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FRV 'Scotia'

Cruise 4/86

REPORT

15 April - 8 May 1986 Part 1: 15-17 April
Part 2: 18-30 April
Part 3: 1-8 May

Personnel:

Part 1	A D McIntosh	HSO (in charge)
	D C Moore	HSO
	R D Adams	SO
	G Slesser	SO
	J McKie	SO
Part 2	J H A Martin	PSO (in charge)
	E W Henderson	SSO
	N T Nicoll	HSO
	R Payne	HSO
	R D Adams	SO
	G Slesser	SO
	J McKie	SO
	N McDougal	SMBA (part-time)
	C Burton	NCC
Part 3	A D McIntosh	HSO (in charge)
	A D Hawkins	DCSO
	D M Finlayson	SSO
	D C Moore	HSO
	G Slesser	SO
	T Archibald	Snr. Storeman
	P R Mackie	TRS
	M Leaver	Student
	C Francis (Miss)	Student

Fishing gear: Aberdeen 48' trawl (BT101)

Objectives:

Part 1 15-17 April

1. To perform benthic sampling south of Arran and in the Solway Firth.
2. To conduct hydrographic, hydrochemical and hydrocarbon surveys in conjunction with objective 1.
3. To obtain sediment samples from the proposed Faslane dump site.

Part 2 18-30 April

1. To work the Faroe-Shetland channel section and lay 2 mooring systems.
2. To retrieve 2 current meter moorings at Sule Skerry, refurbish and relay and do associated hydrography.

3. To retrieve 6 current meter moorings in the Clyde, refurbish and relay.
4. To do a hydrochemical survey of the Clyde Basin.
5. To collect radio-caesium samples.

Part 3 1-8 May

1. To assess the impact that oil exploration and production has had on the east Shetland Basin and specifically to ascertain whether the whole area is contaminated or if the effects are localised around individual platforms.
2. Biological monitoring of natural populations of infauna and fish species from the east Shetland Basin and areas outwith the influence of oil related activity to investigate any genetic damage as a result of such activity.
3. Hydrographic measurements in the east Shetland Basin.
4. Some sediment sampling at Beryl for hydrocarbon analysis and collection of Nephtys.
5. Collection of water for radio-caesium analysis.

Narrative: Part 1

"Scotia" departed from Greenock at 1600 hrs on 15 April, adverse weather and refit completion work preventing an earlier departure, and from 1700 - 2230 hrs sediment sampling on the proposed Faslane dump site was undertaken. Overnight, and while making passage south, water samples for chemical analysis were taken at regular intervals from Irvine Bay to the Solway Firth. Sediment sampling in the Solway Firth commenced at 1100 hrs on 16 April and was completed by 0030 hrs on the 17th when "Scotia" headed back up the Clyde towards Arran, water sampling for chemical analysis again being done overnight and while making passage. Sediment sampling south of Arran was completed by 1230 hrs when "Scotia" then headed for Greenock, docking at 1630 hrs, when loading for Part 2 was completed ready for sailing on the tide on the 18th.

Part 2

"Scotia" sailed from Greenock at 1700 hrs on 18 April. Hydrographic work commenced immediately and continued until midnight 21-22 April. During this time five current meter moorings were uplifted, serviced and replaced and a hydrochemical survey of the Clyde Basin carried out.

On the completion of this work "Scotia" sailed northward and hydrographic work commenced at the northern end of the Minch early evening of 22 April. A mooring was uplifted and serviced. It was replaced and a new mooring was relocated further north to replace the one that had been lost.

The Faroe-Shetland Channel section was worked with further stations occupied west of Orkney before the Jonsis Line was worked prior to the "Scotia" returning to Aberdeen on the morning of 30 April.

