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**DEPARTMENT OF AGRICULTURE [NI]**
**AQUATIC SCIENCES RESEARCH DIVISION**

**CRUISE REPORT - LF/05/94**

**NW IRISH SCALLOP STOCKS 14-18 FEBRUARY 1994**

**PERSONNEL**

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**OBJECTIVES**

1. To survey the scallop, *Pecten maximus* grounds off the County Down coast and collect the following scallop data:
   a. catch per unit effort.
   b. age composition.
   c. measure growth of scallops from shell band widths.
   d. weight, height and length of individual scallops.
   d. abductor muscle weight.

2. To collect samples of scallop abductor muscle tissue for analysis of heavy metal and organic residue levels.

3. Identify and quantify macrofauna associated with scallops.

**METHODS**

The gear used during the cruise were two beams, each of which were attached to four 2-foot scallop dredges of the design used in the commercial fishery. On the second day one dredge was fitted with a fine mesh (20mm) liner to increase retention of small fauna. Catches were sorted and the associated fauna identified and quantified where possible. Scallops were weighed and measured (shell height and breadth). Meat yield was determined from abductor muscle weight. Shells were aged by microscope examination of growth bands on the flat shell and on the hinge ligament. The width of growth bands were measured to the nearest millimetre below. Selected age classes of scallops had their abductor muscle removed and frozen for future heavy metal analysis.

**NARRATIVE**

*Sunday 13 February*

Scientific personnel boarded *MRV Lough Foyle* on the evening of Sunday 13 February.

*Monday 14 February*

Owing to a faulty autopilot the vessel did not sail until 09h.20. Despite strong winds from the east 5 tows (stations 15,1,2, 12 ) were completed on the northern side of Belfast Lough. Initial plans to anchor off Bangor were abandoned due to a deterioration in the weather. *Lough Foyle* returned to her Belfast Berth for the night, docking at 21h.35.

*Tuesday 15 February*

Improved weather permitted work to continue with tows to the north of Belfast Lough being completed (tows 6-11 in Figure 1). The night was spent at anchor in the Lough.

*Wednesday 16 February*

Weather calm but very cold. Dredges were deployed at 07h.43 at station 4 (tow 12) followed by stations 3,24,25,23 and 27 outside of Belfast Lough. The vessel then moved to stations 21,20 and 17 off the Ards peninsular. The night was spent steaming slowly south in readiness to dredge the most southern stations the following day.

*Thursday 17 February*

Dredges were deployed at station 8 at 07h.40 in a slight easterly breeze. This was followed by movement northward, fishing stations 5,7,6,16,18 and 17. The night was spent at anchor in Belfast Lough.

*Friday 18 February*

Despite a husky SE breeze dredges were deployed at 07h.53 at stations 12/13 just north of Belfast Lough. This tow was aborted due to upside-down dredges and was therefore repeated to give a valid tow (27). This tow was done in order that catch rates could be compared with those earlier in the cruise in this area. As this completed the stations planned for the cruise *MRV Lough Foyle* steamed for Belfast, docking at 11h.15

**RESULTS**

During the cruise 27 valid tows were completed as indicated in Figure 1 and over 600 scallops were aged microscopically and processed as described in the methods section. Comparison of the more precise assessment of age using a microscope with the "quick and dirty, by eye" method showed the latter to be accurate $\pm$ one year, which was better than anticipated. This means that for a speedy assessment of the overall situation the quick method is adequate, but if analytical assessments and more sophisticated statistical procedures are envisaged the microscope method of ageing is prefered.

.gure 1 shows the approximate position of tows and the stations sampled. Table 1 gives the total scallop catch expressed as catch per 8 X 2 foot dredges per hour of fishing, together with details of water depth. Figure 2 is the age composition of scallops from stations grouped by different geographic areas as defined in Figure 1. There to be a predominance of young scallops in more southern stations (area I). The relationship between shell length and age for the pooled data is shown in Figure 3. Meat yield for different sizes of scallops is shown in Figure 4 and Figure 6 is a frequency distribution of first year growth indicating the presence of both spring and autumn spawners. Although the latter appear to dominate the more northern stations these data will undergo further analysis at a later date.

