WHOI-84-40

**Radiocesium and Other Nuclides in the
Norwegian-Greenland Seas
1981 - 1982**

by

Susan A. Casso
and
Hugh D. Livingston

Woods Hole Oceanographic Institution
Woods Hole, Massachusetts 02543

September 1984

Technical Report

*Funding was provided by the U.S. National Science Foundation
under Grants OCE-8300491 and OCE-8402849.*

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Robert B. Gagosian, Chairman
Department of Chemistry

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ABSTRACT

This report contains data obtained from measurements of various artificial radiotracers in seawater samples from the Norwegian-Greenland Seas and adjacent seas during 1981-82. The radionuclides measured include ^{137}Cs , ^{134}Cs , ^{90}Sr and ^3H . The sampling and analytical work result from the efforts of several laboratories viz. Deutsches Hydrographisches Institut, Germany; Ministry of Agriculture, Fisheries and Food (Fisheries Laboratory), U.K.; Riso National Laboratory, Denmark; University of Miami Tritium Laboratory, U.S.A.; and Woods Hole Oceanographic Institution, U.S.A.

The data set includes a large number of measurements in surface water in the region and a substantial number of vertical profiles in the various water masses. The radiotracers in the region originate from nuclear fallout from atmospheric nuclear weapons tests and from low level releases of liquid waste to European coastal waters in association with the reprocessing of nuclear fuel. The data represent a comprehensive series of measurements suitable for gaining new insight in respect to the rates and routes of the regional circulation and to the dispersal pattern of pollutants introduced to European shelf waters.

INTRODUCTION

The Norwegian-Greenland Seas are well recognized as a northern source region for the formation and supply of deep water to the global ocean circulation. Atmospherically injected tracers delivered to surface waters of the region have been shown to be advected southward into the deep North Atlantic at rates with short timescales. During the 1950's and 1960's, artificial radiotracers from atmospheric nuclear weapons testing were delivered to the oceans and have been important general tools for the study of oceanic circulation and biogeochemical processes. Radionuclides such as ^3H , ^{14}C , ^{90}Sr , and ^{137}Cs have been used to trace water circulation and transport in the Norwegian-Greenland Seas. Towards the end of the last decade, it was realized that there was a new artificial radiotracer input to the region. This resulted from releases to European coastal waters of radioactive wastes produced from the reprocessing of spent nuclear fuel. The major fraction of this input has been to the eastern Irish Sea from the British Nuclear Fuels Ltd. reprocessing plant (Windscale Works--now renamed Sellafield). A substantially smaller input to the English Channel has come from the French reprocessing plant at Cap de la Hague. A review of these inputs has been published dealing with the variation over time in amount and composition, discharge and regional monitoring practices and potential use as oceanic tracers (Livingston et al., 1982). Cs radionuclides, ^{137}Cs and ^{134}Cs , can serve as water tracers at least as far downstream from their input as the Arctic Ocean and sub-Arctic seas, on account of their soluble properties and high discharge levels.

Recognizing the tracer potential of this release, a number of different laboratories in several countries have organized research cruises and made measurements which have generated information on the dispersion of radiocesium in the Norwegian-Greenland Seas and adjacent shelf regions. In 1981 and 1982, there was an unusually extensive series of sampling programs which, taken together, have produced a remarkably comprehensive data set describing the tracer distribution pattern during this period. Because of the potential usefulness of this data set as a tool for the study of regional circulation processes, it was decided that it would be extremely

helpful to collect the results from the various laboratories in a single data report. We agreed to take on the task of producing the report and have collected and compiled data from the various laboratories involved.

The report includes all data available within a reasonably short period following sample collection. For most laboratories some additional data may be forthcoming for samples not yet analyzed or for radionuclides not reported in the tables. The data set for ^{90}Sr , for example, is more limited--partly because of the greater analytical effort required and partly because of the stronger signal that ^{137}Cs provides as a tracer of the nuclear fuel reprocessing waste. Additional data are likely to represent a minor fraction of the data set and are likely to contribute to defining the tracer patterns in more detail--without altering the broad patterns already established.

SAMPLE COLLECTION AND RADIOCHEMICAL ANALYSIS

The data in this report come from samples collected between June 1981 and August 1982 on nine cruises on ships from six countries. In July and August 1981, the R/V CIROLANA of the Fisheries Laboratory in Lowestoft of the U.K. Ministry of Agriculture, Fisheries and Food collected a very detailed set of samples in the Norwegian Coastal Current, Barents Sea, eastern Greenland and Norwegian Seas. Surface water was sampled in greatest detail, but subsurface water was collected at about one half of the stations. At all but two stations, the subsurface samples came from three depths down to 500 m or bottom--whichever was shallower. Six samples were collected at depths down to 2500 m at two stations. Analyses of the CIROLANA samples were made in D. F. Jefferies' laboratory at Lowestoft. In the same time period, R/V KNORR of the Woods Hole Oceanographic Institution (W.H.O.I.), Woods Hole, MA, U.S.A., collected a series of samples in the Norwegian-Greenland Seas as part (Leg 5) of the Transient Tracers in the Ocean program, North Atlantic Study. Measurements of a variety of tracers were made as part of this program; these results and the detailed hydrography will appear elsewhere. For the Cs and Sr isotope work included in this report, detailed vertical profile samples were collected at twelve stations in the major basins of the Norwegian-Greenland Seas and south of the Greenland-Scotland sills. ³H data included are a small subset of the measurements made from this cruise by H. G. Ostlund at the Tritium Laboratory in Miami, FL (Ostlund, 1983, 1984a). Surface samples at these and other locations along the cruise track completed the sampling on this cruise. Again in August 1981, a few surface samples for Cs isotope analyses were collected in shelf waters around Spitsbergen on the Norwegian vessel LANCE. The data set for this time period was completed by the measurement of Cs isotopes by Aarkrog et al. (1982) of the Riso National Laboratory, Roskilde, Denmark, on surface waters sampled in June 1981 along a transect between Bergen, Norway, and Iceland on M/S SMYRIL.

Two cruises in late winter/early spring 1982 added samples to the suite for which data appear in this report. During March 1982, the Canadian ship R/V HUDSON occupied a large number of stations in the Norwegian-

Greenland Seas. A report on this cruise has recently been prepared (Anonymous, 1984); a substantial number of vertical tritium profiles have been measured by H. G. Ostlund's laboratory in Miami, FL, U.S.A. (Ostlund, 1984b). Sampling for Cs and Sr isotope analysis in the laboratory in Woods Hole was limited to a substantial series of surface samples along the cruise track and three vertical profiles along the slope in the northeastern area of the Norwegian Sea--to the west of the Barents Sea. Then in May 1982, the German ship R/V METEOR collected samples for Cs and Sr isotope analysis from a series of depths at eight stations in the Norwegian-Greenland Seas. One achievement of this sampling effort was the occupation of stations farther to the west in the Greenland Sea basin. This resulted in the sampling of southward-flowing Arctic Ocean deep water. An additional small number of surface waters were also sampled on this cruise for Cs and Sr isotope analysis. The radiochemical analyses of the majority of the samples collected on this cruise were conducted in Dr. H. Kautsky's laboratory at the Deutsches Hydrographisches Institut in Hamburg, F.D.R. A small number of surface samples were analyzed for Cs isotopes at Woods Hole. Finally in 1982, three cruises were organized by Dr. A. Aarkrog's laboratory (Riso National Laboratory, Roskilde, Denmark) to the western Greenland Sea. The ships involved were H.M.S. FYLLA (in February), R/V DANA (July/August), and M/S NELLA DAN (in August). The results of the radiochemical analyses made in Denmark on this suite of samples have been reported by Aarkrog et al. (1983a,b).

The radiochemical methods employed by the various laboratories vary somewhat but are not discussed here. A representative reference is included for each laboratory which discusses, or refers to, details of the techniques followed. All of the laboratories involved have participated in intercomparison exercises on both bilateral bases and on samples organized for radiochemistry intercomparison purposes by the Monaco Laboratory of the International Atomic Energy Agency. It is a tribute to the analytical skills of the five laboratories whose data appear in this report that data for samples closely spaced in both time and location show remarkably good agreement.

REFERENCES TO ANALYTICAL PROCEDURES USED BY EACH LABORATORY

Riso National Laboratory

- A. Aarkrog, H. Dahlgaard, L. Hallstadius, E. Holm, H. Hansen and J. Lippert, 1983. Environmental Radioactivity in Greenland in 1982, Riso National Laboratory Report R-489 (Appendix D).

Deutsches Hydrographisches Institut

- H. Kautsky, 1980. Distribution of radioactive fallout products in the water of the North Atlantic and the Barents Sea during the year 1972. Isotope Marine Chemistry, Chapter 2, pp. 9-23, Uchida Rokakuho Pub. Co. Ltd., Tokyo, Japan.

Fisheries Laboratory, Lowestoft

- D. F. Jefferies, A. K. Steele, A. Preston, 1982. Further studies on the distribution of ^{137}Cs in British coastal waters--I. Irish Sea. Deep Sea Res. 29, 713-738.

Woods Hole Oceanographic Institution

- K. M. Wong, V. E. Noshkin and V. T. Bowen, 1970. Radiochemical procedures used at WHOI for the analysis of Sr, Sb, rare-earths, Cs and Pu in sea-water samples. In: Reference Methods for Marine Radioactivity Studies (Y./Nishiwaki and R. Fukai, Eds.), Tech. Rept. Studies, IAEA, Vienna, No. 118, pp. 119-127. Also, see Mann and Casso, 1984, in references.

University of Miami, Tritium Laboratory

- H. G. Ostlund and R. Brescher, 1982. Geosecs Tritium. Tritium Laboratory Data Report No. 12, University of Miami, Rosenstiel School of Marine and Atmospheric Sciences.

RESULTS

The radionuclide data appear in five sections. The first four sections contain collections of data tables organized by cruise. Data are tabulated for either surface samples by cruise or for vertical profile samples by cruise and station. Salinities and potential temperatures are included when known. Densities are conventionally expressed as sigma theta, calculated using the specific gravity relationship of Cox et al. (1970) according to the International Equation of State (Millero et al. (1980)). All depths are in meters. A "C" following a depth or a cruise station listing in a surface table indicates a Cs absorber cartridge sample analyzed at W.H.O.I. (Mann and Casso, 1984). All Cs and Sr data are expressed as dpm/100 kg as of collection date with one sigma counting uncertainties (indicated in the columns labelled by the letter e (error)). All ^3H data are reported in TU 81 units. An appendix which displays all the radionuclide data in Bq units is available upon request.

Section 1 contains station and surface data from KNORR 89, leg 5; surface data from LANCE 1981, and station and surface data from HUDSON 1982. Section 2 contains CIROLANA 7/81 station data followed by a table of all the surface data. A "B" after a depth indicates a bottom sample (>250 m, <500 m). Section 3 contains 1981-1982 Riso surface data. Section 4 presents METEOR 61 station and surface data.

Finally, Section 5 is comprised of ten figures. Surface ^{137}Cs concentrations included in this report are plotted in Figure 1 and are contoured in Figure 2. Each symbol in these figures represents a sample collection location. The filled symbols are for 1981 cruises; the open symbols for 1982 cruises. Figures 3-10 contain vertical profile plots of ^{137}Cs (dpm/100 kg) vs. depth (m) by region--Iceland-Scotland, Norwegian Sea, Western Barents Sea slope, Eastern Fram Strait, Western Greenland Sea, Central Greenland Sea, Iceland Sea, and Northern Irminger Sea. The same symbols have been used as in Figures 1 and 2 to indicate year, vessel, and position of sampling.

ACKNOWLEDGEMENTS

We wish to thank our colleagues at the various laboratories who have contributed to this report for making their data available to us and for agreeing to the preparation of this report. A large part of the Woods Hole laboratory's contribution was made possible by our involvement with the Transient Tracers in Oceanography, North Atlantic Study and we thank our colleagues in this program for making our participation possible. Our appreciation goes to the officers and crews of the many ships involved in collection of samples. Our particular thanks are expressed to Drs. J. H. Swift and V. E. Lee, and to Dr. S. L. Pfirman for collecting samples for us on R/V HUDSON and LANCE, respectively.

The Woods Hole laboratory data were made possible through the technical skills of W. R. Clarke and J. M. Palmieri, the data processing of M. H. Smith, and the secretarial assistance of M. R. Hess. All of this expert assistance is acknowledged with thanks.

Support for the work in our laboratory at Woods Hole Oceanographic Institution came from the U. S. National Science Foundation under grants OCE-8300491 and OCE-8402849. This support is gratefully acknowledged.

