	1.05
11	159.3	153	17.040	35.7927	2.1999	2.11	7.35	Below detection	25.4	0.22	2.14
10	199.7	193	15.734	35.6593	2.2504	2.16	15.05	-	27.4	19.83	2.07
9	314.2	307	15.577	36.1544	2.2826	2.19	5.28	Below detection	-	20.54	2.21
8	424.4	418	13.823	35.9362	2.2250	2.13	7.36	"	39.4	20.85	2.70
7	600.1	591	11.659	35.6512	2.2263	2.15	6.64	"	40.8	22.69	2.56
6	774.6	762	10.463	35.5606	2.2504	2.17	8.42	"	63.5	24.17	3.06
5	1001.0	989	8.785	35.4046	2.2439	2.16	12.45	-	82.7	26.11	2.92
4	-	-	-	-	-	-	-	-	-	-	-
3	1498.3	1480	5.120	35.0286	2.2664	2.19	45.88	-	90.2	26.46	3.20
2	1749.0	1725	3.859	34.9168	2.2497	2.17	70.19	-	139.7	25.99	2.78
1	1925.9	1899	3.217	34.8664	2.2966	2.22	80.48	-	152.3	25.43	3.20

18.10.86 Small Volume CTD rosette Station 1707/01

Go-Flo No	P CTD(db)	Wire	Temp °C	Salinity S °/∘∘	Alkalinity meq/l Total	Carb	Diss O_2 uM/kg	Diss H_2S	Silicate uM/kg	Nitrate uM/kg	Phosphate uM/kg
12	24.5	20	24.585	35.7654	-	2.11	*41.48?	-	0.95	-	1.19
11	109.5	104	15.788	35.5375	-	2.15	26.28	-	29.30	-	1.04
10	149.0	143	15.851	35.7314	-	2.16	18.13	-	25.58	-	1.21
9	199.8	193	14.177	35.4816	-	2.17	19.83	-	34.74	-	1.44
-	-	-	-	-	-	-	-	-	-	-	-
7	373.8	366	12.811	35.5992	-	2.18	23.70	-	34.07	-	1.21
6	531.6	522	11.898	35.5769	-	2.16	20.37	-	43.14	-	1.26
5	709.2	697	11.669	35.7488	-	2.17	-	-	49.44	-	1.31
4	885.3	869	10.652	35.6389	-	2.19	47.42	-	59.94	-	1.36
3	1002.0	984	9.174	35.4638	-	2.22	11.75	-	75.21	-	1.36
2	1201.7	1187	7.400	35.2625	-	2.25	30.48	-	84.75	-	1.49
1	1416.7	1400	5.785	35.1023	-	2.2	213.07	-	103.84	-	1.46

* Problem with titration.
Dissolved O_2 and phosphate appear suspect.

20.10.86

Small Volume CTD rosette

Station 1712/02

Go-Flo No	P CTD(db)	Wire	Temp °C	Salinity S°/oo	Alkalinity meq/l Total	Alkalinity meq/l Carb	Diss O_2 uM/kg	Diss H_2S	Silicate uM/kg	Nitrate uM/kg	Phosphate uM/kg
12	50.2	45	22.714	35.7202	-	2.14	160.14	-	5.72	13.2	.917
11	97.8	92	20.546	36.0481	-	2.36	32.15	-	11.83	36.5	2.14
10	127.4	121	17.504	35.5386	-	2.17	61.06	-	18.25	34.5	1.88
9	199.0	192	15.373	35.6424	-	2.15	15.91	-	25.57	33.5	2.39
8	423.1	414	12.000	35.4551	-	2.23	31.35	-	35.10	33.5	2.45
7	485.0	474	12.089	35.5487	-	2.19	19.99	-	37.00	47.7	2.45
6	532.7	521	11.773	35.5436	-	2.21	19.71	-	40.11	40.6	2.56
5	761.0	749	10.409	35.5100	-	2.16	15.85	-	57.16	45.2	2.84
4	1499.3	1482	5.740	35.0708	-	2.24	28.32	-	97.27	65.5	2.95
3	2186.4	2160	2.966	34.9464	-	2.24	77.05	-	119.33	50.24	2.95
2	2800.5	2775	2.042	34.8362	-	2.30	97.31	-	129.36	47.4	2.95
1	3995.1	3956	1.717	34.7689	-	2.09	105.93	-	140.39	41.1	2.78

21-22.10.86 Large and Small Volume CTD rosette Station 1713/01/02/08

Go-Flo No	P CTD(db)	Wire	Temp °C	Salinity S°/oo	Alkalinity meq/l Total	Carb	Diss O_2 uM/kg	Diss H_2S	Silicate uM/kg	Nitrate uM/kg	Phosphate uM/kg
1713/08											
12	24.9	20	27.102	36.0196	-	2.19	232.02	-	1.84	-	0.14
11	88.9	83	22.251	36.1123	-	2.28	92.29	-	8.71	22.72	1.31
10	106.2	101	20.346	35.7696	-	2.17	59.38	-	14.24	24.31	1.44
9	123.2	117	19.896	35.8899	-	2.18	13.79	-	15.37	22.72	1.83
8	180.9	174	16.128	35.6205	-	2.16	17.22	-	23.66	28.03	1.79
7	225.0	218	14.168	35.4918	-	2.15	40.09	-	24.48	29.69	1.79
6	272.0	265	12.644	35.2699	-	2.25	82.00	-	23.56	29.46	1.51
5	336.6	330	12.265	35.2903	-	2.13	69.46	-	26.64	26.74	1.57
4	347.3	241	12.092	*36.0246	-	-	-	-	-	-	-
3	459.6	453	12.719	35.6509	-	2.17	12.37	-	37.08	32.57	2.22
2	649.6	647	11.579	35.6357	-	2.28	13.76	-	48.35	37.87	2.22
1	850.3	845	10.522	35.6248	-	2.23	18.32	-	59.42	35.98	2.17
1713/02											
10	1038.0	1042	9.210	35.5187	-	2.31	20.04	-	71.71	35.33	4.11
9	1198.8	1192	7.493	35.2685	-	2.33	26.23	-	86.05	34.58	2.88
8	1320.0	1313	6.600	35.1635	-	2.39	53.32	-	94.25	42.85	3.04
7	1379.3	1368	6.415	35.1463	-	2.47	36.83	-	96.30	43.61	3.09
6	1601.0	1579	4.947	35.0138	-	2.30	60.53	-	107.57	44.36	2.88
5	1701.6	1676	4.487	34.9578	-	2.31	61.23	-	143.42	39.10	2.93
4	1948.5	1919	3.399	34.8682	-	2.31	85.47	-	143.42	21.88	2.93
3	2000.8	1969	3.212	34.8610	-	2.31	86.99	-	133.18	26.99	2.88
2	2399.6	2362	2.298	34.7890	-	2.30	116.48	-	133.18	43.61	2.73
1	3600.6	3552	1.759	34.7679	-	2.21	120.55	-	122.94	34.21	2.83

21-22/10/86 Small Volume CTD rosette Station 1713/02/01

Go-Flo No	P CTD(db)	Wire	Temp °C	Salinity S °/∘∘	Alkalinity meq/l Total	Carb	Diss O_2 uM/kg	Diss H_25	Silicate uM/kg	Nitrate uM/kg	Phosphate uM/kg
12	197.0	190	16.394	35.6719	-	2.28	12.33	-	25.32	22.55	2.46
1713/01											
1	679.8	674	11.239	35.6031	-	2.22	32.85	-	49.07	26.69	2.79
2	"	"	"	-	-	-	-		49.17	-	-
3	"	"	"	-	-	-	-	-	48.15	-	-
4	"	"	"	-	-	-	-	-	49.07	-	-
5	"	"	"	-	-	-	-	-	48.35	-	-
6	"	"	"	-	-	-	-	-	48.15	-	-
7	150.3	147	18.197	35.8064	-	2.21	34.13	-	20.28	21.05	2.34
8	"	"	"	-	-	-	-	-	19.98	-	-
9	"	"	"	-	-	-	-	-	20.28	-	-
10	"	"	-	-	-	-	-	-	19.46	-	-
11	"	"	-	-	-	-	-	-	20.28	-	-
12	"	"	-	-	-	-	-	-	19.57	-	-

23-24/10/86 Large and Small Volume CTD rosette Station 17/15/02/04/07/08

Go-Flo No	P CTD(db)	Wire	Temp °C	Salinity S °/..	Alkalinity meq/l Total	Carb	Diss O_2 uM/kg	Diss H_2S	Silicate uM/kg	Nitrate uM/kg	Phosphate uM/kg
1715/08											
12	14.7	11	27.759	36.1119	-	2.21	208.88	-	Below detection	2.13	0.12
11	130.7	125	19.410	35.5772	-	2.21	117.42	-	11.90	28.53	1.37
10	198.2	191	16.529	35.6612	-	2.19	13.84	-	22.33	30.48	2.31
9	240.4	233	14.441	35.4865	-	2.23	46.66	-	23.21	20.20	2.26
8	304.0	295	14.123	35.6772	-	2.20	15.66	-	28.19	28.90	2.26
7	501.8	491	12.419	35.6527	-	2.29	15.77	-	27.62	37.75	2.55
6	800.2	789	10.777	35.6142	-	2.24	10.64	-	55.59	42.53	2.80
5	845.7	835	10.212	35.5401	-	2.35	8.49	-	61.45	48.56	2.84
4	1000.2	989	9.138	35.4583	-	2.22	16.35	-	69.25	43.2	2.84
3	1199.9	1186	7.507	35.2736	-	2.22	25.57	-	82.90	48.2	3.04
2	1399.8	1383	6.119	35.2086	-	2.31	35.84	-	88.80	48.6	2.99
1	1600.9	1582	4.770	35.1122	-	2.41	40.80	-	94.60	55.3	2.90
1715/04											
12	1799.2	1768	3.842	34.8940	-	2.35	83.94	-	128.54	39.74	3.24
11	1999.7	1965	3.169	34.8455	-	2.26	90.48	-	133.23	41.16	3.18
10	2199.4	2162	2.731	34.7665	-	2.24	101.62	-	133.23	45.08	3.51
9	2399.4	2359	2.368	34.8392	-	2.33	93.53	-	133.23	44.73	3.02
8	2599.5	2556	2.117	34.7197	-	2.31	117.74	-	138.10	44.73	2.97
7	2800.0	2752	1.949	34.8326	-	2.22	97.22	-	133.32	43.66	3.18
6	2999.7	2947	1.847	34.7860	-	2.28	103.57	-	133.32	51.32	2.86
5	3200.0	3143	1.785	34.7401	-	2.23	119.62	-	138.10	42.94	2.81
4	3399.0	3339	1.749	34.7380	-	2.35	134.95	-	168.10	42.23	2.81
3	3600.3	3534	1.730	34.7275	-	2.31	135.11	-	140.01	50.25	3.08
*1	4051.1	3975	1.650	35.1132	-	2.28	50.27	-	91.27	50.78	3.02

* Premature firing of Bottle No 1 between 1600 m and 1800m

Go-Flo No	P CTD(db)	Wire	Temp °C	Salinity S °/..	Alkalinity meq/l Total	Alkalinity meq/l Carb	Diss O_2 uM/kg	Diss H_2S	Silicate uM/kg	Nitrate uM/kg	Phosphate uM/kg
1715/07											
1	260.9	259	141.486	35.5142	-	2.17	43.88	-	23.93	25.16	2.06
3									25.22	-	-
5	-	-	-	-	-	-	-	-	23.73	-	-
7	-	-	-	-	-	-	-	-	24.03	-	-
9	-	-	-	-	-	-	-	-	24.13	-	-
11	-	-	-	-	-	-	-	-	24.82	-	-
1715/02											
1)								-	132.43		
2)									137.8		
3)	4059.1	3981	1.648	34.8102	-	2.43	104.52	-	137.18	26.94	2.59
4)									-		
5)									137.18		
6)									137.18		
7)									34.46		
8)									34.55		
9)	439.7	429	13.194	35.5051	-	2.29	7.24	-	34.55	35.80	2.86
10)									34.74		
11)									34.55		
12)									34.65		

27.10.86 Small Volume CTD rosette Station 1726/01

Go-Flo No	P CTD(db)	Wire	Temp °C	Salinity S°/oo	Alkalinity meq/l Total	Carb	Diss O_2 uM/kg	Diss H_2S	Silicate uM/kg	Nitrate uM/kg	Phosphate uM/kg
12	148.6	142	18.923	35.9706	-	2.34	5.67	-	20.20	24.10	2.45
11	199.5	192	18.280	36.4258	-	2.37	17.42	-	21.84	21.87	1.95
10	300.2	291	15.671	36.1713	-	2.37	6.18	-	28.86	22.34	2.45
9	499.3	494	13.024	35.8418	-	2.25	6.26	-	41.18	26.55	2.89
8	626.1	615	11.866	35.6757	-	2.33	5.44	-	48.11	23.40	2.74
7	749.0	737	10.970	35.5932	-	2.28	4.76	-	56.77	29.95	2.53
6	873.8	862	9.857	35.5051	-	2.36	7.25	-	66.40	31.58	2.74
5	1000.0	987	9.080	35.4322	-	2.27	6.39	-	73.12	33.92	2.99
4	1203.1	1188	7.583	35.2712	-	2.38	11.28	-	86.59	31.70	3.15
3	1449.5	1434	5.899	35.1011	-	2.36	31.81	-	105.84	35.44	3.15
2	1702.0	1684	4.556	35.0587?	-	2.38	40.67	-	115.46?	35.56?	3.05?
*1	1702.0	1684	4.556	34.9582	-	2.29	54.85?	-	129.89?	33.92?	2.79?