A selection of scallop shells were retained for age verification by the MAFF Lowestoft Laboratory using stable oxygen isotope analysis.

Samples of scallop abductor muscle tissue were frozen for future heavy metal and organic residue analysis. A wide range of benthic fauna associated with scallops were noted and quantified where possible. These data will contribute towards a time series database on scallop biology and associates that will provide a base to compare the affects of fishing or environmental change on these stocks.

Data collected during the cruise will be compared with those from previous surveys and also related to data shortly to be obtained from the commercial fishery, in order to understand more of the population biology of Pecten maximus.

Richard Briggs
(Scientist in Charge)

Andrew Niblock
(Master)

18 February 1994

Table 1

Catch rates by tow expressed as number per 8 dredges (2x4) per hour

| TOW | STN | CATCH | DEPTH (m) |
|---|---|---|---|
| 1 | 15 | 18 | 17 |
| 2 | 15 | 15 | 27 |
| 3 | 1 | 140 | 44 |
| 4 | 2 | 57 | 45 |
| 5 | 12/2 | 128 | 46 |
| 6 | 2 | 73 | 39 |
| 7 | 2 | 159 | 26 |
| 8 | 2 | 53 | 40 |
| 9 | 12 | 152 | 43 |
| 10 | 9 | 80 | 44 |
| 11 | 13 | 26 | 50 |
| 12 | 4 | 27 | 17 |
| 13 | 3 | 34 | 48 |
| 14 | 24 | 17 | 62 |
| 15 | 25 | 23 | 77 |
| 16 | 23/27 | 6 | 82 |
| 17 | 21 | 52 | 40 |
| 18 | 20 | 136 | 48 |
| 19 | 17 | 120 | 37 |
| 20 | 8 | 123 | 36 |
| 21 | 5 | 60 | 46 |
| 22 | 7 | 27 | 51 |
| 23 | 6 | 30 | 42 |
| 24 | 16 | 82 | 33 |
| 25 | 18 | 19 | 33 |
| 26 | 17 | 12 | 31 |
| 27 | 12/13 | 166 | 47 |

