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Herring larval surveys in the Celtic Sea and
Division VIIj in 1983/1984

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ABSTRACT

Surveys for herring larvae in the Celtic Sea were conducted for the sixth successive season between October 1983 and February 1984. The modifications made to the survey grid in the previous season to take account of the amalgamation of the Celtic Sea and Division VIIj for assessment purposes and to ascertain if larvae drift into the Irish Sea were also adopted for the 1983/84 surveys. A drift of larvae towards the Irish Sea was apparent in 1983/84. The larval abundance index for 1983/84 based on a standard survey area was almost three times higher than any previous value. A continuous increase in larval indices since 1978/79 indicates a recovery of the spawning stock.

RESUME

On a fait des enquêtes sur les larves des harengs dans la mer celtique pour la sixième saison successive entre octobre 1983 et février 1984. Pour les enquêtes 1983/1984, on a employé les modifications au graticule qu'on l'a apporté la saison antérieure. Une derive des larves vers la mer celtique se manifestait en 1983/1984. L'indice d'abondance des larves de 1983/84, qui se fondait sur une zone étalonne, était presque trois fois plus grand que tous les résultats antérieurs. Une augmentation soutenue des indices des larves depuis 1978/79 montre un recouvrement du stock des geniteurs.

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INTRODUCTION

Surveys for larvae of autumn and winter spawning herring have been conducted between October and February each season since 1978/79 (Grainger 1979, 1980; Grainger and Cullen 1981; Grainger, McArdle, Cullen and Barnwall 1982; Grainger, Barnwall and Cullen 1983). In 1982 herring in the Celtic Sea and Division VIIj were amalgamated for assessment (Anon 1982). For the 1982/83 surveys an attempt was made to extend the survey grid westwards to 10°13'W during the autumn so as to cover the areas in Division VIIj where it was suspected that spawning occurred. However, severe weather conditions meant that coverage extended this far west on only one cruise.

In the 1983 autumn surveys coverage in the westward extension was complete on two of the cruises. As in the previous season, winter coverage in 1983/84 did not extend west of 8°31'W but it did extend northwards into the Irish Sea on the eastern end of the grid to see if many larvae were drifting into the Irish Sea. Coverage on time throughout the whole season was good with a cruise approximately every 14 days. A total of ten cruises was made.

METHODS

The sampling methods were exactly the same as in the previous season (Grainger et al 1983) and the same vessel (MFV Stelimar) was used as in the last three seasons.

For the purpose of calculating the larval abundance index only those stations in the standard area as used in the previous assessments were used. The standard area is west of 6°00'W, south of 52°20'N and east of 9°30'W in autumn or east of 8°31'W in winter. Coverage within this area was good in both 1982/83 and 1983/84. Calculation of the autumn larval index for <10mm larvae, the winter index for <11mm larvae and the total index was exactly as for previous seasons (Grainger et al 1982).

RESULTS AND DISCUSSION

The distributions of larvae (when larvae were present) in the three size categories are shown for each cruise in Figures 1-10. Stations sampled but at which no larvae in that size category were taken are marked with a dot.

Small larvae were most abundant as in previous years off Cork Harbour and in Baginbun Bay. As is generally the case larvae off Cork drifted westwards but larvae from Baginbun appeared to drift eastwards in 1983/84 towards the Irish Sea which is a pattern not observed in 1982/83.

In the westward extension to the grid, autumn larvae were most abundant off the Shannon Estuary and in Dingle Bay.

The abundance of larvae in each size class for each cruise in 1983/1984 is shown in Table 1. Small larvae were much more abundant than in previous years and showed a major peak in the autumn and a secondary peak in the winter. In all, five of the ten cruises showed abundances which exceeded those at corresponding periods in previous years.

The winter index is multiplied by 1.465 (to allow for the lower fecundity of winter spawners) and added to the autumn index to produce a total index ($\times 10^{-6}$) for each season (numbers of cruises in brackets):

	Autumn	Winter x 1.465	Total
1978/79	7 163 (3)	122 (3)	7 284 *)
1979/80	9 503 (5)	3 374 (5)	12 877
1980/81	7 601 (4)	8 932 (4)	16 533
1981/82	16 285 (5)	1 510 (5)	17 795
1982/83	14 557 (5)	5 164 (6)	19 721
1983/84	42 393 (5)	15 608 (5)	58 001

*) = Monthly cruises - inefficient estimate

The total index for 1983/84 is 58×10^9 which is almost three times the 1982/83 value (the previous maximum).

For the fifth year in succession the larval index has increased indicating a continuing growth in spawning stock biomass for this stock. However the increase shown by the 1983/84 value is unprecedented.

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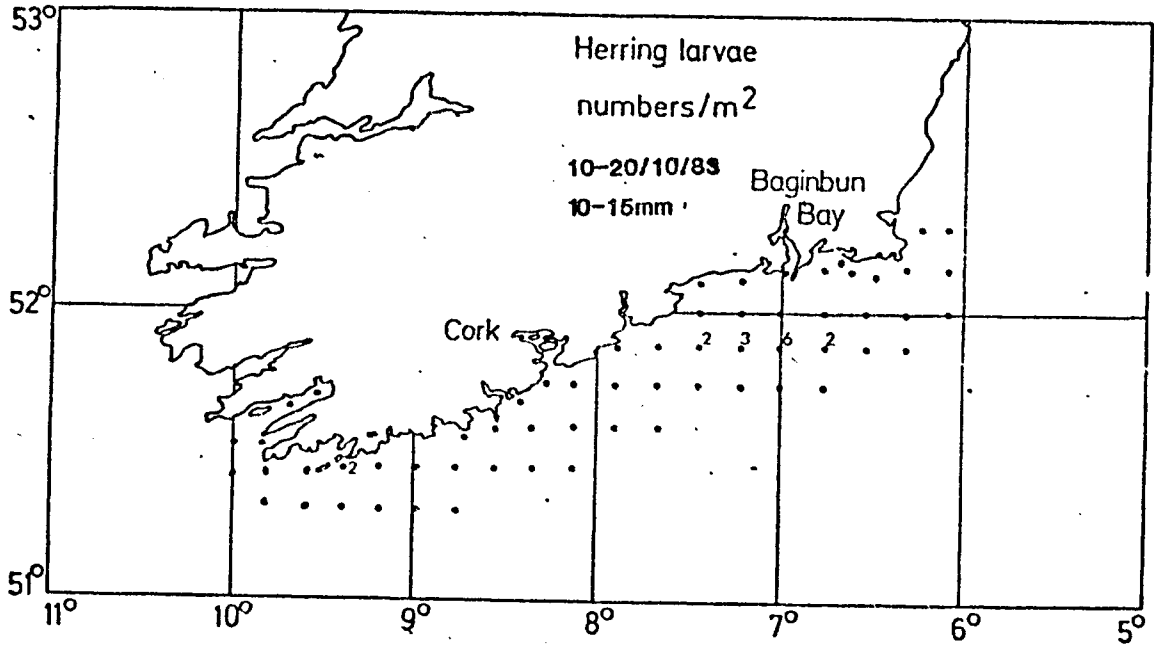
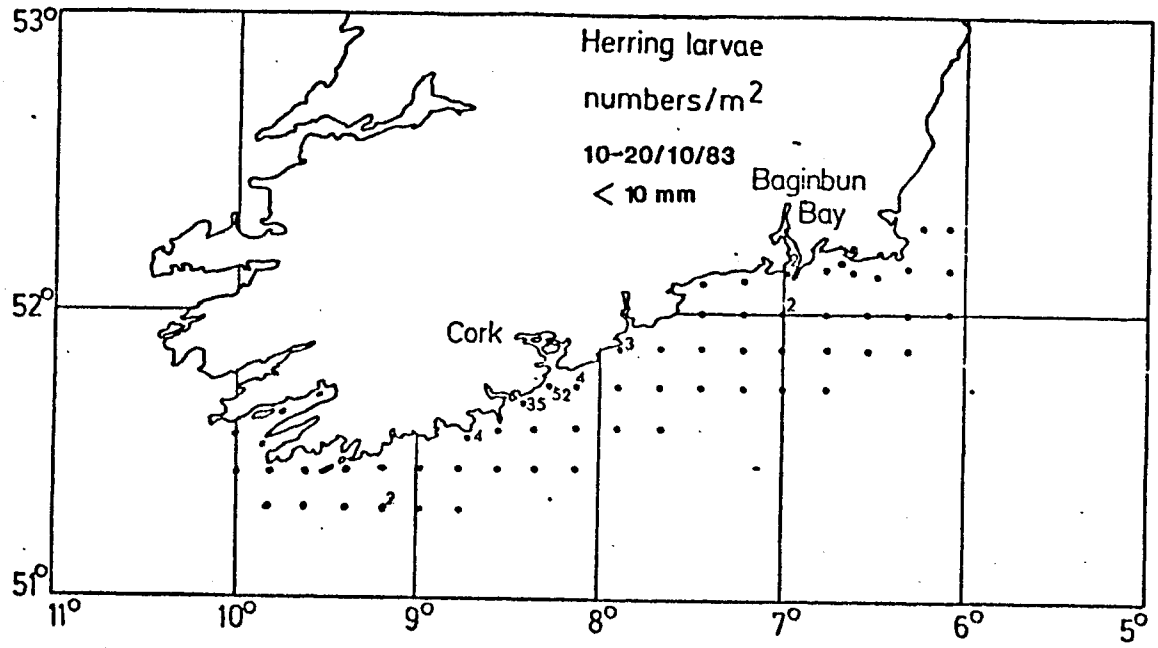