? Possible Bottle No2 is not a reliable water sample

29.10.86

Small Volume CTD rosette

Station 1730/03

Go-Flo No	P CTD(db)	Wire	Temp °C	Salinity S °/oo	Alkalinity meq/l Total	Alkalinity meq/l Carb	Diss O_2 uM/kg	Diss H_2S	Silicate uM/kg	Nitrate uM/kg	Phosphate uM/kg
12	8.2	5	27.921	36.0013	-	2.32	212.20	-	0	0.16	0.25
11	60.1	55	21.487	35.5306	-	2.36	144.34	-	9.10	14.81	1.08
10	225.0	217	17.269	36.3312	-	2.34	9.93	-	23.73	15.29	2.45
9	399.2	389	13.821	35.9338	-	2.33	5.43	-	35.36	27.70	2.75
8	600.1	588	11.684	35.6597	-	2.28	5.93	-	48.44	31.85	3.09
7	800.2	786	10.059	35.5259	-	2.24	7.72	-	63.93	25.96	2.94
6	1200.7	1180	7.177	35.2496	-	2.29	16.61	-	90.57	25.64	3.19
5	2001.2	1968	3.115	34.8473	-	2.45	85.96	-	135.62	47.15	3.63
4	-	-	-	-	-	-	-	-	-	-	-
3	3499.9	3439	1.728	34.7426	-	2.41	147.05	-	143.85	38.39	3.14
*2	3620	-	-	34.7392	-	2.44	126.03	-	143.85	44.44	3.19
*1	3620	-	-	-	-	2.44	-	-	-	-	-

* Rosette < 5m off bottom

29.10.86 Small Volume CTD rosette Station 1733/03

Go-Flo No	P CTD(db)	Wire	Temp °C	Salinity S °/₀₀	Alkalinity meq/l Total	Alkalinity meq/l Carb	Diss O_2 uM/kg	Diss H_2S	Silicate uM/kg	Nitrate uM/kg	Phosphate uM/kg
12	15.3	5	27.484	36.655	-	2.29	210.48	-	1.90	0.46	-
11	69.5	58	19.492	35.987	-	2.34	7.33	-	18.75	28.96	1.89
10	251.4	238	16.914	36.411	-	2.06	13.02	-	26.65	22.56	1.81
9	399.4	383	13.587	35.924	-	2.27	6.92	-	36.65	24.54	2.02
8	550.0	532	11.997	35.681	-	2.31	7.75	-	46.83	30.95	2.29
7	700.1	680	10.975	35.583	-	2.38	7.89	-	55.21	35.06	2.49
6	849.6	829	9.772	35.485	-	2.34	6.77	-	66.63	34.76	2.79
5	999.4	975	8.784	35.391	-	2.28	9.68	-	75.96	49.95	2.68
4	1500.0	1474	5.371	35.049	-	2.39	37.65	-	114.22	48.48	2.83
3	2102.0	2073	2.870	34.826	-	2.45	90.11	-	138.02	38.38	2.73
2	2848.5	2814	1.9110	34.753	-	2.33	113.41	-	142.78	40.86	2.73
1	2848.5	2814	1.9110	34.754	-	2.42	114.53	-	142.78	45.43	2.70

2.11.86

Small Volume CTD rosette

Station 1737/01

Go-Flo No	P CTD(db)	Wire	Temp °C	Salinity S°/₀₀	Alkalinity meq/l Total	Carb	Diss O_2 uM/kg	Diss H_2S	Silicate uM/kg	Nitrate uM/kg	Phosphate uM/kg
12	11.6	4	27.738	36.881	-	2.22	195.38	-	1.90	1.27	0.46
11	20.0	12	26.220	36.768	-	2.20	168.61	-	2.85	14.07	0.65
9	96.0	88	19.617	36.765?	-	2.20	123.23	-	5.70	5.63	1.02
10	"	"	"								
7	250.1	241	18.892	36.964	-	2.25	25.64	-	19.18	22.51	2.04
8	"	"	"								
5	375.0	365	15.596	36.357	-	2.24	14.74	-	28.48	25.32	2.32
6	"	"	"								
3	449.0	440	14.236	36.105	-	2.25	11.25	-	33.22	18.00	2.50
4	"	"	"	"							
1	459.0	450	14.222	36.099	-	2.28	10.89	-	34.08	19.69	2.53
2	"	"	"								

Hydrography of Niskin casts Stn 1701-02

Depth	Salinity	Diss O_2	Silicate	Nitrate	Phosphate
m	S ‰	µM/kg	µM/kg	µM/kg	µM/kg
0	taken as 35 ‰	216.30	0.51		
25	for calculations	213.92	0.91		
50	on O_2	144.23	6.59		
75		50.71	14.20		
100		10.85	19.27		
150		27.24	23.33		
200		25.98	23.53		
250		22.76	24.44		
300		27.75	28.40		
400		17.45	33.45		
500		19.65	40.57		
600		22.64	48.68		
800		24.00	60.85		
1000		28.22	75.05		
1200		30.61	86.21		
1400		26.84	111.57		
1600		69.76	131.85		
1800		83.16	136.92		
2000		89.74	142.00		
2100		108.99	142.00		
2130		100.18	142.00		

Hydrographic Results from Niskin Bottles. Stn 1707-02

Depth	Salinity	Diss O_2	Silicate	Nitrate	Phosphate
m	°/oo	µM/kg	µM/kg	µM/kg	µM/kg
0	35.9040	227.59	0.94		
25	35.7730	189.32	5.09		
50	35.6584	87.33	13.10		
75	35.5029	68.82	19.33		
100	-	33.97	22.63		
150	35.6357	18.26	25.93		
200	35.5985	44.87	27.35		
250	35.5985	28.87	29.14		
300	35.6246	19.22	32.25		
400	35.5989	22.06	35.84		
500	-	20.62	39.80		
600	35.6519	21.00	43.38		
680	35.7370	34.28	47.15		
780	35.6727	26.83	52.81		
980	35.5764	33.30	64.79		
1890	35.3678	28.08	81.57		
1380	35.1087	46.04	102.79		
1430	35.0659	52.00	112.20		

Hydrographic Results from Niskin Bottles Stn 1715-05

Depth	Salinity	Diss O_2	Silicate	Nitrate	Phosphate
m	°/∘∘	M/kg	μM/kg	μM/kg	μM/kg
0	36.1042	211.05			
25	36.0640	221.06			
50	35.9610	179.49			
75	35.8909	167.58			
100	35.5021	145.14			
150	35.7961	16.37			
200	35.5288	29.04			
250	35.6792	9.07			
300	35.8120	6.18			
400	35.6452	11.56			
500	35.6225	16.57			
600	35.6545	10.87			
800	35.5440	8.25			
1000	35.4181	12.72			
1200	35.2505	22.62			
1400	35.1029	42.08			
1800	34.8977	76.50			
2200	34.8136	99.75			
2600	34.7697	115.91			
3000	34.7484	126.30			
3400	34.7417	136.47			
3800	34.7523	145.28			
3900	34.7354	142.17			
4000	34.7425	144.30			

Hydrographic Results from Niskin Bottles   Stn 1726-02

Depth m	Salinity °/oo	Diss O_2 µM/kg	Silicate µM/kg	Nitrate µM/kg	Phosphate µM/kg
0	36.1905	207.65	1.44	0.00	0.225
25	36.4266	203.90	1.73	1.17	0.220
50	36.2571	151.98	3.08	9.36	1.037
75	36.3189	55.25	8.95	16.88	1.66
100	36.0673	11.79	15.30	19.65	2.14
150	36.1901	12.19	21.17	21.76	1.93
200	36.5189	21.67	21.17	19.65	2.29
250	36.2337	8.07	26.17	16.14	2.61
300	36.2143	8.14	28.58	14.74	2.08
400	36.1330	7.05	31.27	25.27	2.40
500	35.8590	11.19	39.16	22.11	2.34
600	35.7367	7.45	46.18	21.99	2.61
800	35.4376	7.34	61.58	38.13	2.87
1000	35.5545	8.72	74.09	36.03	3.03
1200	35.2897	9.13	86.59	35.80	3.18
1400	35.1437	20.03	99.10	40.36	3.18
1600	35.0235	42.63	115.46	34.86	2.87
1800	34.9078	67.73	129.89	28.89	3.24

Hydrographic Results from Niskin Bottles Stn 1730-04

Depth	Salinity	Diss O_2	Silicate	Nitrate	Phosphate
m	°/oo	µM/kg	µM/kg	µM/kg	µM/kg
0	36.0067	211.33	0.48	0.00	
25	35.9455	207.41	ND	0.00	
50	35.5268	154.03	8.04	16.29	
75	35.7799	64.97	11.14	26.27	
100	35.8109	11.20	17.15	28.03	
150	35.7664	8.24	22.96	22.16	
200	35.8082	9.85	23.64	22.46	
250	35.8922	8.08	25.28	28.77	
300	36.3633	10.71	25.28	25.98	
400	35.8525	10.25	33.81	20.70	
500	35.8192	7.48	39.23	21.43	
600	35.6770	7.13	46.79	25.83	
800	34.7870	7.93	57.54	26.27	
1000	35.5150	11.91	67.32	32.29	
1200	35.3787	19.67	77.98	28.33	
1600	35.2175	58.07	101.23	25.83	
2000	34.9695	89.04	106.07	32.29	
2400	34.8467	105.96	115.76	33.91	
2800	34.7536	119.35	143.85	32.44	
3000	34.7477	123.18	144.82	27.30	
3200	34.7481	127.13	143.85	29.50	
2400	34.8459?	121.69?	135.13?	39.63	
3500	34.7408	128.81	143.85	31.12	
3550	34.7388	129.76	144.34	30.23	

ND - Not detectable.

Hydrographic Results from Niskin Bottles Stn 1733-04

Depth	Salinity	Diss O_2	Silicate	Nitrate	Phosphate
m	°/₀₀	μM/kg	μM/kg	μM/kg	μM/kg
0	36.6783	212.84	1.71	0.00	0.00
25	36.0463	122.13	1.90	10.34	0.18
50	36.0855	11.72	14.18	26.37	1.70
75	36.0368	8.99	19.04	23.78	1.98
100	36.1058	10.06	21.13	21.80	2.00
150	36.3314	12.92	21.89	19.67	1.81
200	36.4758	20.53	22.08	19.51	3.07
250	36.5709	23.25	23.60	24.85	1.96
300	36.2819	11.70	27.89	22.56	2.00
400	35.9408	9.93	36.17	1.22	2.23
500	35.7498	8.95	42.83	16.16	2.26
600	35.6397	9.08	37.31	25.31	2.58
700	35.5787	8.26	51.88	17.07	2.82
800	35.5210	11.75	60.92	24.39	2.43
1000	35.3926	7.05	83.76	27.14	2.82
1200	35.2563	15.06	85.67	34.61	3.00
1400	35.1163	30.69	97.09	42.38	2.88
1800	34.9110	69.60	123.74	37.81	2.43
2000	34.8781	77.29	133.26	27.14	2.77
2200	34.8267	99.28	138.02	37.81	2.71
2400	34.7969	105.24	140.88	33.54	2.27
2600	34.7685	112.25	140.88	31.71	2.57
2800	34.7592	117.07	142.78	30.95	2.68
2850	34.7621	116.67	142.78	30.95	2.42

Hydrographic Data for Niskin Stations   Stn 1738-02

Depth	Salinity	Diss O_2	Silicate	Nitrate	Phosphate
m	°/oo	μM/kg	μM/kg	μM/kg	μM/kg
0	36.7266				
25	36.22.15				
50	36.1730				
75	36.0250				
100	36.0541				
150	36.2494				
200	36.3152				
250	36.2754				
300	36.2378				
400	35.8586				
500	35.7570				
800	35.5070				
1200	35.2583				
1800	34.8812				
2500	34.7475				
2900	34.7275				
3100	34.7174				
3200	34.7133				

Stn 1701-02 WATER FILTERING 17.10.86

NUCLEPORE FILTERS. 37mm 0.4 um

DEPTH (Un-corrected) m	CAST	Volume collected	Volume unfiltered	Volume filtered	Holder No.	Bottle No.(Niskin)	Remarks
0	4	9.5	6.8	2.7	As labelled	15	
25	4	9.5	6.2	3.3	"	16	
50	4	9.5	2.5	7.0	"	17	
75	3	9.5	0.5	9.0	"	15	
100	4	8.5	1.3	7.2	"	16	
150	3	9.5	1.3	8.2	"	17	
200	3	9.5	0.4	9.1	"	18	
250	3	9.5	2.4	7.1	"	19	
300	3	9.5	0.5	9.0	"	20	
400	2	9.5	1.0	8.5	"	15	
500	2	9.5	2.9	6.6	"	16	
600	2	9.5	0.6	8.9	"	17	
800	2	9.5	1.7	7.8	"	18	
1000	2	9.5	0.8	8.7	"	19	
1200	2	9.5	0.6	8.9	"	20	
1400	1	9.5	1.0	9.5	"	15	
1600	1	6.6	0.4	6.2	"	16	
1800	1	9.5	1.2	8.3	"	17	
2000	1	9.5	2.0	7.5	"	18	
2100	1	9.5	5.1	4.4	"	19	
2130	1	9.5	0.6	8.9	"	20	

Bottom
2150.

Niskin bottles - neoprene spring.

Stn 17-07-02 WATER FILTERING 19.10.86

NUCLEPORE FILTERS. 37mm 0.4 um

DEPTH (Un-corrected) m	CAST	Volume collected	Volume unfiltered	Volume filtered	Holder No.	Bottle No.(Niskin)	Remarks
0	3	9.51	8.21	1.31	As indicated	15	
25	3	9.51	6.21	3.31		16	
50	3	9.51	1.21	8.31		17	
75	3	9.51	1.11	8.41		18	
100	3	9.51	0.61	8.91		19	
150	3	9.51	0.61	8.91		20	
200	2	9.51	0.71	8.81		15	slight fold in membrane.
250	2	9.51	1.31	8.21		16	
300	2	9.51	0.81	8.71		17	
400	2	9.51	1.01	8.51		18	
500	2	9.51	1.01	8.51		19	
600	2	9.51	0.71	8.81		20	
680	1	9.51	0.51	9.01		15	
780	1	9.51	0.51	9.01		16	
980	1	9.51	0.51	9.01		17	
1180	1	9.51	1.2	8.31		18	
1380	1	9.51	0.21	9.31		19	
1430	1	9.51	0.21	9.31		20	

301 Niskin bottles - neoprene spring

Stn 17-12-02 WATER FILTERING 20.10.86

NUCLEPORE FILTERS. 37mm 0.4 um (From CTD CAST)

DEPTH	CAST	Volume collected	Volume unfiltered	Volume filtered	Holder No.	Bottle No.Goflo	Remarks
					As indicated		
45	(45)	6.5	2.7	3.8	"	1	
92	(92)	6.5	0.4	6.1	"	2	
121	(121)	7.1	0.7	6.4	"	3	
192	199	6.8	0.4	6.4	"	4	
414	423	4.8	0.4	4.4	"	5	
474	485	7.3	5.1	2.2	"	6	*see repeat
521	533	7.0	0.3	6.7	"	7	
749	761	6.4	0.3	6.1	"	8	
1482	1499	6.8	1.0	5.8	"	9	
2160	2186	7.0	1.2	5.8	"	10	
2775	2800	7.2	0.5	6.7	"	11	
3956	3995	6.0	0.9	5.1	"	12	
474* repeat		5.1	0.0	5.1	"	6	

Sampling of water started 1 hr after recovery of cast and lasted 3.5 hrs.