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- Ostlund, H. G., 1984a. University of Miami, Tritium Laboratory Data Release 84-34.
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SECTION 1

W. R. Clarke, J. M. Palmieri, S. A. Casso and H. D. Livingston

Woods Hole Oceanographic Institution

Woods Hole, Massachusetts 02543

U. S. A.

and

H. G. Ostlund

Tritium Laboratory

University of Miami

Miami, Florida 33149

U. S. A.

	<u>Pages</u>
KNORR 89 (Leg 5): Station data	10-19
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LANCE 1981 : Surface sample data	23
HUDSON 1982 : Station data	24-25
HUDSON 1982 : Surface sample data	26-28

CRUISE-STATION	POSITION			COLLECTION DATE	BOTTOM DEPTH
KN89-141	58	34.2	N	07/23/81	1756 M
	11	31.6	W		

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
				e	e	e	e	e
4	35.306			22.0 0.2			5.22 0.10	4.2 0.1
349	35.347	9.360	27.332	17.5 0.2			4.39 0.14	4.0 0.1
655	35.281	8.600	27.403	23.1 0.2	14.0 0.4	1.65 0.05	4.35 0.15	5.3 0.2
1500	34.990	4.277	27.749		9.2 0.4		2.00 0.10	
1647	34.980	3.887	27.782	13.3 0.1	7.6 0.4	1.75 0.09	2.01 0.11	6.6 0.4

CRUISE-STATION	POSITION			COLLECTION DATE	BOTTOM DEPTH
KN89-142	61	20.7	N	07/24/81	802 M
	7	59.9	W		

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
				e	e	e	e	e
4	35.235	10.494	27.051	17.7 0.2			4.11 0.17	4.3 0.2
646	34.913	-0.080	28.040	12.5 0.2			2.10 0.10	6.0 0.3
797	34.910	-0.540	28.061	10.9 0.2	6.6 0.5	1.65 0.13	1.66 0.10	6.6 0.4

CRUISE--STA#	POSITION			COLLECTION DATE	BOTTOM DEPTH
KN89-144	67	41.2	N	07/26/81	3778 M
	3	20.2	W		

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
5				34.7	0.2		4.84	0.15
67	35.071	4.350	27.805	29.8	0.3		4.47	0.12
153	34.988	3.050	27.871	25.9	0.2	13.7	4.69	0.13
304	34.983	2.550	27.912	33.5	0.2		4.98	0.13
647	34.986	0.780	27.984	25.5	0.2	11.6	3.73	0.12
1090	34.911	-0.490	28.059	10.1	0.2		1.61	0.06
1687	34.912	-0.902	28.078	7.3	0.2	3.9	0.44	0.05
2738 C	34.908	-1.061	28.081	2.4	0.1		0.21	0.06
2749	34.908	-1.047	28.081	2.1	0.1	2.4	0.23	0.05
3235	34.908	-1.060	28.081	2.4	0.2	2.4	0.38	0.05
3736	34.907	-1.058	28.080	3.8	0.1	2.1	0.30	0.04

CRUISE-STATION	POSITION			COLLECTION DATE	BOTTOM DEPTH
KN89-145	69	59.8	N	07/28/81	3222 M
	2	29.0	E		

DEPTH	SALINITY	POT. T	DENSITY	CS-137		SR-90		CS/SR		H-3		CS/H-3	
				e		e		e		e		e	
5 C				53.0	0.9					4.47	0.15	11.9	0.5
64	35.121	5.348	27.730	50.2	0.4					4.60	0.16	10.9	0.4
99	35.097	4.640	27.794	56.1	0.4	20.4	1.0	2.75	0.14	4.34	0.16	12.9	0.5
149	35.071	4.098	27.832	48.6	0.3	15.8	0.2	3.08	0.04	4.73	0.16	10.3	0.4
200	35.063	3.860	27.851	56.7	0.4					4.82	0.16	11.8	0.4
449	35.045	3.440	27.879	54.4	0.3					4.85	0.16	11.2	0.4
650 C	35.036	3.170	27.897	54.1	0.3					4.89	0.15	11.1	0.3
796	35.001	2.740	27.909	44.4	0.3	15.2	0.3	2.92	0.06	5.06	0.17	8.8	0.3
1133 C	34.909	-0.030	28.034	15.4	0.2					2.74	0.11	5.6	0.2
1437	34.912	-0.577	28.064	10.2	0.2	6.3	0.3	1.62	0.08	1.46	0.07	7.0	0.4
1743	34.911	-0.810	28.073	5.2	0.2					0.72	0.06	7.2	0.7
2770 C	34.907	-1.052	28.080	3.1	0.1					0.21	0.05	14.8	3.6
2902	34.907			3.2	0.2					0.39	0.06	8.2	1.4
3075	34.909	-1.048	28.082	2.3	0.1	1.9	1.0	1.21	0.64	0.27	0.07	8.5	2.2

CRUISE-STATION	POSITION			COLLECTION DATE	BOTTOM DEPTH
KN89-148	74	56.1	N	07/30/81	3691 M
	1	8.0	W		

DEPTH	SALINITY	POT. T	DENSITY	CG-137	BR-90	CG/SR	H-3	CG/H-3
				e	e	e	e	e
9	34.413	3.490	27.370	28.8	0.2	15.0	4.0	1.92 0.51 4.32 0.14 6.7 0.2
77	34.865	-0.700	28.031	31.8	0.3	15.4	0.4	2.06 0.06 3.71 0.12 8.6 0.3
248 C	34.869	-1.200	28.055	25.4	0.2	9.8	1.8	2.27 0.07 2.60 0.09 9.8 0.4
447	34.884	-1.135	28.064	16.2	0.2	9.3	0.3	1.74 0.06 2.05 0.11 7.9 0.4
839	34.890	-1.220	28.073	13.7	0.3	9.6	0.4	1.43 0.07 1.78 0.09 7.7 0.4
1138	34.891	-1.213	28.073	9.9	0.2	5.4	1.0	1.83 0.34 1.48 0.09 6.7 0.4
1632	34.894	-1.225	28.076	7.6	0.2	3.7	0.4	2.05 0.23 1.30 0.07 5.9 0.4
1883	34.891	-1.252	28.074	7.2	0.2	4.5	0.8	1.60 0.29 1.30 0.06 5.5 0.3
2186 C	34.891	-1.283	28.076	7.9	0.1			1.34 0.07 5.9 0.3
2488 C	34.888	-1.278	28.073	7.1	0.1			1.32 0.06 5.4 0.3
3128	34.891	-1.287	28.076	7.8	0.1			1.45 0.06 5.4 0.2
3612	34.888	-1.306	28.074	6.3	0.2			1.17 0.06 5.4 0.3

CRUISE-STATION	POSITION			COLLECTION DATE	BOTTOM DEPTH
KN89-149	76	52.6	N	07/31/81	3197 M
	1	2.3	E		

DEPTH	SALINITY	POT. T	DENSITY	CS-137		SR-90		CS/SR		H-3		CS/H-3	
				e		e		e		e		e	
9	33.810	-0.080	27.149	70.8	0.4	22.6	0.8	3.13	0.11	6.49	0.18	10.9	0.3
49	34.872	1.670	27.895	60.3	0.4					5.04	0.16	12.0	0.4
99	34.926	1.390	27.958	45.4	0.3	18.8	0.5	2.41	0.07	4.96	0.17	9.1	0.3
149	34.930	1.130	27.980	40.9	0.4					4.39	0.14	9.3	0.3
248 C	34.887	0.230	28.002	34.0	0.3					3.82	0.15	8.9	0.4
298	34.894	0.100	28.015	30.9	0.3	13.9	0.1	2.22	0.03	3.70	0.13	8.4	0.3
446	34.874	-0.560	28.032	26.3	0.2					3.59	0.14	7.3	0.3
747	34.880	-0.820	28.049	19.7	0.2					3.21	0.13	6.1	0.3
946 C	34.904	-0.820	28.068	13.5	0.2								
1145	34.899	-0.901	28.067	10.1	0.2					1.80	0.10	5.6	0.3
1640 C	34.905	-1.014	28.077	5.5	0.1					1.33	0.09	4.1	0.3
2381	34.902	-1.130	28.079	5.1	0.2	3.7	0.7	1.38	0.27	0.80	0.06	6.4	0.5
3135 C	34.891	-1.232	28.074	5.7	0.1					0.76	0.06	7.5	0.6

CRUISE-STATION	POSITION			COLLECTION DATE	BOTTOM DEPTH
KN89-154	78	33.4	N	08/02/81	376 M
	9	34.5	E		

DEPTH	SALINITY	POT. T	DENSITY	CS-137		SR-90		CS/SR		H-3		CS/H-3	
				e		e		e		e		e	
2	33.881	3.766	26.919	93.0	0.4	23.9	0.7	3.89	0.12	5.60	0.16	16.6	0.5
23	34.827	5.190	27.516	109.7	0.6	30.2	0.9	3.63	0.11	5.15	0.15	21.3	0.6
64	35.073	5.090	27.723	89.8	0.3	30.3	0.4	2.96	0.04	5.01	0.14	17.9	0.5
101	35.063	4.440	27.789	84.0	0.5	22.0	1.5	3.82	0.26	5.26	0.14	16.0	0.4
155	35.042	3.880	27.832	75.2	0.3	18.5	0.5	4.06	0.11	4.75	0.15	15.8	0.5
319	34.986	2.540	27.915	74.4	0.6	22.5	0.3	3.31	0.05	5.06	0.14	14.7	0.4
370	34.964	2.240	27.923	71.9	0.4	20.6	0.7	3.49	0.12	4.94	0.13	14.6	0.4

CRUISE-STATION	POSITION			COLLECTION DATE	BOTTOM DEPTH
KN89-156	78	26.5	N	08/03/81	1778 M
	8	21.1	E		

DEPTH	SALINITY	POT. T	DENSITY	CS-137		SR-90		CS/SR		H-3		CS/H-3	
				e		e		e		e		e	
5 C				99.9	0.8								
5	34.626	5.480	27.322	96.4	0.4	27.1	0.6	3.56	0.08	5.28	0.15	18.3	0.5
99	34.977	3.050	27.862	80.2	0.3	24.9	1.7	3.22	0.22	4.98	0.15	16.1	0.5
199	34.980	2.300	27.931	66.1	0.3					5.14	0.15	12.9	0.4
298	34.985	2.080	27.953	65.4	0.3	21.2	0.5	3.08	0.07	4.92	0.15	13.3	0.4
447	34.966	1.650	27.972	59.8	1.7	21.0	0.2	2.85	0.09				
695	34.894	0.180	28.011	35.8	0.5	14.7	0.3	2.44	0.06	3.98	0.12	9.2	0.3
1239	34.909	-0.785	28.071	7.8	0.2	4.6	0.4	1.70	0.15				
1488	34.912	-0.953	28.080	5.9	0.1	5.2	0.6	1.13	0.13				
1719	34.914	-0.998	28.083	10.5	0.2	6.0	0.3	1.75	0.09	0.87	0.06	12.1	0.9

CRUISE-STATION	POSITION	COLLECTION DATE	BOTTOM DEPTH
KN89-158	71 10.4 N 7 33.1 W	08/05/81	2195 M

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
				e	e	e	e	e
2	31.431	3.230	25.017	45.7 0.3	14.4 2.8	3.17 0.62	10.75 0.25	4.3 0.1
30 C	34.249	-1.140	27.550	48.6 0.6	1.05 0.0	1.05 0.0	0.01 0.0	0.0
99 C	34.709	-1.0	28.0	51.4 0.7	1.05 0.0	1.05 0.0	0.01 0.0	0.0

CRUISE-STATION	POSITION	COLLECTION DATE	BOTTOM DEPTH
KN89-159	68 43.5 N 10 33.7 W	08/06/81	2161 M

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
				e	e	e	e	e
11	34.680	5.120	27.408	23.8 0.3	11.6 0.2	2.05 0.04	4.65 0.14	5.1 0.2
76 C	34.785	-0.580	27.961				1.12	
201	34.835	-0.480	27.997	24.9 0.4	13.9 0.5	1.79 0.07	4.45 0.12	5.6 0.2
301 C	34.855	-0.420	28.010	31.1 0.1			4.08 0.11	7.6 0.2
399	34.895	-0.150	28.029					
600 C	34.908	-0.440	28.054	12.3 0.1			2.48 0.09	5.0 0.2
797 C	34.912	-0.640	28.067					
949 C	34.909	-0.750	28.069				1.42 0.07	
1547	34.905	-0.942	28.074	6.2 0.3	4.4 0.4	1.41 0.15	0.69 0.06	9.0 0.9
2140 C	34.902	-0.989	28.073	5.4 0.1			0.61 0.06	8.9 0.9

CRUISE-STATION	POSITION	COLLECTION DATE	BOTTOM DEPTH
KN89-164	62 30.3 N 30 27.1 W	08/12/81	2522 M

DEPTH	SALINITY	POT. T	DENSITY	CS-137 e	SR-90 e	CS/SR e	H-3 e	CS/H-3 e
10 C	34.840	10.110	26.814	18.1 0.1			4.49 0.18	4.0 0.2
199	35.038	6.180	27.559	15.9 0.2			4.34 0.17	3.7 0.2
398 C	34.972	5.230	27.626	16.6 0.1			3.66 0.11	4.5 0.1
593 C	34.947	4.540	27.686	15.7 0.1			3.68 0.14	4.3 0.2
767 C	34.930	4.140	27.715	13.1 0.1				
868	34.890	3.870	27.713	14.1 0.2				
1056 C	34.927	3.820	27.747	9.8 0.1			2.80 0.12	3.5 0.2
1358	34.932	3.633	27.770	10.8 0.2			2.84 0.13	3.8 0.2
1946 C	34.944	3.302	27.812	8.7 0.1			1.92 0.10	4.5 0.2

