R1/6 1CR87

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"Clupea"

Cruise 1/87

Report

12-30 January 1987

Personnel

J A Gauld	HSO (in charge)
R Priestley	SSO
A D McIntosh	HSO
P A Kunzlik	SO P
P J Barkel	PTO

Objectives

1. To investigate the behaviour, biology and distribution of sandeels at Shetland.

2. To monitor hydro-carbon residues in Sullom Voe.

Narrative

Due to NE gales "Clupea" was unable to sail for Shetland until 0930 hours on 15 January. On 16 January the sandeel fishing ground at East Fair Isle was surveyed whilst en route to Scalloway. From 17-19 January SW gales prevailed and "Clupea" was stormbound at Scalloway. To compensate for this loss of cruise time the official half-trip break was brought forward from 22 to 19 January.

During the period 20-29 January the vessel worked uninterrupted. Sandeel fishing grounds to the S and E of Shetland were surveyed using the Laboratory's RCTV system, sandeel trawl and sandeel dredge. Sampling for hydrocarbon residues by grab and dredge was carried out at Sullom Voe and live queen scallops (Chlamys opercularis) were deployed in a series of cages near the oil terminal. Arrangements were made with the environmental control authorities at Sullom Voe for the queen scallops to be recovered at a later date. In addition dredge sampling was carried out at four sites to determine the possible effects of the use of the anti-foulants which are used in relation to fish farming. Due to an operational problem the RCTV was out of commission during 23-26 January.

On 29 January "Clupea" sailed south to the East Fair Isle sandeel ground which was surveyed for a second time. "Clupea" thereafter proceeded to Buckie where the cruise finished at 1230 hours on 30 January.

Results

1. Sandeel investigations

A total of nine sandeel fishing grounds to the S and E of Shetland were surveyed for the presence of sandeels. A combination of survey techniques was employed dependent on the area of individual grounds and prevailing weather conditions. The techniques employed were:

Fishing Ground	Survey technique employed			
East Fair Isle	RCTV	trawl/RCTV	dredge/RCTV	echo-sounding
Trink	RCTV	trawl/RCTV	dredge/RCTV	echo-sounding
Grutnes	RCTV		dredge/RCTV	echo-sounding
Voe	RCTV	trawl/RCTV		echo-sounding
Clumlie	RCTV		dredge/RCTV	echo-sounding
Mousa	RCTV	trawl/RCTV	dredge/RCTV	echo-sounding
Helliness	RCTV		dredge/RCTV	echo-sounding
South Sands	RCTV	trawl/RCTV		echo-sounding
Balta		trawl	dredge	echo-sounding

Large numbers of sandeels, up to 1.5 t per 20 min haul, were taken by trawl at East Fair Isle, Mousa and at South Sands. Lesser amounts were taken on the other grounds and when dredging. The dominant species on all grounds was Ammodytes marinus.

Echo-sounding observations were made using a Simrad dual frequency (50 kz and 200 kz) colour sounder. More marks were observed using 50 kz but could not all be identified as sandeels. Marks fished through at East Fair Isle resulted in good catches of sandeels with little or no by-catch. Marks, tentatively identified as sandeels, were observed in mid-water and near to the surface at Fair Isle and at Mousa. Sea-birds were observed to be feeding in the vicinity of these surface marks.

Shoals of free-swimming sandeels were observed near the sea-bed at East Fair Isle on 16 January. Examination of specimens caught by trawl showed most of these fish to be about to spawn. Samples of gonads were collected for fecundity and egg measurements. When this ground was re-surveyed on 29 January it was found that practically all sandeels caught were spent, thereby indicating that spawning had occurred during the intervening period. Sandeels taken on the other grounds over 20-28 January were generally spent. Examination of sandeel stomachs showed that approximately 20% had been feeding, including the "mature" fish taken at East Fair Isle on 16 January. The main prey organism was found to be small Euphausiids. Samples of A. marinus stomachs were collected for detailed identification of their contents at the Laboratory.

The stomachs of all other fish species caught were examined for the presence of sandeels. Of the 27 species caught, 13 were found to have been feeding to a greater or lesser degree on sandeels.

Data on age and length composition, sex and state of maturity and weight at length were collected for A. marinus for each the fishing grounds surveyed. These data are currently being processed. In addition, samples of sandeels for water/fat/oil content ananlysis were collected from five fishing grounds.