Figure 1

STATIONS DREDGED DURING CRUISE

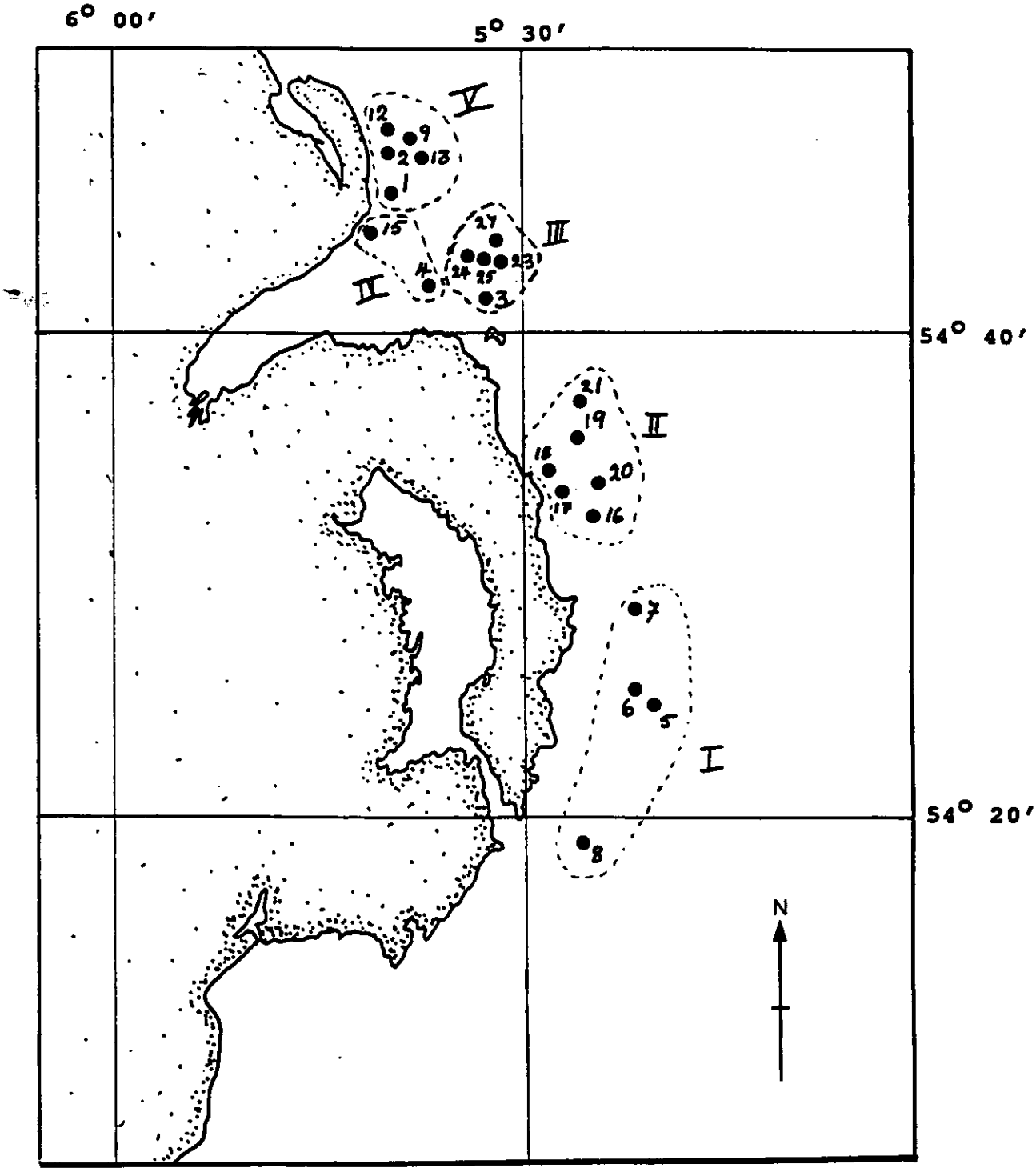
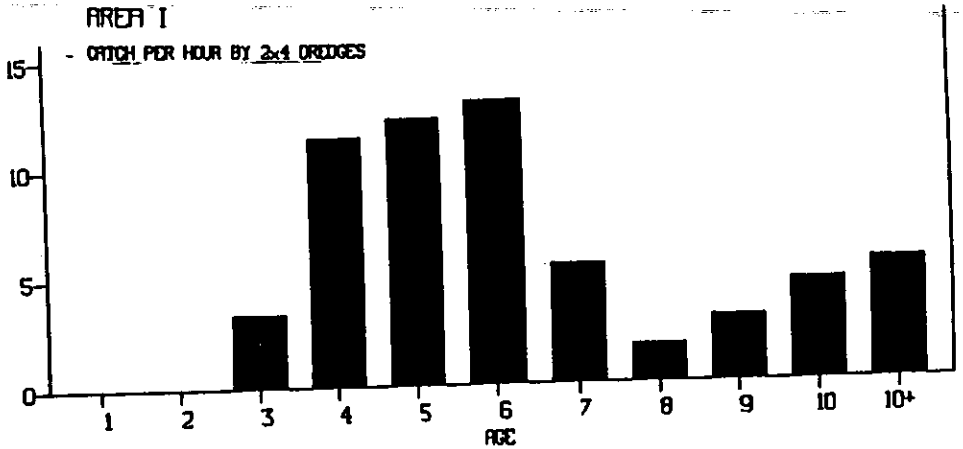
