Department of Agriculture for Northern Ireland Cruise Report.

LF2595 Ichthyoplankton Survey (EU/AIR3 cruise 12).

30 April - 07 May 1995

Personnel.

W Mc Curdy	DANI SIC/SSO
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M Mc Aliskey	DANI SO
J Molloy	DOM
J Peel	DANI ASO
A Windrum	Student

Objectives.

1. To survey Irish Sea fish egg abundance and distribution for the AIR egg abundance project (AIR3 2263).

3. To collect fish eggs for iso-electric focusing.

2. To measure and freeze samples of whiting and other fish larvae, caught by Gulf III deployment and by ring net drift, for lipid analysis.

4. To survey Irish Sea fish and Nephrops larvae, abundance and distribution.

5. To complete a 24 hour sampling cycle with both the Gulf III and the Ring Net, at an Irish coast station where a reasonable abundance of fish and *Nephrops* larvae were observed.

6. To compare Gulf III and Ring Net whiting larvae catch rates.

7. To study variation in the shrinkage rates of dab, whiting and sprat larvae that have been fixed in alcohol and formaldehyde solutions.

8. To investigate the abundance of euphausiids and other macro zooplankton in the Irish Sea.

Cruise narrative.

Sunday 30 April 1995.
All scientific crew were on board by 21:00. Mr. Woods the chief officer, conducted a safety drill for the scientific staff, during which the use of lifejackets, use of the abandonment suits, use of smoke hoods, fire & general alarm signals, and the position of the emergency exits was covered. The ship sailed for station 38E47 at 22:40 (Figure 1).

Monday 01 May 1995.
Sampling started at 00:18 at station 38E47, and a total of 20 stations in the north channel, to the north east of the Isle of Man, and off the Solway Firth were sampled in strong to moderate southerly winds.

Tuesday 02 May 1995.
25 stations to the east and south east of the Isle of Man, and off the Cumbrian coast were sampled in moderate to fair southerly winds.

Wednesday 03 May 1995.
22 stations off the north Wales coast and between Anglsey and the Wicklow coast were sampled in calm conditions.

Thursday 04 May 1995.
22 stations on the Irish coast between Skerries and Clougher Head, and to the east of Ireland were sampled in light to fresh southerly winds.

Friday 05 May 1995.
12 stations to the south west of the Isle of Man, and off the south Down coast were sampled in fresh southerly winds.
Three day grab deployments were also made at the position 54° 5' 36"N 5° 13' 16"W. Station 36e45n was selected for the 24 hour sampling cycle, and after a two hour steam to this position, and hourly sampling commenced at 16:29hrs. Nine Gulf III deployments and nine Ring Net hauls were made in light north easterly winds at the 24 hour sampling cycle site.

Saturday 06 May 1995
The remaining sixteen Gulf III deployments and nine Ring Net hauls were completed in light north easterly winds and calm conditions, at the 24 hour sampling cycle site. The vessel then steamed for seven hours and sampled station 37e52 (north of Peel IoM) in light north easterly winds.

Sunday 07 May 1995
The remaining three stations between the north west of the Isle of Man and Portavogie were sampled in light north easterly winds, and the vessel proceeded to Belfast and docked at 09:00 hrs.

Methods.

At each station the high speed plankton sampler was deployed to 4m off the sea bed. The temperature salinity and chlorophyll content of the water column was monitored with the Pronet system. The plankton samples were sorted and all the fish larvae removed, counted and then fixed in 99% ethanol.

Where fish eggs were encountered in sufficient numbers, a sub-sample was removed, and those eggs which were ≥1mm and which exhibited no distinguishing features (*eg.* oil globules, sculptured membranes, large perivitelline spaces and sculptured embryos), were staged, measured and individually frozen for later iso-electric focusing in Bergen.

The remaining macrozooplankton were sorted from the plankton samples, identified counted and weighed to the nearest 0.1g, and then returned to the main sample. The plankton samples were then fixed in 4% buffered formaldehyde and stored in labeled sample bottles for further analysis at the DANI AESD Aquatic Systems Group laboratories in Belfast.

Results.

A total of 130 Gulf III deployments and 24 Ring Net hauls were made (figure 1), and 18.4 million litres of sea water were filtered during the cruise.

A total of 10,683 fish larvae and 1,747 *Nephrops* larvae were caught, and either frozen or preserved in alcohol or formaldehyde.

Print outs were produced for all CTD files (.sum, dat & .vol), and all haul information files (.inf). All files (624) were saved to hard disk and also copied to floppy disks (11). All data were summarized in an "Excel" spreadsheet and copied to a floppy disk.

Fish larvae were most abundant in the areas between the Solway Firth and the Isle of Man, between the east of the Isle of Man the Cumbrian coast, off the North Wales coast, to the south east of the Isle of Man, and off the Irish and south Down coasts. The deeper stations in the southern region of the survey area appeared relatively devoid of fish larvae (figure 2).

Whiting larvae were only abundant at two stations, station 35E42 (off Dublin) and station 36E45N (east of Dundalk Bay). The latter station was selected as the 24 hour sampling cycle site. Due to the lack of sufficient quantities of whiting larvae at other stations, Ring Net hauls were only made at the 24 hour sampling cycle site.

Dab, and sandeel larvae were more abundant in the zooplankton than the larvae of other fish species. Catch rates of whiting larvae appeared relatively low.