Stn 1713-04 WATER FILTERING 22.10.86

NUCLEPORE FILTERS. 37mm 0.4 um

DEPTH m	CAST	Volume collected	Volume unfiltered	Volume filtered	Holder No. As indicated	Bottle No.(Niskin)	Remarks
0	4	9.5	5.9	3.6	"	15	
25	4	9.5	5.4	4.1	"	16	
50	4	9.5	2.9	6.6	:	17	
75	4	9.5	0.8	9.7	"	18	
100	4	9.5	0.3	9.2	"	19	
150	4	9.5	0.2	9.3	"	20	
200	3	9.5	0.7	8.8	"	15	
250	3	9.5	0.7	8.8	"	16	
300	3	9.5	0.4	9.1	"	17	
400	3	9.5	0.9	8.6	"	18	
500	3	9.5	0.5	9.0	"	19	
600	3	9.5	0.5	9.0	"	20	
800	2	9.5	0.8	9.7	"	15	
1000	2	9.5	0.5	9.0	"	16	
1200	2	9.5	1.1	8.4	"	17	
1400	2	9.5	0.8	9.8	"	18	
1800	2	9.5	0.6	8.9	"	19	
2000	2	9.5	0.4	9.1	"	20	see GFF filter remarks
2400	1	9.5	0.2	9.3	"	15	
2800	1	9.5	0.6	8.9	"	16	
3200	1	9.5	0.9	8.6	"	17	
3400	1	9.5	0.0	9.5	"	18	
3600	1	9.5	0.5	9.0	"	19	
3650	1	9.5	0.5	9.0	"	20	

Stn 1715-04 WATER FILTERING 24.10.86

NUCLEPORE FILTERS. 37mm 0.4 um

DEPTH m	CAST	Volume collected	Volume unfiltered	Volume filtered	Holder No. As indi-cated	Bottle No.(Niskin)	Remarks
0	4	9.5	6.8	2.7	■	15	
25	4	9.5	6.8	2.7	■	16	
50	4	9.5	2.5	7.0	■	17	
75	4	9.5	0.6	8.9	■	18	
100	4	9.5	0.2	9.3	■	19	
150	4	9.5	0.2	9.3	■	20	
200	3	9.5	0.8	8.7	■	15	
250	3	9.5	0.9	8.6	■	16	
300	3	9.5	0.7	8.8	■	17	
400	3	9.5	0.7	8.8	■	18	
500	3	9.5	0.3	9.2	■	19	
600	3	9.5	0.2	9.3	■	20	awkward filtering
800	2	9.5	0.5	9.0	■	15	
1000	2	8.3	0.9	8.4	■	16	
1200	2	9.5	0.7	8.8	■	17	
1400	2	9.5	0.2	9.3	■	18	
1800	2	9.5	0.5	9.0	■	19	
2200	2	9.5	0.3	9.2	■	20	
2600	1	9.5	0.0	9.5	■	15	excess yellow? possible contaminated
3000	1	9.5	0.9	8.6	■	16	
3400	1	9.5	0.8	8.7	■	17	
3800	1	9.5	0.0	9.5	■	18	
3900	1	9.5	0.2	9.3	■	19	
4000	1	9.5	0.0	9.5	■	20	

Total depth. 4020

Stn 1726-02 WATER FILTERING 27.10.86

NUCLEPORE FILTERS. 37mm 0.4 um

DEPTH (Un-corrected) m	CAST	Volume collected	Volume unfiltered	Volume filtered	Holder No. As indicated	Bottle No.(Niskin)	Remarks
0	3	9.5	7.1	2.4	"	15	
25	3	9.5	8.0	1.5	"	16	
50	3	9.5	2.9	6.6	"	17	
75	3	9.5	0.4	9.1	"	18	
100	3	9.5	0.3	9.2	"	19	
150	3	9.5	0.2	9.3	"	20	
200	2	9.5	2.0	7.5	"	15	
250	2	9.5	0.0	9.5	"	16	
300	2	9.5	0.8	8.7	"	17	
400	2	9.5	0.8	8.7	"	18	
500	2	9.5	0.4	9.1	"	19	
600	2	9.5	1.2	8.3	"	20	
800	1	9.5	0.0	9.5	"	15	
1000	1	9.5	0.0	9.5	"	16	
1200	1	9.5	0.7	8.8	"	17	
1400	1	9.5	0.8	8.7	"	18	
1600	1	9.5	0.9	8.6	"	19	
1800	1	9.5	0.4	9.1	"	20	

Bottom approx 1900 m shelving.

Stn 1730-04 WATER FILTERING 29.10.86

NUCLEPORE FILTERS. 37mm 0.4 um

DEPTH (Un-corrected) m	CAST	Volume collected	Volume unfiltered	Volume filtered	Holder No. As indicated	Bottle No. (Niskin)	Remarks
0	4	9.5	7.6	1.9	"	15	
25	4	9.5	7.7	1.8	"	16	
50	4	9.5	1.2	8.3	"	17	
75	4	9.5	0.7	8.8	"	18	
100	4	9.5	0.2	9.3	"	19	
150	4	9.5	2.4	7.1	"	20	More colour than 100 m.
200	3	9.5	2.2	7.3	"	15	
250	3	9.5	0.0	9.5	"	16	
300	3	9.5	0.0	9.5	"	17	
400	3	9.5	0.7	8.8	"	18	
500	3	9.5	0.2	9.3	"	19	Copepod darkish
600	3	9.5	0.4	9.1	"	20	
800	2	9.5	0.3	9.2	"	15	
1000	2	9.5	0.0	9.5	"	16	
1200	2	9.5	0.4	9.1	"	17	
1600	2	9.5	0.8	8.7	"	18	
2000	2	9.5	0.4	9.1	"	19	
2400	2	9.5	0.0	9.5	"	20	
2800	1	9.5	0.4	9.1	"	15	
3000	1	9.5	0.2	9.2	"	16	
3200	1	9.5	0.4	9.1	"	17	
3400	1	9.5	0.9	8.6	"	18	
3500	1	9.5	0.4	9.1	"	19	
3550	1	9.5	0.4	9.1	"	20	

Depth 3580 m

Stn 1733-04 WATER FILTERING 1.11.86

NUCLEPORE FILTERS. 37mm 0.4 um

DEPTH (Un-corrected) m	CAST	Volume collected	Volume unfiltered	Volume filtered	Holder No. As indi-cated	Bottle No.(Niskin)	Remarks
0	4	9.5	7.8	1.7	"	15	
25	4	9.5	9.2	0.3	"	16	
50	4	9.5	4.4	5.1	"	17	
75	4	9.5	6.0	3.5	"	18	
100	4	9.5	2.7	6.8	"	19	
150	4	9.5	3.3	6.2	"	20	
200	3	9.5	1.0	8.5	"	15	
250	3	9.5	0.2	9.3	"	16	
300	3	9.5	0.6	8.9	"	17	
400	3	9.5	0.7	8.8	"	18	
500	3	9.5	1.6	7.9	"	19	
600	3	9.5	1.7	7.8	"	20	
700	2	9.5	0.8	8.7	"	15	
800	2	9.5	0.2	9.3	"	16	
1000	2	9.5	0.3	9.2	"	17	
1200	2	9.5	0.9	8.6	"	18	
1400	2	9.5	0.2	9.3	"	19	
1800	2	9.5	0.8	8.7	"	20	
2000	1	9.5	0.3	9.2	"	15	
2200	1	9.5	0.0	9.5	"	16	GF/F filter may be contaminated.
2400	1	9.5	0.6	8.9	"	17	
2600	1	9.5	1.0	8.5	"	18	
2800	1	9.5	0.2	9.3	"	19	
2850	1	9.5	0.2	9.3	"	20	

2880 Depth (Bottom)

Stn 1738-02 WATER FILTERING 3.11.86

NUCLEPORE FILTERS. 37mm 0.4 um

DEPTH (Un-corrected) m	CAST	Volume collected	Volume unfiltered	Volume filtered	Holder No. As indi-cated	Bottle No.(Niskin)	Remarks
0	3	9.5	7.9	1.6	"	15	
25	3	9.5	7.5	2.0	"	16	
50	3	9.5	2.0	7.5	"	17	
75	3	9.5	0.9	8.6	"	18	
100	3	9.5	2.1	7.4	"	19	
150	3	9.5	1.2	8.3	"	20	
200	2	9.5	0.2	9.3	"	15	
250	2	9.5	0.2	9.3	"	16	
300	2	9.5	0.5	9.0	"	17	slightly uneven surface
400	2	9.5	0.9	8.6	"	18	
500	2	9.5	1.1	8.4	"	19	
800	2	9.5	0.3	9.2	"	20	
1200	1	9.5	0.0	9.5	"	15	
1800	1	9.5	0.0	9.5	"	16	
2500	1	9.5	0.5	9.0	"	17	
2900	1	9.5	3.0	6.5	"	18	
3100	1	9.5	0.2	9.3	"	19	
3200	1	9.5	2.0	7.5	"	20	

Depth 3320 m.

Stn 1739-02 WATER FILTERING 5.11.86

NUCLEPORE FILTERS. 37mm 0.4 um

DEPTH (Un-corrected) m	CAST	Volume collected	Volume unfiltered	Volume filtered	Holder No. As indi-cated	Bottle No.(Niskin)	Remarks
0	3	9.5	6.7	2.8	"	15	
25	3	9.5	7.2	2.3	"	16	
50	3	9.5	6.2	3.3	"	17	
75	3	9.5	5.5	4.0	"	18	
100	3	9.5	2.7	6.8	"	19	
150	3	9.5	0.8	8.7	"	20	
200	2	9.5	0.4	9.1	"	15	
250	2	9.5	0.2	9.3	"	16	
300	2	9.5	1.5	8.0	"	17	
400	2	9.5	0.0	9.5	"	18	look for crease on edge re-filtering
500	2	9.5	1.5	8.0	"	19	
700	2	9.5	0.3	9.2	"	20	
900	1	9.5	0.0	9.5	"	15	
1100	1	9.5	0.1	9.4	"	16	Explosion,fast filter discard.
1300	1	9.5	0.8	8.7	"	17	
1600	1	9.5	1.0	8.5	"	18	
1900	1	9.5	0.1	9.4	"	19	
2050	1	9.5	0.0	9.5	"	20	

Stn 1740-02 WATER FILTERING 5.11.86

NUCLEPORE FILTERS. 37mm 0.4 um

DEPTH (Un-corrected) m	CAST	Volume collected	Volume unfiltered	Volume filtered	Holder No. As indi-cated	Bottle No.(Niskin)	Remarks
0	2	9.5	8.1	1.4	"	15	
25	2	9.5	7.7	1.8	"	16	
50	2	9.5	7.8	1.7	"	17	
75	2	9.5	5.0	4.5	"	18	
100	2	9.5	4.6	4.9	"	19	
150	2	9.5	3.7	5.8	"	20	
200	1	9.5	5.2	4.3	"	15	
250	1	9.5	3.8	5.7	"	16	
300	1	9.5	2.8	6.7	"	17	
500	1	9.5	2.8	6.7	"	18	
700	1	9.5	0.0	9.5	"	19	
1200	1	9.5	0.0	9.5	"	20	

Stn 1701-02 WATER FILTERING 17.10.86

GLASS FIBRE. (GF/F) FILTERS

DEPTH (Un-corrected) m	CAST	Volume collected in Kgs	Weight after Filtering	Volume weight Filtered	Holder No. As Labelled	Bottle No.(Niskin)	Remarks
0	4	19.0	5.8	13.2	"	15	
25	4	20.0	9.6	10.4	"	16	
50	4	17.0	Empty 3.6C	13.4	"	17	
75	3	20.4	3.6	16.8	"	15	
100	4	19.8	3.6	16.2	"	16	
150	3	20.2	3.6	16.6	"	17	
200	3	19.0	3.6	15.4	"	18	
250	3	20.2	3.6	16.6	"	19	
300	3	20.2	3.6	16.6	"	20	
400	2	20.2	3.6	16.6	"	15	
500	2	20.8	3.6	17.2	"	16	
600	2	21.2	3.6	17.6	"	17	
800	2	20.2	3.6	16.6	"	18	
1000	2	18.2	3.6	14.6	"	19	
1200	2	19.5	3.6	15.9	"	20	
1400	1	18.6	3.6	15.0	"	15	
1600	1	20.2	3.6	16.6	"	16	
1800	1	20.6	3.6	17.0	"	17	
2000	1	19.2	3.6	15.6	"	18	
2100	1	18.6	3.6	15.0	"	19	
2130	1	19.2	3.6	15.6	"	20	

Bottom 2150

*Tare weight of container 3.6 kg.

Stn 17-07-02 WATER FILTERING 19.10.86

GLASS FIBRE. (GF/F) FILTERS

DEPTH (Un-corrected) m	CAST	Volume collected in Kgs	Weight after Filtering	Volume weight Filtered	Holder No. As Labelled	Bottle No.(Niskin)	Remarks
0	3	19.6	10.5	9.1	"	15	
25	3	19.0	3.6	15.4	"	16	
50	3	18.5	3.6	14.9	"	17	
75	3	18.6	3.6	15.0	"	18	
100	3	16.5	3.6	12.9	"	19	
150	3	18.6	3.6	15.0	"	20	
200	3	19.2	3.6	15.6	"	15	
250	2	18.7	3.6	15.1	"	16	
300	2	19.5	3.6	15.9	"	17	
400	2	19.6	3.6	16.0	"	18	
500	2	19.4	3.6	15.8	"	19	
600	2	17.2	3.6	13.6	"	20	
680	2	19.2	3.6	15.6	"	15	
780	1	15.2	3.6	11.6	"	16	
980	1	19.2	3.6	15.6	"	17	
1180	1	20.4	3.6	16.8	"	18	
1380	1	19.0	3.6	15.4	"	19	
1430	1	19.8	3.6	16.2	"	20	

Stn 1713-04 WATER FILTERING 22.10.86

GLASS FIBRE. (GF/F) FILTERS

DEPTH (Un-corrected) m	CAST	Volume collected in Kgs	Weight after Filtering	Volume weight Filtered	Holder No. As Labelled	Bottle No.(Niskin)	Remarks
0	4	21.2	4.4	16.8	"	15	
25	4	19.2	3.6	15.6	"	16	
50	4	21.4	3.6	17.8	"	17	
75	4	18.4	3.6	15.8	"	18	
100	4	19.2	3.6	15.6	"	19	
150	4	17.4	3.6	13.8	"	20	
200	3	19.0	3.6	15.4	"	15	
250	3	20.0	3.6	16.4	"	16	
300	3	20.8	3.6	17.2	"	17	
400	3	19.2	3.6	15.6	"	18	
500	3	17.5	3.6	13.9	"	19	
600	3	18.0	3.6	14.4	"	20	
800	2	18.5	3.6	14.9	"	15	
1000	2	19.4	3.6	15.8	"	16	
1200	2	20.4	3.6	16.8	"	17	
1400	2	21.2	3.6	17.6	"	18	
1800	2	17.8	3.6	14.2	"	19	
2000*	2	17.5	3.6	13.9	"	10	*Unusual rich/ brown deposit contamination SiO_4 of Nucle- pore can 128 u
2400	1	20.4	3.6	16.8	"	15	
2800	1	20.6	3.6	17.0	"	16	
320	1	21.0	3.6	17.4	"	17	
3400	1	20.8	3.6	17.2	"	18	
3600	1	19.3	3.6	15.7	"	19	
3650	1	18.7	3.6	15.1	"	20	

Stn 1715-05 WATER FILTERING 24.10.86

GLASS FIBRE. (GF/F) FILTERS

DEPTH (Un-corrected) m	CAST	Volume collected in Kgs	Weight after Filtering	Volume weight Filtered	Holder No. As Labelled	Bottle No.(Niskin)	Remarks
0	4	18.6	3.6	15.0	"	15	
25	4	20.6	5.4	15.2	"	16	
50	4	19.4	3.6	15.8	"	17	
75	4	10.0	3.6	25.4	"	18	
100	4	17.5	3.6	13.9	"	19	
150	4	19.2	3.6	15.6	"	20	
200	3	20.2	3.6	16.6	"	15	
250	3	19.4	3.6	15.8	"	16	
300	3	20.4	3.6	16.8	"	17	
400	3	19.4	3.6	15.8	"	18	
500	3	18.8	3.6	15.2	"	19	
600	3	19.2	3.6	15.6	"	20	
800	2	20.2	3.6	16.6	"	15	
1000	2	19.2	3.6	15.6	"	16	
1200	2	18.8	3.6	15.2	"	17	
1400	2	19.8	3.6	16.2	"	18	
1800	2	19.2	3.6	15.6	"	19	
2200	2	19.4	3.6	15.8	"	20	Filtered through Nuclepore in error. Excess yellow colour
2600	1	19.4	3.6	15.8	"	15	
3000	1	19.4	3.6	15.8	"	16	
3400	1	19.6	3.6	16.0	"	17	
3800	1	20.4	3.6	16.8	"	18	
3900	1	19.6	3.6	16.0	"	19	
4000	1	20.4	3.6	16.8	"	20	

Total depth 4020 m.

