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FRV *Scotia*

Cruise 1700S

REPORT

23 October - 5 November 2000

Start port: Aberdeen
End port: Aberdeen

Personnel

P J Wright (In charge)
S Greenstreet
F Armstrong
J Dunn
P Barkel
I M Gibb
F M Kennedy
H Emmerson

Sampling Gear

Sandeel dredge (4' scallop dredge with 6" teeth and spare toothbars) and towing bar with camera attachment, day grab, bongo nets.

Equipment

Side scan sonar, drop frame TV camera, RoxAnn, minilogger, Seabird CTD.

Objectives

1. To investigate the benthic density distribution of sandeels in the vicinity of fished grounds in the Long Forties, near the Firth of Forth and along the Scottish east coast.

2. To map the distribution of habitat by grab sampling.

3. To collect samples of sandeels for analysis of length, maturity and age composition.

4. To conduct a hydrographic transect around the Stonehaven station.

Out-Turn Days Per Project: 7 days C662; 7 days MF0463

Narrative

The scientific staff joined *Scotia* at Aberdeen on the morning of 23 October; final loading and installation of equipment was completed by 1030 hours and the ship departed at 1100 hours. Due to worsening weather in the north the survey work in the Marr-Wee Bankie area was

conducted first. The ship steamed to Scalp bank to calibrate the swathe bathymetry equipment. Following this calibration the TV dredge was deployed north of Marr Bank. The proposed cruise timetable of sampling and seabed mapping was adhered to as closely as possible with dredge sampling between 1700-2200 hours, grab sampling between 2200-0700 hours, swathe bathymetry and RoxAnn between 0700-1400 hours and side-sonar for the remainder of the day. Weather conditions were generally poor during the first week with mainly westerly gales. However, the only weather related interruptions to the working schedule were a cessation of seabed mapping between 0930-1800 hours on 25 October, and work between 2200 hours on 28 October and 1800 hours the next day due to a storm. Due to these periods of bad weather priority was given to swathe and RoxAnn mapping during daylight hours. All previously surveyed dredge stations were completed by 28 October. Consequently, the nights of 29 and 30 October were used solely to complete the grab stations previously surveyed during *Clupea* cruises.

The ship departed from the Marr-Wee Bankie area for the Long Forties on the evening of 31 October. A series of swathe and RoxAnn transects were conducted at Long Forties and Turbot bank during the following days. The nights were spent dredge and grab sampling, the latter being used to groundtruth RoxAnn. As these grounds have not been surveyed previously a grid of dredge stations were conducted that covered the extent of the area where fishing boats have been observed to operate. The survey was completed by the night of the 3/4 November and the vessel then steamed to the Stonehaven hydrographic transect, conducting CTD stations on route. The hydrographic transect was completed by 1700 hours on the night of 4 November and the ship then returned to Aberdeen. The ship was unloaded on 6 and 8 November. A chart showing the cruise track of the survey is given in Figure 1.

Results

1. Benthic density distribution of sandeels in the vicinity of fished grounds

Dredge Sampling

The TV dredge proved to be very successful in monitoring the seabed during deployments. The armoured cable made it possible to rapidly deploy and recover the net and determine the precise times when the dredge began fishing. A total of 19 dredge stations comprising 38 tows were completed in the Marr-Wee bankie area (Fig. 2). The highest catch rates were found around Wee Bankie, although significant concentrations occurred between Berwick and Marr bank (Fig. 3). The Long Forties and Turbot banks were extensively sampled with 47 stations over the known fished area (Fig. 4). However, few stations were characterised by the coarse sand preferred by sandeels and, as expected from such sediments, very few sandeels were caught.

Acoustic Mapping

Swathe and RoxAnn maps were produced for all the main fished banks in the survey area. Due to poor weather during the first week sidescan deployment was restricted to an area of Marr bank. The drop frame camera was deployed six times to groundtruth the sediment and seabed forms. In addition, 35 grabs will made to groudtruth the RoxAnn in the Turbot bank area.

2. Map of the distribution of habitat from grab sampling

Altogether 227 grabs were taken in the Firth of Forth region, at locations previously sampled for projects ELIFONTS and MF0463. Locations of grab stations are given in Figure 5. As with the dredge CPUE, the highest catches were on Wee Bankie (Fig. 6).