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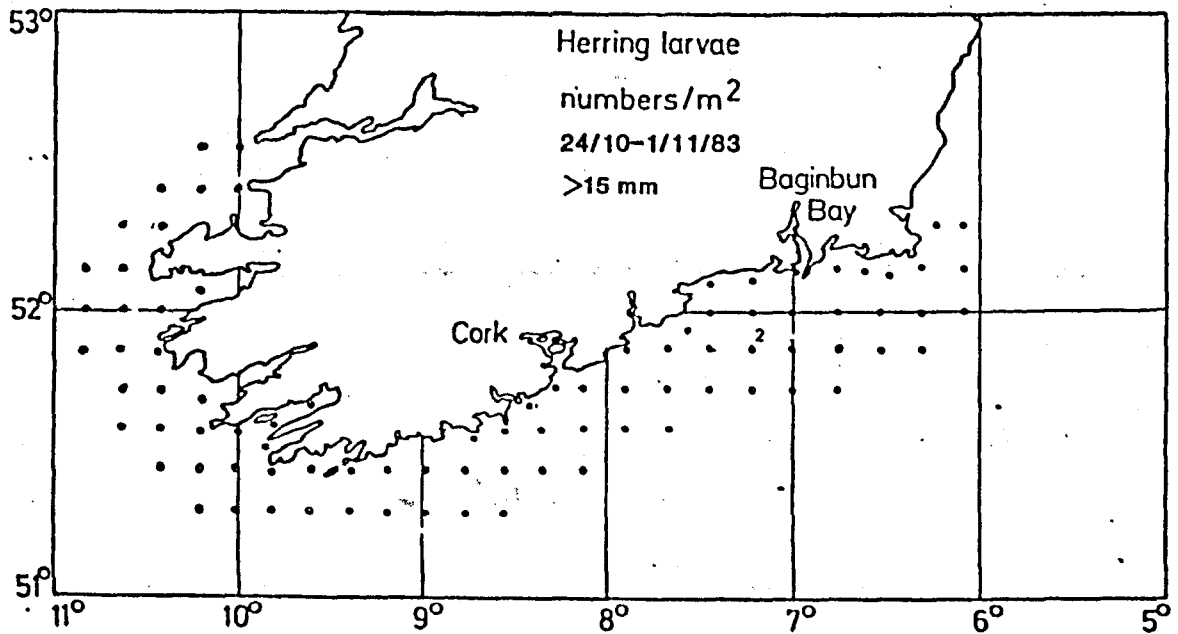
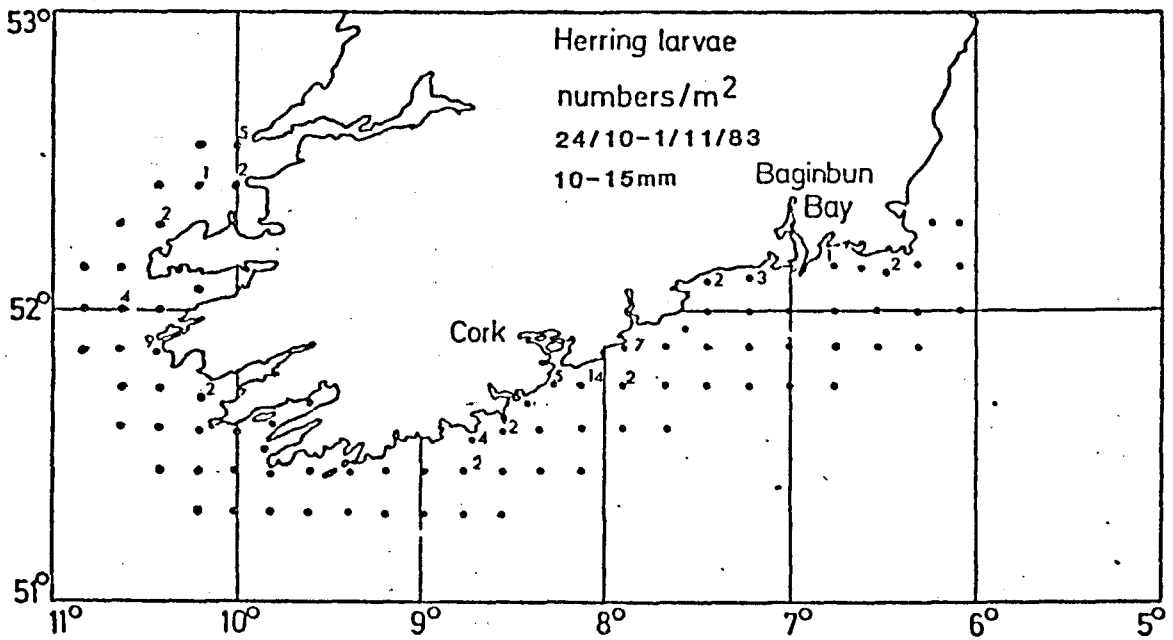
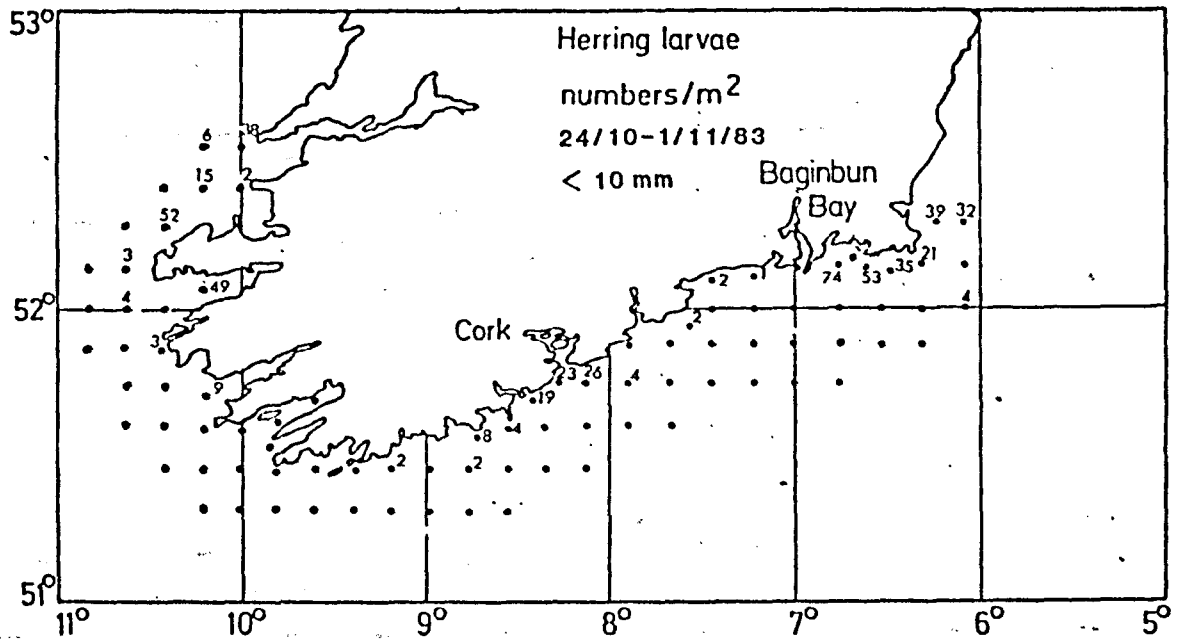