Part 3

"Scotia" departed from Aberdeen at 1030 hrs on 1 May and headed for the east Shetland Basin oil fields. A one hour trawl was taken north of the Little Halibut Bank to provide samples of fish from outwith the influence of oil

related activties. By 0330 hrs on 2 May "Scotia" was on station 100 km south-west of the Alwyn field and sampling by grab for sediments got underway, working a line of stations approaching the oil fields at 10 km intervals. A one hour trawl was taken at the 'Holes' ground.

From mid day on 2 May until the morning of 6 May, "Scotia" worked stations at approximately 2 km intervals that followed a track around the major components of the east Shetland Basin, covering Alwyn to the south, Brent to the east, Magnus to the north and Cormorant to the west. A more intensive sampling was undertaken in areas close to fixed installations. This included grabing and coring for sediments at 500 and 200 m from the oil platforms on two axes, water sampling and macro-faunal collections. Hydrographic measurements were made at approximately 10 km intervals along the track.

Trawling for commercial fish species was undertaken in the vicinity of the Thistle field.

On the night of 4 May, following a heavy shower of rain, a check was made of the decks and personnel, using a portable geiger counter, for evidence of increased levels of background radiation in the light of the Chernobyl accident. Enhanced levels were recorded on deck and all personnel on board were monitored as a precaution. The recorded levels, although elevated above background, were not considered to be injurious to health and were in keeping with levels recorded on structures elsewhere in the North Sea. An entry to this effect was recorded in the ship's log by the OIC. Samples of rain water taken back to the Laboratory for checking by liquid scintillation were found to contain very little activity suggesting that the isotope detected on board "Scotia" was of a short lived nature.

From mid day on 6 May until 1100 hrs on 7 May "Scotia" worked at the Beryl field collecting samples of sediment by grab and core and two further trawls were taken. "Scotia" then headed for Aberdeen, docking at 0630 hrs on the morning of 8 May.

Results:

During Part 1, 13 stations were occupied on the proposed Faslane dump site to provide sediment samples for background asbestos levels. These samples will be analysed commercially. The Solway Firth and the south of Arran sampling provided 29 sediments that will be analysed for hydrocarbon concentrations to provide background levels prior to further oil related activity in these areas.

Part 2

Caesium samples were collected at the standard positions, fulfilling the sampling requirements for both Parts 2 and 3. The current meters placed in the Clyde in January all functioned satisfactorily and gave unexpected results. The currents to the east of Ailsa Craig appear to be in phase with but directionally opposite to the current immediately west of the island but this will be subject to closer analysis when all the results are available. The loss of a mooring off Sule Skerry made the interpretation of the data from the other moorings difficult particularly as there is evidence of a shift in the axis of the Fair Isle current.