Stn 1726-02 WATER FILTERING 27.10.86

GLASS FIBRE. (GF/F) FILTERS

DEPTH (Un-corrected) m	CAST	Volume collected in Kgs	Weight after Filtering	Volume weight Filtered	Holder No. As Labelled	Bottle No.(Niskin)	Remarks
0	3	19.2	4.6	14.6	"	15	
25	3	18.8	8.6	10.2	"	16	
50	3	20.2	3.6	16.6	"	17	
75	3	19.2	3.6	15.6	"	18	
100	3	18.4	3.6	14.8	"	19	
150	3	18.0	3.6	14.4	"	20	
200	2	19.5	3.6	15.9	"	15	
250	2	18.6	3.6	15.0	"	16	
300	2	19.6	3.6	16.0	"	17	
400	2	20.0	3.6	16.4	"	18	
500	2	18.2	3.6	14.6	"	19	
600	2	18.8	3.6	15.2	"	20	
800	1	18.0	3.6	14.4		15	
1000	1	19.0	3.6	15.4	"	16	Yellow brown (Fe?) deposit
1200	1	19.6	3.6	16.0	"	17	
1400	1	18.4	3.6	14.8	"	18	
1600	1	18.4	3.6	14.8	"	19	
1800	1	19.0	3.6	15.4	"	20	

Bottom approx 1900 m - shelving

Stn 1730-04 WATER FILTERING 29.10.86

GLASS FIBRE. (GF/F) FILTERS

DEPTH (Un-corrected) m	CAST	Volume collected in Kgs	Weight after Filtering	Volume weight Filtered	Holder No. As Labelled	Bottle No.(Niskin)	Remarks
0	4	21.0	9.4	11.6	"	15	
25	4	20.2	10.0	10.2	"	16	
50	4	19.2	3.6	15.6	"	17	
75	4	20.2	3.6	16.6	"	18	
100	4	19.6	3.6	16.0	"	19	
150	4	20.2	3.6	16.6	"	20	
200	3	19.6	3.6	16.0	"	15	
250	3	19.4	3.6	15.8	"	16	
300	3	20.2	3.6	16.6	"	17	
400	3	18.2	3.6	14.6	"	18	
500	3	17.4	3.6	13.8	"	19	
600	3	20.2	3.6	16.6	"	20	
800	2	19.4	3.6	15.8	"	15	
1000	2	19.6	3.6	16.0	"	16	
1200	2	20.2	3.6	16.6	"	17	
1600	2	18.6	3.6	15.0	"	18	
2000	2	19.8	3.6	16.2	"	19	
2400	2	20.2	3.6	16.6	"	20	
2800	1	19.0	3.6	15.4	"	15	
3000	1	18.4	3.6	14.8	"	16	
3200	1	18.4	3.6	14.8	"	17	
3400	1	20.0	3.6	16.4	"	18	
3500	1	19.0	3.6	15.4	"	19	
3550	1	18.4	3.6	14.8	"	20	

Depth 3580 m

Stn 1733-04 WATER FILTERING 1.11.86

GLASS FIBRE. (GF/F) FILTERS

DEPTH (Un-corrected) m	CAST	Volume collected in Kgs	Weight after Filtering	Volume weight Filtered	Holder No. As Labelled	Bottle No.(Niskin)	Remarks
0	4	20.0	13.2	6.8	"	15	
25	4	19.2	17.4	1.8	"	16	
50	4	19.8	3.6	16.2	"	17	
75	4	20.8	3.6	17.2	"	18	
100	4	19.2	3.6	15.6	"	19	
150	4	19.2	3.6	15.6	"	20	
200	3	19.4	3.6	15.8	"	15	
250	3	19.8	11.4	8.4	"	16	Filtering with air leak.
300	3	20.8	3.6	17.2	"	17	
400	3	20.0	3.6	16.4	"	18	
550	3	19.2	3.6	15.6	"	19	
600	3	19.4	3.6	15.8	"	20	
700	2	19.2	3.6	15.6	"	15	
800	2	18.6	4.2	14.4	"	16	
1000	2	20.2	3.6	16.6	"	17	
1200	2	19.8	3.6	16.2	"	18	
1400	2	20.2	3.6	16.6	"	19	
1800	2	20.2	3.6	16.6	"	20	
2000	1	18.4	3.6	14.8	"	15	
2200	1	19.2	5.0	14.2	"	16	looks contaminated from 25m of 1730
2400	1	18.0	3.6.	14.4	"	17	
2600	1	20.8	3.6	17.2	"	18	
2800	1	19.2	3.6	15.6	"	19	
2850	1	19.6	3.6	16.0	"	20	

2880 Bottom depth.

Stn 1738-02 WATER FILTERING 3.11.86

GLASS FIBRE. (GF/F) FILTERS

DEPTH (Un-corrected) m	CAST	Volume collected in Kgs	Weight after Filtering	Volume weight Filtered	Holder No. As Labelled	Bottle No.(Niskin)	Remarks
0	3	21.0	15.2	5.8	"	15	
25	3	20.8	11.4	9.4	"	16	
50	3	21.2	3.6	17.6	"	17	
75	3	20.2	3.6	16.6	"	18	
100	3	18.0	3.6	14.4	"	19	
150	3	19.2	3.6	15.6	"	20	
200	2	18.8	3.6	15.2	"	15	
250	2	19.0	3.6	15.4	"	16	
300	2	19.8	3.6	16.2	"	17	
400	2	20.2	3.6	16.6	"	18	
500	2	17.6	3.6	14.0	"	19	
800	2	19.0	3.6	15.4	"	20	
1200	1	15.2	3.6	11.6	"	15	
1800	1	20.0	3.6	16.4	"	16	
2500	1	15.6	3.6	12.0	"	17	
2900	1	20.8	3.6	17.2	"	18	
3100	1	14.8	3.6	11.2	"	19	
3200	1	20.0	3.6	16.4	"	20	

Stn 1739-02 WATER FILTERING 5.11.86

GLASS FIBRE. (GF/F) FILTERS

DEPTH (Un-corrected) m	CAST	Volume collected in Kgs	Weight after Filtering	Volume weight Filtered	Holder No. As Labelled	Bottle No.(Niskin)	Remarks
0	3	16.6	8.6	8.0	"	15	
25	3	19.2	8.8	10.4	"	16	
50	3	20.0	3.6	16.4	"	17	
75	3	19.4	3.6	15.8	"	18	
100	3	18.0	3.6	14.4	"	19	
150	3	19.0	3.6	15.4	"	20	
200	2	19.8	3.6	16.2	"	15	
250	2	21.0	3.6	17.4	"	16	
300	2	21.0	3.6	17.4	"	16	
300	2	20.4	3.6	16.8	"	17	
400	2	19.4	3.6	15.8	"	18	
500	2	18.0	3.6	14.4	"	19	
700	2	19.2	3.6	15.6	"	20	Water lost 81 discard except for C/N
900	1	19.8	3.6	16.2	"	15	
1100	1	20.6	3.6	17.0	"	16	
1300	1	20.2	3.6	16.6	"	17	
1600	1	19.2	3.6	15.6	"	18	
1900	1	18.2	3.6	14.6	"	19	
2050	1	19.0	3.6	15.4	"	20	

Stn 1740-02 WATER FILTERING 4.11.86

GLASS FIBRE. (GF/F) FILTERS

DEPTH (Un-corrected) m	CAST	Volume collected in Kgs	Weight after Filtering	Volume weight Filtered	Holder No. As Labelled	Bottle No.(Niskin)	Remarks
0	2	19.0	9.6	9.4	"	15	
25	2	16.8	6.4	10.4	"	16	
50	2	21.4	7.2	14.2	"	17	
75	2	7.6	3.6	14.0	"	18	
100	2	16.4	3.6	12.8	"	19	
150	2	17.0	3.6	13.4	"	20	
200	1	19.4	7.0	12.4	"	15	
250	1	18.6	3.6	15.0	"	16	
300	1	20.2	3.6	16.6	"	17	
500	1	19.2	3.6	15.6	"	18	
700	1	18.8	3.6	15.2	"	19	
1200	1	20.4	3.6	16.8	"	20	

DUST SAMPLING. (HIGH VOLUME)

Sample	No Date	Time GMT	out / in	Lat N.	Long. E.	Heading	Speed,	Wind (real) Vel kts	Wind (real) Direction	Manometer Reading cm	
H13 A+B	16.10.86	09.56	o	20°39'.1	59°33'	200	11.1	11	250	345	71
	16.10.86	20.30	i	19°08'	58°25'	230	03	13	220	-	-
H14	17.10.86	16.16	o	19°15'	58°38'	195	0.0	12	220	345	71
	18.10.86	01.42	i	18°10'	57°23'	231	0.3	10	230	35	70
H15 out	18.10.86 on										
		01.50	o	18°10'	57°23'	231	0.3	10	230	35	71
		09.27	i	17°43'	57°22'	231	0.0	11	250	50	50
		12.07	o	17°37'	57°22'	178	9.5	12	230	34	71
		05.08	i	17°30'	57°27'	161	0.0	10	140	-	-
H16 A+B	20.10.86	09.37	o	16°43'	57°24'	165	0.0	06	070	52	52
	21.10.86	11.04	o	16°41'	57°25'	179	11.5	08	080	34.5	70.5
		00.36	i	15°02'	57°25'	61	0.3	12	060	38	66.5
H17 A+B	21.10.86	20.31	o	15°11'	57°21'	181.9	11.7	10	040	66.5	38
	22.10.86	04.00	i	13°51'	57°22'	063.3	0.1	12	060	35	70
H18 A+B	22.10.86	06.39	o	13°.51'	57°22	051	5.4	08	050	35	70
	23.10.86	05.50	i	16°37'	60°40'	031	0.0	05	050	39	65
H19 A+B	24.10.86	20.36	o	16°48'	16°34'	319	11.6	05	ND	31	63
	25.10.86	12.25	i	19°04'	58°21'	114	0.6			64.5	41
H20 A+B	25.10.86	18.30	o								
	27.10.86	01.15	i	21°04	59°35'	097	0.0	05	080	35	61
H21 A+B	27.10.86	1127	o	21°38'	59°52'	208	0.0	05	110		
	27.20.86	1840	i	21°42'	59°36'	173	0.0	Calm			
H22 A+B	27.10.86	2155	o	21°46'	59°55'	166	11.6	Calm		39	64
	28.10.86	0455	i	20°44	60°11	221	0.0	08	170	37	64

DUST SAMPLING. (HIGH VOLUME)

Sample	No Date out / in	Time GMT	out / in	Lat N.	Long. E.	Heading	Speed,	Wind (real) Vel kts	Direction	Manometer Reading cm	
H23 A+B	28.10.86	07.40	o	20°43'	60°10'	153	90-11.6	Calm		37	64
	28.10.86	12.23	i	19°59'	60°37'	051	0.0	05	330	37	64
H24 A+B	28.10.86	21.00	o	19°35'	60°49'	11.0	068	03	170	40	64
	29.10.86	02.20	i	19°54'	61°43'	0.0	341	Calm		40.5	64
H25 A+B	29.10.86	22.47	o	19°57'	61°36	07.0	10	07	060	40	63
	30.10.86	06.04	i	21°24'	61°35'	19.0	2.1	06	050	39.5	63
H26 A+B	31.10.86	04.35	o	21°41'	60°33'	271	11.3	Calm		39	64.5
	31.10.86	15.13	i	22°33'	59°57'	038	11	05	N	39	65
H27	1.11.86	12.45	o	22°34'	60°18'	304	11.0	07	010	38	66
	1.11.86	16.02	i	22°40'	59°46	257	3.5	0.5	VAR	39	63.5
H28 A+B	1.11.86	18.33	o	22°43'	59°43'	318	6.8	Calm		39.5	63
	2.11.86	02.38	i	23°20'	59°07'	228	7.0	Calm		40.5	62
H29 A+B	2.11.86	02.48	o	23°19''	59°05'	229	7.2	Calm		72	30
	2.11.86	03.35	i	23°15'	59°02'		7.2	Calm		51.5	51.5
H30 A+B	2.11.86	03.46	o	23°15"	59°02'	136	6.9	Light Airs		64	38
	2.11.86	09.15	i	22°39'	59°35'	150	4.4	Calm		62.5	39.5
H31 A+B	2.11.86	23.25	o	22°37'	59°40'	058	11.2	07	310		
	3.11.86	01.29	i	22°48'	60°05'	090	11.3	08	020		
H32 A+B	3.11.86	01.40	o	22°48'	60°08'	090	11.3	08	020		
	3.11.86	07.25	i	22°45'	61°20	009	0.6	08	360		
H33 A+B	4.11.86	01.35	o	22°45'	61°23'	085	11.6				
	4.11.86	11.5	i	21°11'	63°09'	240	3.3				

DUST SAMPLING. (HIGH VOLUME)