Nephrops larvae were most abundant in the western part of the Irish Sea and in the North Channel. Lower concentrations were found in the area between the Isle of Man and the Cumbrian coast (figure 3). Total *Nephrops* larvae estimates were 156 billion for the western Irish Sea, and 2.4 billion for the eastern Irish Sea.

The ctenophores and arrow worms were abundant in the zooplankton. Euphausiids were most common in the western part of the Irish Sea and were notably absent in the area between Liverpool Bay and the Isle of Man (figure 4). The euphausiids stock was estimated to be 16,000 tonnes. This figure is in the same region as the estimates from the previous two cruises.

The water in Dundalk bay , on the North Wales coast, and north west of the Isle of Man was warmer, (figure 5), while the water in the southern region was more saline (figure 6).

Evidence of water column stratification was found at stations off the Irish coast, over the western Irish Sea mud patch. Evidence of water column stratification was also found at stations east of Barrow in Furness, and off the North Wales coast (figure 7).

Nine surface sea water samples were collected to calibrate the Gulf III salinometer.

Chlorophyll values were highest in the Solway Firth, on the North Wales coast, in Dundalk bay, and at station 37E58N, to the east of the Isle of Man.

25 dab larvae from Gulf III catches were measured and individually fixed in alcohol and a further 25 were measured and individually fixed in formaldehyde.

20 dab larvae from Gulf III catches were washed in ultra pure water, measured and individually freeze dried for lipid analysis.
20 whiting larvae from Gulf III catches were washed in ultra pure water, measured and individually freeze dried for lipid analysis.

1 dragonet, 2 witch, 1 blenny, 4 whiting, 16 dab, 1 cod and 3 plaice larvae, from Ring Net catches, were washed in ultra pure water, measured and individually freeze dried.

Due to a lack of fish eggs of suitable species at all stations, no fish eggs were individually staged measured or frozen for iso-electric focusing.

Within the area surveyed, relative flourescence values were lower than on the previous cruise on 18-26 April, (figure 9).

<u>24 Hour sampling cycle at station 36E45N (16:00 on 06/05/95 to 15:00 on 07/05/95):</u>

Both the Gulf III and the Ring Net catches showed considerable variation (figure 8). The variation was higher than previous cruises (table 1).

High water times at the sampling site were approximately 15:09 on 5/05/95, and 03:32 & 15:59 on 6/05/95. Low water times at the sampling site were approximately 20:38 on 5/05/95, and 09:25 on 6/05/95.

Acknowledgments.

The officers and crew of the RV *Lough Foyle* must be thanked for their hard work and help. Their dedication lead to a very successful cruise. The scientific team must be thanked for their commitment to the aims of the cruise. They maintained a high standard of cooperation and productivity despite the disadvantages of a six on/six off watch system. Their team work and efficiency was crucial to the successful completion of the cruise.

