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

1974 RESEARCH VESSEL PROGRAMME

REPORT: R V CIROLANA: CRUISE 6b/74

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

STAFF:

D F Jefferies
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DURATION:

Left Stornoway 0830 h 17 July
Arrived Grimsby 1430 h 30 July

All times are Greenwich Mean Time

LOCALITY:

North-east Atlantic, Scottish coastal waters, Irish Sea, Celtic Sea, Bristol Channel and English Channel.

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 and the north-east Atlantic for radiocaesium and trace element analyses.

4 To collect core samples of the seabed in deep mud areas of the Bristol Channel for examination of the distribution of ^{137}Cs and ^{210}Pb with depth from the surface layers.

NARRATIVE

CIROLANA sailed from Stornoway 17 July and commenced work in the Minch, sampling seawater for ^{137}Cs and trace element analyses. For ^{137}Cs analyses, 50 litre samples were taken from surface and bottom water. The latter samples were obtained with 30 litre Niskin bottles. The samples were filtered through 0.22 µm membrane filters and the filtrate was passed through ion exchange columns containing ammonium dodecamolydo phosphate (AMP) on silica gel. 5 litre samples for trace element analyses were obtained by bucket from surface water and by Niskin bottle at depth. All samples were filtered on board and the third litre was processed by passing it through a special ion exchange cartridge for the selective extraction of Hg and return to the laboratory for analysis. The fourth and fifth litres were retained on board, deep frozen, for the subsequent analysis ashore for Zn, Mn, Cu, Ni, Cd and Pb.

Work continued on a grid of 28 stations (chart appended) from the Pentland Firth to a position at the northern end of the North Channel of the Irish Sea. At 2200h 19 July freshening winds and a severe gale forecast caused a temporary abandonment of the programme while CIROLANA sheltered in Red Bay, Northern Ireland. The opportunity was taken, while at anchor, to rig up and test a Reineck box corer on loan from IOS Taunton. Good cores were obtained from a sand bottom and samples were retained by pushing 4" diameter PVC pipe into the sample box and deep freezing immediately after collection.

With an improvement in the weather, work was resumed in the Irish Sea at 1500 h 20 July. In addition to the collection of water samples, seabed samples were obtained, wherever possible, by box corer or grab, from a grid of 62 stations. Trace metal sampling was as for the early part of the cruise, but 25 litre samples were passed through potassium cobalt hexacyanoferrate (KCFC) ion exchange columns for the selective extraction of ^{137}Cs and ^{134}Cs. Additional samples were also retained at selected stations for ^{90}Sr, Pu, $^{95}Zr/^{95}Nb$, ^{144}Ce, ^{106}Ru and ^{3}H analyses. The opportunity was also taken to test a method for the selective extraction of $^{95}Zr/^{95}Nb$ and ^{144}Ce by ion exchange.

A recording was made of the total gamma count rate from seawater within 20 miles from BNFL Windscale. The water was passed continuously over an NaI crystal coupled to a gamma spectrometer. The trace showed that the maximal count rate was 10 x background and was to be found at a position some 10 miles south of Windscale. A short time period gamma scan showed that most of the gamma activity present was ^{137}Cs and $^{95}Zr/^{95}Nb$.

Samples of seabed obtained by the Reineck box corer at 20 stations, including 8 hard sand areas, were immediately deep frozen but were sectioned on board at a later stage of the cruise.

Work in the Irish Sea was completed by 2230 h 24 July and a further 12 stations were worked in the Celtic Sea, out to 11°., for ^{137}Cs and trace element determination. Afterwards CIROLANA worked a grid of 7 stations in the Bristol Channel. Attempts were made, using a gravity corer on loan from IOS Taunton, to obtain depth samples of mud in three areas. In two areas attempts had limited success; although 1000 lb weight of lead was used, the maximal depth of core obtained was 80 cm. The third area chosen proved to be hard bed rock. CIROLANA then sailed for Grimsby, sampling seawater en route in the English Channel and North Sea, and docked at 1430 h 30 July 1974.

RESULTS

All the aims of the cruise were completed. The opportunity was also taken to collect seawater in the Bristol Channel for trace element analyses, especially Cd.

The 30 unit ion exchange column system was worked satisfactorily. The onboard processing of seawater samples through ion exchange columns for Hg analyses also proved satisfactory.