CRUISE-STATION	POSITION			COLLECTION DATE	BOTTOM DEPTH
KN89-167	64	4.5	N	08/13/81	2333 M
	33	19.6	W		

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
				e	e	e	e	e
5 C	35.023	5.650	27.615	15.8	0.1	1.8	4.39	3.6
203	35.023	5.650	27.615	14.7	0.2	1.8	3.97	3.7
396 C	34.963	4.750	27.674	14.1	0.1	1.8	3.89	3.6
837	34.914	3.890	27.729	13.6	0.3	7.9	3.31	4.1
1233 C	34.922	3.618	27.763	11.6	0.1	1.8	2.78	4.2
1805	34.947	3.279	27.816			1.8	1.58	
1966	34.952	3.117	27.836	7.9	0.1	1.8		
2006	34.950	3.089	27.837			1.8	1.47	
2106	34.930	2.776	27.849			1.8	2.15	
2124 C	34.926	2.699	27.853	11.4	0.1			
2166	34.877	1.921	27.879				3.08	0.15
2201 C	34.830	1.414	27.880	23.8	0.1			
2218	34.823	1.011	27.902				3.68	0.10
2245	34.853	0.977	27.929				3.63	0.15
2262 C	34.858	0.917	27.937	20.1	0.2			
2269	34.871	0.883	27.955				3.23	0.14
2272	34.871	0.831	27.953	20.8	0.4	11.5	1.81	0.07
2301	34.880	0.240	27.996				2.96	0.09
2317	34.874	0.282	27.989	17.6	0.3	9.8	1.80	0.06
2323	34.881	0.225	27.998				2.97	0.10

CRUISE-STATION POSITION COLLECTION DATE BOTTOM DEPTH

KN89-170 65 6.9 N 08/14/81 267 M
34 31.7 W

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
				e	e	e	e	e
5	33.834	3.767	26.245	34.7 0.2	25.4 0.5	1.37 0.03	17.42 0.59	2.0 0.1
12 C	33.651	4.600	26.650	32.4 1.1			13.67 0.47	2.4 0.1
52	34.420	4.140	27.310	26.8 0.2	12.2 1.1	2.20 0.20	8.45 0.30	3.2 0.1
106 C	34.865	5.200	27.545	21.9 1.0			5.38 0.21	4.1 0.2
173	35.046	5.660	27.632	16.0 0.2			3.72 0.15	4.3 0.2

CRUISE-STATION POSITION COLLECTION DATE BOTTOM DEPTH

KN89-171 63 40.0 N 08/14/81 2741 M
33 19.0 W

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
				e	e	e	e	e
2049 C	34.948	3.124	27.932	9.0 0.1			1.40 0.06	6.4 0.3
2378 C	34.944	2.719	27.859	10.5 0.1			1.58 0.07	6.7 0.3
2572 C	34.903	2.229	27.875	16.0 0.1			2.65 0.11	6.0 0.3
2730 C	34.876	0.880	27.954	21.6 0.2			3.19 0.12	6.8 0.3

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CRUISE-STA DATE	POSITION BOTTOM DEPTH	SALINITY	POT TEMP	DENSITY	CS-137 e	CS-134 e	SR-90 e	H-3 e
KN89-141 07/23/81	58 34.2 N 11 31.6 W 1756 M	35.306			22.0 0.2			5.22 0.10
KN89-142 07/24/81	61 20.7 N 7 59.9 W 802 M	35.235	10.494	27.051	17.7 0.2			4.11 0.17
KN89-143 07/25/81	64 49.3 N 6 12.8 W 3836 M	34.923	8.450	27.145	27.6 0.3			5.18 0.16
KN89-144 07/26/81	67 41.2 N 3 20.2 W 3778 M				34.7 0.2			4.84 0.15
KN89-145 07/28/81	69 59.8 N 2 29 E 3222 M				53.0 0.9	1.0 0.3		4.47 0.15
KN89-146 07/29/81	72 24.8 N 2 4.3 E 3106 M	34.964	6.730	27.427	49.4 0.3		17.4 0.3	5.07 0.12
KN89-147 07/29/81	73 5.6 N 0 46.3 E 3075 M	33.496	4.296	26.559	43.6 0.4			
KN89-148 07/30/81	74 56.1 N 1 8 W 3691 M	34.413	3.490	27.370	28.8 0.2		15.0 4.0	4.32 0.14
KN89-149 07/31/81	76 52.6 N 1 2.3 E 3197 M	33.810	-0.080	27.149	70.8 0.4	1.6 0.2	22.6 0.8	6.49 0.18
KN89-151 08/01/81	78 6.4 N 2 46.2 E 2981 M	33.170	3.112	26.414	76.0 0.3	1.7 0.5		
KN89-152 08/02/81	78 42 N 5 41.7 E 2333 M	33.354	3.800	26.497	84.8 0.3	2.0 0.6	24.8 0.8	6.49 0.15
KN89-154 08/02/81	78 33.4 N 9 34.5 E 376 M	33.881	3.766	26.919	93.0 0.4	1.7 0.7	23.9 0.7	5.60 0.16

CRUISE-STA DATE	POSITION BOTTOM DEPTH	SALINITY	POT TEMP	DENSITY	CS-137 e	CS-134 e	SR-90 e	H-3 e
KN89-155 08/02/81	78 30 N 8 50 E 948 M	34.924	6.095	27.400	111.0 0.4	3.4 0.6		
KN89-156 08/03/81	78 26.5 N 8 21.1 E 1778 M				99.9 0.8	3.1 0.5		5.28 0.15
KN89-157 08/03/81	78 18.9 N 6 51.5 E 3185 M	34.584	5.480	27.289	86.0 0.5	2.4 0.3		
KN89-158 08/05/81	71 10.4 N 7 33.1 W 2195 M	31.431	3.230	25.017	45.7 0.3		14.4 2.8	10.75 0.25
KN89-159 08/06/81	68 43.5 N 10 33.7 W 2161 M	34.600	5.120	27.408	23.8 0.3		11.6 0.2	4.65 0.14
KN89-164 08/12/81	62 30.3 N 30 27.1 W 2522 M	34.848	10.110	26.814	18.1 0.1			4.49 0.18
KN89-167 08/13/81	64 4.5 N 33 19.6 W 2333 M				15.8 0.1			4.39 0.14
KN89-170 08/14/81	65 6.9 N 34 31.7 W 267 M	33.034	3.767	26.245	34.7 0.2	0.3 0.2	25.4 0.5	17.42 0.59
KN89-145A 07/28/81	71 14 N 2 10 E	35.000	8.700		80.8 0.3			
KN89-148A 07/30/81	75 33 N 1 6 W	34.690	4.940		26.9 0.3		12.9 0.2	
KN89-153A 08/02/81	78 42.7 N 7 3 E	34.600	6.450		86.2 0.4	2.0 0.6		
KN89-157A 08/04/81	73 32 N 0 59 W	32.970	5.800		50.6 0.3			
KN89-157B 08/05/81	71 49 N 5 42 W	32.270	4.860		52.8 0.3		17.5 0.2	

CRUISE-STATION DATE	POSITION BOTTOM DEPTH	SALINITY	POT TEMP	DENSITY	CS-137 e	CS-134 e	SR-90 e	H-3 e
KN89-159A	66 43 N	34.530	6.990		26.2	0.2		
08/07/81	12 3 W							

LANCE81

CRUISE-STA DATE	POSITION BOTTOM DEPTH	SALINITY	POT TEMP	DENSITY	CS-137 e	CS-134 e	SR-90 e	H-3 e
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LANCE-8 C	78 55 N	34.13	19.40	50.6	2.7	1.5	0.8	
08/23/81	28 01 E							

LANCE-10 C	79 08 N	33.8	19.1	53.6	0.5	0.9	0.2	
08/26/81	38 08 E							

LANCE-13 C	81 00 N	34.1	19.2	76.8	1.0	2.1	0.2	
08/30/81	14 31 E							

LANCE-14 C	78 25 N			64.8	4.0			
09/02/81	11 09 E							

CRUISE-STATION POSITION COLLECTION DATE BOTTOM DEPTH

HUD82-46 78 53.6 N 03/13/82 1600 M
6 43.1 E

DEPTH	SALINITY	POT. T	DENSITY	CS-137 e	SR-90 e	CS/SR e	H-3 e	CS/H-3 e
5				85.4 0.3	24.2 0.2	3.53 0.03		
6 C				89.0 1.6				
47	34.829	3.074	27.742	88.3 1.0	25.2 0.5	3.50 0.08		
116	35.053	3.447	27.838	79.0 0.6				
186	35.046	3.447	27.879	63.6 0.4				
276	35.001	2.706	27.912	70.8 0.6	22.5 0.9	3.15 0.13		
385	35.017	2.716	27.925	65.8 0.6				
543	34.993	1.999	27.966	66.5 0.5				
732	34.980	1.589	27.988	53.8 0.4	20.5 0.3	2.62 0.04		
929	34.929	0.731	28.006	43.4 0.4	16.3 0.2	2.66 0.04		
1150	34.909	-0.192	28.043	14.2 0.2				
1298	34.910	-0.642	28.065	7.7 0.4				
1471	34.909	-0.923	28.077	4.7 0.2				
1569	34.909	-0.936	28.077	4.3 0.3	3.2 1.9	1.34 0.80		

CRUISE-STATION	POSITION			COLLECTION DATE	BOTTOM DEPTH
HUD82-71	74	32.1	N	03/20/82	1494 M
	15	15.7	E		

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
				e	e	e	e	e
7	35.070	4.665	27.776	69.7	0.3			
116	35.085	4.186	27.835	60.5	0.6			
275	35.066	3.404	27.899	69.9	0.6			
547	34.939	1.380	27.970	37.7	0.6			
919	34.909	-0.703	28.067	7.0	0.3			
1266	34.909	-0.985	28.079	3.2	0.2			
1486	34.909	-1.063	28.082	3.2	0.3	3.1	0.5	1.03 0.19

HUD-SURF

CRUISE-STA DATE	POSITION BOTTOM DEPTH	SALINITY	POT TEMP	DENSITY	CS-137 e	CS-134 e	SR-90 e	H-3 e
HUD-UW2 C	68 06.5 N 15 04.1 W				34.2 1.7	0.2 0.5		
HUD-4 02/28/82	68 43.2 N 10 29.1 W 2133 M	34.783	-0.644	27.963	26.8 0.2			
HUD-9 03/02/82	70 32.7 N 04 08.8 W 3169 M	35.045	2.903	27.930	47.1 0.2			
HUD-11 C 03/03/82	72 51.2 N 04 33.7 E 3317 M	35.021	2.538	27.943	49.7 1.7	0.4 0.9		
HUD-13 03/04/82	74 29.7 N 04 40.2 E 3397 M	34.589	-1.855	27.848	46.3 0.3			
HUD-14 C 03/05/82	74 54.6 N 01 20.0 E 3724 M	34.808	-1.888	28.027	36.8 1.9	0.8 0.7		
HUD-16 C 03/05/82	75 51.8 N 02 30.7 E 3119 M	34.793	-1.815	28.013	36.4 1.7	0.1 0.5		
HUD-18 03/06/82	76 50.1 N 04 21.2 E 3209 M	34.854	-0.575	28.017	38.3 0.2			
HUD-21-2 C 03/07/82	77 52.0 N 09 43.1 E				88.5 2.1	2.0 0.9		
HUD-25 C 03/07/82	77 36.7 N 05 44.5 E 2488 M	34.975	1.433	27.995	65.4 2.0	2.2 1.0		
HUD-27 C 03/08/82	77 45.4 N 01 28.4 E 2936 M	34.855	-0.894	28.031	31.7 1.0	0.6 0.6		3.86 0.16
HUD-28 03/08/82	77 59.8 N 00 38.8 W 3032 M	34.883	0.800	27.965	57.0 0.3			