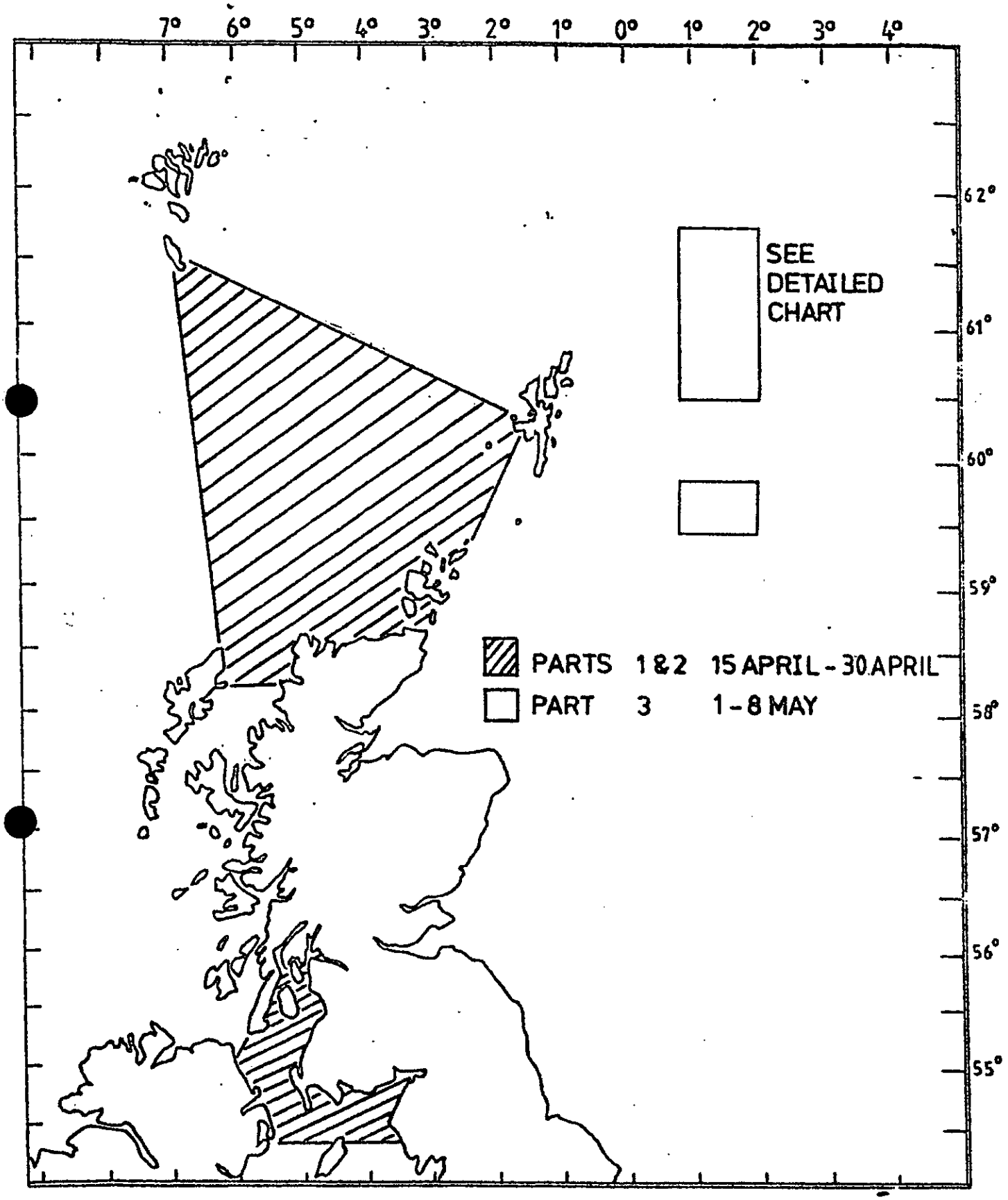
Atlantic water in the Faroe-Shetland Channel was of average temperature but rather less saline than normal with a mean salinity of 35.34‰.

Part 3 of this cruise provided over 250 sediment samples, from 108 stations occupied in the east Shetland Basin, which, having been kept frozen and returned to the Laboratory, will await analysis for 'total' hydrocarbons and selected further analysis by gas chromatography. At over 50 stations sediments were incubated with ^{14}C substrates, (1-^{14}C naphthalene and ^{14}C (U) amino acid) to provide information on the indigenous microbial population's capacity to mineralise hydrocarbons. The continued analysis will be completed in Aberdeen. Twenty-two samples of mid and surface seawater were collected and extracted by closed loop stripping and will be analysed by gas chromatography for low molecular weight hydrocarbons. Five demersal trawls were taken to provide samples of different commercial fish species for evidence of hydrocarbons contamination. The analyses will involve assessment of taint by taste panel and chemical analyses of tissues. From 13 stations a total of 91 seawater samples will provide hydrographic data as temperature, salinity and depth covering the cruise track in the east Shetland Basin.

Too few Nephtys were collected to allow investigation into any genetic damage caused by oil related activity.