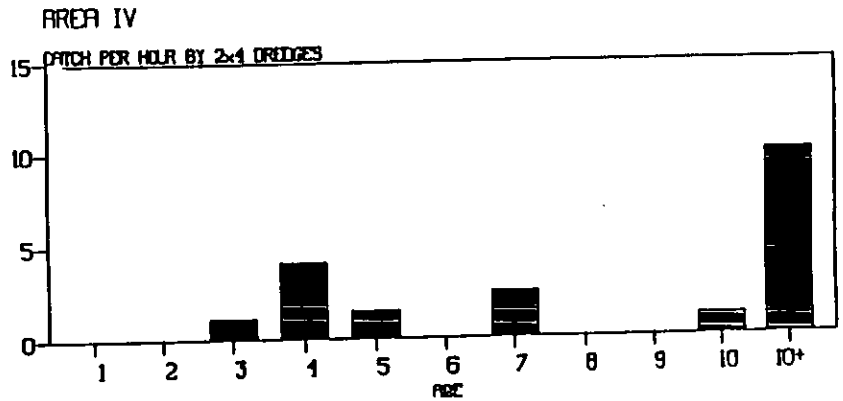
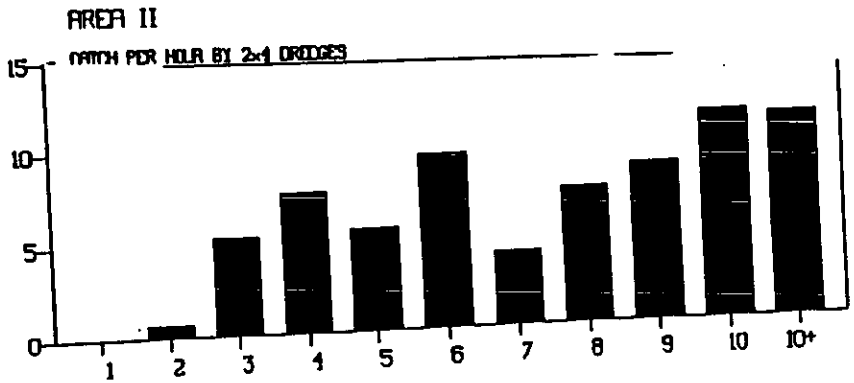