3. Analysis of length, maturity and age composition

Dredge Samples

Length frequency compositions for all stations were made at sea. In addition, 200 sandeels were frozen from each dredge station for subsequent analysis of maturity, body weight, liver weight and age. Ovaries were extracted and fixed from 140 females for later histological analyses. The carcases were frozen for subsequent analysis of condition.

Grab Samples

Total length, and weight (± 0.1 g) were measured at sea for all sandeels taken by the grab. Otoliths were extracted for latter age reading.

4. Hydrographic data

Altogether 69 CTD stations were conducted at the sandeel grounds and the Stonehaven transect. The distribution of CTD stations is given in Figure 7. In addition, samples for water chemistry and plankton investigations were collected along the Stonehaven transect.

PJ Wright
28 November 2000

Seen in draft: Capt P Ramsay, OIC

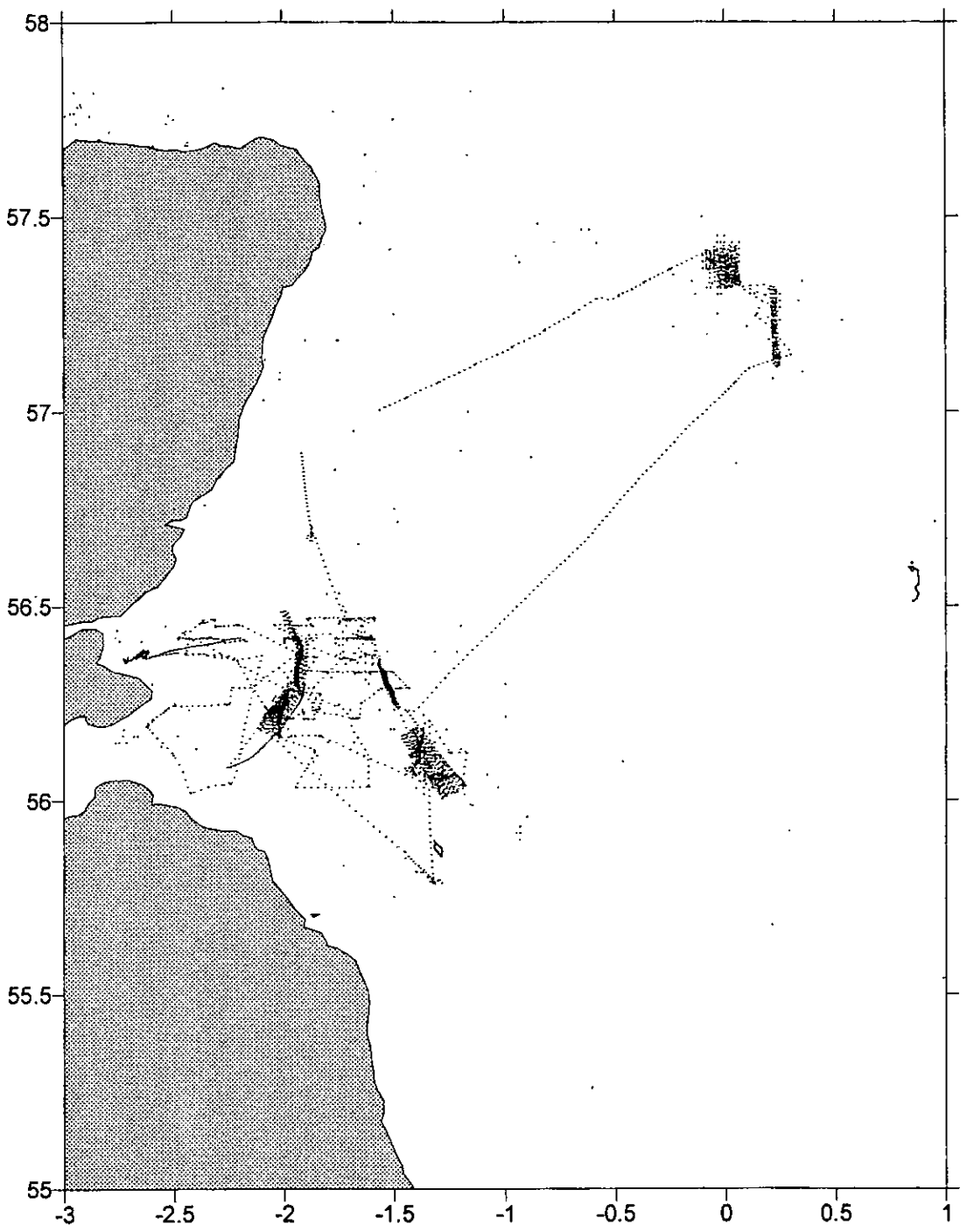


Figure 1. Cruise track for 1700S showing fishing grounds surveyed

Figure 2. Location of dredge tows (+) near the Firth of Forth grounds (shaded lines)