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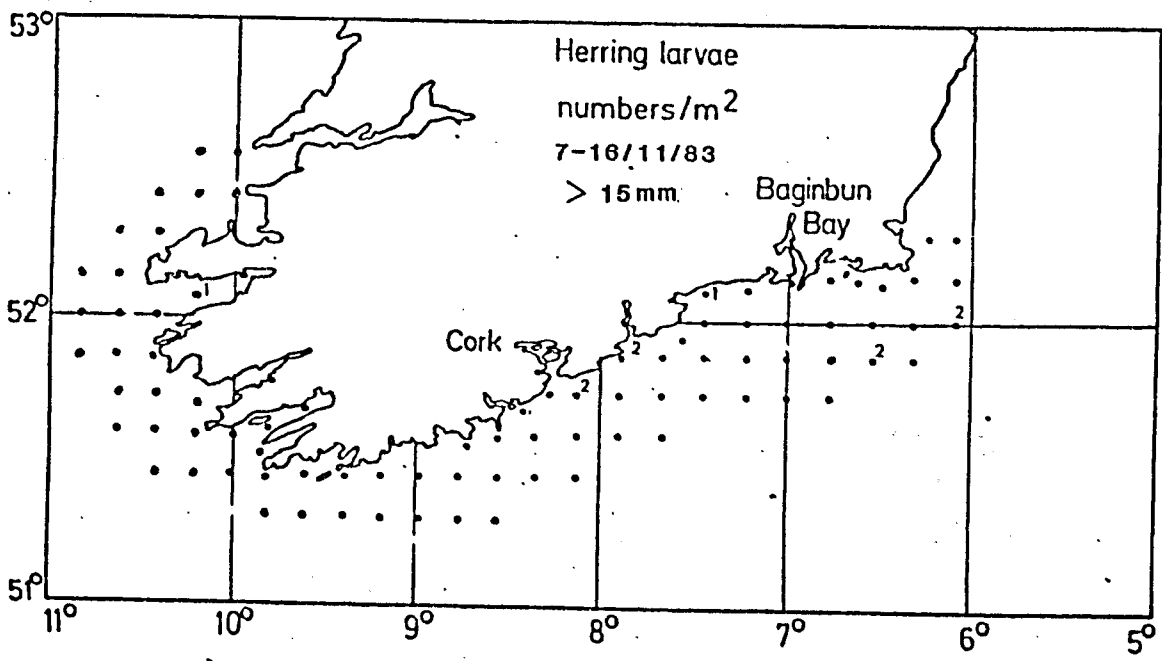
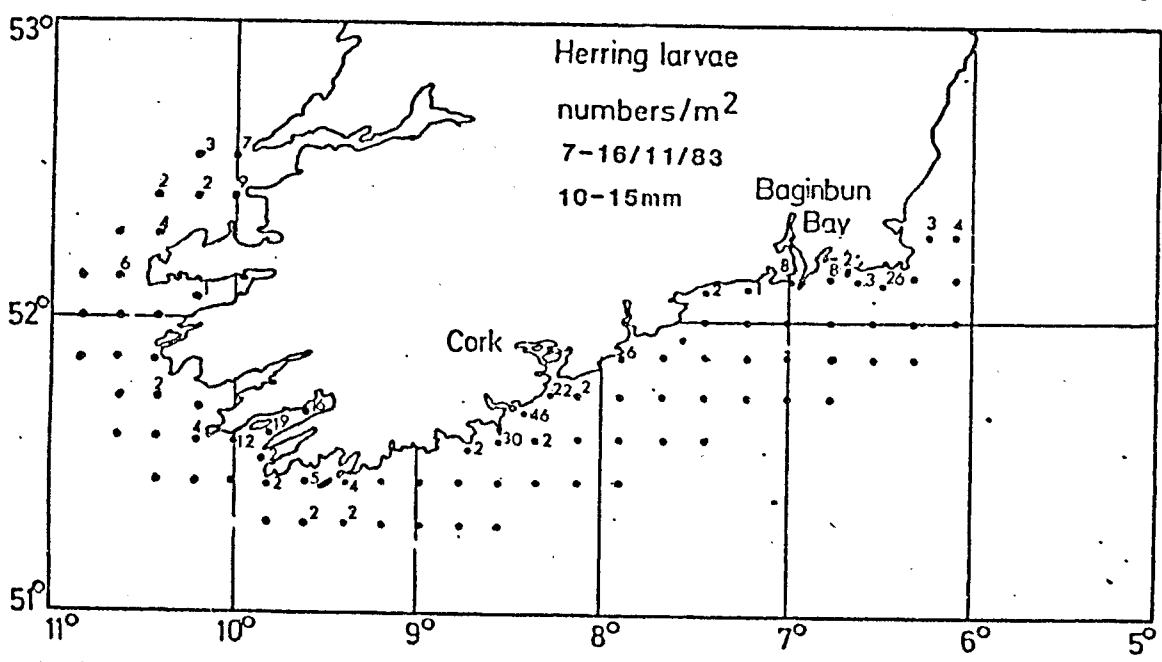
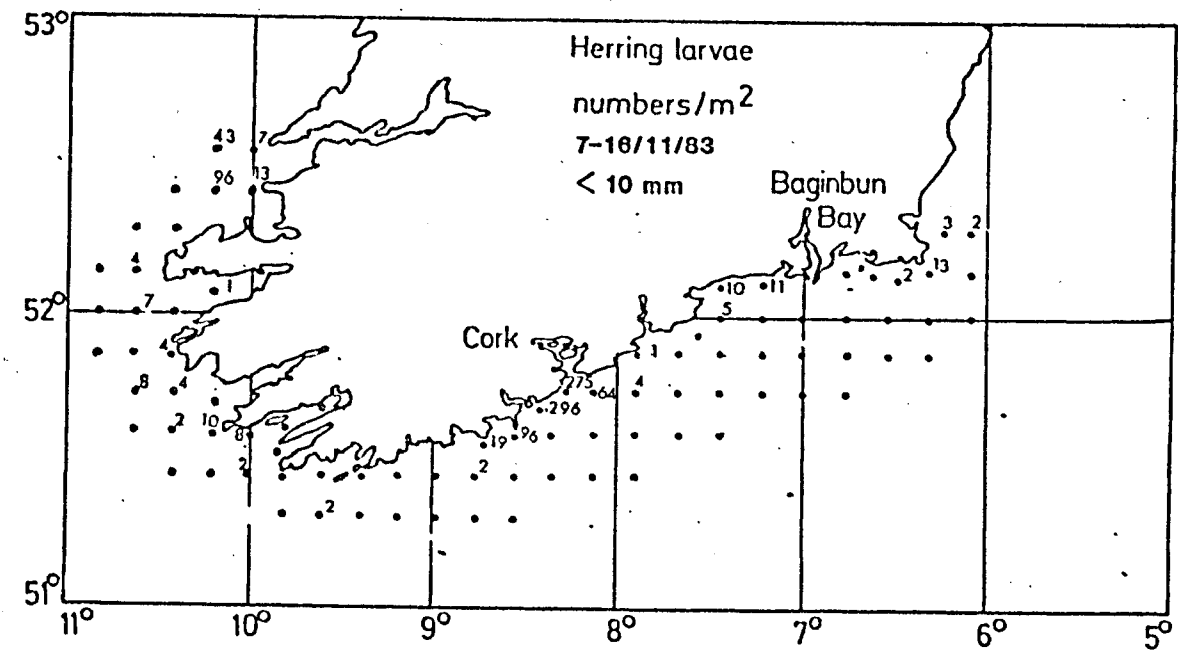