Signed

SIC: **Date:**

Master: **Date:**

Division Head: **Date:**

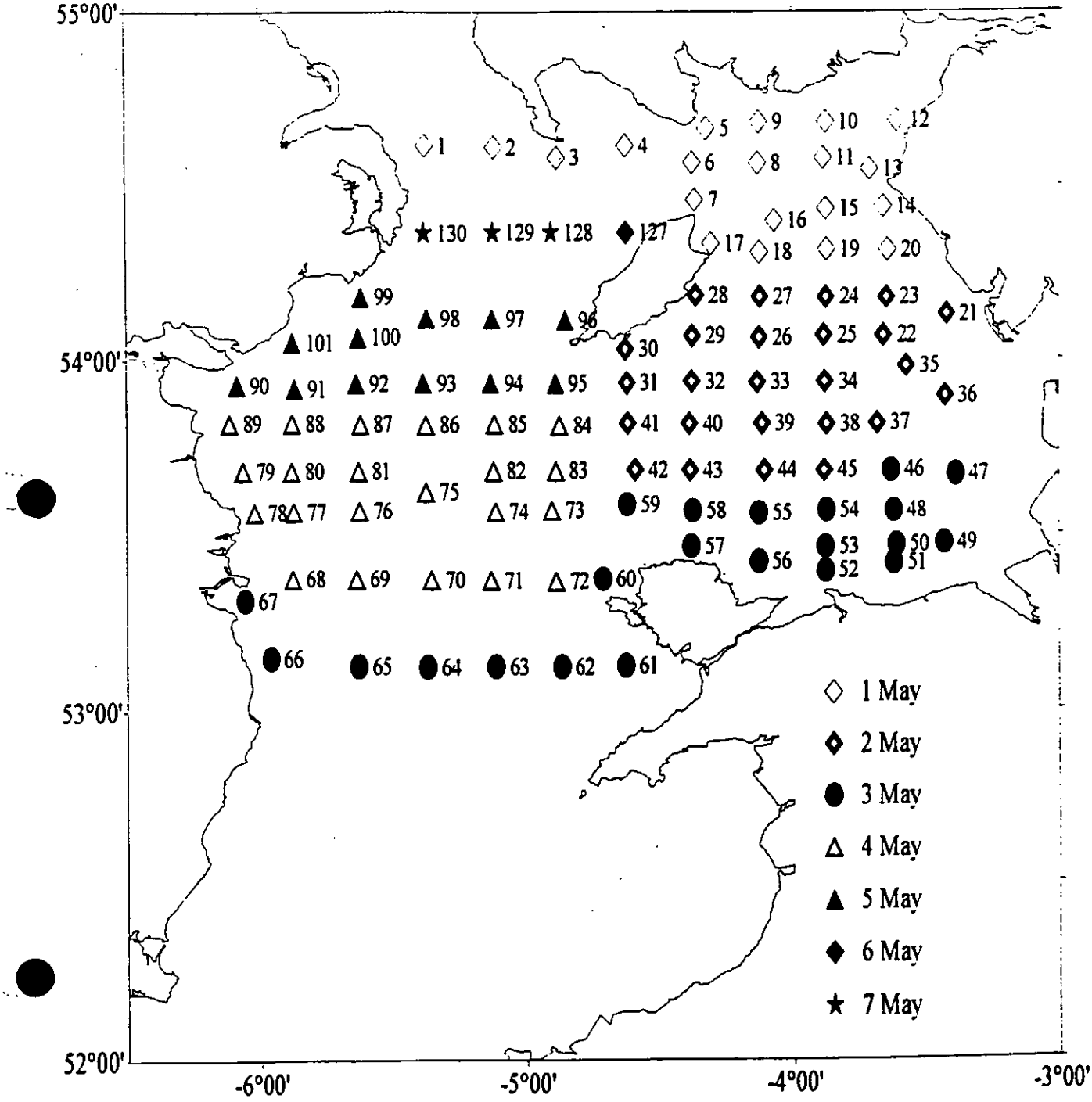

Figure 1 Hauls made in May on LF2595

Hauls 102 to 126 were taken at the same station as haul 80

