R1/3

Not to be cited without prior reference to the Laboratory.

RV "Dana" (Danish Institute for Fisheries and Marine Research) Cruise 2/94

**Reports**

22 February - 2 March

**Loading and Unloading** : Aberdeen

**Personnel**

| | | |
|---|---|---|
| K Richardson | | (DIFMR) (in charge) |
| M St John | | (DIFMR) |
| A Christoffersen | | (DIFMR) |
| M Fryd | | (DIFMR) |
| T Dyrnesli | | (DIFMR) |
| C Mikkelsen | | (DIFMR) |
| M Heath | PSO | (SOAFD) |
| R Mitchell | SSO | (SOAFD) |

**Objectives**

1. To determine the distribution, development and physiological states of *Calanus finmarchicus* in relation to the oceanographic features of the Faroe-Shetland channel and northwest shelf.

2. To collect measurements of primary production and copepod egg production.

**Narrative**

"Dana" sailed from Aberdeen on the afternoon of 22 February, and sampling commenced near Fair Isle the following morning. Over the following three days the vessel visited 34 sampling stations (Figure 1), finishing off the Butt of Lewis. The return passage to Fair Isle occupied 24 hours due to strong easterly winds. Flowmeter calibrations, and an intercomparison of the zooplankton catching efficiencies of ARIES and vertical net hauls, were carried out off Fair Isle on the morning of 28 February, and the ship then commenced a passage to Aberdeen. Strong southeasterly winds delayed the passage south, and the vessel docked on the afternoon of 2 March, 24 hours later than expected.

**Results**

The survey compiled three lines of stations. The first was a standard line also sampled on previous cruises across the Faroe-Shetland Channel. The second straddled the Wyville-Thomson Ridge in a southwesterly direction, and the third took the vessel southeast, back onto the continental shelf off the Butt of Lewis.

On the Faroe-Shetland Channel line, zooplankton, nutrients and hydrographic parameters were sampled by 16 oblique dives of the ARIES system, to a maximum sampling depth of 980 m. At several locations, data and live material were collected for primary production and *Calanus* egg production rate measurements. Specimens of *Calanus* collected at different depths by ARIES were preserved in liquid nitrogen for lipid analysis. All the remaining material was preserved in formaldehyde solution.

Only conventional lowered CTD stations were carried out along the Wyville-Thomson Ridge survey line.

Lowered CTD and vertical haul plankton net samples were collected along the survey line terminating off the Butt of Lewis, the sea state being too rough for ARIES deployments. Further primary production and egg production measurements were carried out along this line.