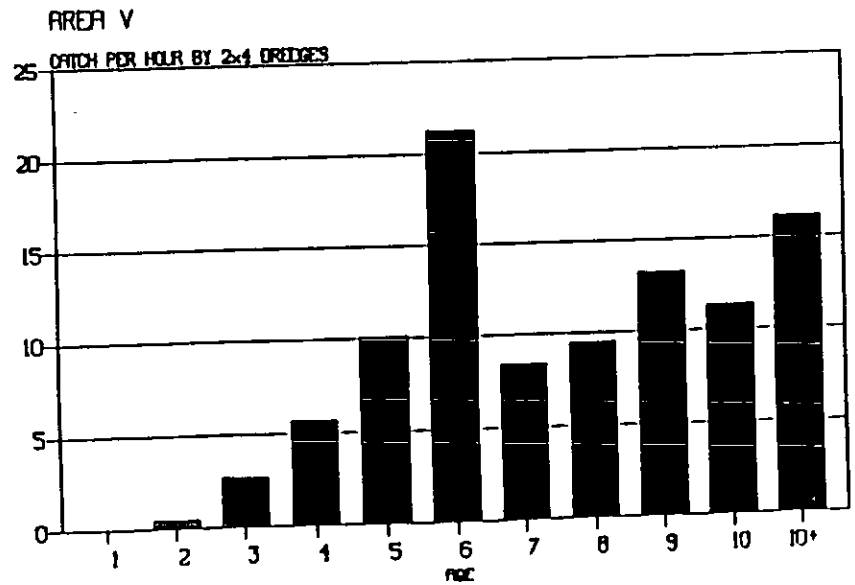
Figure 2

Age composition of catches from 5 main areas dredged. These data are expressed as numbers caught per hour by 2x4 two foot dredges.



