

MINISTRY OF AGRICULTURE, FISHERIES AND FOOD
FISHERIES LABORATORY, LOWESTOFT, SUFFOLK, ENGLAND

1973 RESEARCH VESSEL PROGRAMME

REPORT: RV CORELLA: CRUISE 11/73

(PROVISIONAL: Not to be quoted without prior reference to the author)

STAFF

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DURATION

Left Lowestoft 0530 h, 10 July

Arrived Lowestoft 0530 h, 26 July

All times are Greenwich Mean Time

LOCALITY

Irish Sea and British Isles Coastal Waters

AIMS

1. To continue the examination of the budget of artificial radionuclides in the Irish Sea.
2. To collect seawater samples from selected stations in the Irish Sea for trace element analyses.
3. To collect seawater samples in British Isles coastal waters to determine caesium-134 and caesium-137 concentrations.
4. To collect seawater samples from coastal areas of northern Scotland on behalf of Dr Kautsky (DHI) for North Sea radiocaesium studies.
5. To collect seawater samples from 16 stations in the Firth of Clyde and approaches for Dr G Topping (DAFS) for trace element budget studies.

NARRATIVE

RV CORELLA sailed on the morning tide of 10 July and proceeded south about to the Irish Sea (the cruise track is shown on the attached chart) collecting seawater samples at 24 stations en route. 50 litre samples were taken from surface water at all stations and at selected stations at depth. The samples were filtered through 0.22 μ m membrane filters and the filtrate passed through ammonium dodeca-molybdophosphate (AMP) ion exchange columns for the selective extraction of the caesium radioisotopes. The sampling programme of a grid of 67 stations in the Irish Sea commenced at 2240 h on 13 July on a line from Fishguard to Rosslare. 25 litre seawater samples were taken from surface, midwater and bottom, filtered, and passed through potassium cobalti-hexacyanoferrate (KCFC) ion exchange columns on board for the later examination of caesium-137 and caesium-134 concentrations. Additional 25 litre seawater samples from the surface layer were taken from 45 stations from

53°25'N to 54°45'N, filtered and acidified for later separations of ^{95}Zr + ^{95}Nb , ^{106}Ru and ^{144}Ce . One litre samples were also taken for ^3H determinations. At selected stations additional 25 litre samples were taken for the determination of the ^{90}Sr and ^{239}Pu content. At all stations east of the Isle of Man and within a radius of 50 miles of the BNFL reprocessing plant at Windscale, Cumberland an attempt was made to obtain core or grab samples of the seabed for later examination of the radioactivity content by gamma and alpha spectrometry.

Samples of flesh from plaice, thornback ray and mackerel were retained, for radioactivity analyses, from a haul made in the near vicinity of the discharge outlet at Windscale.

Surface water samples were collected at 62 stations in the Irish Sea and at selected stations with depth, filtered through a $0.22\ \mu\text{m}$ membrane filter and the filtrate and filter papers retained for the determination of stable trace elements, e.g. Zn, Mn, Cd, Ni, Ca, Co, Hg, Pb.

The Irish Sea programme was completed at 1505 h on 18 July. A short break had to be made on 17 July to allow the Whitehaven pilot boat to be used for the transfer and return of a crew member who had to attend the Whitehaven and West Cumberland Hospital for surgical treatment. En route to the Clyde, with the aid of the coastguard at Portpatrick, the Mate was landed for return to Lowestoft because of a family bereavement.

A programme of water sampling at 16 stations in the North Channel and in the Clyde, on behalf of DAFS Aberdeen, for similar trace element analysis as in the Irish Sea was completed between 1640 h 18 July and 0940 h on 19 July. The filtrates will be analysed by FRL Lowestoft and the particulate fraction by Dr G Topping (DAFS Aberdeen). At selected stations in the Clyde water samples were retained for ^{137}Cs and ^{134}Cs determinations.

CORELLA then sailed from the North Channel to Stornoway collecting more water samples at 17 stations for the examination of the distribution of ^{137}Cs derived from Windscale, outside the confines of the Irish Sea. CORELLA docked at Stornoway at 1630 h, 21 July to take on water and stores and sailed at 0730 h, 22 July en route to Lowestoft. The water sampling programme was continued off the north coast of Scotland for the examination of the ^{137}Cs distribution from Windscale and to attempt to examine the contribution of UKAEA Dounreay to the concentration of ^{137}Cs off the northern coasts of Scotland. The programme proceeded according to plan until CORELLA entered the North Sea via the Pentland Firth and worked station 122 at $58^{\circ}30'\text{N}$ $03^{\circ}00'\text{W}$. The intercooler on the starboard engine then developed a leak and the engine had to be shut down for the remainder of the cruise.

The proposed programme of water sampling still required 570 miles of steaming to Lowestoft and so the decision was taken to abandon 6 stations including those north of the Pentland Firth, off the east coast of Orkney, and work a modified grid of 450 miles of steaming back to Lowestoft.

CORELLA docked at Lowestoft at 0530 h on 26 July.

RESULTS

All the main aims of the cruise were completed except that a reduction had to be made to the programme to examine the input of ^{137}Cs into the North Sea in the Pentland Firth/Orkneys area.

A 30 unit ion exchange column system was worked satisfactorily.

The FRL modified millipore filtering apparatus also worked very well and speeded up the normal filtering procedure.

Two Niskin 30 litre sampling bottles were tested satisfactorily.

D F Jefferies
22 August 1973

SEEN IN DRAFT: J Balfour

INITIALLED: AJL

DISTRIBUTION:

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