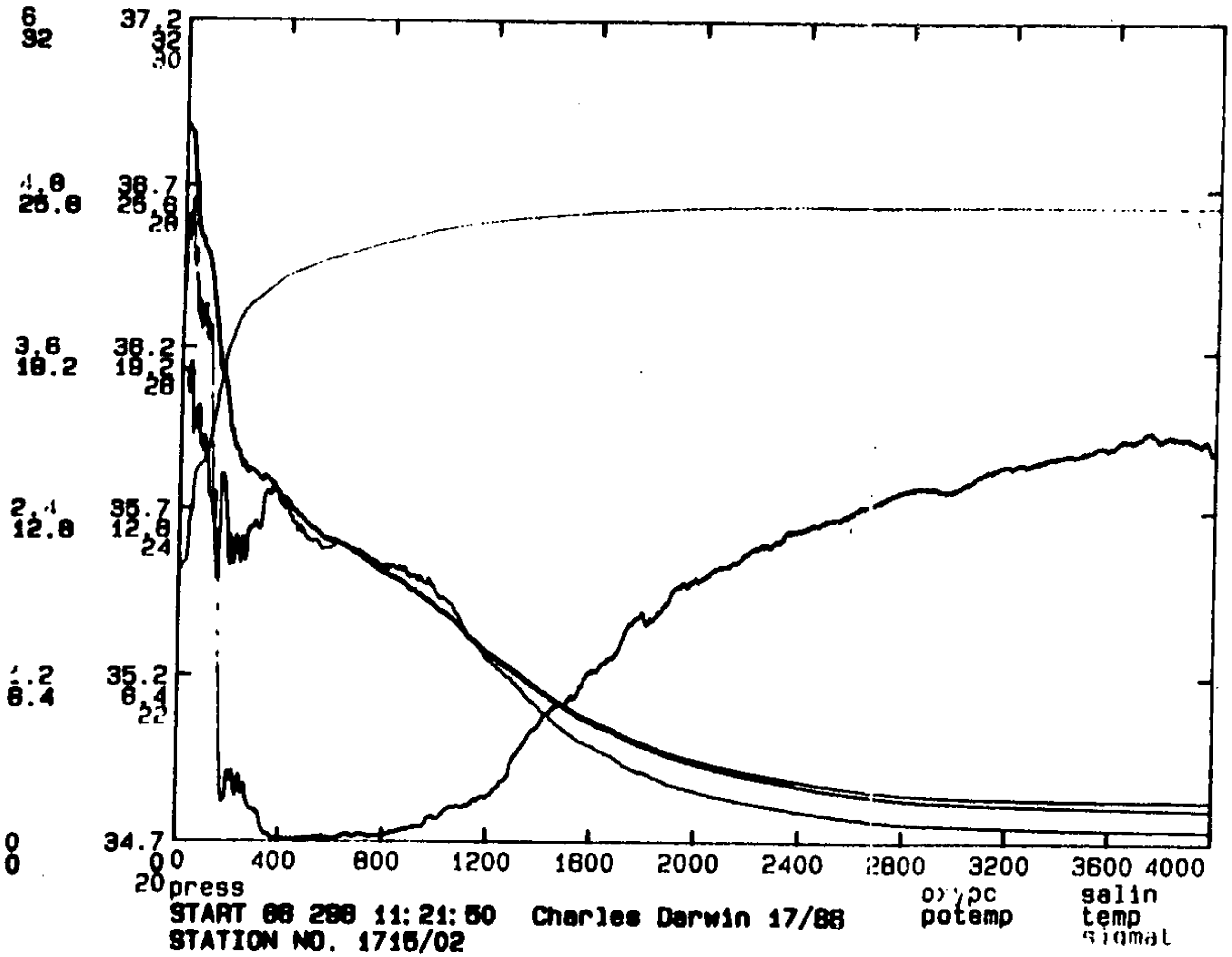
Sample	No Date	out / in	Time GMT	out / in	Lat N.	Long. E.	Heading	Speed,	Wind (real) Vel kts	Direction	Manometer Reading cm
A34 A+B	5.11.86		00.30	o	22°19'	63°14	287	11.2		64	38
	5.11.86		07.20	i	22°49'	61°51	296	11.0		62.5	39
A35 A+B	5.11.86		07.30		22°50'	61°49'	295	10.9		63.5	38
	5.11.86		13.20		23.20'	60°40'	287	11.0		63.5	38
A36 A+B	5.11.86		13.30		23°21'	60°39'	287	11.2		62.5	37
	5.11.86		17.40		23°40'	59°49'	287	11.0		62.5	39.5

DUST SAMPLING. (CASCADE IMPACTORS)

Sample	No Date	out / in	Time GMT	out / off	Lat N.	Long. E.	Heading	Speed,	Wind (real) Vel kts	Wind (real) Direction	Manometer Reading cm	
CI 3	16.11.86	out	09.56	out	20°39'	59°33'	200	11.1	11	250	27	65
			16.05	off					05	230		
			18.15	on	19°21'	58°30'	222	11.0				
			20.30	off	19°08'	58°25'	229	0.3	13	220		
	17.10.86		16.16	on	19°15'	58°38'	220	0	12	220	27	65
	18.10.86		01.42	off	18°10'	57°24'	230	0.3	10	230	58	46
			02.29	on					10	230	23	68
			09.28	off	17°43'	57°22'	231	0.0	11	250	23	68
			12.08	on	17°37'	57°22'	179	9.5	12	230	24	67
			14.58	off	17°33'	57°22'	240	0.1	16	235	23	37
			15.50	on	17°32'	57°23'			18	240		
	19.10.86		04.59	in	17°30'	57°27'	160	0.0	10	140	27	65
CI 4	20.10.86		09.37	out	16°43'	57°24'	163	0.0	06	070	46	46
			11.04	on	16°41'	57°25'	179	11.5	08	080	55.5	36
	21.10.86		00.36	off	15°02'	57°25'	061	0.3	12	060	38	54
			20.31	on	15°11'	57°21'	189	11.7	10	040	38	54
			20.31	on	15°11'	57°21'	189	11.7	10	040	38	54
	22.10.86		04.00	off	13°51'	57°22'	063	0.1	12	060	534	38
			06.39	on	13°51'	57°22'	051	5.9	10	060	52	39
	23.10.86		05.50	off	16°37'	60°40'	081	0.0	05	050	39	25
	24.10.86		20.36	on	16°48'	60°34'	319	11.6	08	N	38	54
	25.10.86		12.35	off	19°04'	58°21'	276	1.0	Calm		45	58
CI 5	26.10.86		18.30	on					03	090	44	57
	27.10.86		01.15	off	21°05'	59°35'	052	0.1	05	080	45	58
			21.55	on	21°46'	59°55'	166	11.6	Calm		43.5	60
	28.10.86		04.15	off	20°44'	60°11'	221	0.0	08	070	44	59
			07.43	on	20°43	60°10'	153	10-11	Calm		44	59
			18.30	off	19°59'	60°37'	051	11.6	05	330	44	59
			15.37	on	19°57'	60°37'	167	11.2	Calm		43	60

DUST SAMPLING. (CASCADE IMPACTORS)

Sample	No Date	Time GMT	out in	Lat N.	Long. E.	Heading	Speed,	Wind (real) Vel kts	Direction	Manometer Reading cm	
CI 5 contd	28.10.86	17.50	off	19°33'	60°44'	152	4.1	Calm		44	59
	29.10.86	21.00	on	19°35'	60°49'	068	11.1	03	120	44	59.5
		02.20	off	19°54'	61°43'	241	0.0	Calm		44	59
		22.47	on	19°57'	61°36'	002	10.5	Calm			
	30.10.86	06.04	off	21°24'	61°35'	019	2.1	06	050	44	58.5
		10.35	on	21°41'	61°52'	273	11.5	05	290	44	59
		15.48	in	21°44'	60°47'	356	0.0	05	VAR	48	58
CI 6	31.10.86	04.35	out	21°41'	60°33'	271	11.3	Calm		44	59
		15.13	in	22°33'	59°57'	039	11.4	05	N	45	67
	1.11.86	12.5	out	22°34'	60°18'	304	11.0	07	010	44.5	58
	2.11.86	02.38	off	23°21'	59°07'			Light Airs		57	45
		03.45	on	23°15'	59°02'	136	6.9	Light Airs		58	45
		09.15	off	22°39'	59°35'	150	4.4	Calm		57	46
		23.25	out	22°38'	59°40'	058	11.2	07	310		
	3.11.86	01.30	in	22°48'	60°08'	090	11.3	08	020		
		01.40	out	22°48'	60°08'	090	11.3	08	020		
		07.28	in	22°45'	61°20'	006	0.6	09	360		
	4.11.86	01.35	out	22°45'	61°23'	084	11.6				
		11.55	in	22°11'	63°09'	140	3.3				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STATION NO. 1715/02
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0
400
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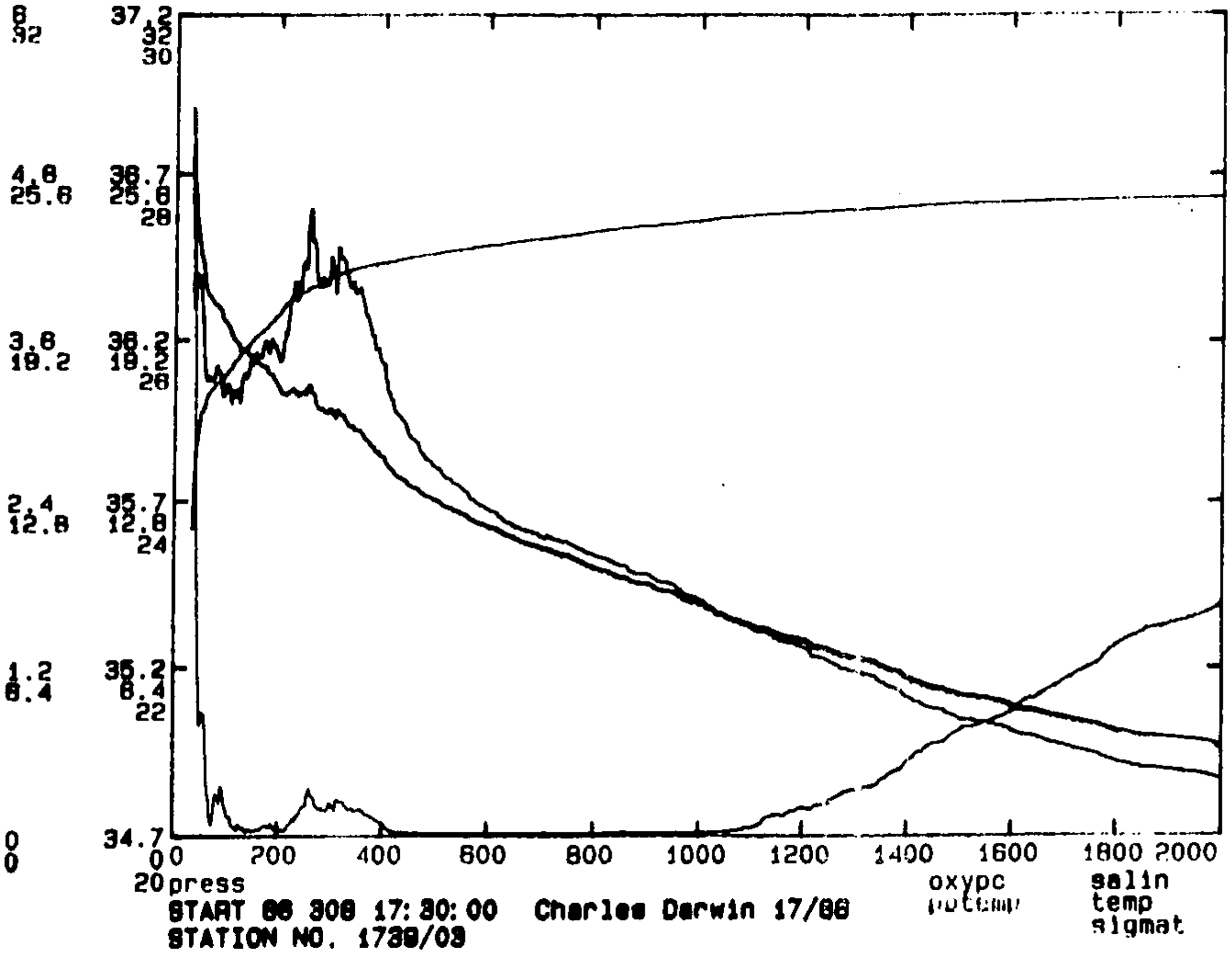

6
32
37.2
32
30
4.8
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25.6
28
3.6
19.2
36.2
19.2
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1.2
6.4
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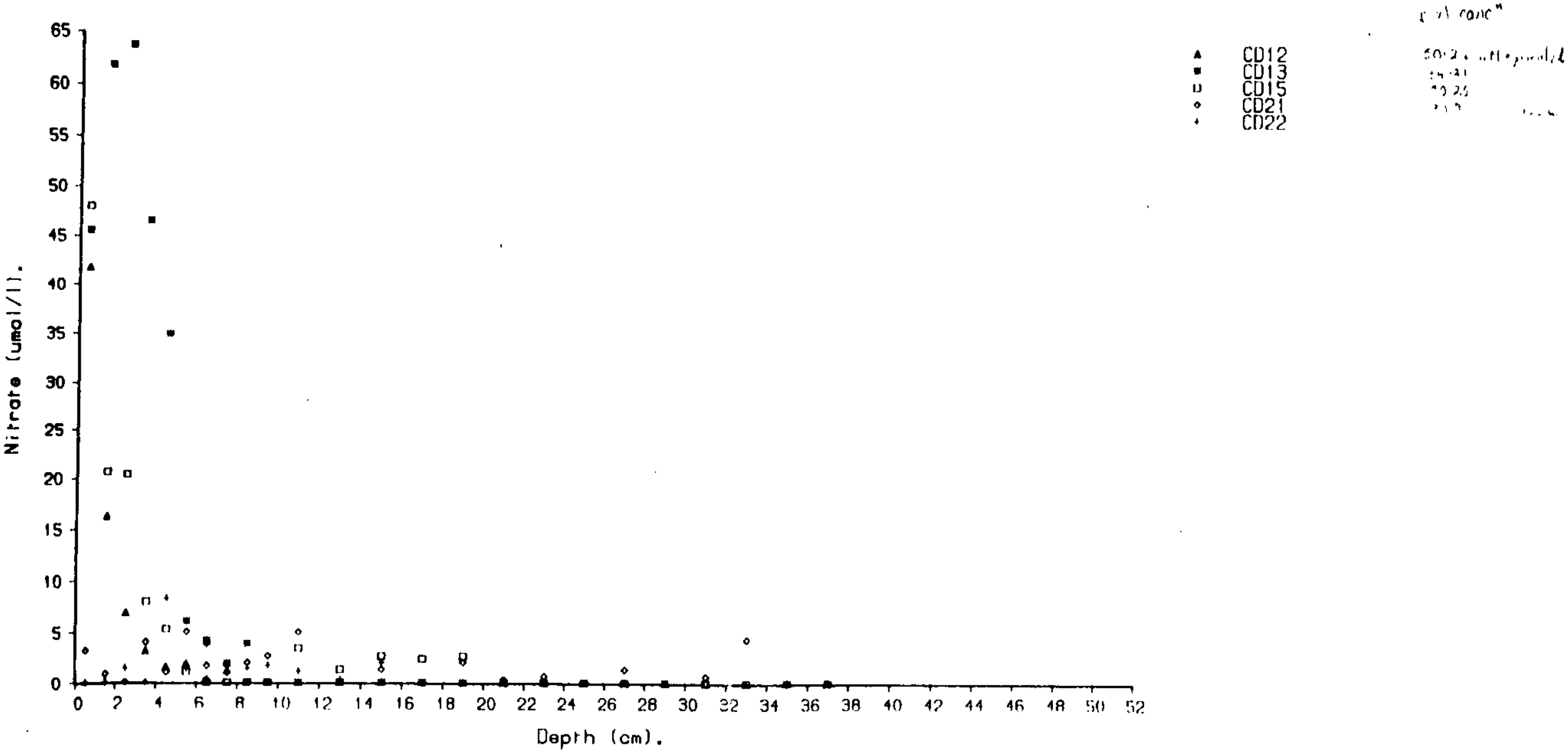

Depth profile of Nitrate (dissolved phase) for CD cores.