Seen in draft: W Findlay

A D McIntosh
J H A Martin
26 June 1986



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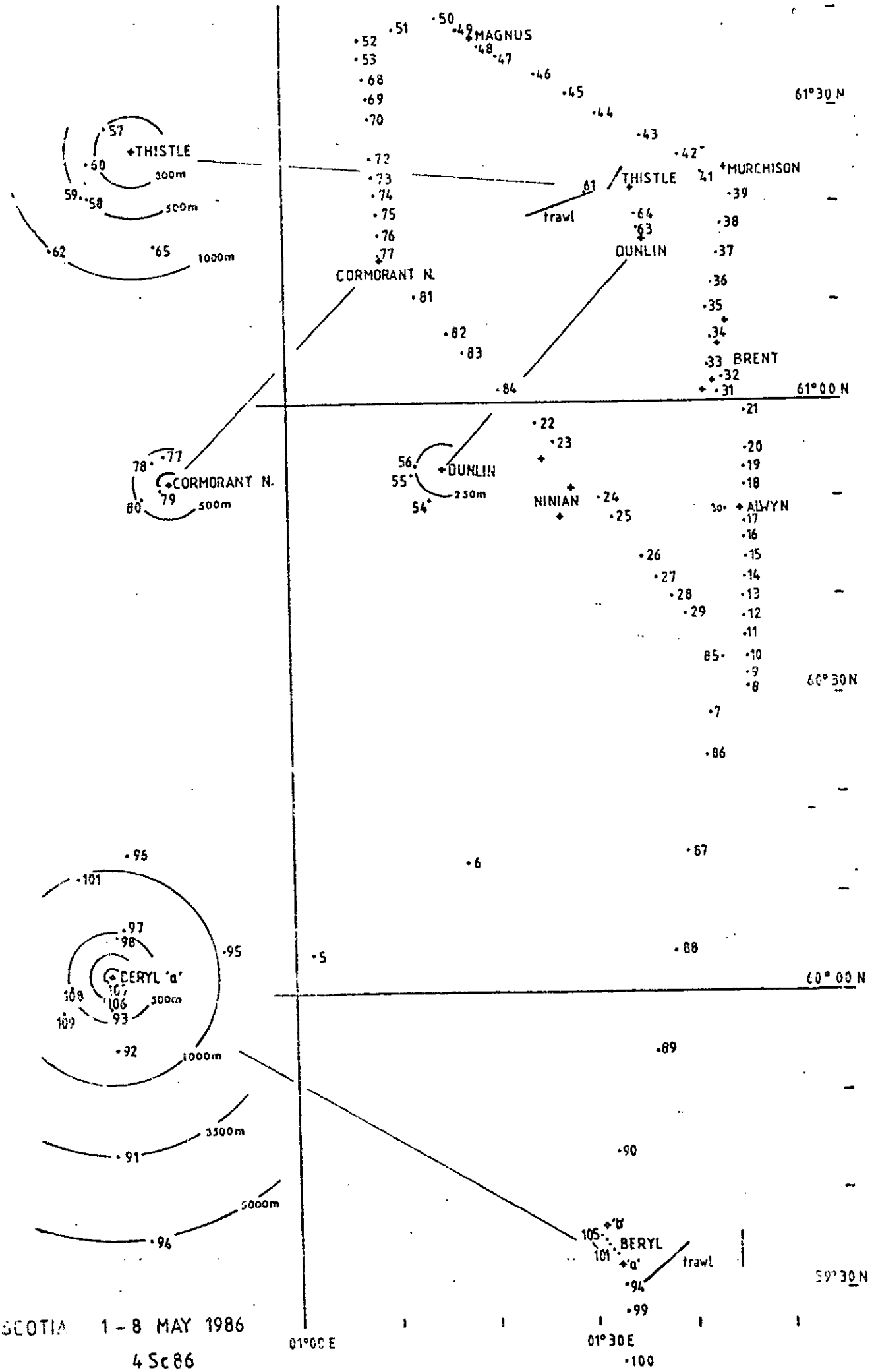

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