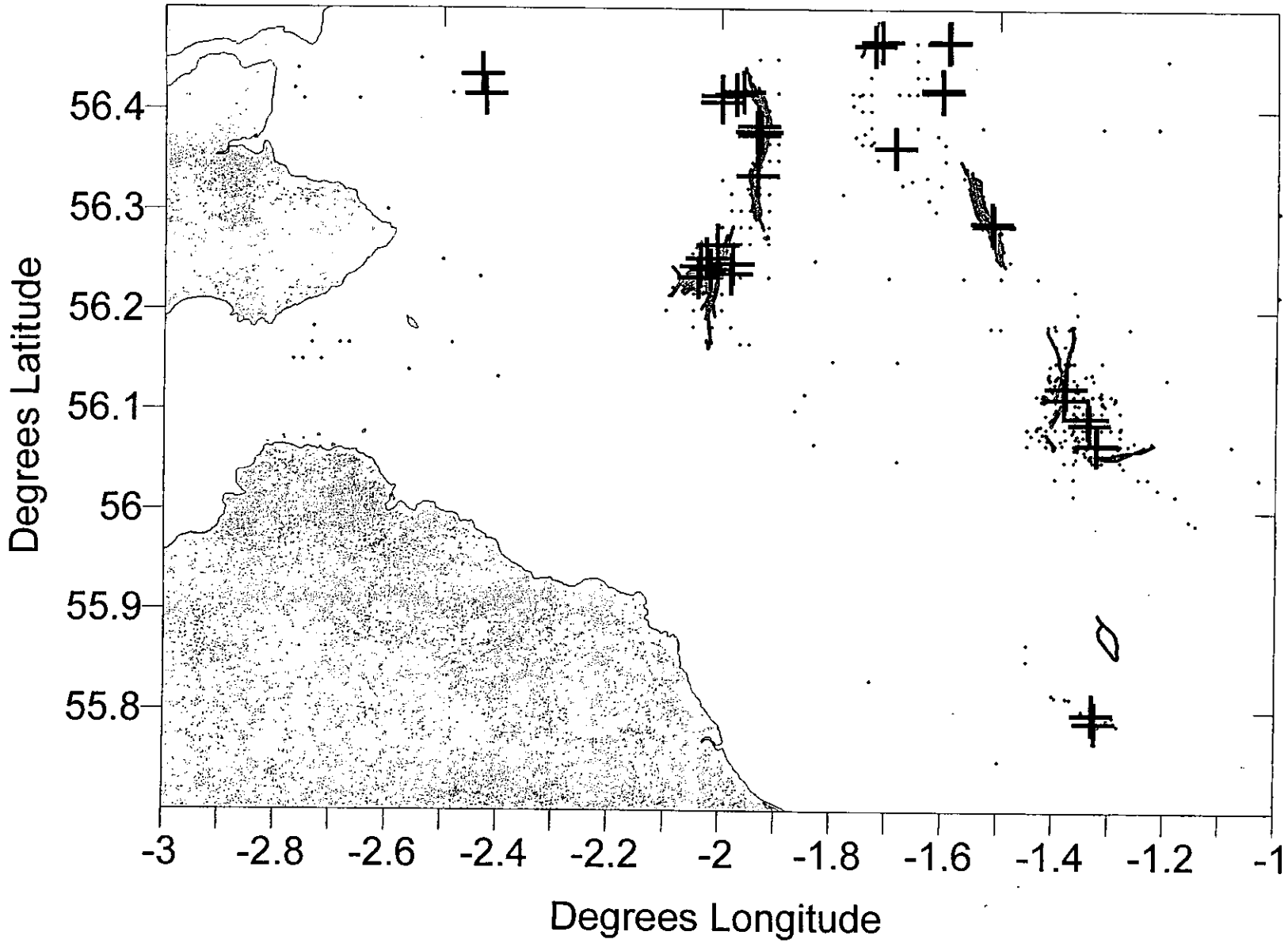