Surface and bottom sea-temperatures and salinity measurements were taken at five of the survey positions, at these positions a sample of plankton was also collected (see attached chart).

2. Hydro-carbon residue monitoring

A total of 20 grab stations and six dredge stations were completed within Sullom Voe. RCTV observations were made at two of the dredge stations. Samples of substrate and of indigenous queen scallops (or scallops) were frozen for later examination at the laboratory. A series of cages containing live queen scallops were deployed at different depth levels at varying distances from the diffuser outlet of the oil terminal. It was arranged for these cages to be recovered and returned to Aberdeen at a later date.

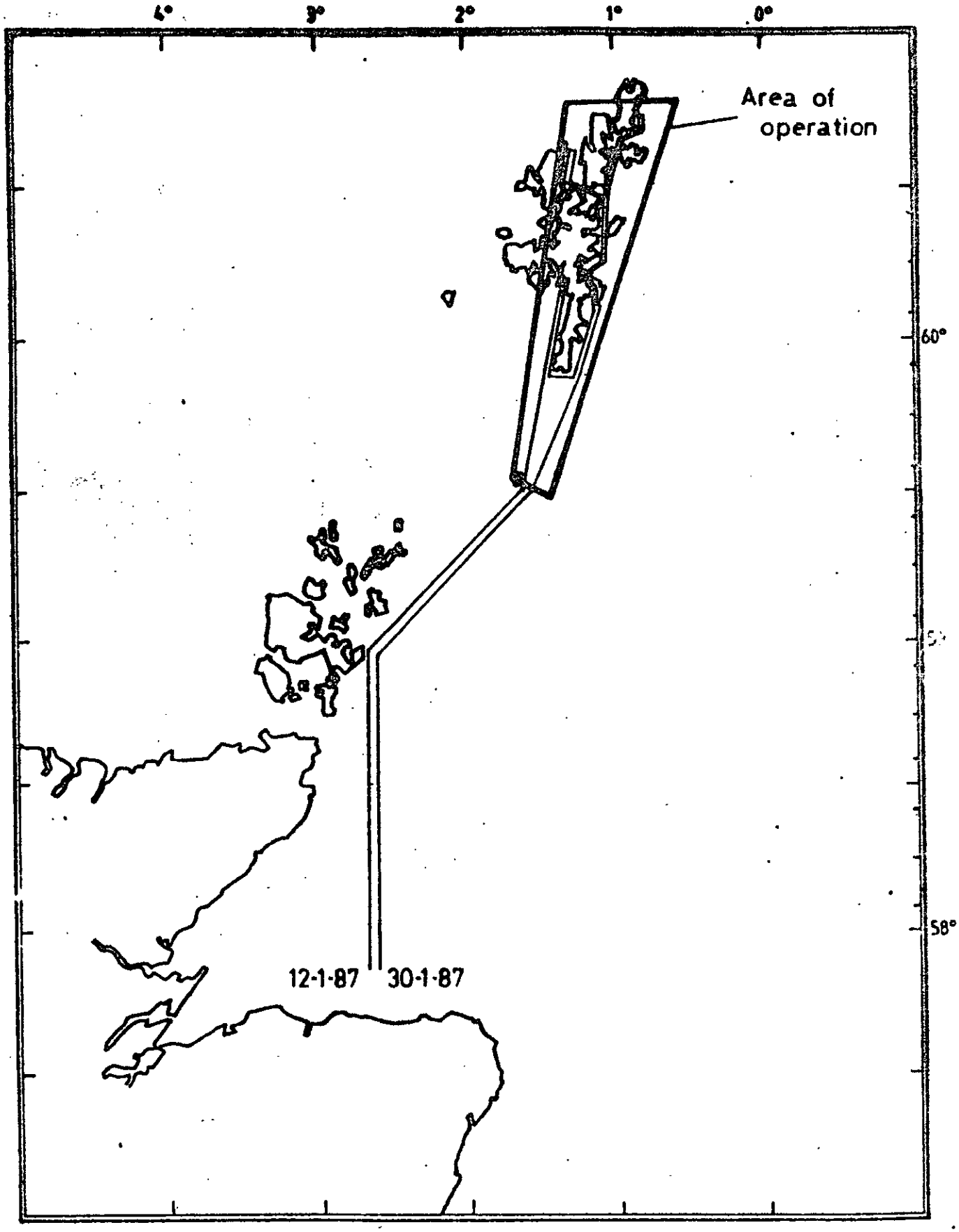
Dredge hauls for specimens of macro-benthos for TBT measurements were made at four locations, namely at Mid-Yell, Uyea Sound, Dury Voe and at Dales Voe.