CRUISE-STA DATE	POSITION BOTTOM DEPTH	SALINITY	POT TEMP	DENSITY	CS-137 e	CS-134 e	SR-90 e	H-3 e
HUD-29 C 03/08/82	78 07.3 N 01 09.5 W 2979 M	34.700	-0.074	27.868	59.5 1.5	0.2 0.7		
HUD-31 03/09/82	77 04.1 N 03 03.4 W 2929 M	34.090	-1.627	27.436	62.6 0.2			
HUD-32 C 03/09/82	77 00.2 N 00 58.8 W 3172 M	34.874	-0.553	28.032	40.4 1.7	0.9 1.1		
HUD-34 C 03/10/82	76 01.8 N 02 10.2 W 3708 M	34.802	-1.823	28.021	35.9 1.8	-0.3 0.5		
HUD-35 03/10/82	75 28.8 N 02 16.9 W 3671 M	34.811	-1.761	28.026	21.2 0.2			
HUD-37 03/11/82	76 52.8 N 00 58.1 E 3209 M	34.862	-0.334	28.012	36.4 0.3			
HUD-43 C 03/12/82	78 55.0 N 01 36.0 W 2626 M	34.126	-1.715	27.468	67.4 2.1	0.1 0.9		8.92 0.15
HUD-46 C 03/13/82	78 53.6 N 06 43.1 E 1566 M	34.739	2.438	27.726	89.0 1.6	2.0 0.8	24.2 0.2	
HUD-49 C 03/14/82	76 35.3 N 10 41.7 E 2111 M	35.031	3.312	27.880	73.9 1.9	1.2 1.0		
HUD-50 03/14/82	76 29.7 N 06 59.8 E 3280 M	34.971	1.278	28.003	55.1 0.3			
HUD-53 C 03/15/82	76 44.0 N 12 49.0 E 1069 M	35.005	4.154	27.774	95.0 1.4	2.4 0.8		5.22 0.14
HUD-57 C 03/17/82	74 57.6 N 02 59.7 W 3631 M	34.779	-1.839	28.002	30.8 1.9	-0.3 0.8		
HUD-58 03/17/82	75 02.8 N 05 12.6 W 3531 M	34.789	-1.844	28.011	27.3 0.2			

CRUISE-STA DATE	POSITION BOTTOM DEPTH	SALINITY	POT TEMP	DENSITY	CS-137 e	CS-134 e	SR-90 e	H-3 e
HUD-60 03/18/82	74 03.2 N 02 43.6 W 3465 M	34.662	-1.866	27.908	36.1	0.3		4.32 0.13
HUD-66 C 03/19/82	74 43.0 N 07 30.0 E 2510 M	34.779	0.570	27.895	51.6	1.6	1.1	0.6 4.45 0.13
HUD-71 03/20/82	74 32.1 N 15 15.7 E 1477 M	35.078	4.665	27.776	69.7	0.3		
HUD-72-3 C 03/21/82	74 31.0 N 16 00.0 E			82.2	1.8	2.1	1.1	
HUD-78-9 C 03/21/82	71 52.0 N 18 29.0 E			142.0	2.0	2.3	0.6	
HUD-92 03/27/82	70 30.4 N 04 49.5 E 3167 M	35.094	3.801	27.882	60.1	0.3		
HUD-102 C 03/29/82	72 13.4 N 06 15.9 W 2766 M	34.607	-1.888	27.864	57.0	2.8	1.7	1.5 5.41 0.13
HUD-112 03/31/82	68 02.5 N 03 55.1 W 3713 M	35.011	2.637	27.927	33.3	0.3		
HUD-116 04/01/82	65 33.1 N 01 29.4 W 3189 M	35.033	3.984	27.814	27.4	0.1		
HUD-130-1C 04/04/82	60 54.0 N 04 50.0 W 1104 M	35.233	7.538	27.526	20.8	1.0		

SECTION 2

D. F. Jefferies and A. K. Steele
Ministry of Agriculture, Fisheries and Food
Directorate of Fisheries Research
Fisheries Laboratory
Lowestoft, Suffolk NR33 OHT
U. K.

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CRUISE-STATION POSITION COLLECTION DATE BOTTOM DEPTH

CIR-14 60 0.0 N 07/15/81
4 0.0 E

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
3	33.240	12.000	25.233	414.0				
100	35.290	8.400	27.441	43.2				
500 B				139.0				

CRUISE-STATION POSITION COLLECTION DATE BOTTOM DEPTH

CIR-16 61 0.0 N 07/15/81
4 0.0 E

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
3	32.200	12.000	24.416	486.0				
100	35.240	8.300	27.417	72.0				
500 B				222.0				

CRUISE-STATION POSITION COLLECTION DATE BOTTOM DEPTH

CIR-18 62 0.0 N 07/15/81
4 0.0 E

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
3	31.630	11.000	24.153	528.0				
100	35.090	6.900	27.504	240.0				

CRUISE-STATION	POSITION			COLLECTION DATE	BOTTOM DEPTH
CIR-20	63	0.0	N	07/15/81	
	5	0.0	E		

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
				e	e	e	e	e
3	33.100	9.000	25.693	498.0	120.0	4.15		
100	35.150	7.600	27.451	162.0				

CRUISE-STATION	POSITION			COLLECTION DATE	BOTTOM DEPTH
CIR-22	64	0.0	N	07/15/81	
	5	0.0	E		

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
				e	e	e	e	e
3	33.360	10.000	25.672	438.0				
100	35.280	8.300	27.448	49.8				
500	35.130	4.900	27.790	162.0				

CRUISE-STATION	POSITION			COLLECTION DATE	BOTTOM DEPTH
CIR-24	65	0.0	N	07/15/81	
	5	0.0	E		

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
				e	e	e	e	e
3	34.950	10.000	26.913	132.0				
100	35.250	6.900	27.630	33.6				
500	34.930	1.500	27.954	18.0				

CRUISE-STATION	POSITION			COLLECTION DATE	BOTTOM DEPTH
CIR-26	65	0.0	N	07/15/81	
	7	0.0	E		

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
3	34.290	11.000	26.223	294.0				
100	35.240	7.600	27.522	66.0				
500 B				126.0				

CRUISE-STATION	POSITION			COLLECTION DATE	BOTTOM DEPTH
CIR-28	65	0.0	N	07/15/81	
	10	0.0	E		

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
3	32.660	12.000	24.773	486.0				
100	33.830	6.900	26.511	348.0				

CRUISE-STATION	POSITION			COLLECTION DATE	BOTTOM DEPTH
CIR-30	66	0.0	N	07/15/81	
	10	0.0	E		

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
3	32.850	12.000	24.920	546.0				
100	34.350	6.900	26.921	324.0				
500 B				114.0				

CRUISE-STATION	POSITION			COLLECTION DATE	BOTTOM DEPTH	CS-137	SR-90	CS/SR	H-3	CS/H-3
CIR-32	67	0.0	N	07/15/81						
	10	0.0	E							
DEPTH	SALINITY	POT. T	DENSITY							
3	33.930	10.000	26.117	444.0	72.0	6.17				
100	35.220	7.100	27.578	90.0						
500 B				66.0						

CRUISE-STATION	POSITION			COLLECTION DATE	BOTTOM DEPTH	CS-137	SR-90	CS/SR	H-3	CS/H-3
CIR-34	68	0.0	N	07/15/81						
	10	0.0	E							
DEPTH	SALINITY	POT. T	DENSITY							
3	34.650	10.000	26.679	264.0						
100	35.260	7.500	27.553	49.8						
500	35.020	3.800	27.823	30.0						

CRUISE-STATION	POSITION			COLLECTION DATE	BOTTOM DEPTH	CS-137	SR-90	CS/SR	H-3	CS/H-3
CIR-36	69	0.0	N	07/15/81						
	10	0.0	E							
DEPTH	SALINITY	POT. T	DENSITY							
3	34.860	8.900	27.025	216.0						
100	35.220	6.600	27.648	66.0						
500	35.060	3.700	27.865	66.0						

CRUISE-STATION	POSITION			COLLECTION DATE	BOTTOM DEPTH
CIR-38	70	0.0	N	07/15/81	
	10	0.0	E		

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
3	34.930	0.500	27.143	198.0				
100	35.180	6.300	27.656	60.0				
500	35.060	3.500	27.885	55.2				

CRUISE-STATION	POSITION			COLLECTION DATE	BOTTOM DEPTH
CIR-40	70	0.0	N	07/15/81	
	13	0.0	E		

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
3	34.730	0.500	26.986	202.0				
100	35.120	6.400	27.595	120.0				
500	35.070	4.000	27.842	66.0				

CRUISE-STATION	POSITION			COLLECTION DATE	BOTTOM DEPTH
CIR-42	70	0.0	N	07/15/81	
	16	0.0	E		

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
3	34.820	9.100	26.961	240.0				
100	34.970	6.300	27.490	138.0				
500	35.080	3.300	27.921	66.0				

CRUISE-STATION	POSITION			COLLECTION DATE	BOTTOM DEPTH
CIR-43	70	0.0	N	07/15/81	
	17	30.0	E		

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
3	33.980	8.700	26.367	450.0	90.0	5.00		
100				426.0				

CRUISE-STATION	POSITION			COLLECTION DATE	BOTTOM DEPTH
CIR-45	71	0.0	N	07/15/81	
	18	0.0	E		

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
3	34.630	8.700	26.876	354.0				
100	34.630	6.400	27.208	240.0				

CRUISE-STATION	POSITION			COLLECTION DATE	BOTTOM DEPTH
CIR-47	71	0.0	N	07/15/81	
	21	0.0	E		

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
3	34.600			288.0				
100		5.000		180.0				

CRUISE-STATION	POSITION	COLLECTION DATE	BOTTOM DEPTH
CIR-49	71 30.0 N 24 0.0 E	07/15/81	

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
3	34.810	7.700	27.169	204.0				
100	35.000	5.300	27.640	138.0				
500 B				114.0				

CRUISE-STATION	POSITION	COLLECTION DATE	BOTTOM DEPTH
CIR-51	71 30.0 N 27 30.0 E	07/15/81	

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
3	34.370	7.400	26.867	300.0				
100	34.730	4.900	27.473	222.0				

CRUISE-STATION	POSITION	COLLECTION DATE	BOTTOM DEPTH
CIR-53	71 0.0 N 30 0.0 E	07/15/81	

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
3	34.340	7.000	26.899	288.0	36.0	8.00		
100	34.640	4.400	27.457	252.0				
500 B				222.0				

CRUISE-STATION	POSITION			COLLECTION DATE	BOTTOM DEPTH
CIR-55	72	0.0	N	07/15/81	
	30	0.0	E		

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
3	34.530	6.600	27.103	252.0				
100	34.860	3.400	27.736	198.0				
500 B				162.0				

CRUISE-STATION	POSITION			COLLECTION DATE	BOTTOM DEPTH
CIR-57	73	0.0	N	07/15/81	
	30	0.0	E		

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
3	34.700	5.800	27.341	190.0				
100	34.900	3.300	27.777	144.0				
500 B				138.0				

CRUISE-STATION	POSITION			COLLECTION DATE	BOTTOM DEPTH
CIR-59	74	0.0	N	07/15/81	
	30	0.0	E		

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
3	34.940	5.100	27.616	144.0				
100	34.960	2.700	27.880	144.0				
500 B				150.0				

CRUISE-STATION#	POSITION			COLLECTION DATE	BOTTOM DEPTH
CIR-61	75	0.0	N	07/15/81	
	30	0.0	E		

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
3	33.470	3.100	26.655	114.0	28.8	3.96		
100	34.960	1.800	27.955	126.0				
500 B				114.0				

CRUISE-STATION#	POSITION			COLLECTION DATE	BOTTOM DEPTH
CIR-63	76	0.0	N	07/15/81	
	30	0.0	E		

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
3	32.990	2.100	26.354	114.0				
100	34.990	1.800	27.979	114.0				
500 B				102.0				

CRUISE-STATION#	POSITION			COLLECTION DATE	BOTTOM DEPTH
CIR-65	77	0.0	N	07/15/81	
	30	0.0	E		

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
3	32.510	1.700	25.998	96.0				
100	34.980	1.200	28.016	108.0				

CRUISE-STATION POSITION COLLECTION DATE BOTTOM DEPTH

CIR-67 76 0.0 N 07/15/81
25 0.0 E

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
3	33.070	0.400	26.540	70.0				
100				72.0				

CRUISE-STATION POSITION COLLECTION DATE BOTTOM DEPTH

CIR-69 75 0.0 N 07/15/81
25 0.0 E

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
3	33.880	3.900	26.905	114.0				
100	34.960	1.100	28.007	102.0				

CRUISE-STATION POSITION COLLECTION DATE BOTTOM DEPTH

CIR-71 74 0.0 N 07/15/81
25 0.0 E

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
3	34.560	5.300	27.291	114.0				
100	34.970	2.600	27.897	114.0				
500 B				96.0				

CRUISE-STATION	POSITION			COLLECTION DATE	BOTTOM DEPTH
CIR-73	73	0.0	N	07/15/81	
	25	0.0	E		

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
3	34.980	6.600	27.458	120.0				
100	35.050	4.400	27.783	102.0				
500 B				108.0				

CRUISE-STATION	POSITION			COLLECTION DATE	BOTTOM DEPTH
CIR-75	72	0.0	N	07/15/81	
	25	0.0	E		

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
3	34.690	7.300	27.133	240.0				
100	34.960	4.500	27.701	162.0				
500 B				132.0				

CRUISE-STATION	POSITION			COLLECTION DATE	BOTTOM DEPTH
CIR-76	72	0.0	N	07/15/81	
	20	0.0	E		

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
3	34.980	7.500	27.332	144.0				
100	35.060	5.100	27.711	108.0				
500 B				102.0				