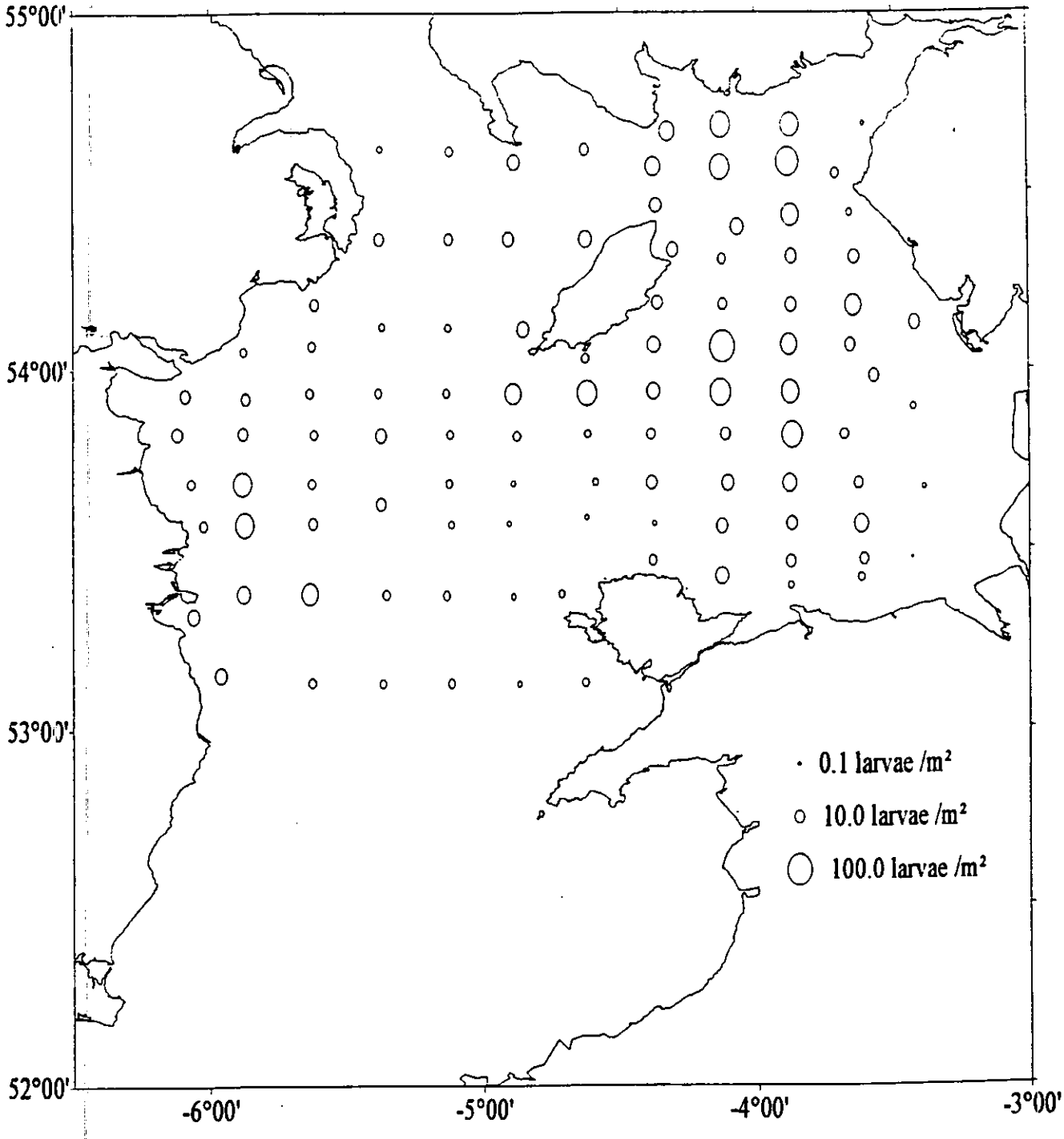

Figure2 Fish larvae per m² in May on LF2595

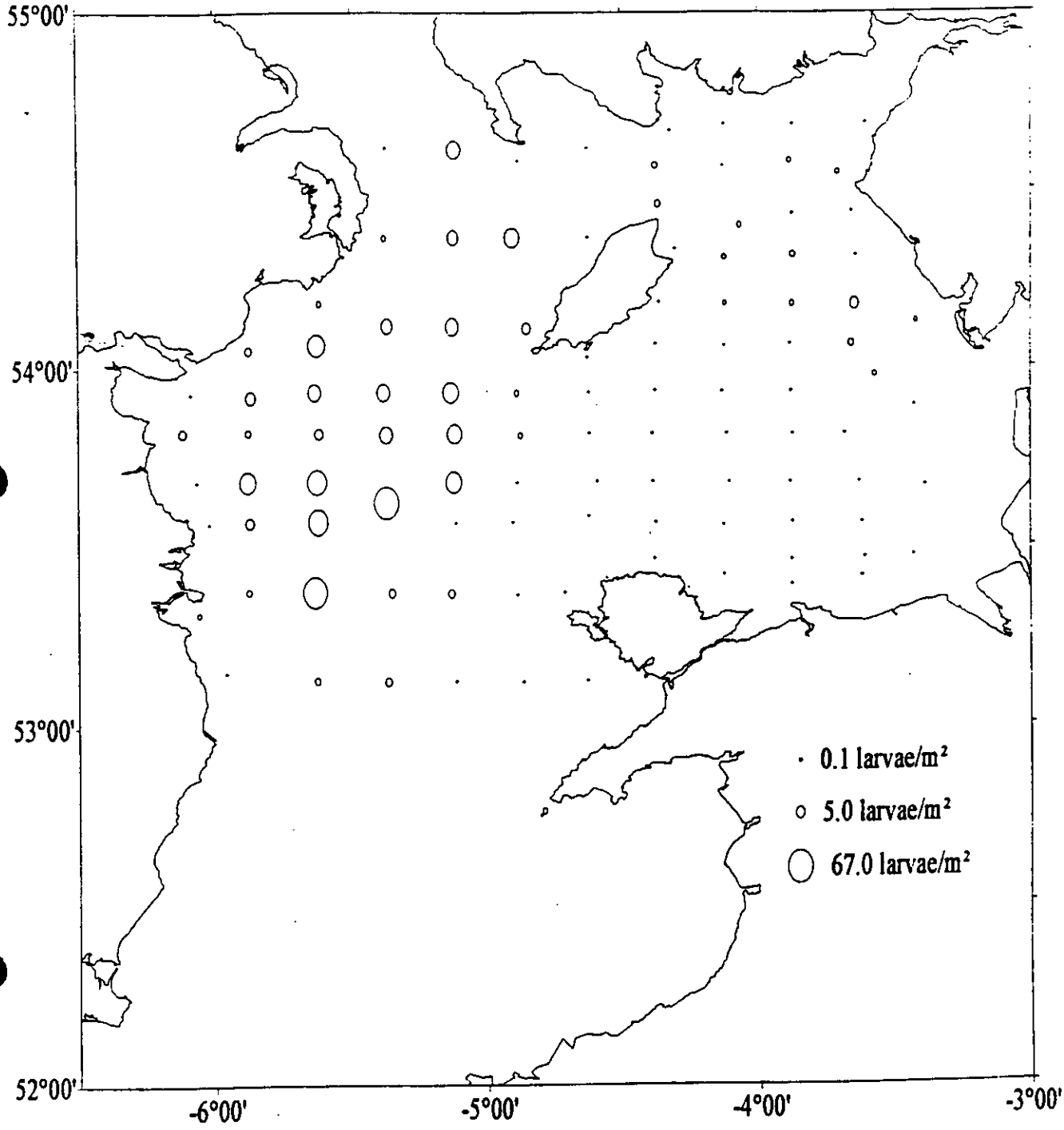

Figure 3 Nephrops per m² in May on LF2595

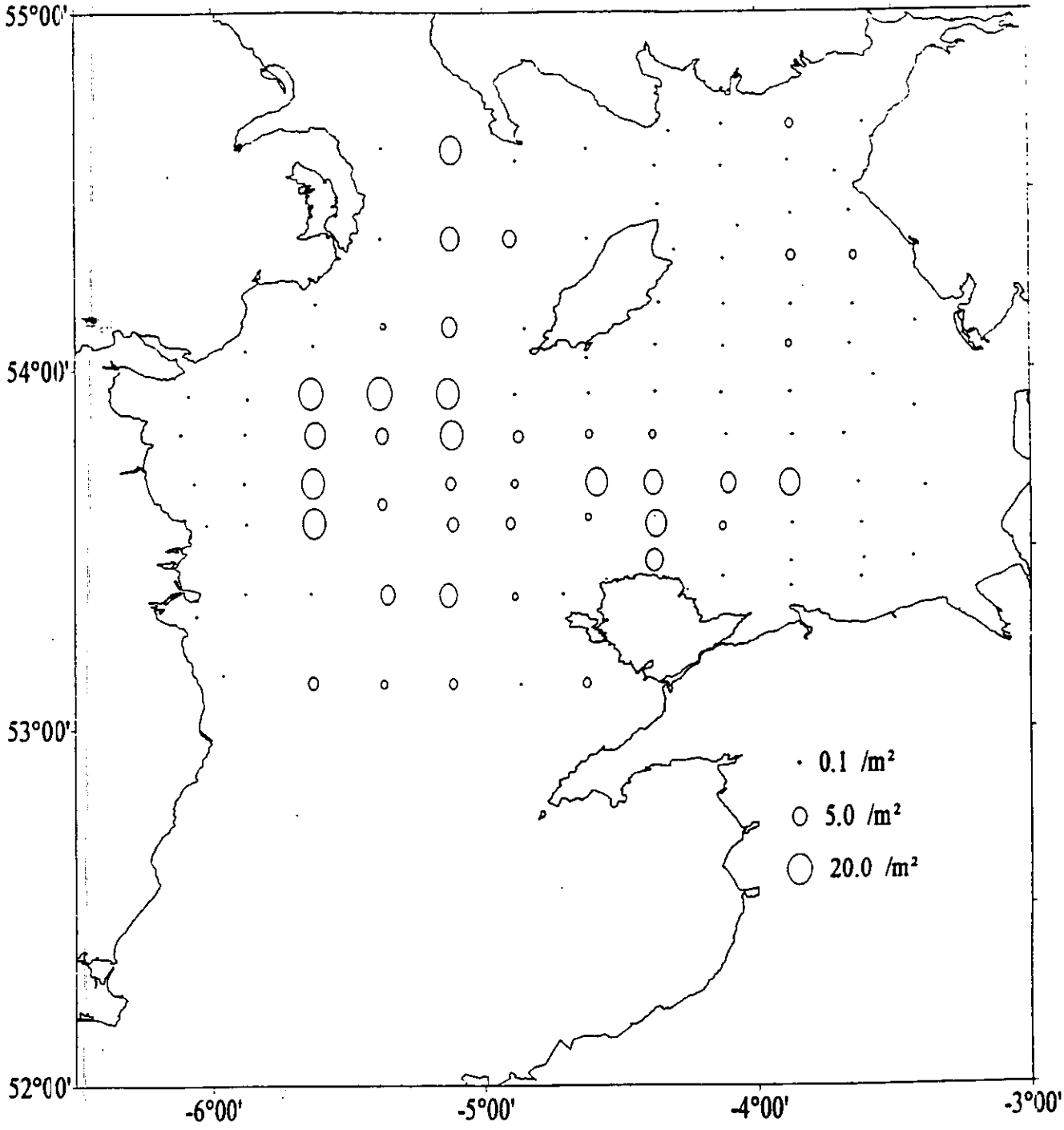