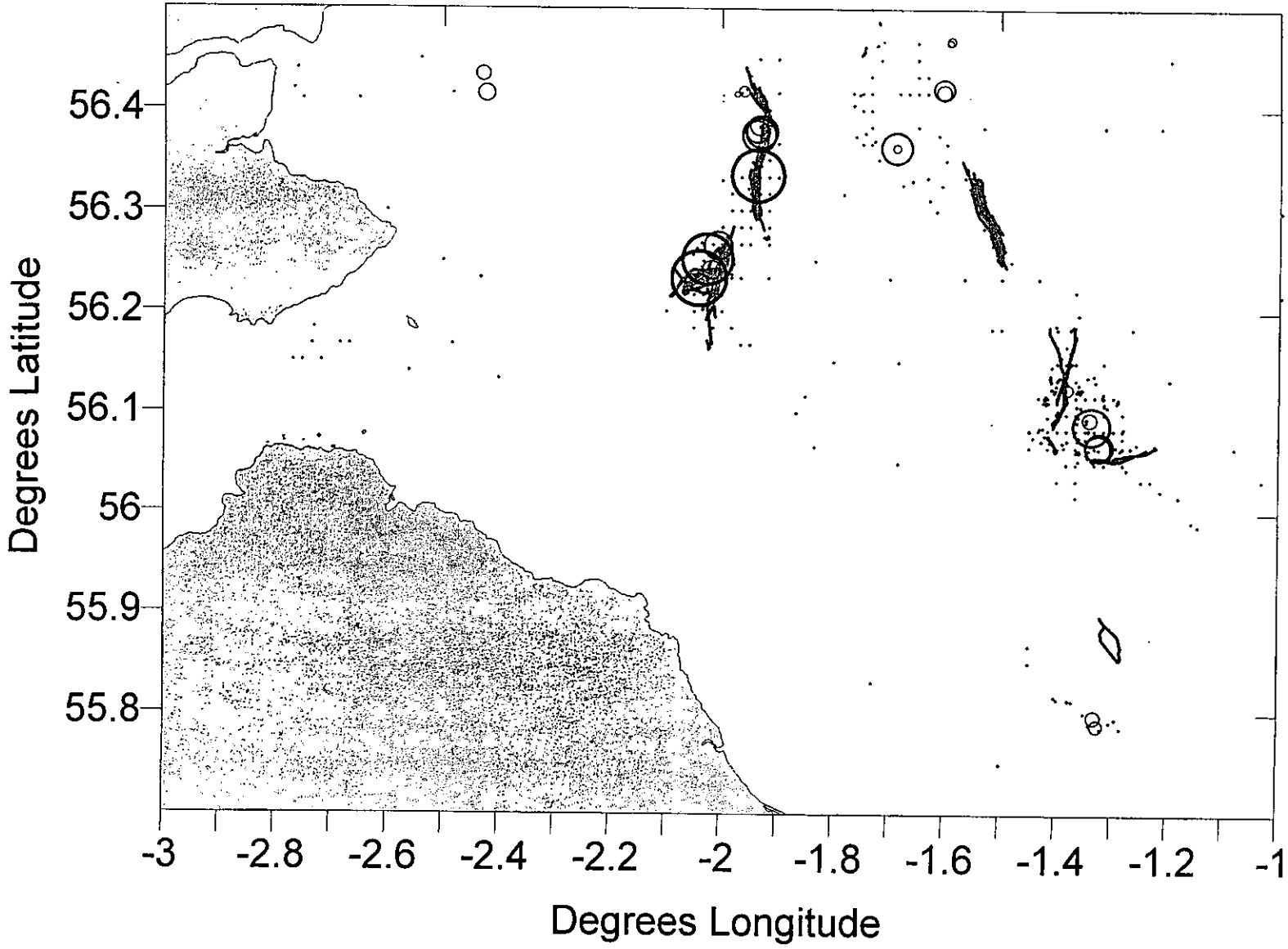