CRUISE-STATION	POSITION			COLLECTION DATE	BOTTOM DEPTH
CIR-78	73	0.0	N	07/15/81	
	20	0.0	E		

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
3	34.980	6.600	27.458	100.0				
100	35.050	4.500	27.772	100.0				
500 B				96.0				

CRUISE-STATION	POSITION			COLLECTION DATE	BOTTOM DEPTH
CIR-80	74	0.0	N	07/15/81	
	20	0.0	E		

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
3	34.820	4.700	27.567	102.0	26.4	3.86		
100	34.940	0.950	28.001	102.0				

CRUISE-STATION	POSITION			COLLECTION DATE	BOTTOM DEPTH
CIR-82	75	0.0	N	07/15/81	
	20	0.0	E		

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
3	34.140	0.590	27.379	96.0				
100				90.0				

CRUISE-STA#	POSITION			COLLECTION DATE	BOTTOM DEPTH
CIR-84	76	0.0	N	07/15/81	
	22	30.0	E		

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
3	33.970	1.900	27.154	90.0				
100				84.0				

CRUISE-STA#	POSITION			COLLECTION DATE	BOTTOM DEPTH
CIR-85	76	0.0	N	07/15/81	
	20	0.0	E		

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
3	34.140			90.0				
100				72.0				

CRUISE-STA#	POSITION			COLLECTION DATE	BOTTOM DEPTH
CIR-87	76	30.0	N	07/15/81	
	15	0.0	E		

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
3	33.700	2.800	26.865	78.0				
100	35.030	3.700	27.841	72.0				

CRUISE-STATION	POSITION			COLLECTION DATE	BOTTOM DEPTH
CIR-88	76	0.0	N	07/15/81	
	15	0.0	E		

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
3	34.140	3.500	27.152	102.0				
100	35.090	4.900	27.758	96.0				
500				46.0				

CRUISE-STATION	POSITION			COLLECTION DATE	BOTTOM DEPTH
CIR-90	75	0.0	N	07/15/81	
	15	0.0	E		

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
3	34.990	6.700	27.453	120.0				
100	35.090	4.700	27.781	78.0				
500	34.960	1.000	27.955	32.0				

CRUISE-STATION	POSITION			COLLECTION DATE	BOTTOM DEPTH
CIR-92	74	0.0	N	07/15/81	
	15	0.0	E		

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
3	34.930	7.700	27.264	192.0				
100	35.120	5.200	27.747	114.0				
500	35.010	2.600	27.929	72.0				

CRUISE-STA#	POSITION			COLLECTION DATE	BOTTOM DEPTH
CIR-94	73	0.0	N	07/15/81	
	15	0.0	E		

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
3	34.820	8.000	27.133	234.0				
100	35.090	5.600	27.675	120.0				
500	35.000	2.600	27.921	49.0				

CRUISE-STA#	POSITION			COLLECTION DATE	BOTTOM DEPTH
CIR-96	72	0.0	N	07/15/81	
	15	0.0	E		

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
3	34.840	8.300	27.103	234.0				
100	35.110	5.700	27.678	102.0				
500	35.110	3.100	27.964	72.0				

CRUISE-STA#	POSITION			COLLECTION DATE	BOTTOM DEPTH
CIR-99	71	0.0	N	07/15/81	
	10	0.0	E		

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
3	35.080	8.300	27.292	132.0				
100	35.090	4.900	27.758	72.0				
500	35.030	2.700	27.936	54.0				

CRUISE-STATION	POSITION			COLLECTION DATE	BOTTOM DEPTH
CIR-101	72	0.0	N	07/15/81	
	10	0.0	E		

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
3	35.040	0.300	27.260	162.0				
100	35.110	4.900	27.774	78.0				
500	34.990	2.300	27.939	56.0				

CRUISE-STATION	POSITION			COLLECTION DATE	BOTTOM DEPTH
CIR-103	73	0.0	N	07/15/81	
	10	0.0	E		

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
3	35.080	6.000	27.510	90.0				
100	34.940	3.500	27.790	53.0				

CRUISE-STATION	POSITION			COLLECTION DATE	BOTTOM DEPTH
CIR-105	74	0.0	N	07/15/81	
	10	0.0	E		

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
3	35.060	6.000	27.494	114.0				
100	35.050	3.500	27.877	72.0				
500	34.940	1.200	27.984	44.0				

CRUISE-STATION POSITION COLLECTION DATE BOTTOM DEPTH

CIR-107 75 0.0 N 07/15/81
10 0.0 E

DEPTH SALINITY POT. T DENSITY CS-137 SR-90 CS/SR H-3 CS/H-3
e e e e e

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3	35.020	5.800	27.594	96.0
100	34.980	3.400	27.831	66.0
500	35.000	1.800	27.988	60.0

CRUISE-STATION POSITION COLLECTION DATE BOTTOM DEPTH

CIR-109 76 0.0 N 07/15/81
10 0.0 E

DEPTH SALINITY POT. T DENSITY CS-137 SR-90 CS/SR H-3 CS/H-3
e e e e e

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3	34.920	5.100	27.600	96.0
100	35.030	3.400	27.871	84.0
500	34.970	1.600	27.979	66.0

CRUISE-STATION POSITION COLLECTION DATE BOTTOM DEPTH

CIR-111 77 0.0 N 07/15/81
10 0.0 E

DEPTH SALINITY POT. T DENSITY CS-137 SR-90 CS/SR H-3 CS/H-3
e e e e e

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3	34.960	5.800	27.547	108.0
100	35.020	3.600	27.843	96.0
500	34.940	1.300	27.977	55.0

CRUISE-STATION POSITION COLLECTION DATE BOTTOM DEPTH

CIR-113 77 30.0 N 07/15/81
13 0.0 E

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
3	34.280	4.900	27.116	102.0				
100				90.0				

CRUISE-STATION POSITION COLLECTION DATE BOTTOM DEPTH

CIR-114 78 0.0 N 07/15/81
10 0.0 E

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
3	33.330	4.100	26.448	102.0	21.6	4.72		
100	34.940	2.500	27.882	90.0				

CRUISE-STATION POSITION COLLECTION DATE BOTTOM DEPTH

CIR-116 78 0.0 N 07/15/81
5 0.0 E

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
3	34.920	4.800	27.635	72.0				
100	34.980	2.300	27.931	57.0				
500	34.880	-0.600	28.039	29.0				

CRUISE-STATION POSITION COLLECTION DATE BOTTOM DEPTH

CIR-118 79 0.0 N 07/15/81
5 0.0 E

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
3	32.520	1.500	26.020	84.0				
100	34.980	2.700	27.896	78.0				
500	34.970	0.900	28.028	46.8				

CRUISE-STATION POSITION COLLECTION DATE BOTTOM DEPTH

CIR-120 79 0.0 N 07/15/81
10 0.0 E

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
3	33.630	4.100	26.686	84.0				
100	34.840	2.100	27.835	84.0				

CRUISE-STATION POSITION COLLECTION DATE BOTTOM DEPTH

CIR-121 79 30.0 N 07/15/81
10 0.0 E

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
3	34.400	3.800	27.329	90.0				
100	34.920	2.100	27.900	84.0				

CRUISE-STATION	POSITION	COLLECTION DATE	BOTTOM DEPTH
CIR-122	80 0.0 N 10 0.0 E	07/15/81	

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
3	32.890	0.530	26.376	96.0				
100	34.920	2.200	27.891	78.0				
500	34.930	0.670	28.011	50.0				

CRUISE-STATION	POSITION	COLLECTION DATE	BOTTOM DEPTH
CIR-124	79 30.0 N 7 30.0 E	07/15/81	

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
3	33.130	4.100	26.289	90.0				
100	35.010	3.200	27.874	90.0				
500	34.960	1.600	27.971	60.0				

CRUISE-STATION	POSITION	COLLECTION DATE	BOTTOM DEPTH
CIR-125	78 30.0 N 7 30.0 E	07/15/81	

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
3	34.470			114.0				
100	34.980	2.700	27.896	84.0				
500	34.920	0.810	27.994	60.0				

CRUISE-STATION POSITION COLLECTION DATE BOTTOM DEPTH

CIR-129 76 0.0 N 07/15/81
5 0.0 E

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
3	34.850	3.500	27.718	41.4				
100	34.910	1.100	27.967	46.8				
500	34.880	-0.860	28.051	13.8				

CRUISE-STATION POSITION COLLECTION DATE BOTTOM DEPTH

CIR-131 75 0.0 N 07/15/81
5 0.0 E

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
3	34.960	5.200	27.620	24.6				
100	34.920	1.500	27.946	38.4				
500	34.890	-0.620	28.048	12.6				

CRUISE-STATION POSITION COLLECTION DATE BOTTOM DEPTH

CIR-133 74 0.0 N 07/15/81
5 0.0 E

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
3	34.610	4.000	27.476	38.4				
100	34.800	-0.810	27.984	34.2				
500	34.880	-0.710	28.044	30.0				

CRUISE-STATION POSITION COLLECTION DATE BOTTOM DEPTH

CIR-135 73 0.0 N 07/15/81
5 0.0 E

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
3	34.910	5.000	27.604	57.0				
100	34.770	0.750	27.877	33.6				
500	34.890	-0.510	28.043	16.2				

CRUISE-STATION POSITION COLLECTION DATE BOTTOM DEPTH

CIR-137 73 0.0 N 07/15/81
1 0.0 E

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
3	34.030	4.000	27.015	43.2				
100	34.830	-0.310	27.985	22.8				
500	34.880	-1.100	28.060	24.6				

CRUISE-STATION POSITION COLLECTION DATE BOTTOM DEPTH

CIR-139 73 0.0 N 07/15/81
4 0.0 W

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
3	32.340	2.900	25.771	45.6				
100	34.840	0.340	27.958	37.8				
500	34.880	-0.900	28.052	12.0				

CRUISE-STATION POSITION COLLECTION DATE BOTTOM DEPTH

CIR-140 73 0.0 N 07/15/81
7 0.0 W

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
3	31.040	0.500	24.888	45.0				
100	34.870	0.770	27.956	48.0				
500	34.690	-0.740	28.053	22.8				

CRUISE-STATION POSITION COLLECTION DATE BOTTOM DEPTH

CIR-141 72 0.0 N 07/15/81
7 0.0 W

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
3	31.520	1.300	25.230	50.4				
100	34.840	-0.660	28.009	49.2				
500	34.880	-0.470	28.033	16.2				

CRUISE-STATION POSITION COLLECTION DATE BOTTOM DEPTH

CIR-142 71 0.0 N 07/15/81
7 0.0 W

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
3	33.390	4.000	26.506	40.8				
100	34.740	-0.095	27.901	50.4				
500	34.880	-0.260	28.023	24.6				

CRUISE-STATION	POSITION			COLLECTION DATE	BOTTOM DEPTH
CIR-144	70	0.0	N	07/15/81	
	7	0.0	W		

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
3	34.930	5.900	27.510	47.4				
300	34.870	3.200	27.763	37.2				
500	34.890	-0.020	28.019	25.2				

CRUISE-STATION	POSITION			COLLECTION DATE	BOTTOM DEPTH
CIR-146	70	0.0	N	07/15/81	
	1	0.0	W		

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
3	35.100	7.800	27.383	102.0				
50				66.0				
100	35.080	4.400	27.807	66.0				
500	35.030	3.200	27.890	60.0				
850				26.4				
1750				3.6				
3250				6.6				

CRUISE-STATION POSITION COLLECTION DATE BOTTOM DEPTH

CIR-148 70 0.0 N 07/15/81
5 0.0 E

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
3	34.960	9.200	27.055	174.0				
100	35.160	6.300	27.640	84.0				
500	35.060	3.700	27.865	66.0				

CRUISE-STATION POSITION COLLECTION DATE BOTTOM DEPTH

CIR-150 67 0.0 N 07/15/81
5 0.0 E

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
3	35.100	9.400	27.132	114.0				
100	35.130	5.200	27.755	46.8				
500	35.020	3.200	27.882	52.2				

CRUISE-STATION POSITION COLLECTION DATE BOTTOM DEPTH

CIR-152 68 0.0 N 07/15/81
5 0.0 E

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
3	35.090	10.000	27.023	84.0				
100	35.190	6.200	27.677	30.6				
500	34.920	1.700	27.931	27.6				

CRUISE-STA#	POSITION			COLLECTION DATE	BOTTOM DEPTH
CIR-154	67	0.0	N	07/15/81	
	5	0.0	E		

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
3	34.700	11.000	26.543	186.0				
300	35.180	7.400	27.504	49.2				

CRUISE-STA#	POSITION			COLLECTION DATE	BOTTOM DEPTH
CIR-155	67	0.0	N	07/15/81	
	3	30.0	E		

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
3	34.750			168.0				
100				24.6				
500	34.930	1.900	27.924	51.6				