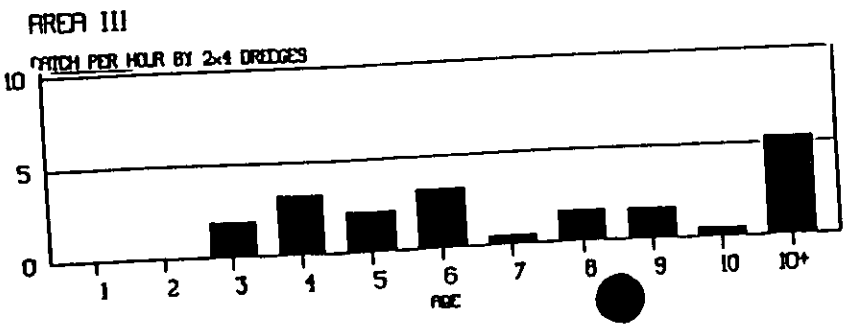



Figure 3

Mean shell length at age for pooled data from all 27 stations

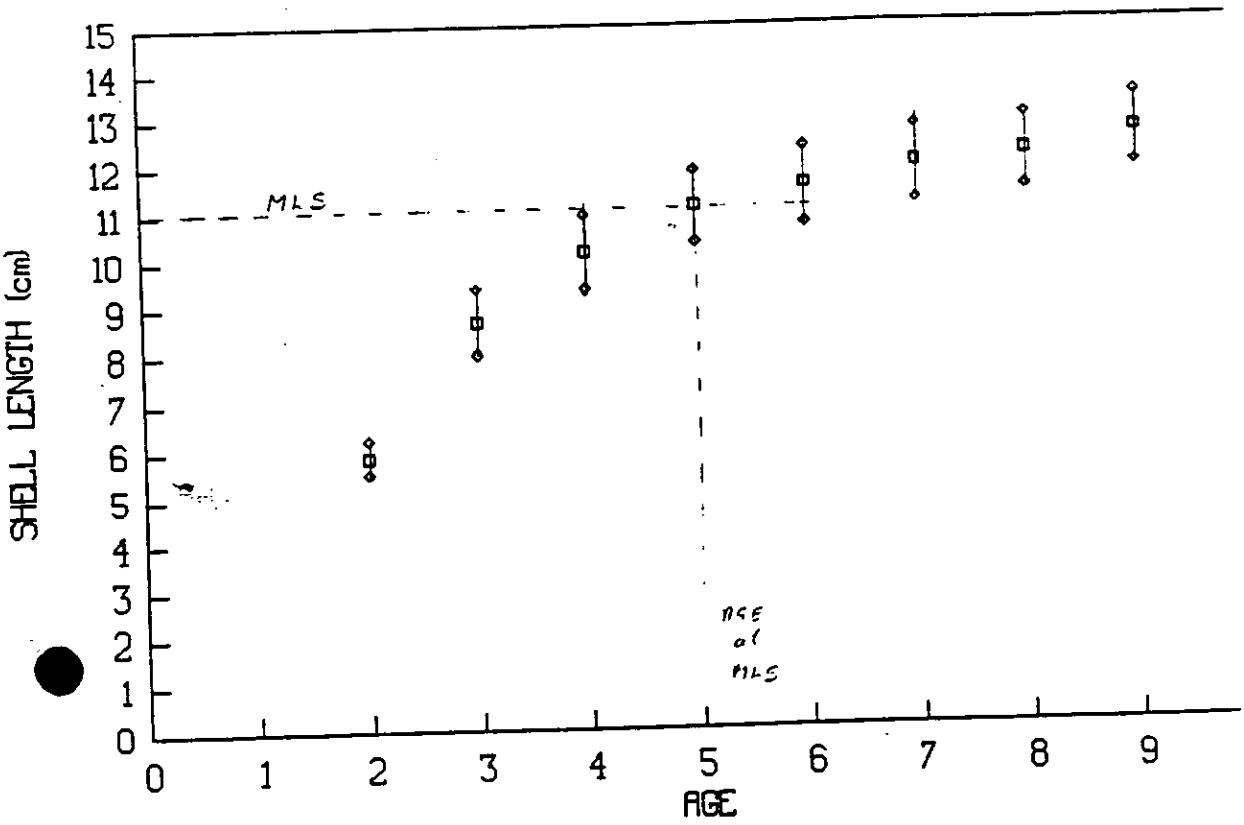



Figure 4
Mean wet meat weight (abductor muscle) plotted against shell length.