Figure3. Dredge CPUE (n.h-1) of sandeels from Firth of Forth grounds



Circles are on a linear scale with a CPUE range 12 - 10122 .h

Figure 4. Location of dredges (triangles) relative to observed distributionof fishing vessels

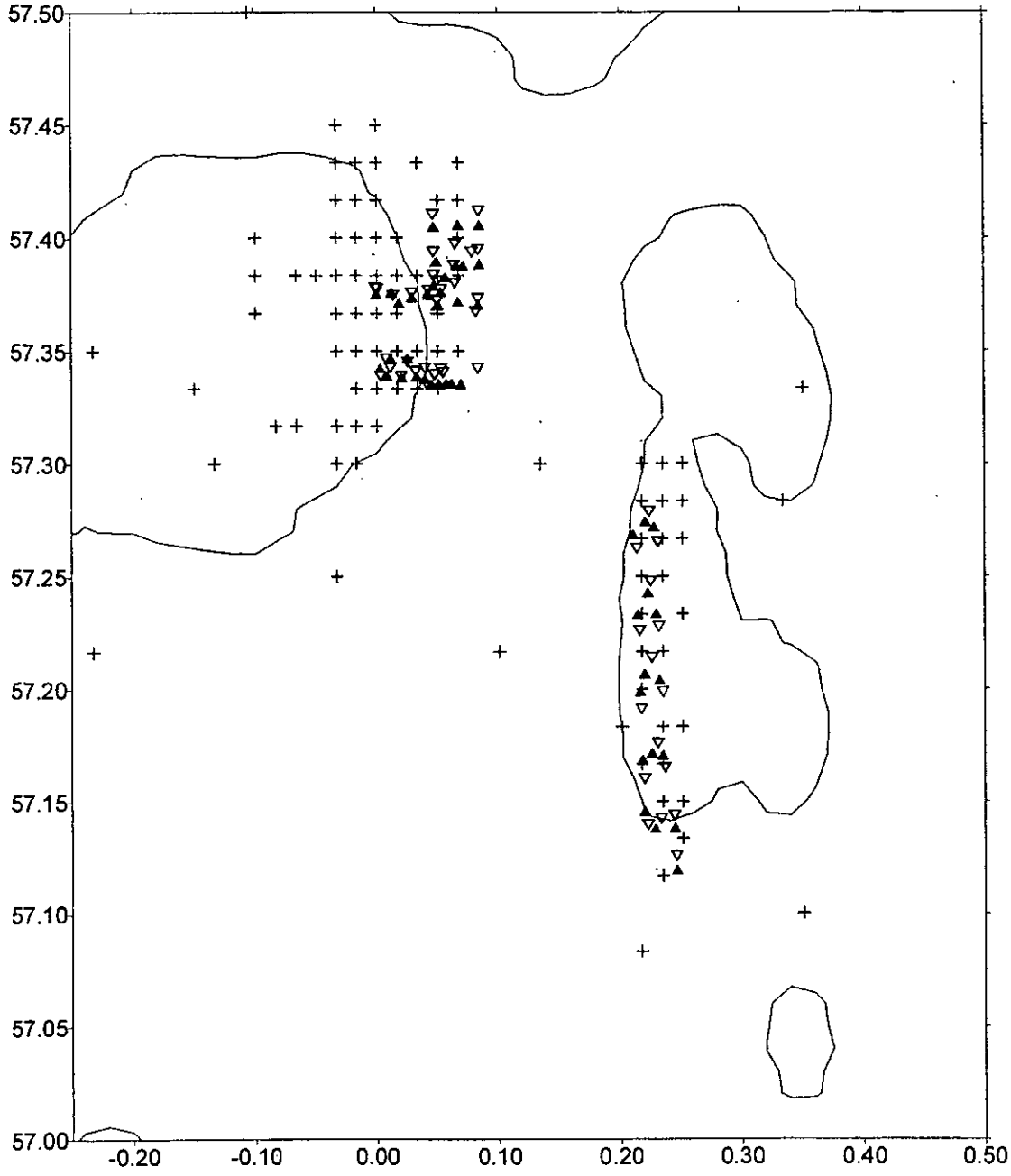


Figure 5. Grab stations in the Firth of Forth sampled in October 2000 (cross - no sample obtained n=56; open circle - sediment sample but not a valid sandeel sample n=6; filled circles - valid sandeel sample and sediment sample obtained n=165).