CRUISE-STA#	POSITION			COLLECTION DATE	BOTTOM DEPTH
CIR-157	67	0.0	N	07/15/81	
	0	0.0			

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
3	35.130	9.300	27.171	37.0				
100	35.100	4.600	27.801	38.4				
500	34.910	1.200	27.960	35.4				

CRUISE-STATION	POSITION	COLLECTION DATE	BOTTOM DEPTH
CIR-160	67 0.0 N 7 30.0 W	07/15/81	

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
3	34.800	7.300	27.219	30.0				
100	34.860	0.800	27.946	34.8				
500	34.910	0.220	28.022	10.8				

CRUISE-STATION	POSITION	COLLECTION DATE	BOTTOM DEPTH
CIR-163	64 0.0 N 7 30.0 W	07/15/81	

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
3	35.070	8.100	27.314	27.0				
100	35.160	6.400	27.627	20.4				
500	34.890	0.110	28.011	19.2				

CRUISE-STATION	POSITION	COLLECTION DATE	BOTTOM DEPTH
CIR-166	64 0.0 N 0 0.0	07/15/81	

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
3	35.160	12.000	26.714	32.4				
100	35.270	7.500	27.560	28.8				
500	34.910	1.500	27.938	28.8				

CRUISE-STATION	POSITION	COLLECTION DATE	BOTTOM DEPTH
CIR-167	63 0.0 N 0 0.0	07/15/81	

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
3	35.270			35.4				
100	35.300			25.8				
500				32.4				

CRUISE-STATION	POSITION	COLLECTION DATE	BOTTOM DEPTH
CIR-168	62 0.0 N 0 0.0	07/15/81	

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
3	35.190	11.000	26.924	34.2				
100	35.240	7.900	27.478	18.6				
500				24.6				

CRUISE-STATION	POSITION	COLLECTION DATE	BOTTOM DEPTH
CIR-170	61 0.0 N 0 0.0	07/15/81	

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
3	35.330	12.000	26.846	37.8				
100		8.600		72.0				

CRUISE-STATION	POSITION			COLLECTION DATE	BOTTOM DEPTH
CIR-171	61	0.0	N	07/15/81	
	1	0.0	W		

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
3	35.340	12.000	26.854	31.8				
100	35.320	9.200	27.337	72.0				

CRUISE-STATION	POSITION			COLLECTION DATE	BOTTOM DEPTH
CIR-172	61	0.0	N	07/15/81	
	2	0.0	W		

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
3	35.310	12.000	26.831	24.0				
100	35.400	9.800	27.299	29.4				

CRUISE-STATION	POSITION			COLLECTION DATE	BOTTOM DEPTH
CIR-174	60	0.0	N	07/15/81	
	2	0.0	W		

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
3		10.000		114.0				
100				96.0				

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CRUISE-STA DATE	POSITION BOTTOM DEPTH	SALINITY	POT TEMP	DENSITY	CS-137 e	CS-134 e	SR-90 e	H-3 e
CIR-14 07/15/81	60 00 N 04 00 E	33.240	12.000	25.223	414.0			
CIR-15 07/15/81	60 30 N 04 00 E				420.0			
CIR-16 07/15/81	61 00 N 04 00 E	32.200	12.000	24.416	486.0			
CIR-17 07/15/81	61 30 N 04 00 E				498.0			
CIR-18 07/15/81	62 00 N 04 00 E	31.630	11.000	24.153	528.0			
CIR-19 07/15/81	62 30 N 04 30 E				558.0			
CIR-20 07/15/81	63 00 N 05 00 E	33.180	9.000	25.693	498.0		120.0	
CIR-21 07/15/81	63 30 N 05 00 E				330.0			
CIR-22 07/15/81	64 00 N 05 00 E	33.360	10.000	25.672	438.0			
CIR-23 07/15/81	64 30 N 05 00 E				156.0			
CIR-24 07/15/81	65 00 N 05 00 E	34.950	10.000	26.913	132.0			
CIR-25 07/15/81	65 00 N 06 00 E	34.790			180.0			

CRUISE-STA DATE	POSITION BOTTOM DEPTH	SALINITY	POT TEMP	DENSITY	CS-137 e	CS-134 e	SR-90 e	H-3 e
CIR-26 07/15/81	65 00 N 07 00 E	34.290	11.000	26.223	294.0			
CIR-27 07/15/81	65 00 N 08 30 E	34.760			240.0			
CIR-28 07/15/81	65 00 N 10 00 E	32.660	12.000	24.773	486.0			
CIR-29 07/15/81	65 30 N 10 00 E				492.0			
CIR-30 07/15/81	66 00 N 10 00 E	32.850	12.000	24.920	546.0			
CIR-31 07/15/81	66 30 N 10 00 E				438.0			
CIR-32 07/15/81	67 00 N 10 00 E	33.930	10.000	26.117	444.0			
CIR-33 07/15/81	67 30 N 10 00 E	33.070			570.0			
CIR-34 07/15/81	68 00 N 10 00 E	34.650	10.000	26.679	264.0			
CIR-35 07/15/81	68 30 N 10 00 E	34.860			174.0			
CIR-36 07/15/81	69 00 N 10 00 E	34.860	8.900	27.025	216.0			
CIR-37 07/15/81	69 30 N 10 00 E	35.020			168.0			
CIR-38 07/15/81	70 00 N 10 00 E	34.930	8.500	27.143	198.0			

CRUISE-STA DATE	POSITION BOTTOM DEPTH	SALINITY	POT TEMP	DENSITY	CS-137 e	CS-134 e	SR-90 e	H-3 e
CIR-39 07/15/81	70 00 N 11 30 E	34.900	8.500	26.986	186.0			
CIR-40 07/15/81	70 00 N 13 00 E	34.730	8.500	26.986	282.0			
CIR-41 07/15/81	70 00 N 14 30 E	34.740			174.0			
CIR-43 07/15/81	70 00 N 16 00 E	34.820	9.100	26.961	240.0			
CIR-43 07/15/81	70 00 N 17 30 E	33.980	8.700	26.367	450.0		90.0	
CIR-44 07/15/81	70 30 N 17 30 E	34.360			414.0			
CIR-45 07/15/81	71 00 N 18 00 E	34.630	8.700	26.876	354.0			
CIR-46 07/15/81	71 00 N 19 00 E	34.590			288.0			
CIR-47 07/15/81	71 00 N 21 00 E	34.600			288.0			
CIR-48 07/15/81	71 00 N 23 00 E	34.730			222.0			
CIR-49 07/15/81	71 30 N 24 00 E	34.810	7.700	27.169	204.0			
CIR-50 07/15/81	71 30 N 26 00 E	34.560			276.0			
CIR-51 07/15/81	71 30 N 27 30 E	34.370	7.400	26.867	300.0			

CRUISE-STA DATE	POSITION BOTTOM DEPTH	SALINITY	POT TEMP	DENSITY	CS-137 e	CS-134 e	SR-90 e	H-3 e
CIR-52 07/15/81	71 15 N 20 30 E	34.470			264.0			
CIR-53 07/15/81	71 00 N 30 00 E	34.340	7.000	26.899	288.0		36.0	
CIR-54 07/15/81	71 30 N 30 00 E	34.440			294.0			
CIR-55 07/15/81	72 00 N 30 00 E	34.530	6.600	27.103	252.0			
CIR-56 07/15/81	72 30 N 30 00 E	34.680			210.0			
CIR-57 07/15/81	73 00 N 30 00 E	34.700	5.800	27.341	198.0			
CIR-58 07/15/81	73 30 N 30 00 E	34.900			138.0			
CIR-59 07/15/81	74 00 N 30 00 E	34.940	5.100	27.616	144.0			
CIR-60 07/15/81	74 30 N 30 00 E	34.900			132.0			
CIR-61 07/15/81	75 00 N 30 00 E	33.470	3.100	26.655	114.0		28.8	
CIR-62 07/15/81	75 30 N 30 00 E	33.430			114.0			
CIR-63 07/15/81	76 00 N 30 00 E	32.990	2.100	26.354	114.0			
CIR-64 07/15/81	76 30 N 30 00 E	33.200			114.0			

CRUISE-STA DATE	POSITION BOTTOM DEPTH	SALINITY	POT TEMP	DENSITY	CS-137 e	CS-134 e	SR-90 e	H-3 e
CIR-65 07/15/81	77 00 N 30 00 E	32.510	1.700	25.998	96.0			
CIR-66 07/15/81	76 30 N 27 30 E	33.240			96.0			
CIR-67 07/15/81	76 00 N 25 00 E	33.090	0.480	26.540	78.0			
CIR-68 07/15/81	75 30 N 25 00 E	33.350			102.0			
CIR-69 07/15/81	75 00 N 25 00 E	33.880	3.900	26.905	114.0			
CIR-70 07/15/81	74 30 N 25 00 E	34.250			114.0			
CIR-71 07/15/81	74 00 N 25 00 E	34.560	5.300	27.291	114.0			
CIR-72 07/15/81	73 30 N 25 00 E	34.920			114.0			
CIR-73 07/15/81	73 00 N 25 00 E	34.980	6.600	27.458	120.0			
CIR-74 07/15/81	72 30 N 25 00 E	34.760			186.0			
CIR-75 07/15/81	72 00 N 25 00 E	34.690	7.300	27.133	240.0			
CIR-76 07/15/81	72 00 N 20 00 E	34.980	7.500	27.332	144.0			
CIR-77 07/15/81	72 30 N 20 00 E	35.000			138.0			

CRUISE-STA DATE	POSITION BOTTOM DEPTH	SALINITY	POT TEMP	DENSITY	CS-137 e	CS-134 e	SR-90 e	H-3 e
CIR-78 07/15/81	73 00 N 20 00 E	34.980	6.600	27.458	108.0			
CIR-79 07/15/81	73 30 N 20 00 E	34.930			108.0			
CIR-80 07/15/81	74 00 N 20 00 E	34.820	4.700	27.567	102.0		26.4	
CIR-81 07/15/81	74 30 N 20 00 E	33.600			90.0			
CIR-82 07/15/81	75 00 N 20 00 E	34.140	0.590	27.379	96.0			
CIR-83 07/15/81	75 30 N 20 00 E	34.380			90.0		22.2	
CIR-84 07/15/81	76 00 N 22 30 E	33.970	1.900	27.154	90.0			
CIR-85 07/15/81	76 00 N 20 00 E	34.140			90.0			
CIR-86 07/15/81	76 00 N 17 30 E	32.130						
CIR-87 07/15/81	76 30 N 15 00 E	33.700	2.800	26.865	78.0			
CIR-88 07/15/81	76 00 N 15 00 E	34.140	3.500	27.152	102.0			
CIR-89 07/15/81	75 30 N 15 00 E	34.370			96.0			
CIR-90 07/15/81	75 00 N 15 00 E	34.990	6.700	27.453	120.0			

CRUISE-STA DATE	POSITION BOTTOM DEPTH	SALINITY	POT TEMP	DENSITY	CS-137 e	CS-134 e	SR-90 e	H-3 e
CIR-91 07/15/81	74 30 N 15 00 E	35.020			120.0			
CIR-92 07/15/81	74 00 N 15 00 E	34.930	7.700	27.264	192.0			
CIR-93 07/15/81	73 30 N 15 00 E	35.020			144.0			
CIR-94 07/15/81	73 00 N 15 00 E	34.820	8.000	27.133	234.0			
CIR-95 07/15/81	72 30 N 15 00 E	34.630			306.0			
CIR-96 07/15/81	72 00 N 15 00 E	34.840	8.300	27.103	234.0			
CIR-97 07/15/81	71 30 N 15 00 E	34.680			288.0			
CIR-98 07/15/81	71 00 N 15 00 E	34.730	8.700	26.955	270.0			
CIR-99 07/15/81	71 00 N 10 00 E	35.080	8.300	27.292	132.0			
CIR-100 07/15/81	71 30 N 10 00 E	34.980			162.0			
CIR-101 07/15/81	72 00 N 10 00 E	35.040	8.300	27.260	162.0			
CIR-102 07/15/81	72 30 N 10 00 E	35.000			114.0			
CIR-103 07/15/81	73 00 N 10 00 E	35.080	6.800	27.510	90.0			

CRUISE-STA DATE	POSITION BOTTOM DEPTH	SALINITY	POT TEMP	DENSITY	CS-137 e	CS-134 e	SR-90 e	H-3 e
CIR-104 07/15/81	73 30 N 10 00 E	35.060			96.0			
CIR-105 07/15/81	74 00 N 10 00 E	35.060	6.800	27.494	114.0			
CIR-106 07/15/81	74 30 N 10 00 E	35.010			72.0		31.2	
CIR-107 07/15/81	75 00 N 10 00 E	35.020	5.800	27.594	96.0			
CIR-109 07/15/81	76 00 N 10 00 E	34.920	5.100	27.600	96.0			
CIR-110 07/15/81	76 30 N 10 00 E	34.890			96.0			
CIR-111 07/15/81	77 00 N 10 00 E	34.960	5.800	27.547	108.0			
CIR-112 07/15/81	77 30 N 10 00 E	34.890			138.0			
CIR-113 07/15/81	77 30 N 13 00 E	34.280	4.900	27.116	102.0			
CIR-114 07/15/81	78 00 N 10 00 E	33.330	4.100	26.448	102.0		21.6	
CIR-115 07/15/81	78 00 N 07 30 E	34.700			84.0			
CIR-116 07/15/81	78 00 N 05 00 E	34.920	4.800	27.635	72.0			
CIR-117 07/15/81	78 30 N 05 00 E	34.750			90.0			