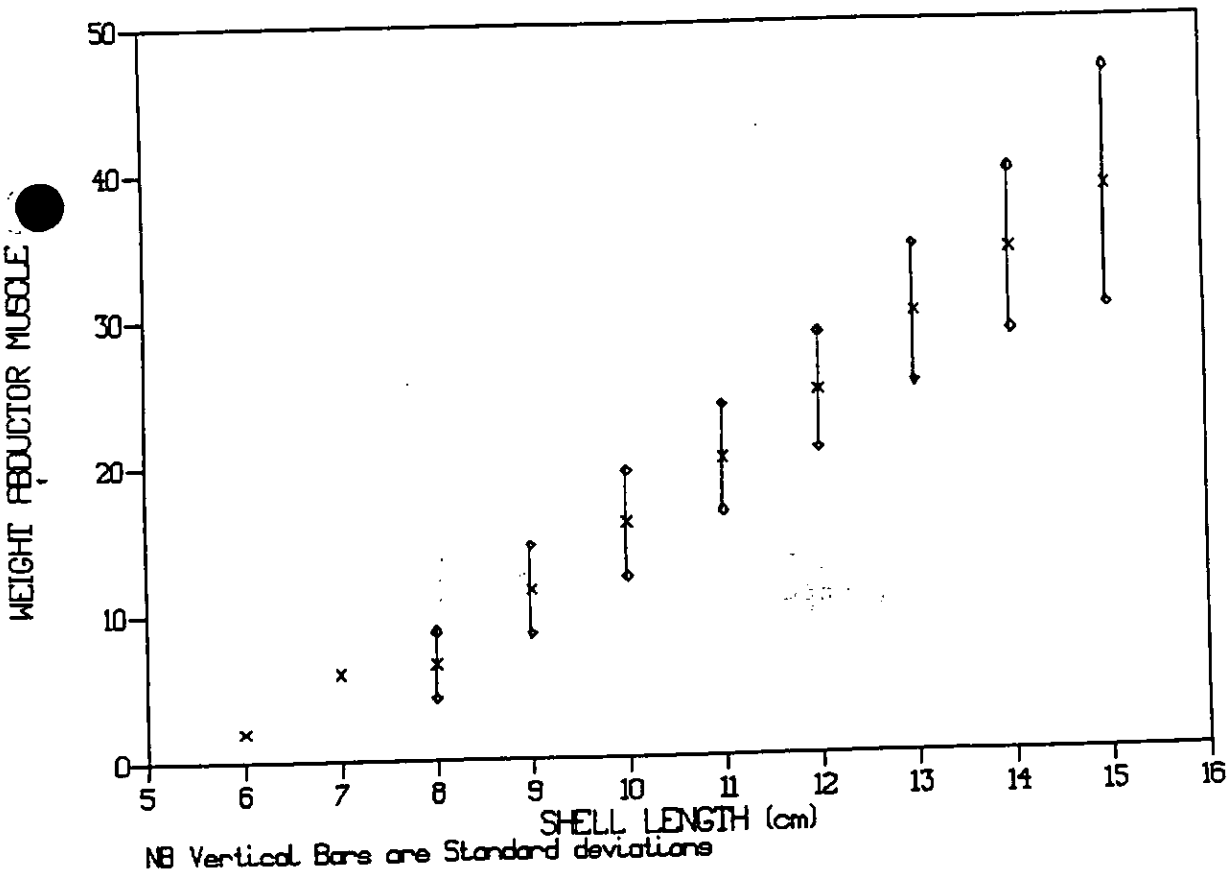
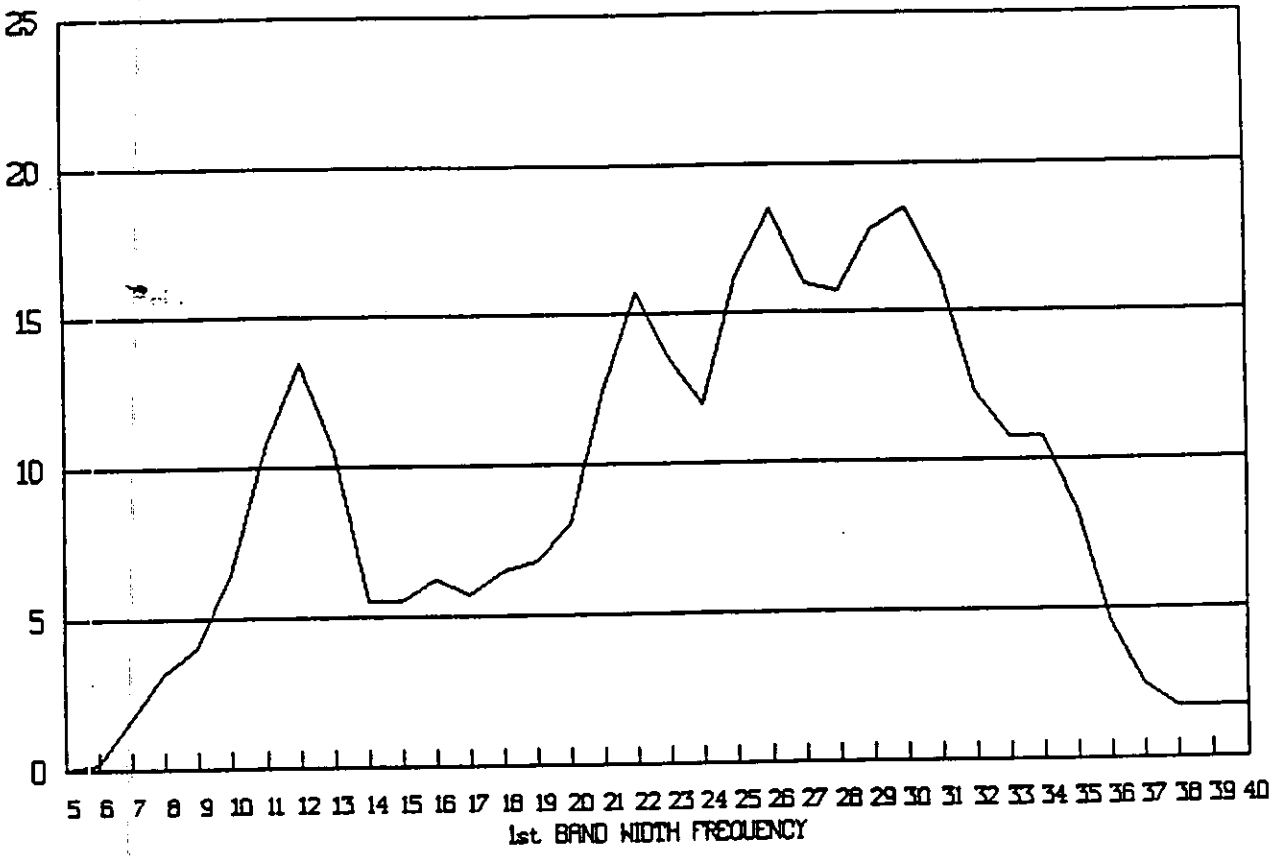


Figure 5

Frequency distribution of first year growth band width for scallops from (a) Northern stations and (b) more southern stations. These data suggest that spring spawned scallops (broad first year band) are more common in northern stations.

*Northern Stations*

FW(smooth) = (FW+1 + (2FW) + FW-1)/4
where FW is the band width frequency to be smoothed




*Southern Stations*