EGE042 (2976) JCMB 3210
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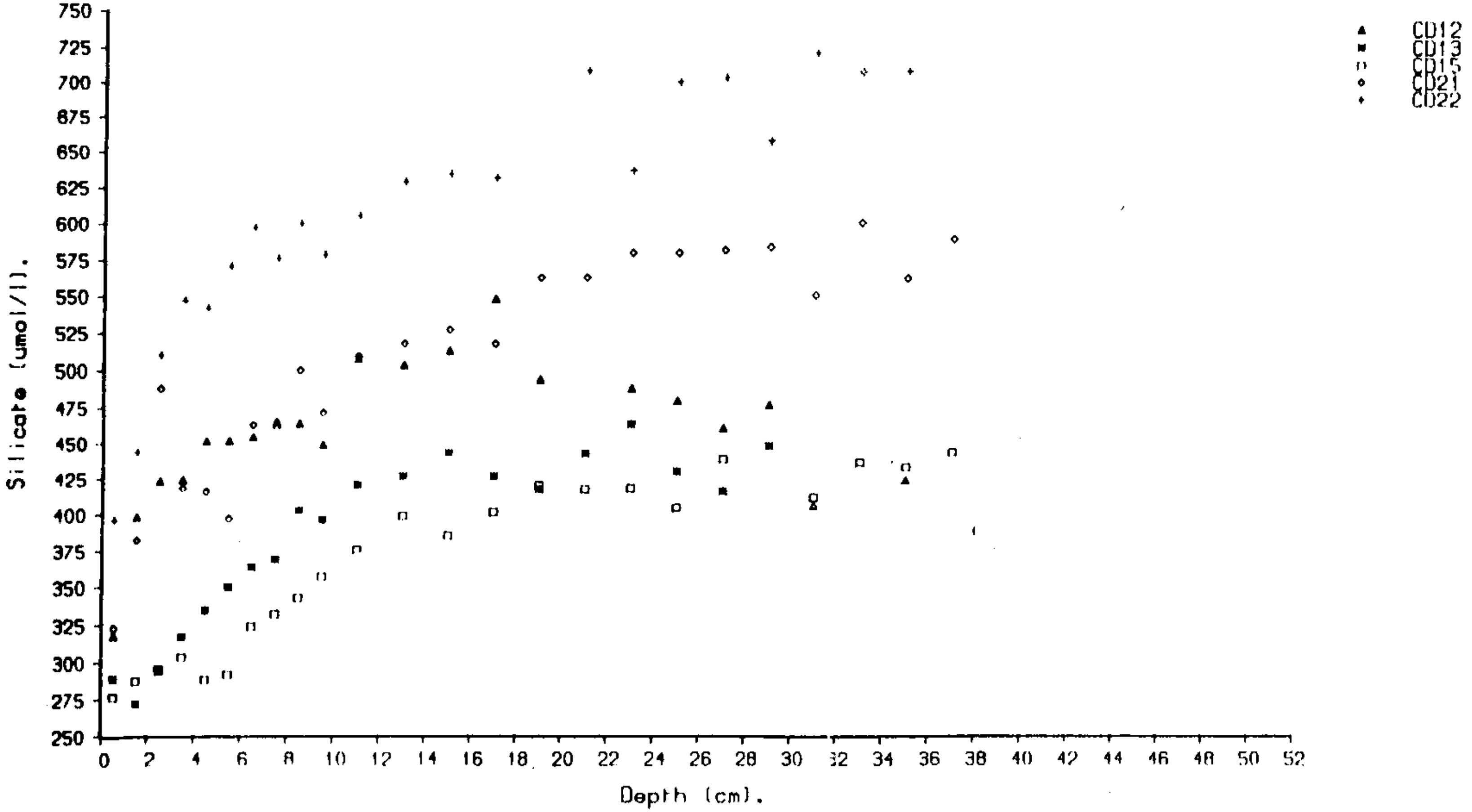

Depth profile of Silicate (dissolved phase) for CD cores.

EGE042 (2976) JCMB 3210
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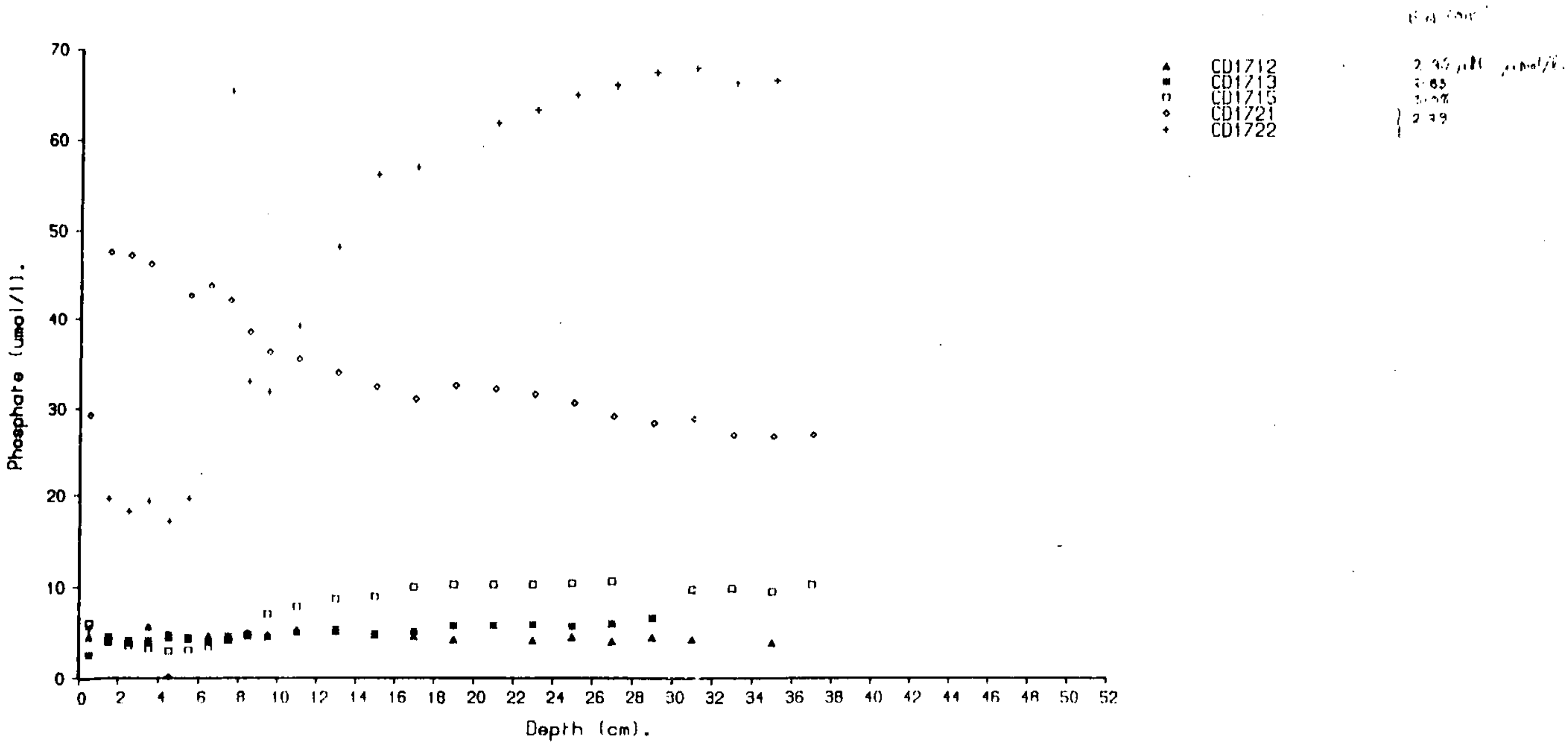
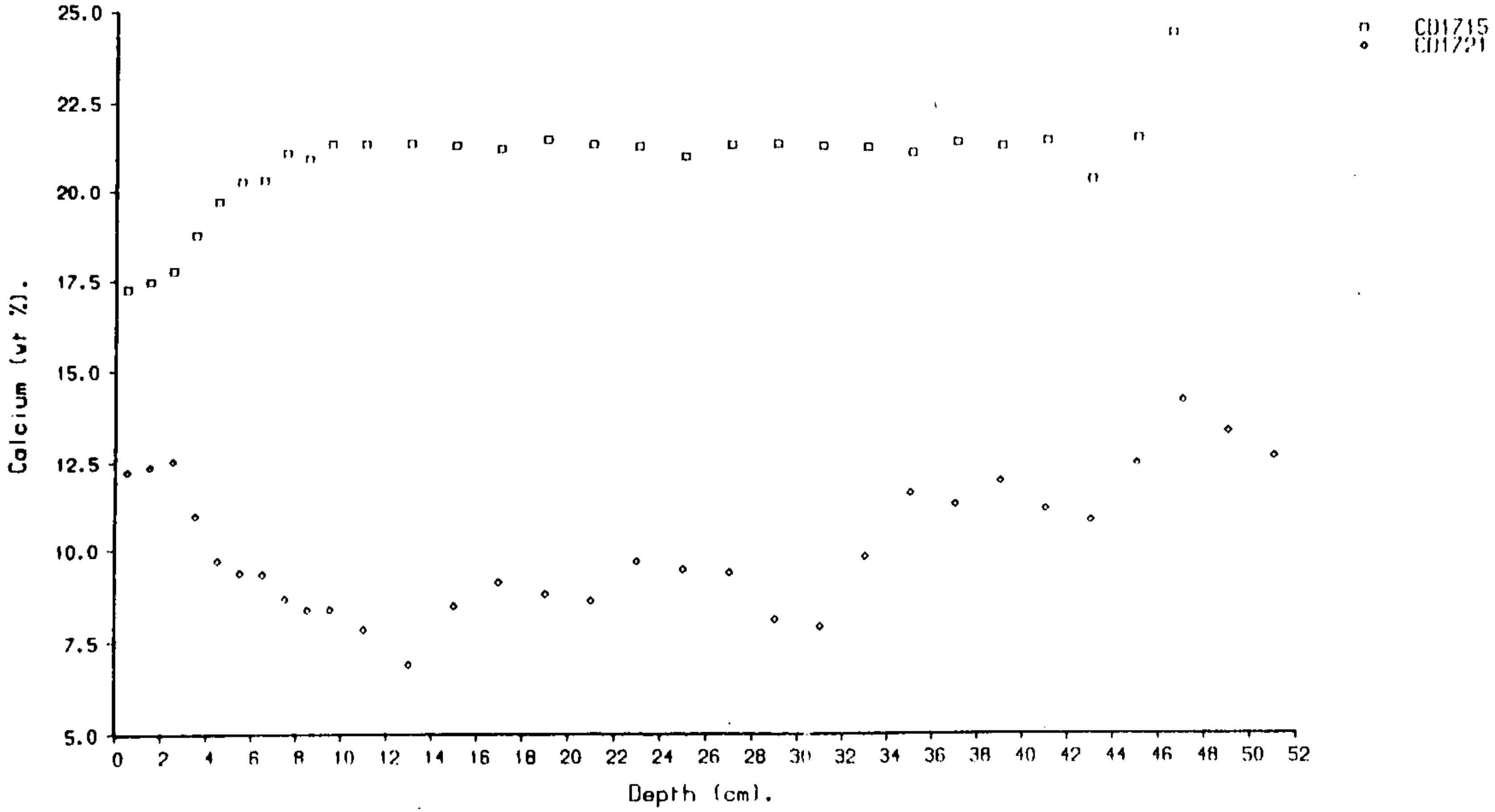


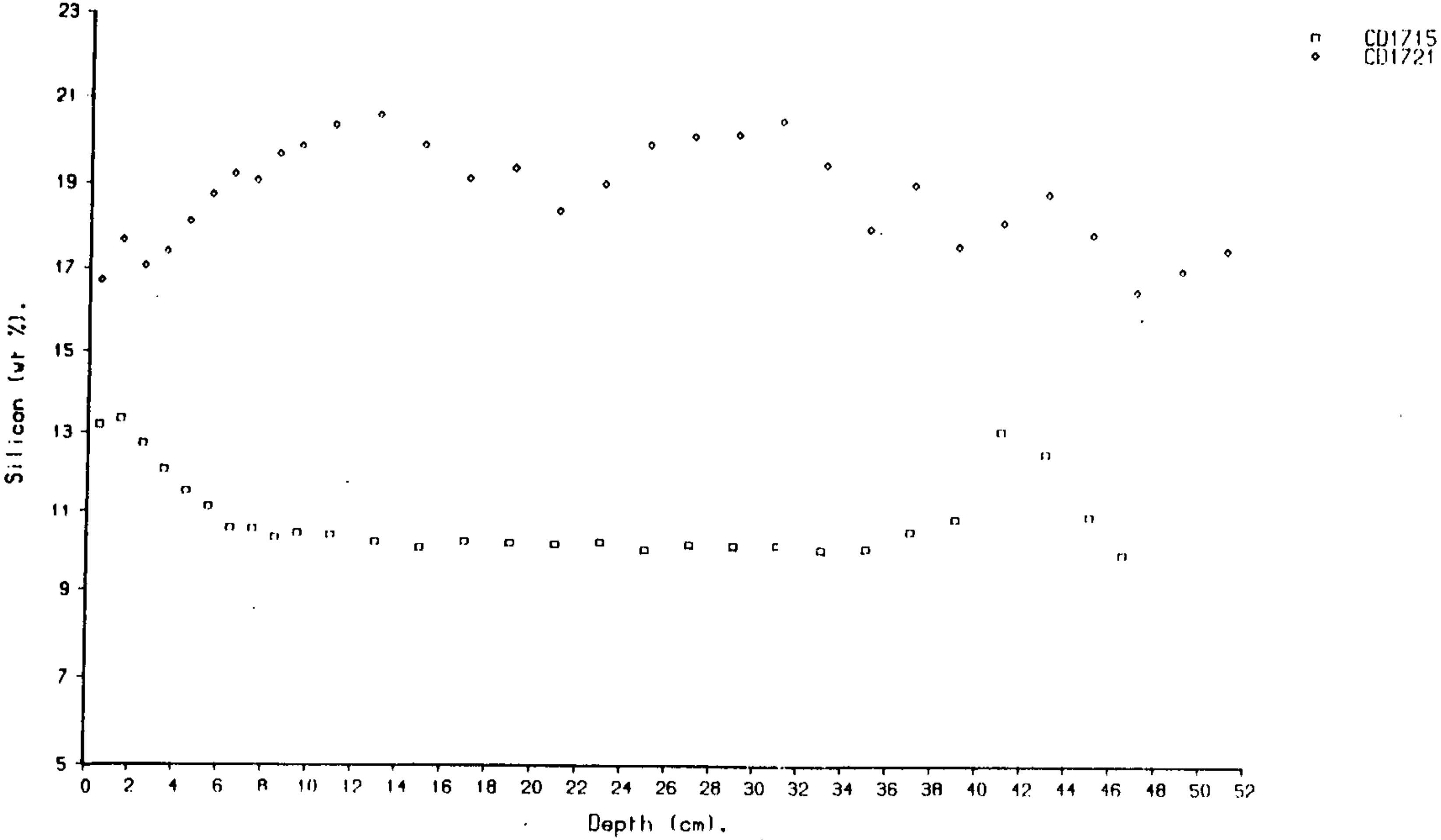
Depth profile of Phosphate (dissolved phase) for CD cores.