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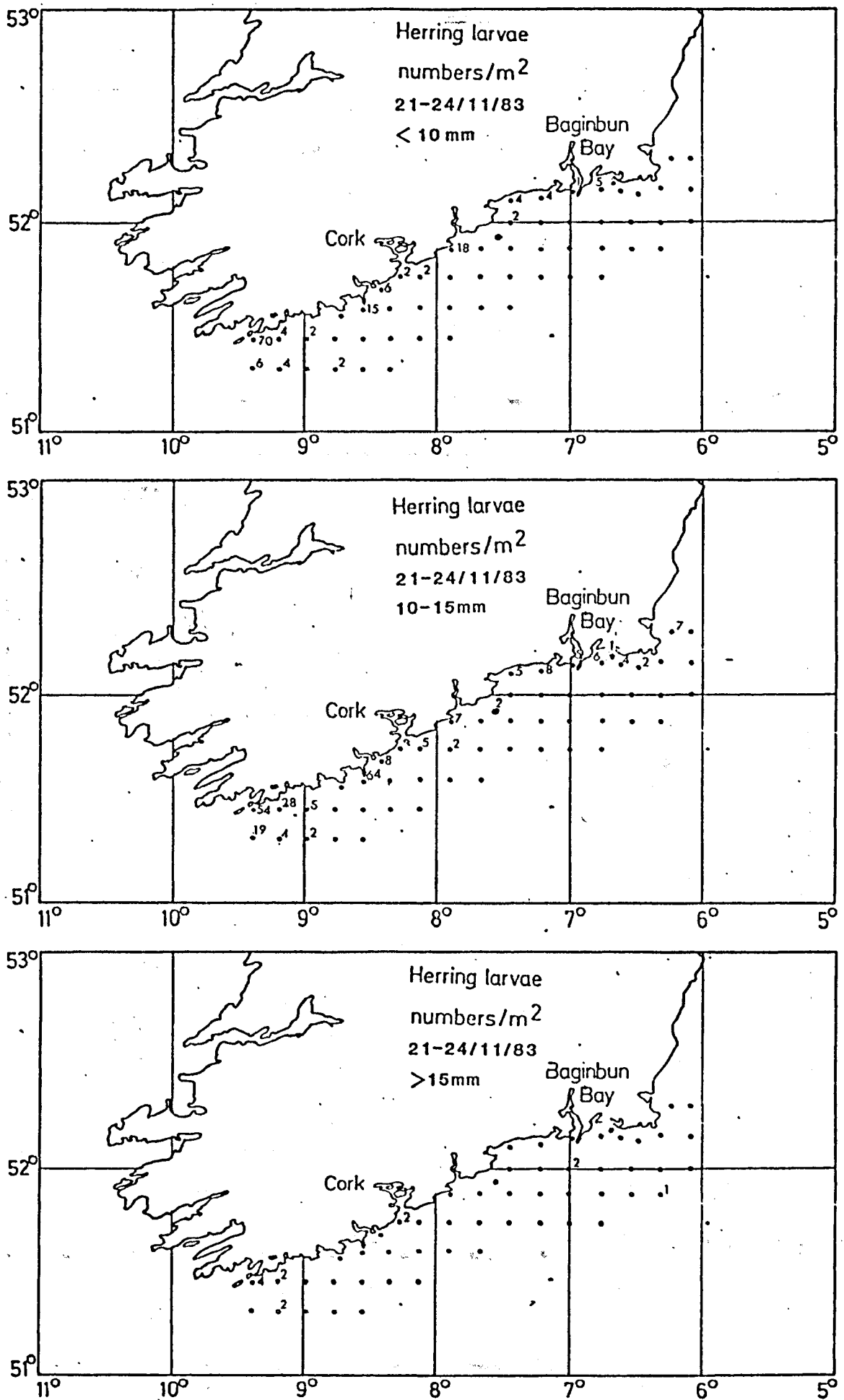


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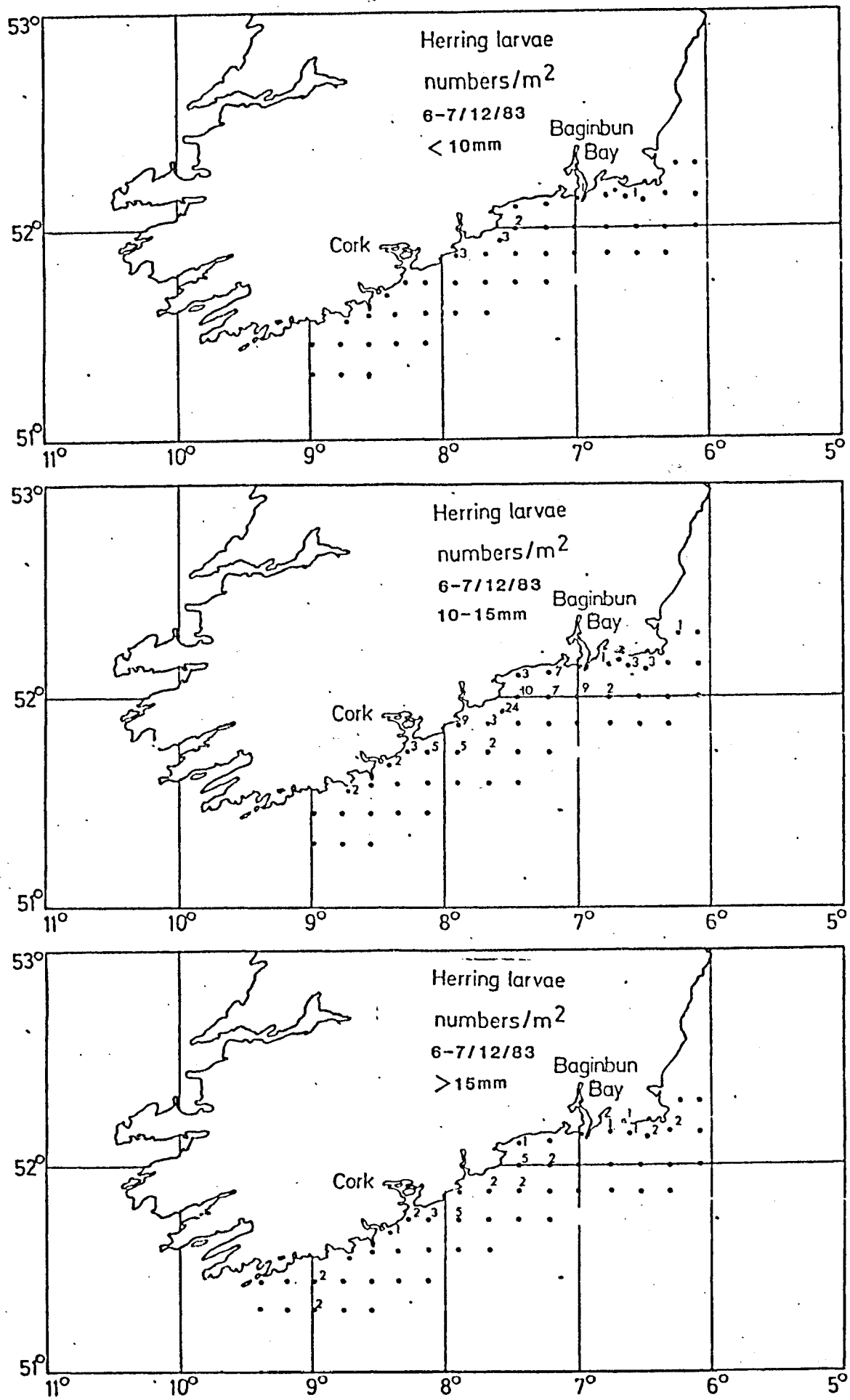