CRUISE-STA DATE	POSITION BOTTOM DEPTH	SALINITY	POT TEMP	DENSITY	CS-137 e	CS-134 e	SR-90 e	H-3 e
CIR-118 07/15/81	79 00 N 05 00 E	32.520	1.500	26.020	84.0			
CIR-119 07/15/81	79 00 N 07 30 E	34.760			90.0			
CIR-120 07/15/81	79 00 N 10 00 E	33.630	4.100	26.686	84.0			
CIR-121 07/15/81	79 30 N 10 00 E	34.400	3.800	27.329	90.0			
CIR-122 07/15/81	80 00 N 10 00 E	32.890	0.530	26.376	96.0			
CIR-123 07/15/81	80 00 N 07 30 E	33.300			96.0		22.8	
CIR-124 07/15/81	79 30 N 07 30 N	33.130	4.100	26.289	90.0			
CIR-125 07/15/81	78 30 N 07 30 E	34.470			114.0			
CIR-126 07/15/81	77 30 N 05 00 E	34.800			78.0			
CIR-127 07/15/81	77 00 N 05 00 E	34.890			90.0			
CIR-128 07/15/81	76 30 N 05 00 E	34.960			60.0			
CIR-129 07/15/81	76 00 N 05 00 E	34.850	3.500	27.718	41.4			
CIR-130 07/15/81	75 30 N 05 00 E	35.010			72.0			

CRUISE-STA DATE	POSITION BOTTOM DEPTH	SALINITY	POT TEMP	DENSITY	CS-137 e	CS-134 e	SR-90 e	H-3 e
CIR-131 07/15/81	75 00 N 05 00 E	34.960	5.200	27.620	24.6			
CIR-132 07/15/81	74 30 N 05 00 E	34.660			30.6			
CIR-133 07/15/81	74 00 N 05 00 E	34.610	4.000	27.476	38.4			
CIR-134 07/15/81	73 30 N 05 00 E	34.890			50.4			
CIR-135 07/15/81	73 00 N 05 00 E	34.910	5.000	27.604	57.0			
CIR-136 07/15/81	73 00 N 03 30 E	34.790			46.8			
CIR-137 07/15/81	73 00 N 01 00 E	34.030	4.000	27.015	43.2			
CIR-138 07/15/81	73 00 N 01 30 W	33.400			45.0			
CIR-139 07/15/81	73 00 N 04 00 W	32.340	2.900	25.771	45.6			
CIR-140 07/15/81	73 00 N 07 00 W	31.040	0.500	24.888	45.0			
CIR-141 07/15/81	72 00 N 07 00 W	31.520	1.300	25.230	50.4			
CIR-142 07/15/81	71 00 N 07 00 W	33.390	4.000	26.506	40.8			
CIR-143 07/15/81	70 00 N 10 00 W	34.900			41.4			

CRUISE-STA DATE	POSITION BOTTOM DEPTH	SALINITY	POT TEMP	DENSITY	CS-137 e	CS-134 e	SR-90 e	H-3 e
CIR-144 07/15/81	70 00 N 07 00 W	34.930	5.900	27.510	47.4			
CIR-145 07/15/81	70 00 N 04 00 W	35.100			49.8			
CIR-146 07/15/81	70 00 N 01 00 W	35.100	7.800	27.383	102.0			
CIR-147 07/15/81	70 00 N 02 00 E	35.110			72.0			
CIR-148 07/15/81	70 00 N 05 00 E	34.960	9.200	27.055	174.0			
CIR-149 07/15/81	69 30 N 05 00 E	35.050			132.0			
CIR-150 07/15/81	69 00 N 05 00 E	35.100	9.400	27.132	114.0			
CIR-151 07/15/81	68 30 N 05 00 E	35.150			55.2			
CIR-152 07/15/81	68 00 N 05 00 E	35.090	10.000	27.023	84.0			
CIR-153 07/15/81	67 30 N 05 00 E	35.160			54.0			
CIR-154 07/15/81	67 00 N 05 00 E	34.700	11.000	26.543	186.0			
CIR-155 07/15/81	67 00 N 03 30 E	34.750			168.0			
CIR-156 07/15/81	67 00 N 02 00 E	35.080	11.000	26.838	90.0			

CRUISE-STA DATE	POSITION BOTTOM DEPTH	SALINITY	POT TEMP	DENSITY	CS-137 e	CS-134 e	SR-90 e	H-3 e
CIR-157 07/15/81	67 00 N 00 00	35.130	9.300	27.171	37.8			
CIR-158 07/15/81	67 00 N 02 30 W	35.000			39.6			
CIR-159 07/15/81	67 00 N 05 00 W	35.020			36.6			
CIR-160 07/15/81	67 00 N 07 30 W	34.800	7.300	27.219	30.0			
CIR-162 07/15/81	65 00 N 07 30 W	34.840			27.0			
CIR-163 07/15/81	64 00 N 07 30 W	35.070	8.100	27.314	27.0			
CIR-164 07/15/81	64 00 N 05 00 W	34.970			28.8			
CIR-165 07/15/81	64 00 N 02 30 W	35.200			26.4			
CIR-166 07/15/81	64 00 N 00 00	35.160	12.000	26.714	32.4	4.2	0.4	
CIR-167 07/15/81	63 00 N 00 00	35.270			35.4	2.2	0.2	
CIR-168 07/15/81	62 00 N 00 00	35.190	11.000	26.924	34.2			
CIR-169 07/15/81	61 30 N 00 00	35.310			29.4			
CIR-170 07/15/81	61 00 N 00 00	35.330	12.000	26.846	37.8			

CRUISE-STA DATE	POSITION BOTTOM DEPTH	SALINITY	POT TEMP	DENSITY	CS-137 e	CS-134 e	SR-90 e	H-3 e
CIR-171 07/15/81	61 00 N 01 00 W	35.340	12.000	26.854	31.8			
CIR-172 07/15/81	61 00 N 02 00 W 35 M	35.310	12.000	26.831	24.0			
CIR-173 07/15/81	60 30 N 02 00 W	35.280			108.0			
CIR-174 07/15/81	60 00 N 02 00 W		10.000		114.0			
CIR-43-45C 07/15/81	70-71 N 17-18 E				384.0	2.0	13.1	0.5
CIR-57-60C 07/15/81	73-74.5N 30 00 E				126.0	1.0		
CIR-85-87C 07/15/81	76-76.5N 20-15 E				82.0	1.0		
115-117C 07/15/81	78-78.5N 7.5-5 E				80.0	3.0	2.3	1.0
121-123C 07/15/81	79.5-80N 9.5-7.5E				99.0	1.0	2.1	0.6
172-174C 07/15/81	61-60 N 02 00 W				97.0	3.0	2.6	0.8
CIR-108 07/15/81	75 30 N 10 00 E	34.960			96.0			

SECTION 3

A. Aarkrog
Riso National Laboratory
DK-400 Roskilde
Denmark

1981-1982 Surface data

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RISQSURF

CRUISE-STA DATE	POSITION BOTTOM DEPTH	SALINITY	POT TEMP	DENSITY	CS-137 e	CS-134 e	SR-90 e	H-3 e
1 08/13/82	74 59 N 18 22 W	29.900	1.500		34.0	1.3		59.3
2 08/17/82	74 55 N 13 36 W	29.600	-1.000		41.2	1.2		
3 08/17/82	74 42 N 16 00 W	29.800	-1.000		36.5	1.2		34.7
4 08/20/82	74 29 N 15 52 W	30.200	-1.500		38.3	1.4		22.8
5 08/09/82	74 19 N 20 14 W	30.100	0.500		32.8	1.3		34.7
6 08/08/82	74 00 N 19 49 W	26.900	1.000		31.6	1.1		37.2
7 08/07/82	72 27 N 21 21 W	27.600			34.5	1.2		37.2
8 08/21/82	72 13 N 17 05 W	31.100	1.000		48.5	0.9		18.6
9 08/07/82	70 35 N 21 16 W	31.200	-0.300		31.3	0.9		37.2
10 08/24/82	70 22 N 21 53 W	28.400	-0.500		31.0	1.3		
11 08/05/82	70 02 N 21 08 W	29.400	2.000		33.4	1.3		27.9
12 08/25/82	69 53 N 20 03 W	30.400	1.000		36.4	1.3		25.4

CRUISE-STA DATE	POSITION BOTTOM DEPTH	SALINITY	POT TEMP	DENSITY	CS-137 e	CS-134 e	SR-90 e	H-3 e
13 08/06/82	68 52 N 55 16 W	33.000	5.600		31.9 2.0		25.0 0.7	16.9
14 08/07/82	68 49 N 58 12 W	31.400	3.200		27.8 2.1		25.8 0.8	15.7
15 08/04/82	68 25 N 55 29 W	32.000	6.600		35.1 1.9			9.3
16 08/04/82	68 25 N 15 10 W	34.500	5.500		30.2 0.7			12.7
17 08/05/82	68 21 N 57 32 W	32.600	3.800		29.4 2.1			11.8
18 08/04/82	68 18 N 57 13 W	32.600	5.200		29.7 2.3			12.7
19 08/05/82	68 12 N 56 26 W	32.200	4.800		26.9 2.6			12.7
20 08/26/82	67 27 N 14 34 W	34.400	7.000		24.1 1.1			
21 08/26/82	65 25 N 10 06 W	34.500	7.000		26.2 0.8			
22 02/27/82	65 10 N 37 13 W	35.200			17.5 2.1		11.9	
23 02/24/82	65 03 N 27 07 W	35.300			16.7 2.2		12.9	
24 08/03/82	64 38 N 07 29 W	34.700	9.000		18.5 0.7			12.7
25 02/27/82	64 31 N 35 58 W	34.900			23.2 1.9		14.8	

CRUISE-STA DATE	POSITION BOTTOM DEPTH	SALINITY	POT TEMP	DENSITY	CS-137 e	CS-134 e	SR-90 e	H-3 e
26 07/20/82	64 02 N 52 13 W	32.500	7.800		37.7 2.0		25.3 0.5	14.4
27 02/20/82	63 27 N 31 32 W	35.400			21.4 3.3		11.9	18.6
28 07/20/82	63 11 N 52 17 W	32.400	1.800		40.8 2.2			9.3
29 08/20/82	62 49 N 52 23 W	32.700	1.700		38.3 3.4			15.7
30 08/27/82	62 38 N 03 60 W	35.100	10.000		19.7 1.0			11.9
31 07/20/82	62 04 N 52 36 W	33.000	5.100		34.7 3.2			9.3
32 04/00/82	62 00 N 06 18 W	34.900			20.9 2.1		15.7	
33 09/00/82	62 00 N 06 18 W	35.000			18.7 2.2		20.8	
34 08/02/82	61 32 N 00 39 W	35.300	13.000		64.6 1.4	2.5 0.6		31.3
35 02/19/82	60 47 N 05 37 W	35.400			24.7 2.1		13.3	29.6
36 02/27/82	61 19 N 38 08 W	35.400			16.1 1.9		11.3	
37 02/19/82	61 13 N 07 23 W	35.400			22.1 3.3		13.6	26.2
38 06/14/82	60 48 N 00 49 W				184.5 3.7	6.8 1.5		

CRUISE-STA DATE	POSITION BOTTOM DEPTH	SALINITY	POT TEMP	DENSITY	CS-137 e	CS-134 e	SR-90 e	H-3 e
39 08/27/82	60 39 N 00 05 W	35.200	12.000		155.3	2.2		22.0
40 08/14/82	60 25 N 14 50 W	35.100	13.800		21.7	2.4	15.2	0.5 12.7
41 07/17/82	60 17 N 31 02 W	34.800	14.900		24.7	2.1		12.7
42 02/19/82	60 14 N 03 28 W	35.600			43.4	2.3	18.9	
43 07/19/82	60 09 N 49 29 W	33.600	5.400		23.3	2.2	16.1	0.5 7.6
44 07/18/82	60 09 N 32 53 W	35.000	11.000		26.0	2.2		12.7
45 07/18/82	59 52 N 35 30 W	34.500	10.900		22.6	2.5		7.6
46 07/18/82	59 29 N 38 26 W	34.400	10.000		19.0	1.7		5.9
47 07/18/82	59 12 N 40 11 W	34.400	8.600		19.7	1.9	16.2	0.5 5.9
48 07/19/82	58 42 N 42 01 W	34.500	7.200		16.9	2.0	15.6	0.9 7.6
49 07/19/82	58 22 N 44 06 W	34.500	8.100		20.9	2.3	13.4	0.5 4.7
50 08/13/82	60 09 N 25 22 W	34.800	12.400		18.7	2.1	14.8	0.3 11.0
51 10/00/82	65 36 N 37 41 W	28.800			38.4		33.1	0.7 14.4