Figure 4 Euphausiids per m² in May on LF2595

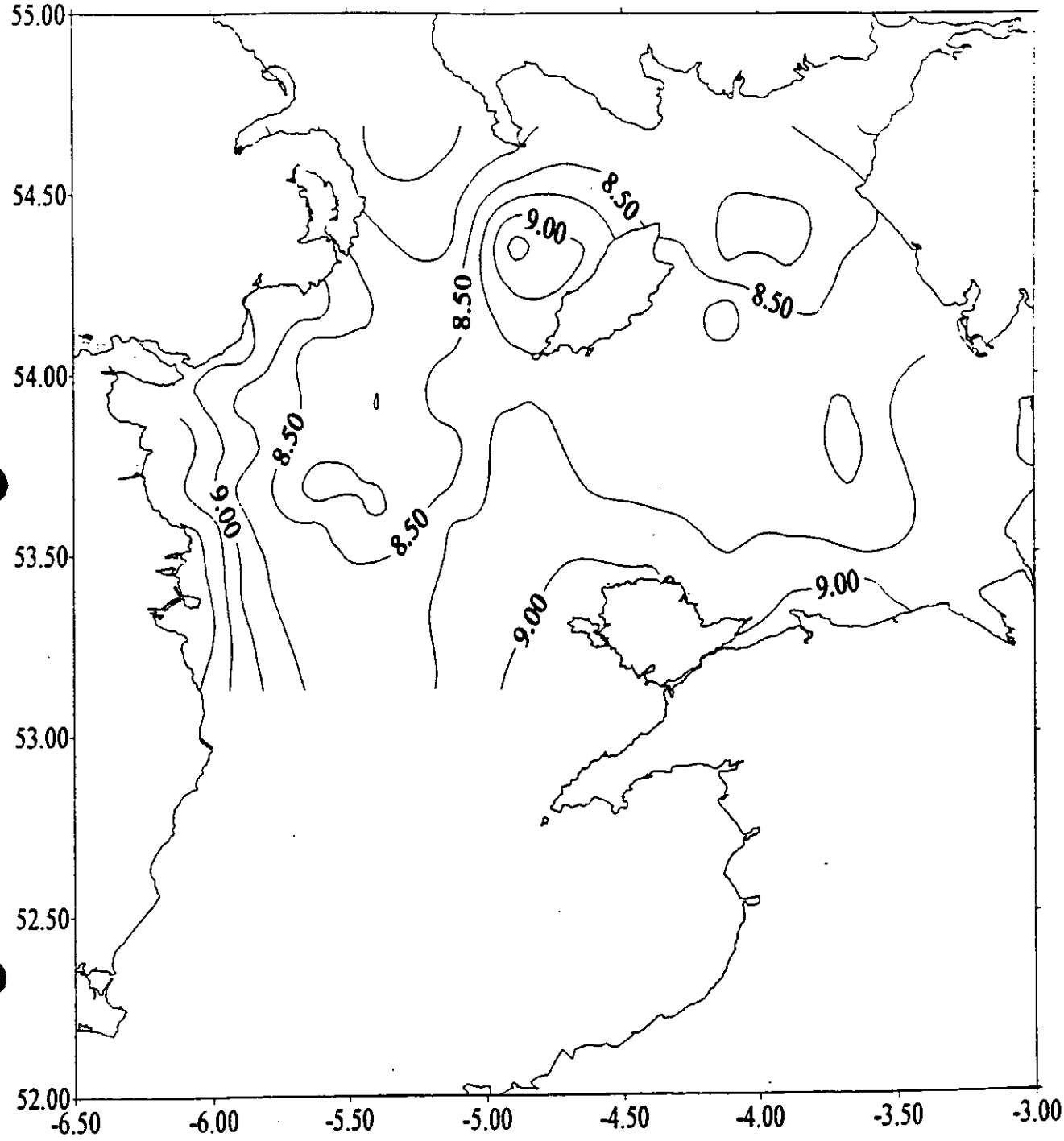

Figure 5 Median temperature °C of the water on LF2595

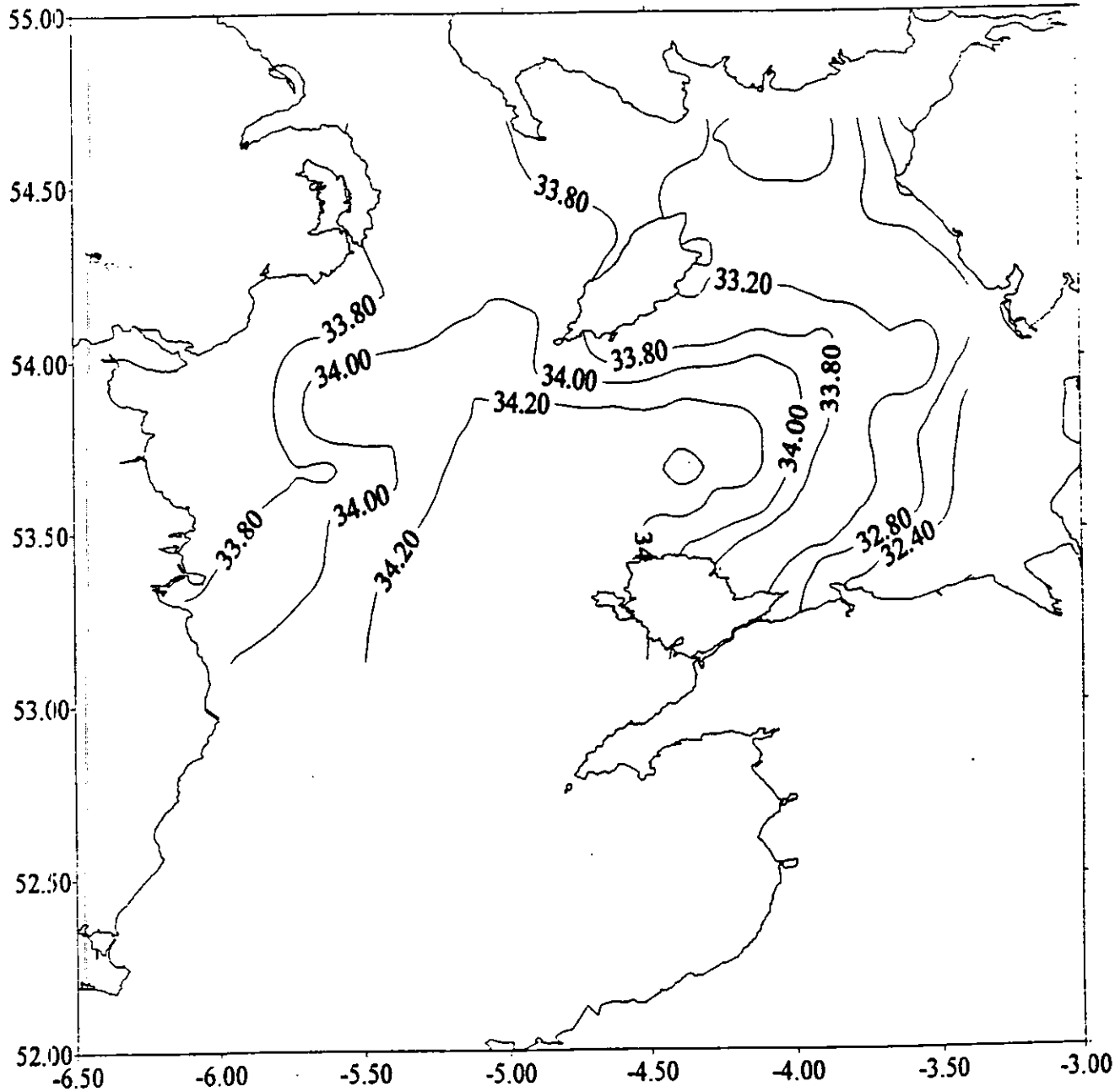