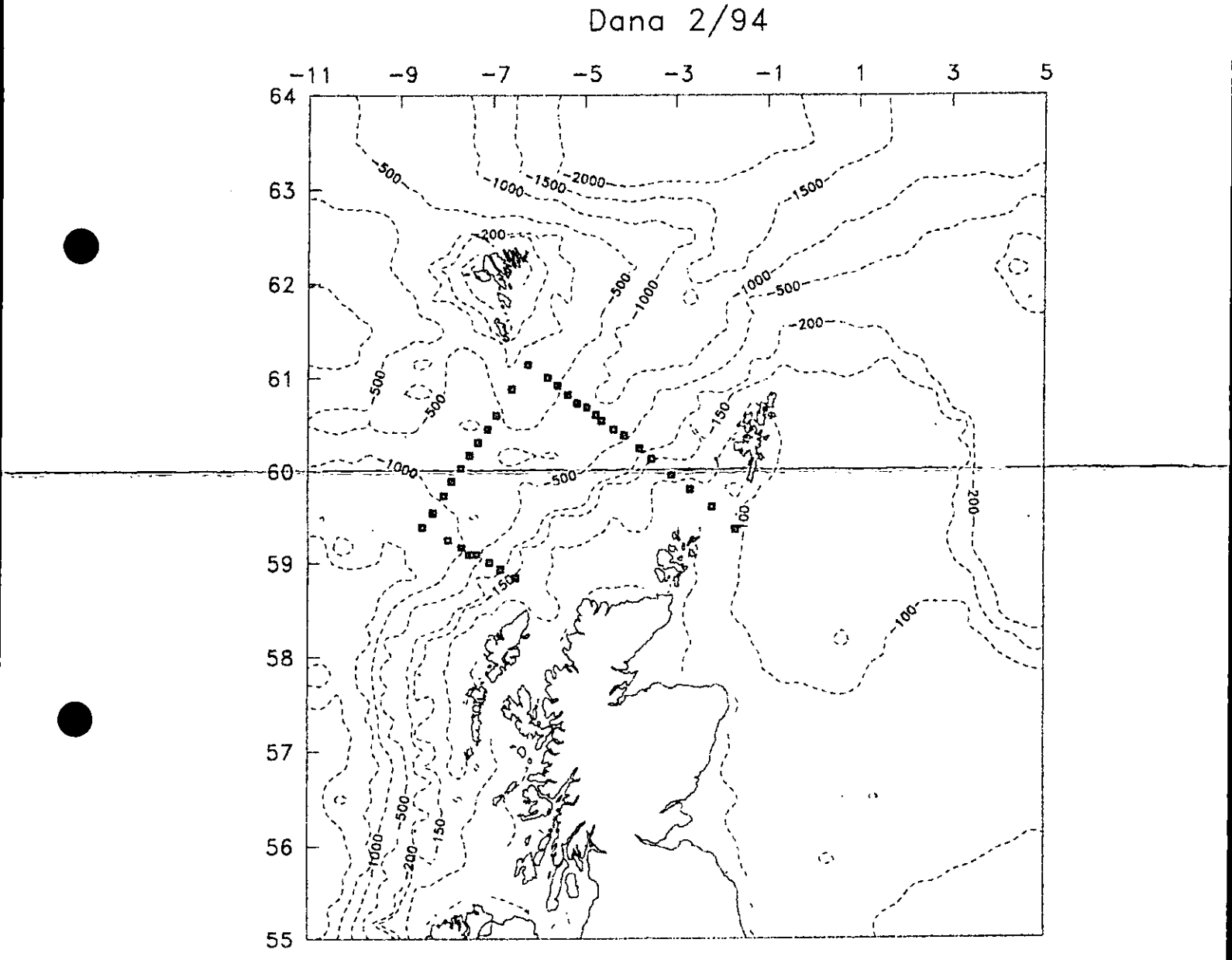
Adult (stage six) *Calanus* were found in moderate concentrations in the waters between Fair Isle and the shelf edge, and low rates of egg production were recorded (approximately 1 egg/female/day). However, the highest concentrations were found at depths >600 m in the Faroe-Shetland Channel and these were almost exclusively stage five animals. A mixture of stage five and six specimens was found in the surface waters of the Channel. Few *Calanus* were found on the Faroe shelf.

The hydrography of the Faroe-Shetland Channel showed a typical distribution of temperature and salinity, ie: Atlantic water (>8° C, >35.2 ppt) in the upper 300 m, and Norwegian Sea Deep Water (NSDW) (<1° C, <35.0 ppt) at depths >600 m. The main concentrations of overwintering stage five *Calanus* were in the NSDW.

The Faroe-Shetland Channel is blocked to the southwest by the Wyville-Thomson Ridge, and the deep water in the Channel turn northwest around the western side of the Faroe Islands. The hydrographic survey across the ridge showed that no overflow of NSDW into the Atlantic was occurring at the time of the sampling. Water temperatures at depths >600 m to the south of the Ridge were approximately 7° C higher than in the Channel. Very few specimens of *Calanus* were caught in the deep vertical net hauls south of the Ridge, or at the shelf stations off the Butt of Lewis. No adult female specimens could be found to conduct egg production experiments, contrasting sharply with the situation further north along the Fair Isle - Faroe Line.

M Heath

15 March 1994


Dana 2/94
-11
-9
-7
-5
-3
-1
1
3
5
64
63
62
61
60
59
58
57
56
55
500
1000
1500
2000
200
150
100