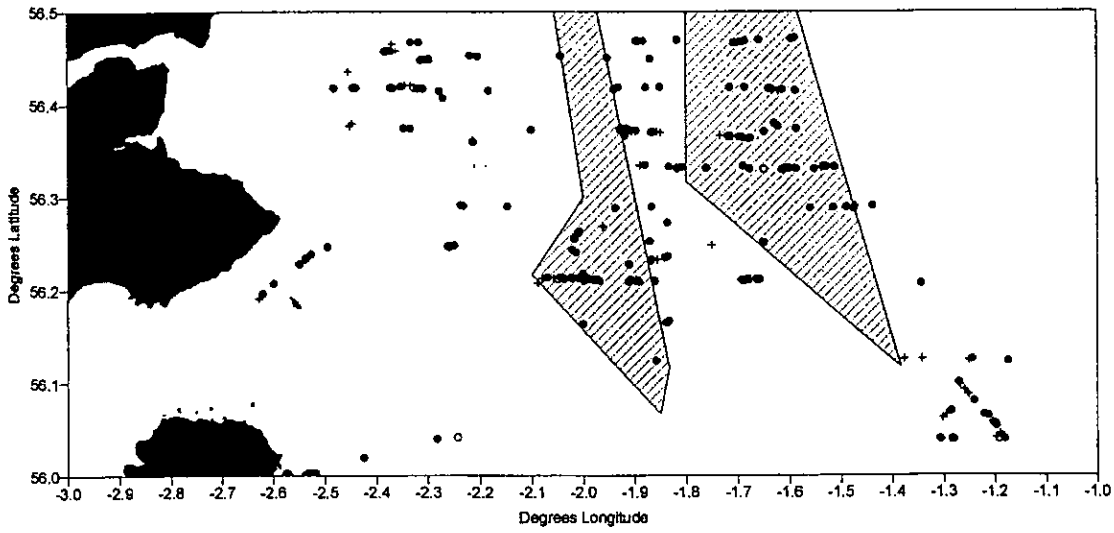


Figure 6. Variation in sandeel catch at valid sample locations. Circles are on a linear scale with minimum size representing a zero catch and the maximum size representing a catch of 47 sandeels in the grab. Of the 165 valid sandeel samples, 58 contained sandeels and 107 had a catch of zero.

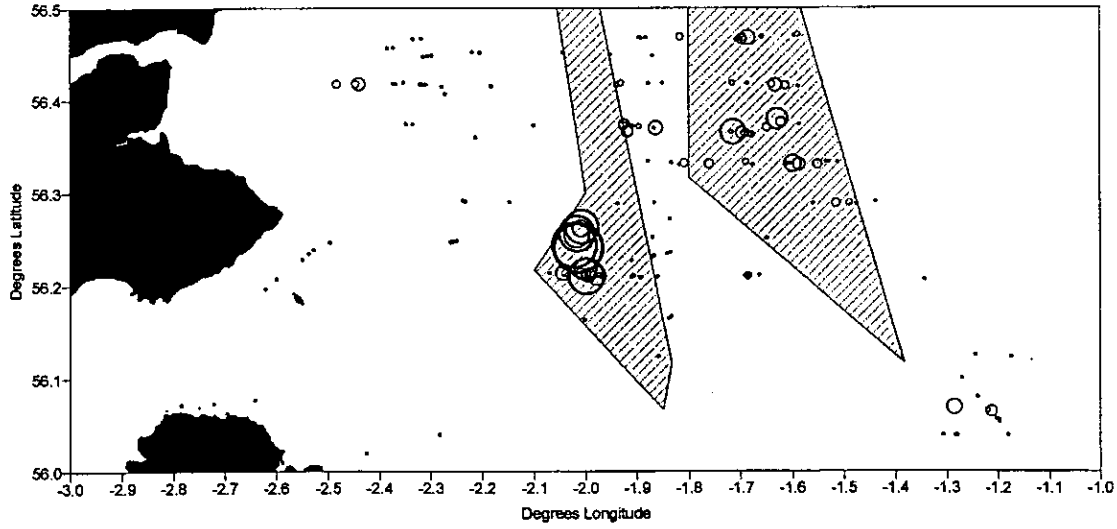


Figure 7. Distribution of CTD stations 1700S