Core-sectioning on board has considerably reduced the effort required in processing cruise samples ashore.

D F Jefferies
13.8.74

SEEN IN DRAFT: T H F (Master)
G W A (Fishing Skipper)

INITIALLED: A J L

DISTRIBUTION

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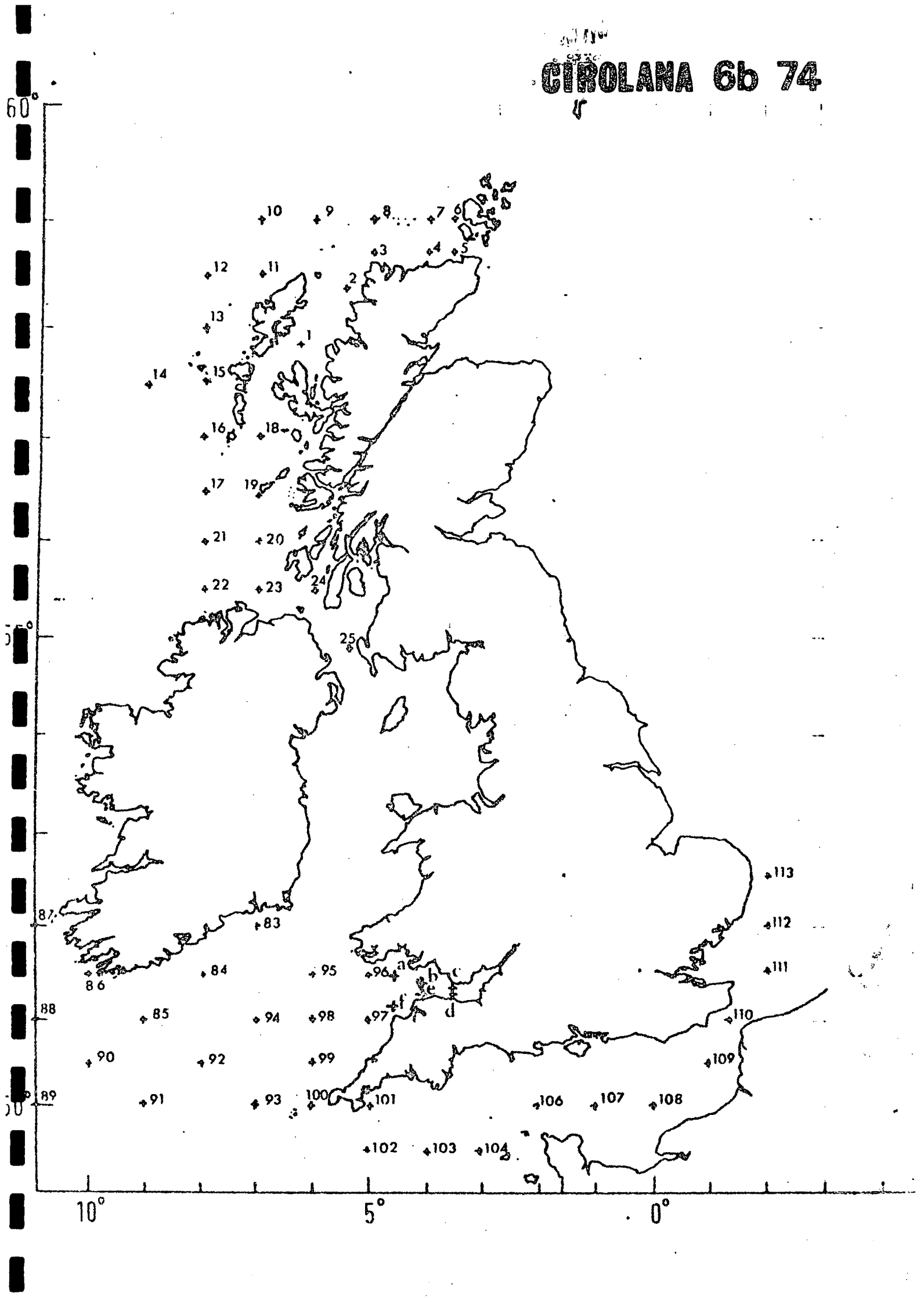
CIROLANA 6b 74



CIRCULANA 66/74