Figure 6 Median salinity (ppth) of the water on LF2595

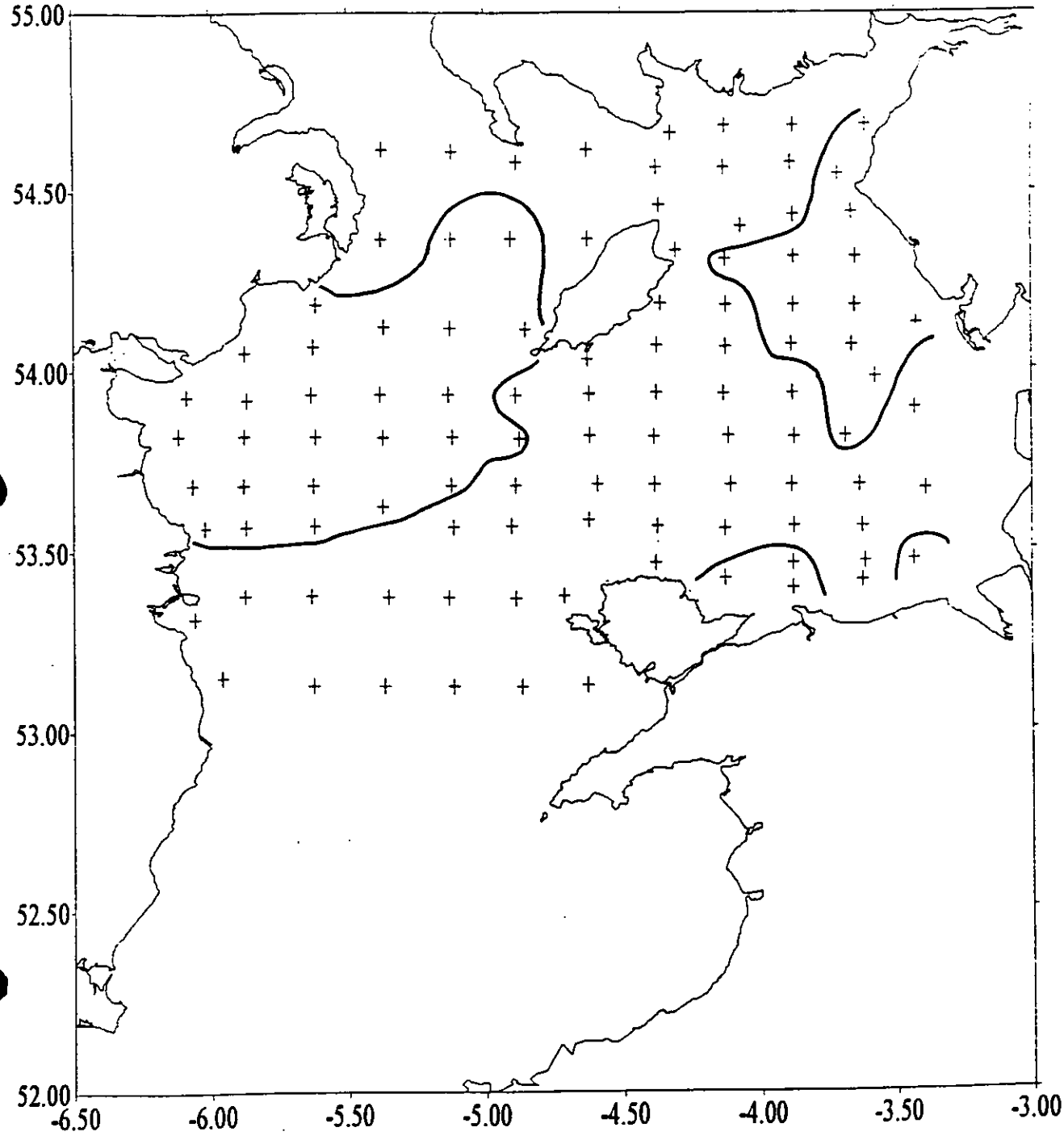

Figure 7 Areas of water stratification on LF2595

Coefficient of variation for fish and nephrops larvae
at 24 hour fixed stations on cruises LF1494 and LF2595.

cruise	date	equip.	CV over 24 hours (%)	
			Fish	*Nephrops*
LF1495	20 May	GULF III	36.5	62.3
LF2595	06 May	GULF III	32.6	45.5
LF2596	06 May	Ring net	64.4	81