EGE042 (2976) JCMB 3210
File P04PLOT#1 created 08/05/87 16.54.04



Depth profile of Calcium (solid phase) in CD1715 and CD1721.

EGE042 (2976) JCMB 3210
File CAPLOT#1 created 08/05/87 15.51.04



Depth profile of Silicon (solid phase) in CD1715 and CD1721.

EGE042 (2976) JCMB 3210
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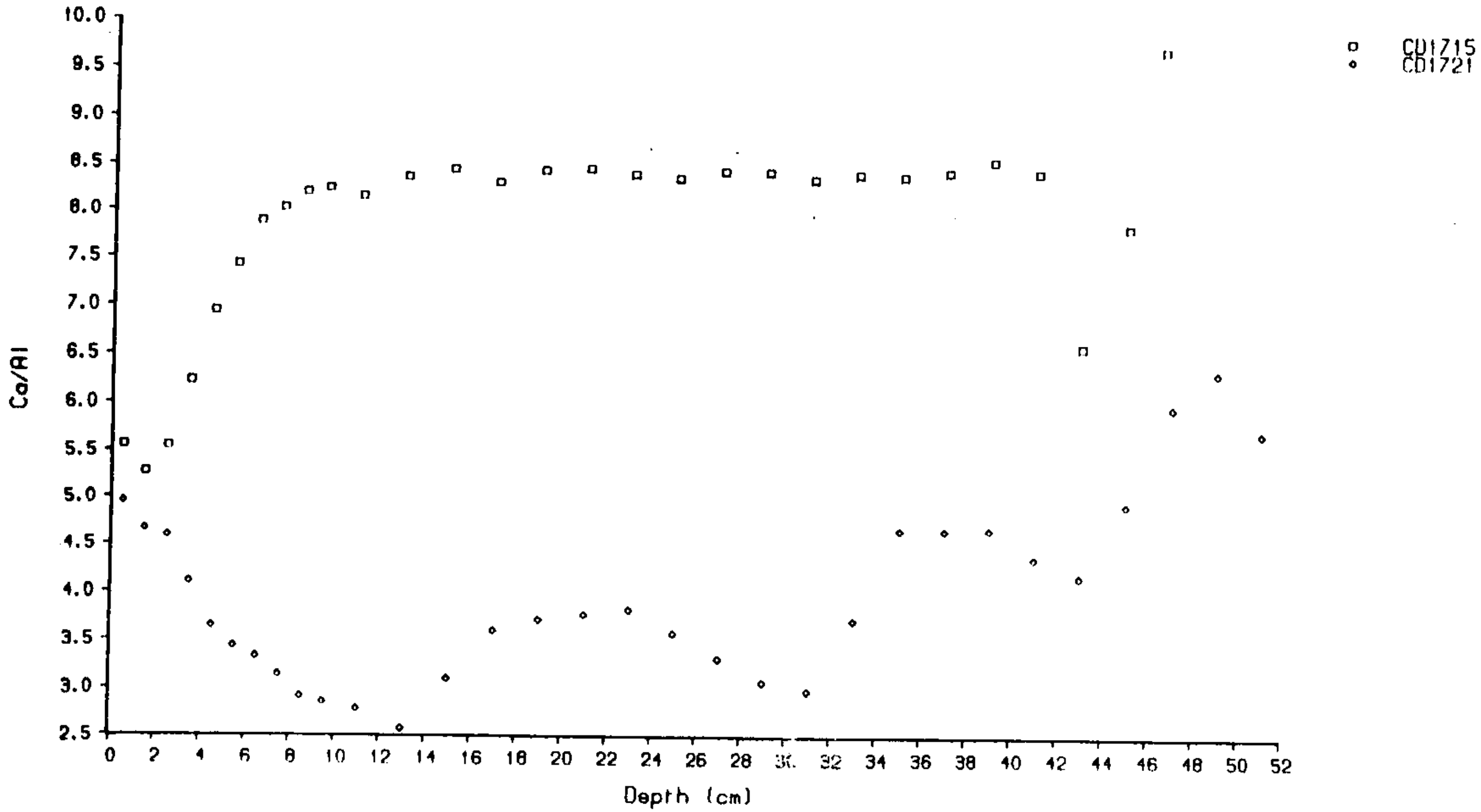

Ca/Al against depth for cores CD1715 and CD1721

EGE042 (2976) JCMB 3210
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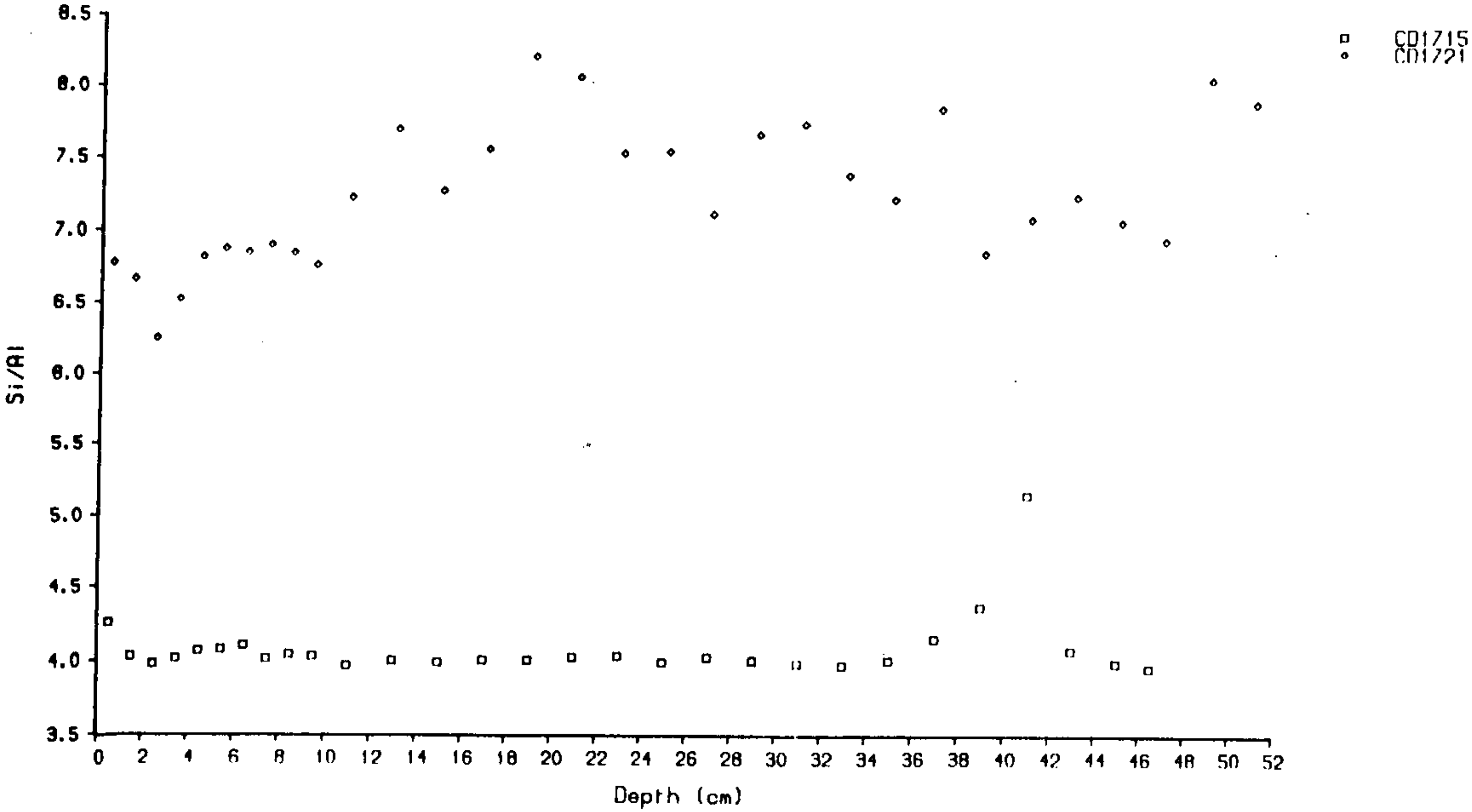

Si/Al against depth for cores CD1715 and CD1721.

EGE042 (2976) JCMB 3210
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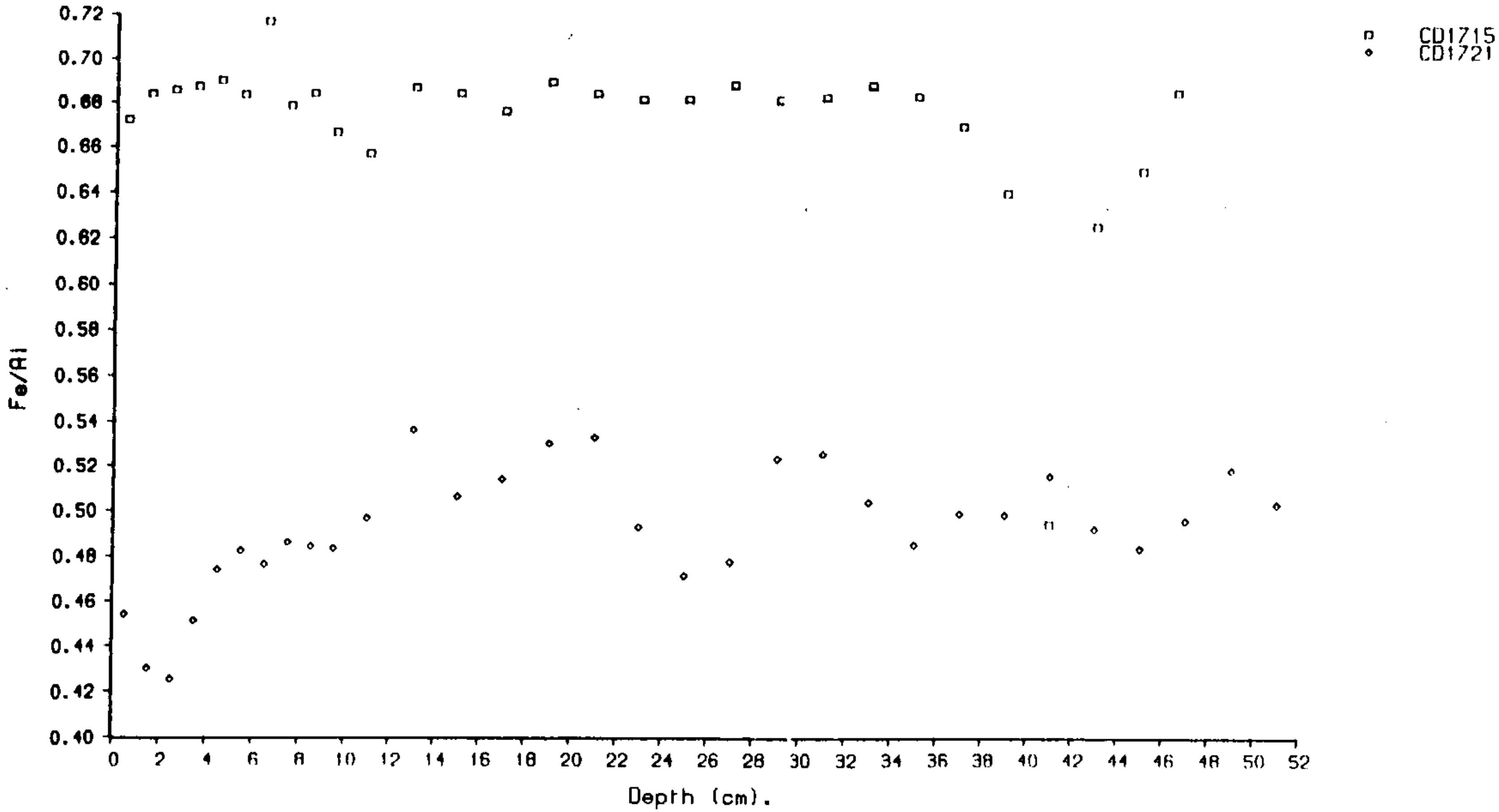

Fe/Al against depth for cores CD1715 and CD1721.