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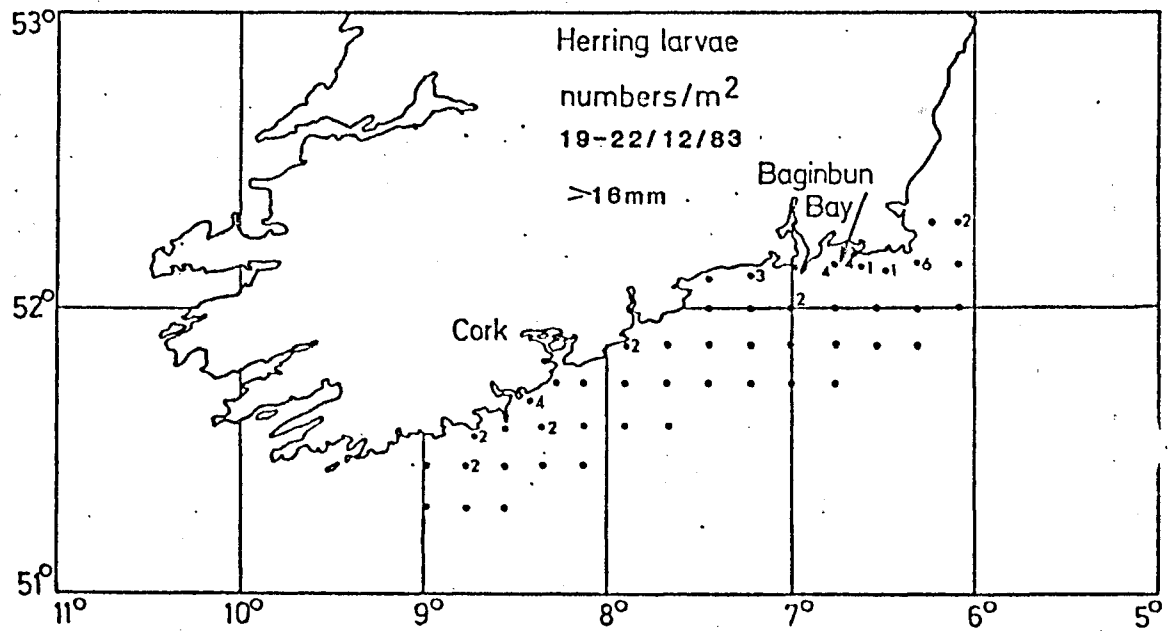
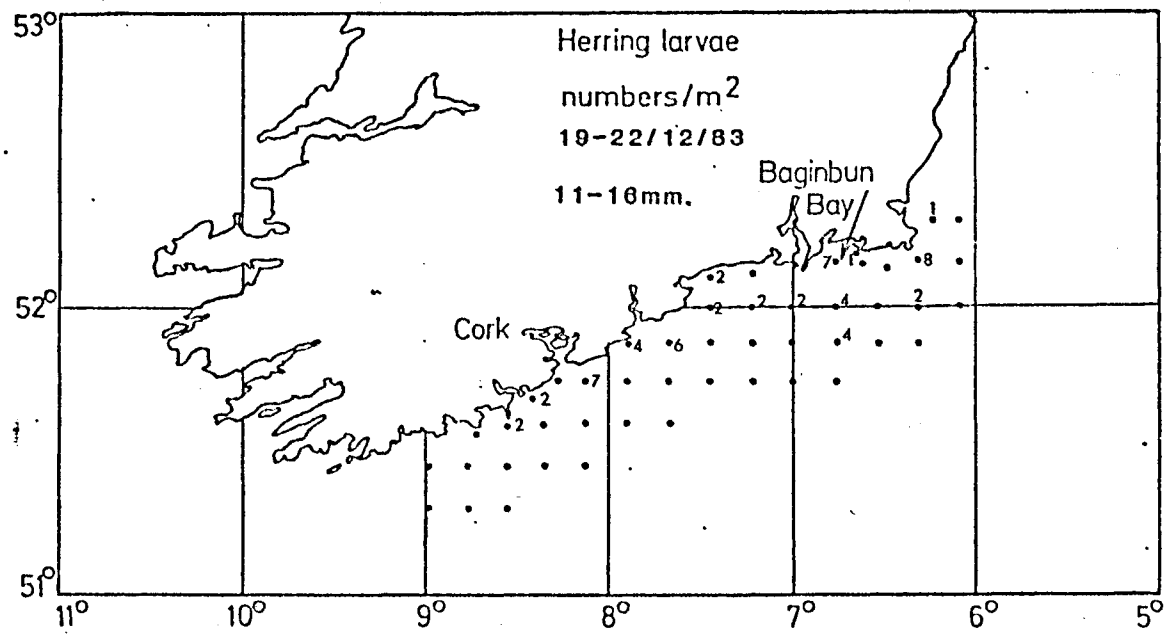
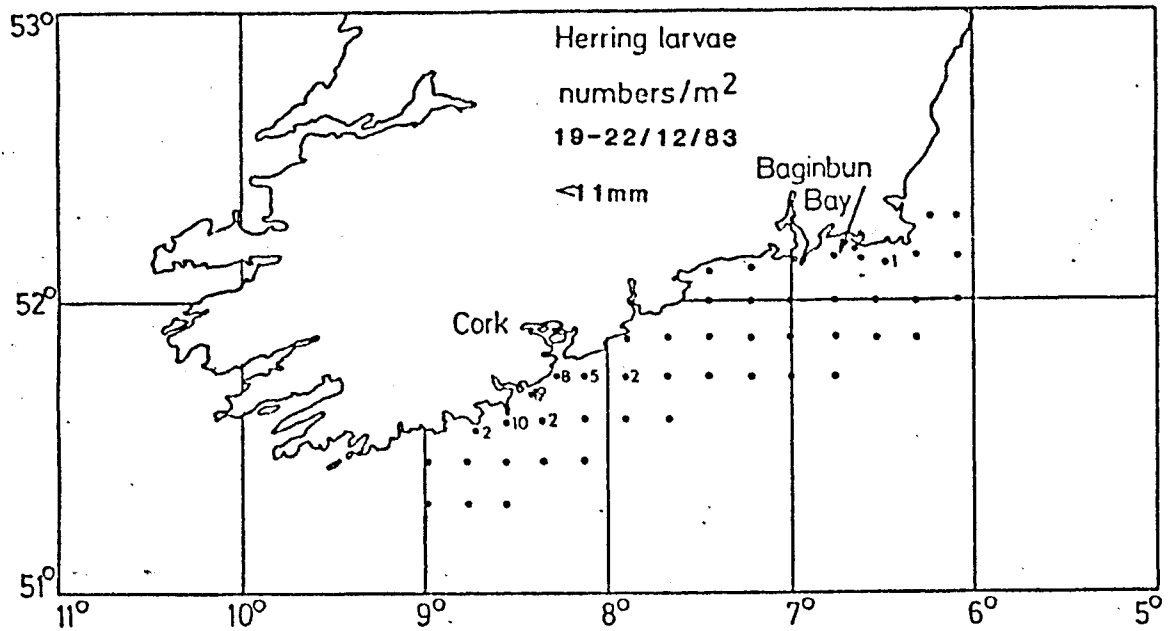