CRUISE-STA DATE	POSITION BOTTOM DEPTH	SALINITY	POT TEMP	DENSITY	CS-137 e	CS-134 e	SR-90 e	H-3 e
52 08/04/82	68 48 N 15 59 W	30.600	1.000		46.2	0.9	20.3	14.4
53 08/04/82	69 05 N 17 01 W	30.300	0.500		45.6	1.4	24.5	14.4
54 08/05/82	69 21 N 18 02 W	30.200	0.500		41.4	2.1	37.6	30.5
55 08/05/82	69 40 N 19 09 W	30.300	1.000		40.2	1.2	42.9	29.6
56 08/05/82	68 04 N 15 59 W	34.300	5.000		35.1		21.1	15.7
57 08/05/82	69 53 N 20 02 W	30.400	1.000		35.8			33.0
58 08/25/82	68 45 N 18 05 W	31.300	1.500		45.3			11.9
59 08/26/82	66 16 N 12 03 W	34.200	7.000		27.5			14.4
60 08/26/82	64 31 N 08 04 W	34.600	7.500		24.2			9.3
61 08/27/82	63 41 N 06 13 W	34.600	9.000		20.6			4.2
62 08/27/82	61 34 N 01 40 W	34.900	12.000		21.0			
63 11/00/82	76 50 N 18 29 W	29.300			36.6			37.2
61 06/13/81	60 45 N 04 41 E	31.740			546.0	5.0	21.0	2.0

CRUISE-STA DATE	POSITION BOTTOM DEPTH	SALINITY	POT TEMP	DENSITY	CS-137 e	CS-134 e	SR-90 e	H-3 e
S2 06/13/81	61 06 N 02 40 E	34.750			342.0 3.0	17.0 2.0		
S3 06/13/81	61 19 N 00 45 E	35.210			32.0 2.0			
S4 06/14/81	61 30 N 01 22 W	35.210			23.0 2.0			
S5 06/14/81	61 40 N 03 23 W	35.210			25.0 2.0			
S6 06/14/81	61 51 N 05 28 W	35.210			21.0 2.0			
F7-9 06/14/81	62 02 N 06 45 W	33.540			21.0 1.0			
I22-24 06/19/81	63 50 N 22 27 W	32.360			17.0 1.0			
I 27 35 36 06/22/81	66 07 N 23 06 W	34.100			18.0 1.0			
I 37/I 38 06/24/81	66 09 N 18 55 W	32.550			19.0 1.0			
I 48/I 49 06/26/81	66 28 N 15 55 W	31.210			19.0 1.0			
I 53/I 54 06/28/81	65 10 N 13 43 W	28.580			19.0 1.0			
S58 07/01/81	63 43 N 09 52 W	35.210			20.0 2.0			
S59 07/01/81	62 53 N 08 00 W	34.970			19.0 2.0			

CRUISE-STA DATE	POSITION BOTTOM DEPTH	SALINITY	POT TEMP	DENSITY	CS-137 e	CS-134 e	SR-90 e	H-3 e
S60 07/01/81	61 59 N 06 02 W	34.960			20.0 2.0			
S61 07/02/81	61 44 N 03 47 W	35.090			24.0 2.0			
S62 07/02/81	61 30 N 01 31 W	35.090			23.0 2.0			
S63 07/02/81	61 20 N 00 42 E	35.090			34.0 2.0			
S64 07/02/81	61 00 N 02 55 E	33.410			300.0 3.0	17.0 2.0		
S65 07/02/81	60 45 N 04 36 E	31.740			498.0 5.0	20.0 1.0		

SECTION 4

H. Kautsky
Deutsches Hydrographisches Institut
Hamburg
Federal Republic of Germany

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CRUISE-STATION POSITION COLLECTION DATE BOTTOM DEPTH

ME61-284 65 0.2 N 05/23/82 3120 M
2 0.2 W

DEPTH SALINITY POT. T DENSITY CS-137 SR-90 CS/SR H-3 CS/H-3
e e e e e

0	35.090	6.434	27.567	29.4
50	35.086	5.023	27.741	27.0
100	35.057	4.430	27.785	36.0
250	34.940	2.186	27.908	28.8
500	34.896	0.242	28.009	17.4
750	34.911	-0.309	28.050	12.6
1000	34.915	-0.585	28.067	7.8
1250	34.914	-0.780	28.074	4.8
1500	34.913	-0.907	28.079	3.0
2000	34.911	-1.019	28.082	1.2
2500	34.910	-1.052	28.083	1.2
3000	34.911	-1.055	28.083	2.4

CRUISE-STATION	POSITION			COLLECTION DATE	BOTTOM DEPTH
ME61-320	69	44.7	N	05/29/82	1770 M
	11	59.8	W		

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
				e	e	e	e	e
6	34.517	-0.139	27.723	38.4				
50	34.730	-0.703	27.922	34.8				
100	34.862	0.205	27.984	36.0				
250	34.875	-0.001	28.005	29.4				
500	34.898	-0.345	28.042	14.4				
750	34.907	-0.622	28.062	9.0				
1000	34.912	-0.767	28.072	7.3				
1250	34.911	-0.878	28.076	5.4				
1500	34.911	-0.945	28.079	4.2				
1745	34.910	-0.976	28.080	3.6				

CRUISE-STATION	POSITION			COLLECTION DATE	BOTTOM DEPTH
ME61-339	71	54.3	N	06/01/82	1030 M
	4	13.1	W		

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
				e	e	e	e	e
0	33.871	-0.680	27.226	44.4				
50	34.639	-1.634	27.883	47.4				
100	34.785	-0.555	27.960	49.8				
250	34.880	0.110	28.003	31.8				
500	34.887	-0.477	28.039	16.2				
750	34.904	-0.800	28.067	11.4				
1027	34.903	-0.858	28.069	10.2				

CRUISE-STATION	POSITION			COLLECTION DATE	BOTTOM DEPTH
ME61-364	74	57.6	N	06/05/82	2160 M
	11	44.3	W		

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
				e	e	e	e	e
0	34.134	-0.714	27.440	53.4				
50	34.758	-0.225	27.922	45.6				
100	34.846	-0.336	27.999	38.4				
250	34.880	-0.236	28.022	39.6				
500	34.888	-0.547	28.043	23.4				
750				10.2				
1000	34.914	-0.740	28.073	7.2				
1250	34.915	-0.858	28.079	6.0				
1500	34.913	-0.936	28.080	5.4				
2134	34.900	-1.188	28.080	4.9				

CRUISE-STATION	POSITION			COLLECTION DATE	BOTTOM DEPTH
ME61-403	73	18.2	N	06/09/82	1074 M
	14	6.9	E		

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
				e	e	e	e	e
0				168.0				
50				150.0				
100				114.0				
250				72.0				
500				49.2				
750				7.8				
1000				4.2				

CRUISE-STATION	POSITION			COLLECTION DATE	BOTTOM DEPTH
ME61-430	75	52.1	N	06/18/82	2170 M
	7	50.1	W		

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
				e	e	e	e	e
7	34.067	0.313	27.336	56.4				
50	34.764	0.500	27.887	52.8				
100	34.909	0.919	27.978	53.4				
250	34.909	0.345	28.013	41.4				
500	34.904	-0.167	28.038	12.6				
750				12.6				
1000	34.912	-0.662	28.068	6.4				
1250	34.911	-0.823	28.074	4.2				
1500	34.911	-0.922	28.078	6.0				
2161	34.901	-1.167	28.080	4.8				

CRUISE-STATION	POSITION			COLLECTION DATE	BOTTOM DEPTH
ME61-436	77	45.0	N	06/20/82	2725 M
	4	4.5	W		

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
				e	e	e	e	e
5	34.211	0.202	27.458	57.6				
50	34.674	0.279	27.828	46.8				
100	34.976	1.880	27.962	57.0				
250	34.951	1.198	27.993	34.8				
500	34.891	0.092	28.013	28.8				
750	34.892	-0.652	28.051	17.4				
1000	34.909	-0.696	28.067	9.0				
1250	34.917	-0.760	28.076	9.6				
1500	34.919	-0.837	28.081	7.2				
2000	34.916	-0.961	28.084	5.4				
2704	34.896	-1.222	28.078	4.2				

CRUISE-STATION	POSITION			COLLECTION DATE	BOTTOM DEPTH
ME61-444	77	41.5	N	06/22/82	525 M
	10	30.0	E		

DEPTH	SALINITY	POT. T	DENSITY	CS-137	SR-90	CS/SR	H-3	CS/H-3
				e	e	e	e	e
0	33.542	1.106	26.866	78.0				
50	35.069	4.804	27.753	78.0				
100	35.083	4.376	27.812	72.0				
250	35.048	3.281	27.897	66.0				
500	34.972	1.824	27.963	72.0				

METEOR61

CRUISE-STA DATE	POSITION BOTTOM DEPTH	SALINITY	POT TEMP	DENSITY	CS-137 e	CS-134 e	SR-90 e	H-3 e
M61-282 05/22/82	62 24.0 N 01 05.0 W 1560 M				18.6			
M61-283 05/22/82	64 00.0 N 01 41.0 W 2745 M				24.6			
M61-284 05/23/82	65 00.2 N 02 00.2 W 3120 M	35.090	6.434	27.567	29.4			
M61-286 05/24/82	67 16.0 N 00 00 3630 M				34.8			
M61-292C 05/25/82	68 55.0 N 01 17.0 E 3035 M				42.7	2.3	0.3	0.9
M61-296C 05/26/82	68 28.0 N 01 23.0 W 2820 M				42.9	2.5	0.5	1.0
M61-293 05/25/82	68 37.0 N 00 00 2450 M	35.168	5.979	27.688	42.0			
M61-304C 05/28/82	69 27.0 N 04 32.0 W 3525 M				38.9	3.7	0.8	1.1
M61-320 05/29/82	69 44.7 N 11 59.0 W 1770 M	34.517	-0.139	27.723	38.4			
M61-339 06/01/82	71 54.3 N 04 13.1 W 1030 M	33.871	-0.680	27.226	44.4			
M61-343 06/02/82	71 15.0 N 00 00.0 1995 M	35.126	4.496	27.833	55.2			
M61-349 06/03/82	72 20.0 N 00 14.0 E 1955 M				48.6			

CRUISE-STA DATE	POSITION BOTTOM DEPTH	SALINITY	POT TEMP	DENSITY	CS-137 e	CS-134 e	SR-90 e	H-3 e
M61-350C 06/03/82	72 12.0 N 00 56.0 W 2770 M				59.7	4.7	1.0	1.3
M61-364 06/05/82	74 57.6 N 11 44.3 N 2160 M	34.134	-0.714	27.440	53.4			
M61-386 06/07/82	73 37.7 N 00 00.0 3200 M				38.4			
M61-393C 06/08/82	72 32.0 N 07 03.0 E 2686 M				65.8	2.1	1.0	1.0
M61-403 06/09/82	73 18.2 N 14 06.9 E 1074 M				168.0			
M61-407 06/10/82	72 30.0 N 20 00.0 E 385 M				114.0			
M61-424 06/17/82	74 50.0 N 00 00.0 3775 M				30.6			
M61-428C 06/18/82	75 37.0 N 06 10.0 N 3400 M				52.9	4.0	0.9	1.3
M61-430 06/18/82	75 52.1 N 07 50.1 W 2170 M	34.067	0.313	27.336	56.4			
M61-436 06/20/82	77 45.0 N 04 04.5 W 2725 M	34.211	0.202	27.458	57.6			
M61-438 06/20/82	77 32.5 N 00 00.0 3170 M				47.4			
M61-444 06/22/82	77 41.5 N 10 30.0 E 525 M	33.542	1.106	26.866	78.0			
M61-451 06/23/82	79 34.0 N 05 57.0 E 1824 M				84.0			

CRUISE-STA	POSITION	SALINITY	POT	DENSITY	CS-137	CS-134	SR-90	H-3
DATE	BOTTOM DEPTH		TEMP		e	e	e	e
M61-453	79 39.0 N				78.0			
06/24/82	10 00.1 E							
	135 M							

SECTION 5

Surface Distribution and Vertical Profiles of ^{137}Cs

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9	^{137}Cs vertical profiles in Iceland Sea	100
10	^{137}Cs vertical profiles in Northern Irminger Sea	101

SURFACE ^{137}Cs (d.p.m./100kg) 1981-82

FIGURE 1

FIGURE 2

FIGURE 3

NORWEGIAN SEA

FIGURE 4

WESTERN BARENTS SEA SLOPE

FIGURE 5

EASTERN FRAM STRAIT

FIGURE 6

WESTERN GREENLAND SEA

FIGURE 7

CENTRAL GREENLAND SEA

FIGURE 8

FIGURE 9

NORTHERN IRMINGER SEA

FIGURE 10