EGE042 (2976) JCMB 3210
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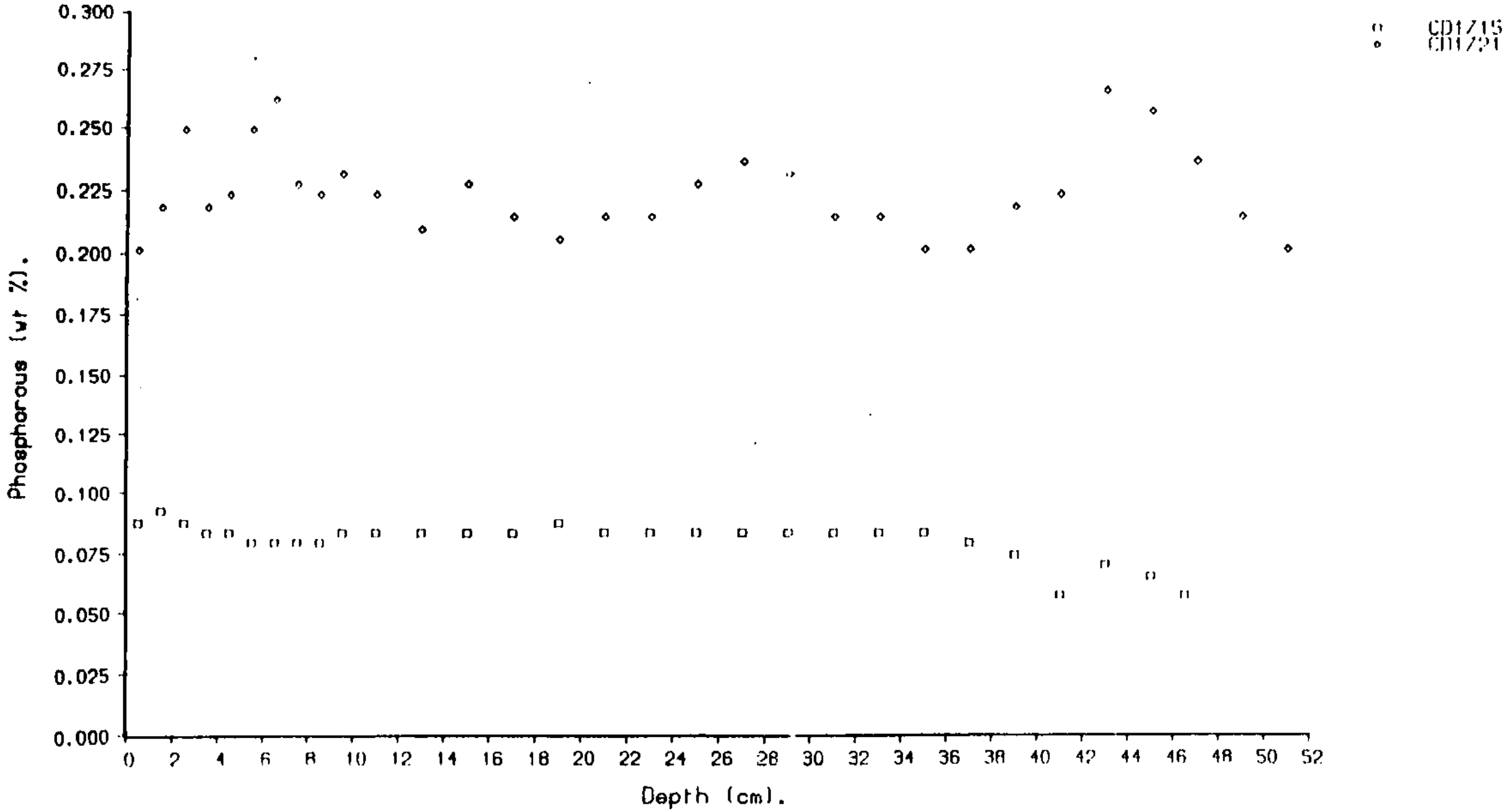
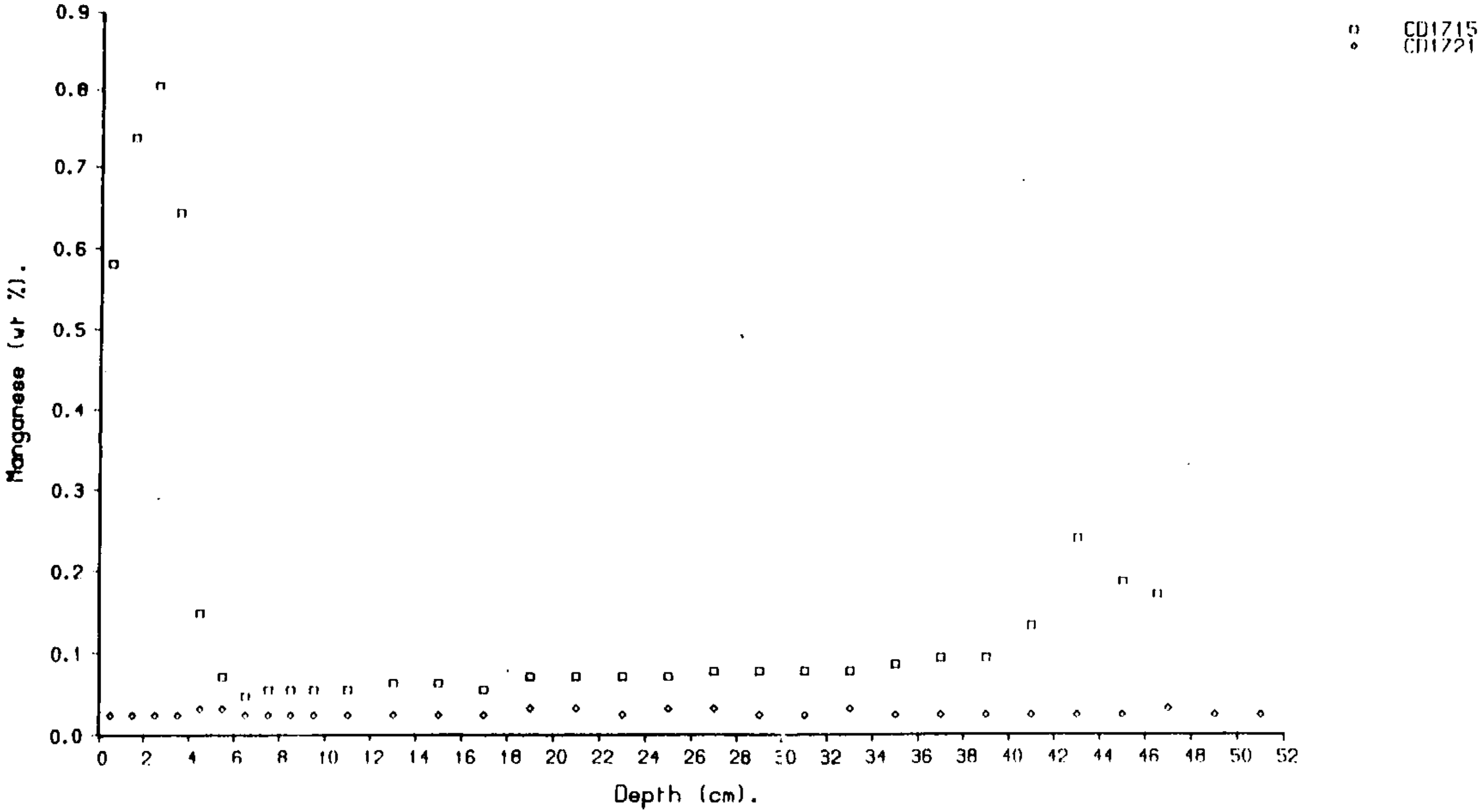
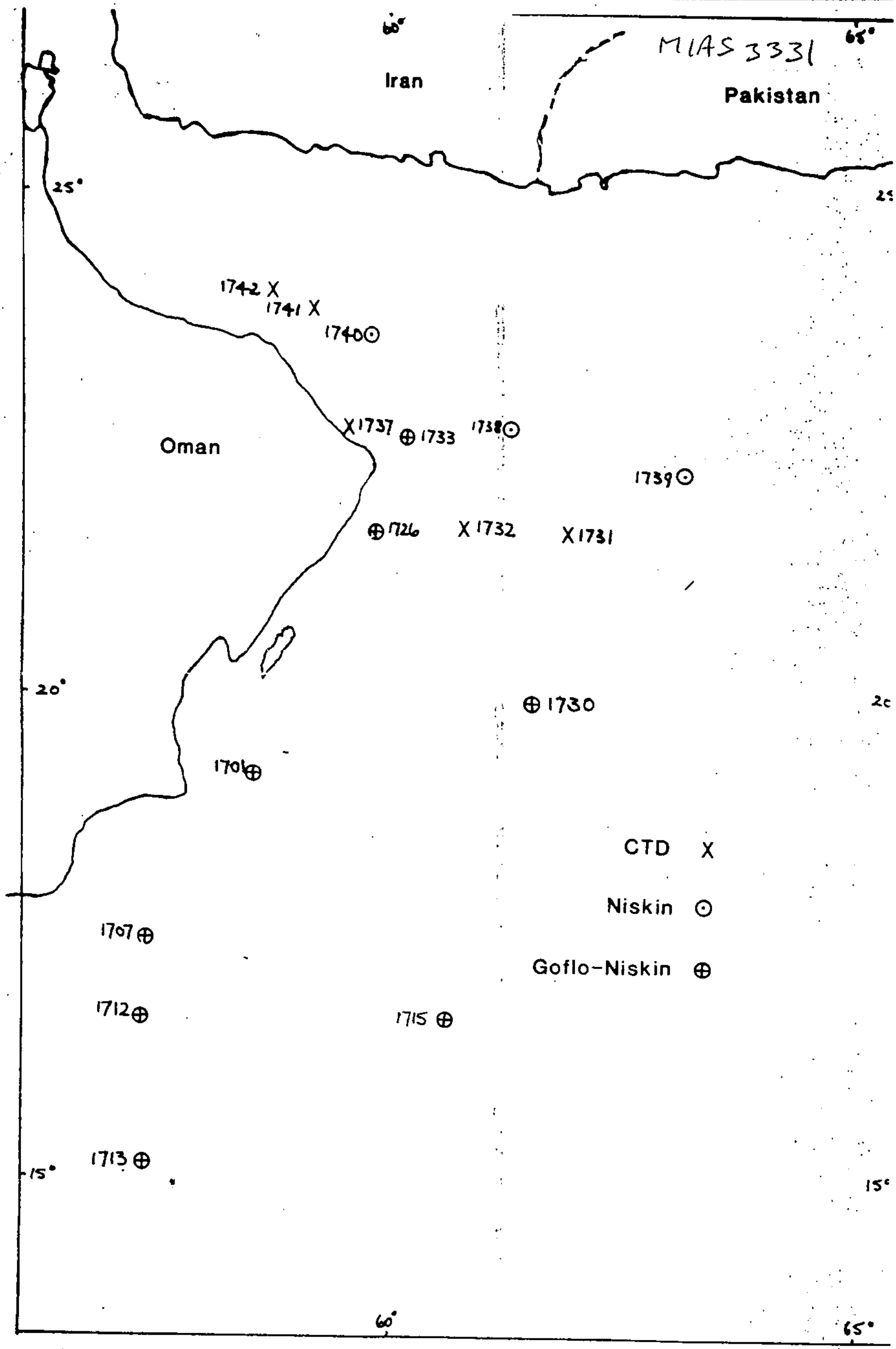


Depth profile of Phosphorous (solid phase) in CD1715 and CD1721.



Depth profile of Manganese (solid phase) in CD1715 and CD1721.

EGE042 (2976) GEOLOGYK.B.
File MNPLOT#1 created 08/05/87 15.10.39



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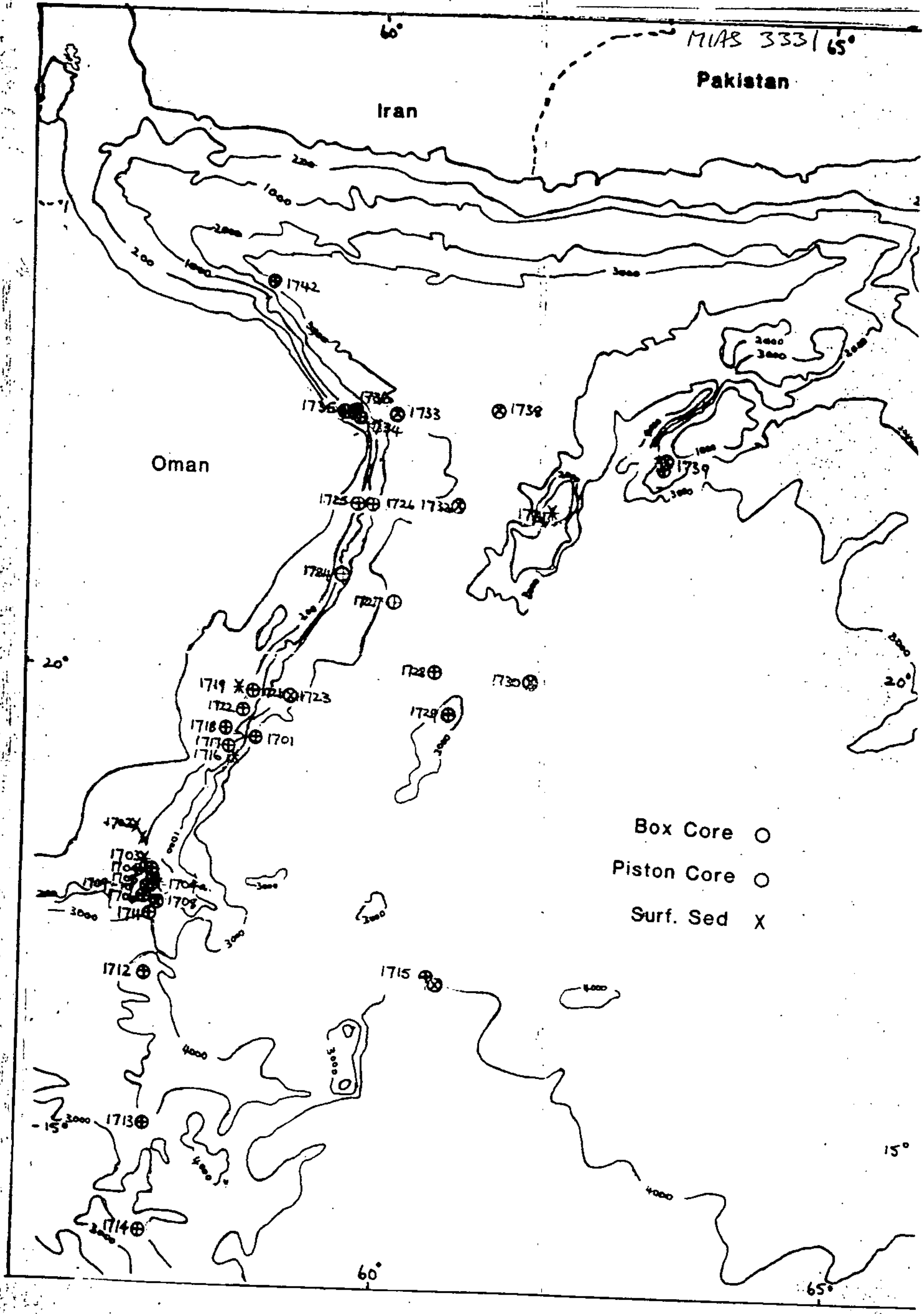

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