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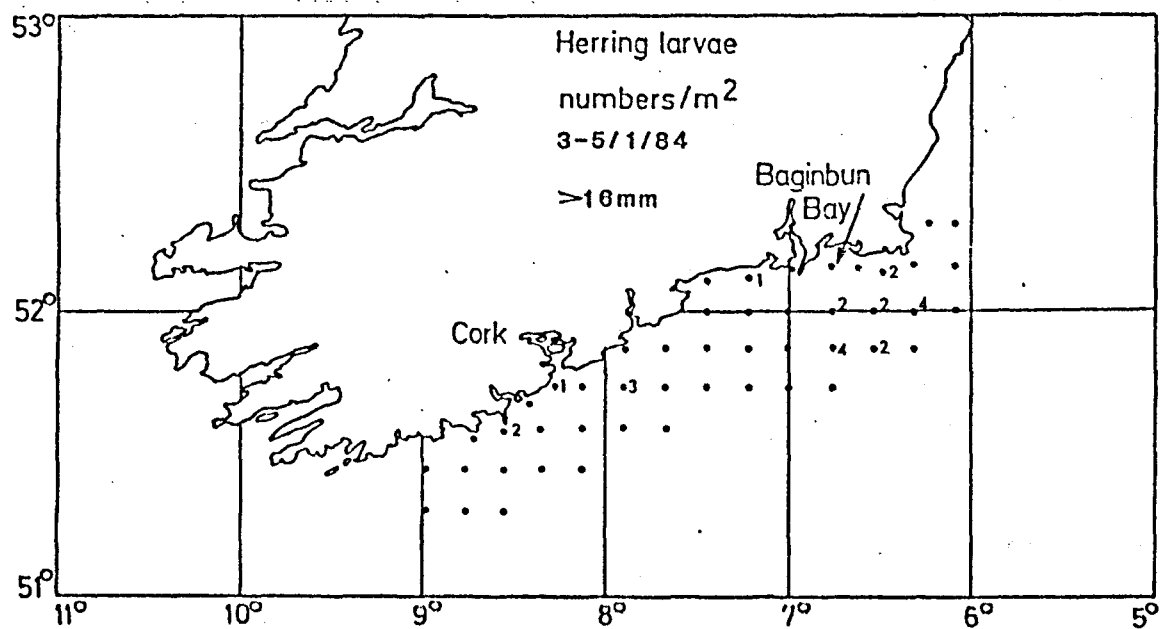
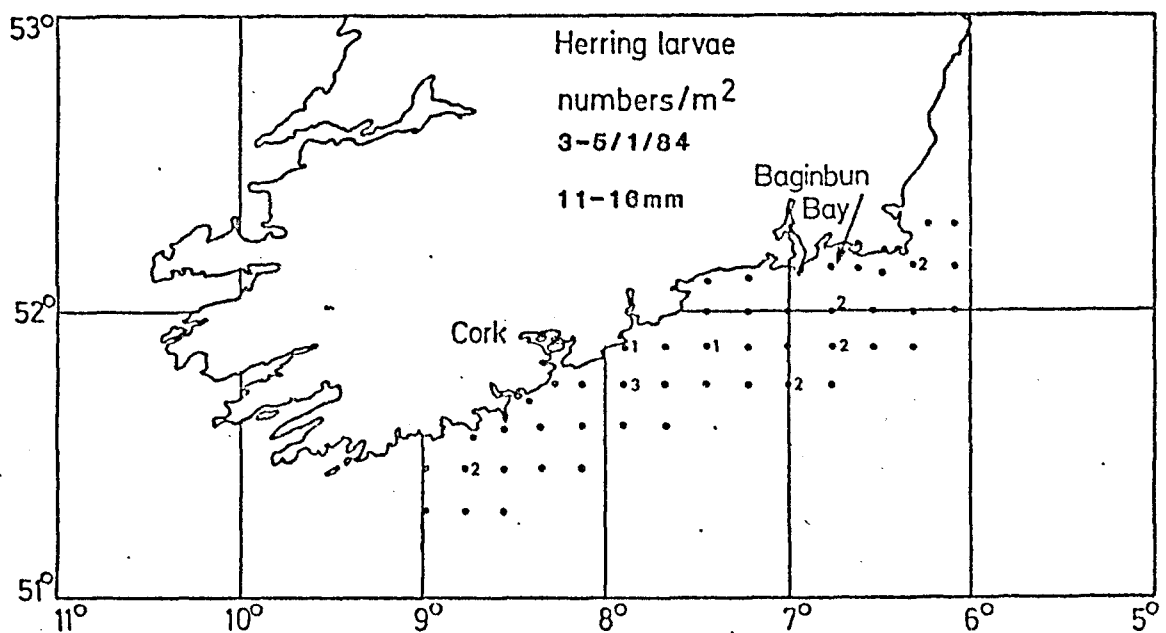
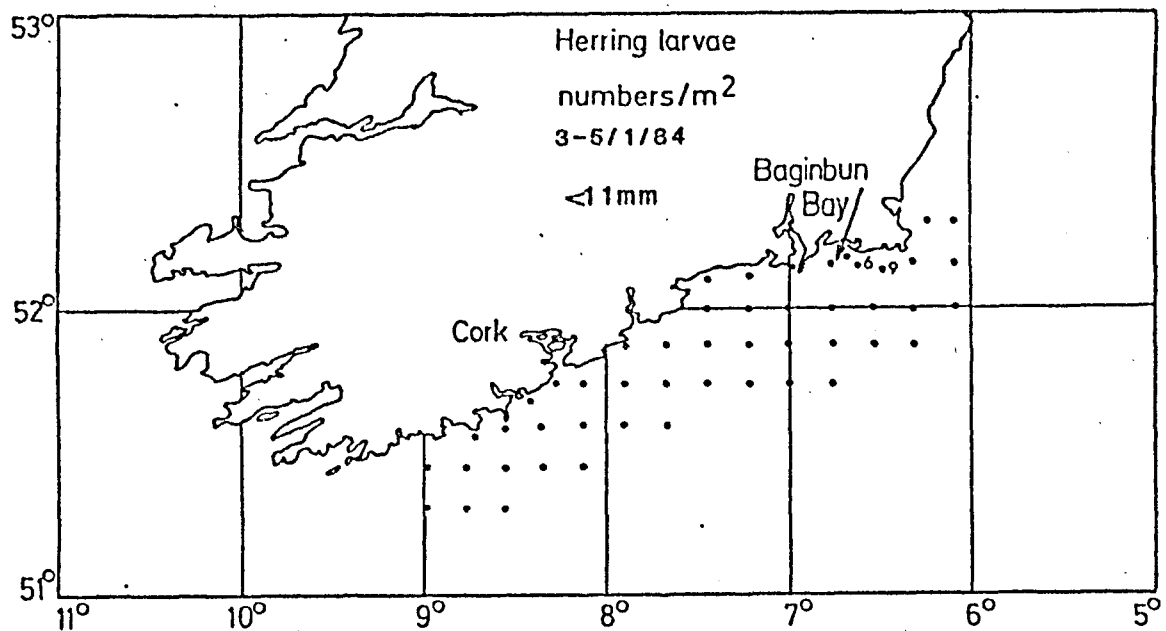