J A Gauld

23 February 1987

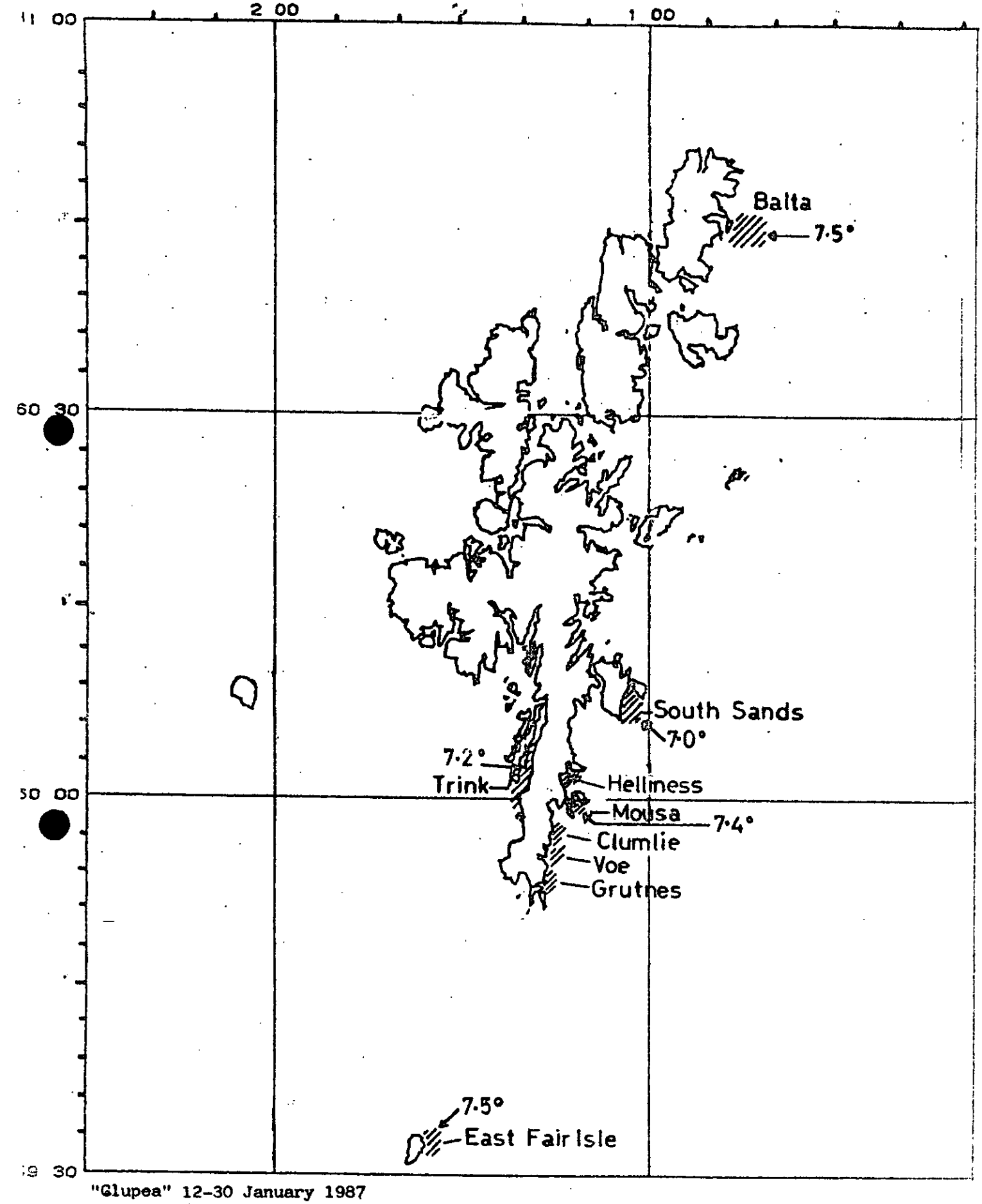
Seen in draft:

W Smith



Clupea 12 – 30/1/87 1C87

Fishing
Sandeel Grounds at Shetland; mean sea-temperature (°C)
January 1987



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