Gulf III data from number per m²
Ring net data from actual catches

Table 1

Variation in fish and Nephrops larvae catches over a 24hr period

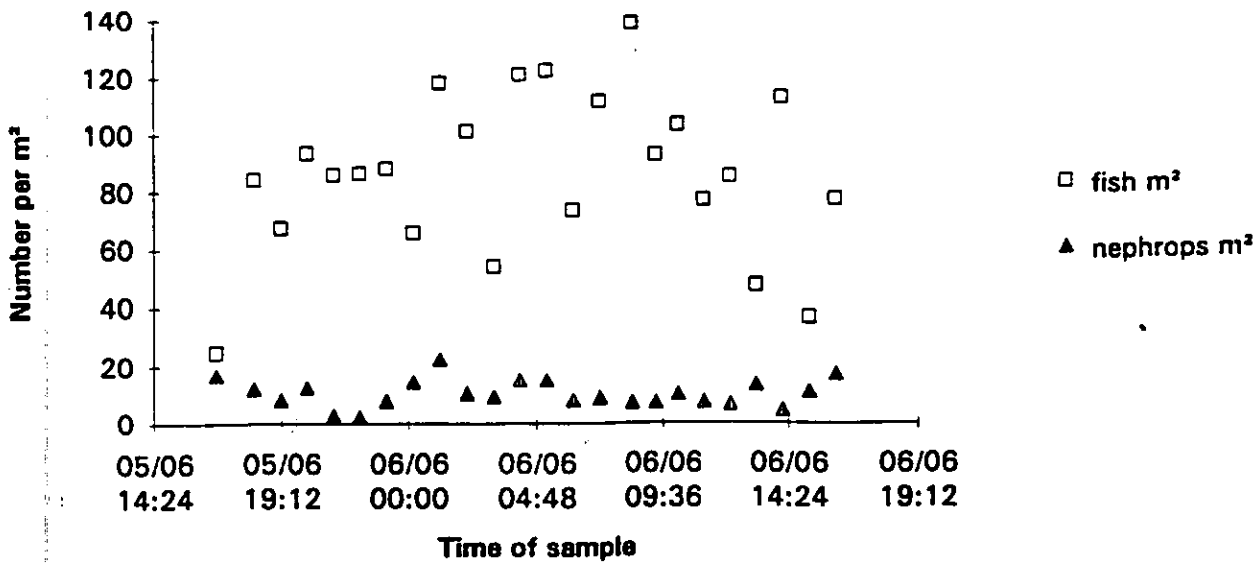

Figure 8.

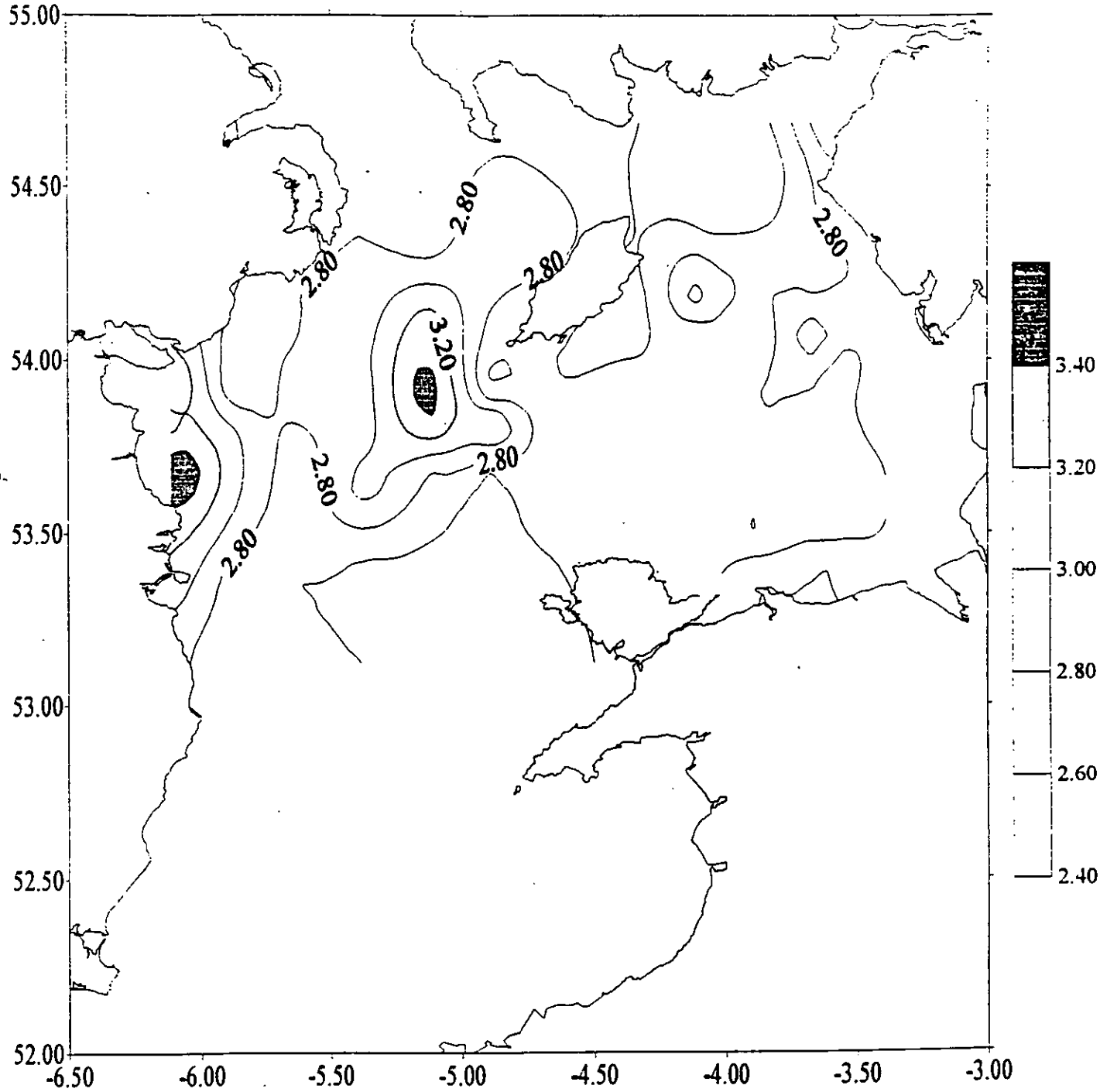

Figure 9 Relative fluorescence values (median of the water column) on LF2595