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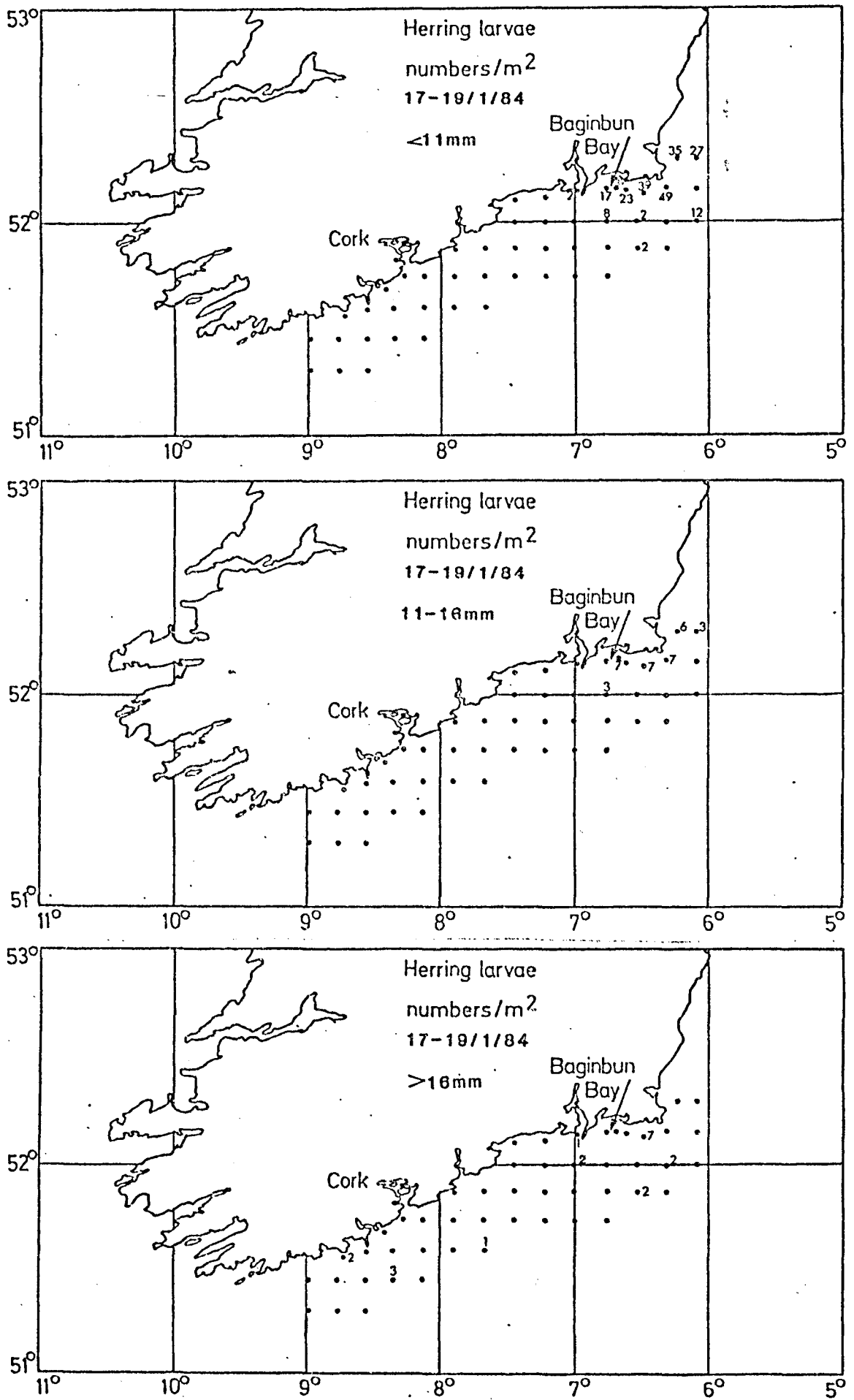


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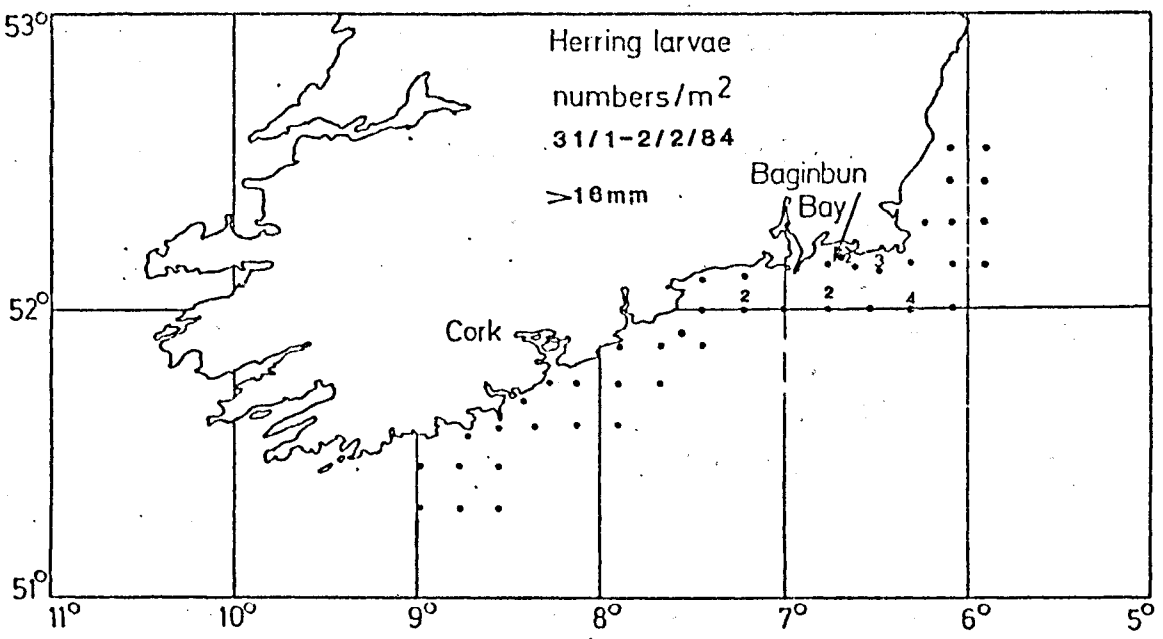
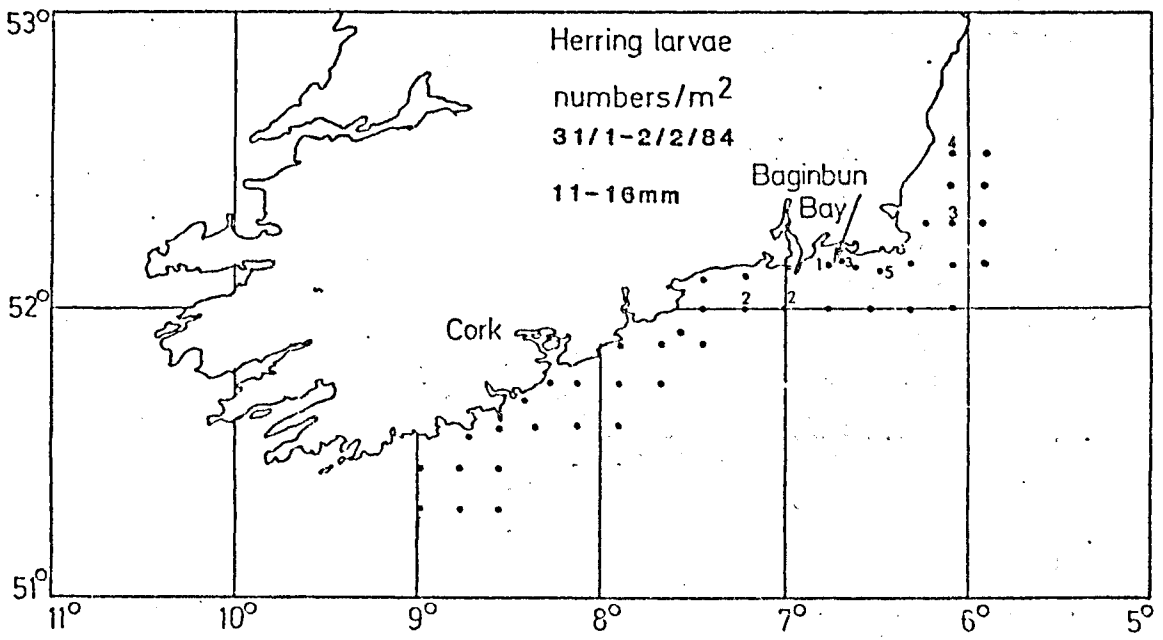
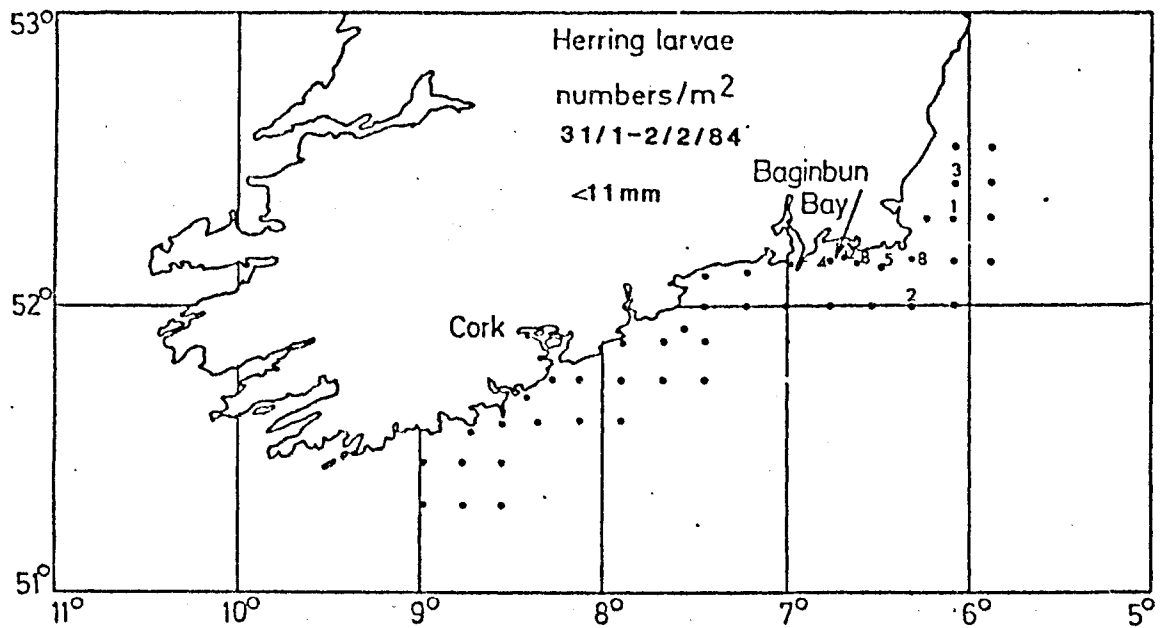


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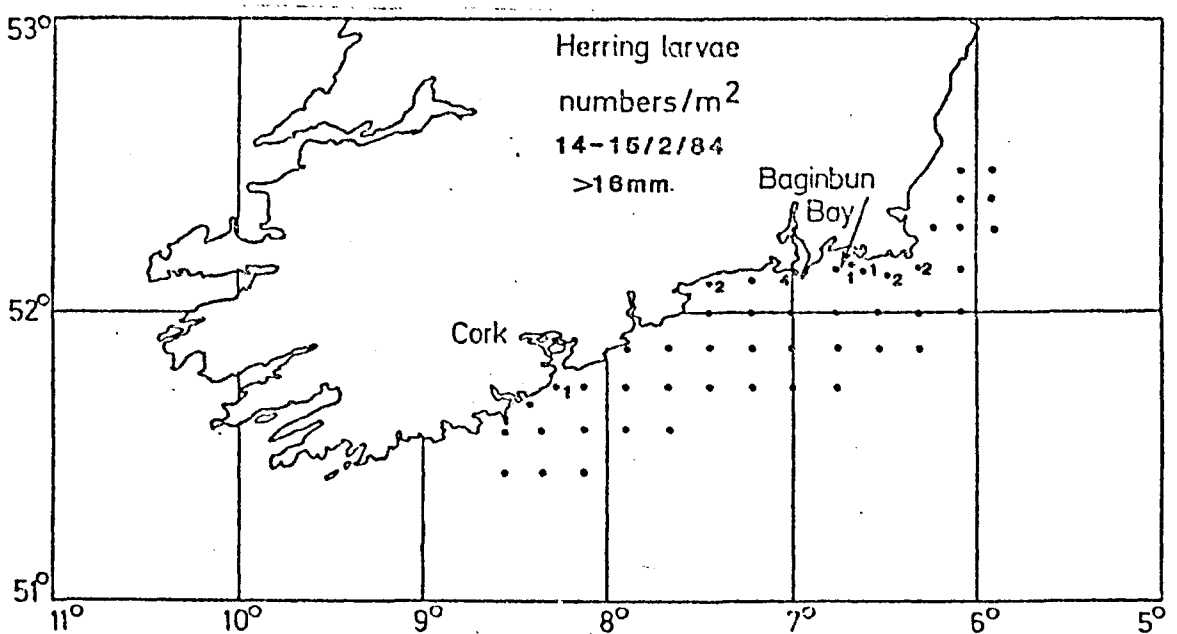
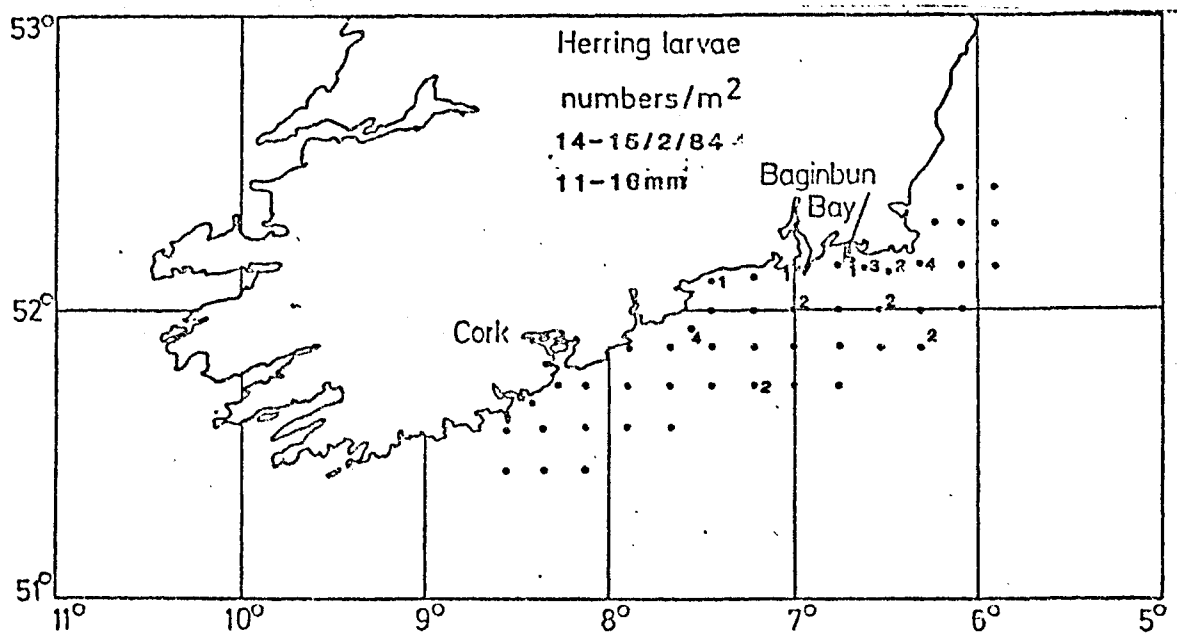
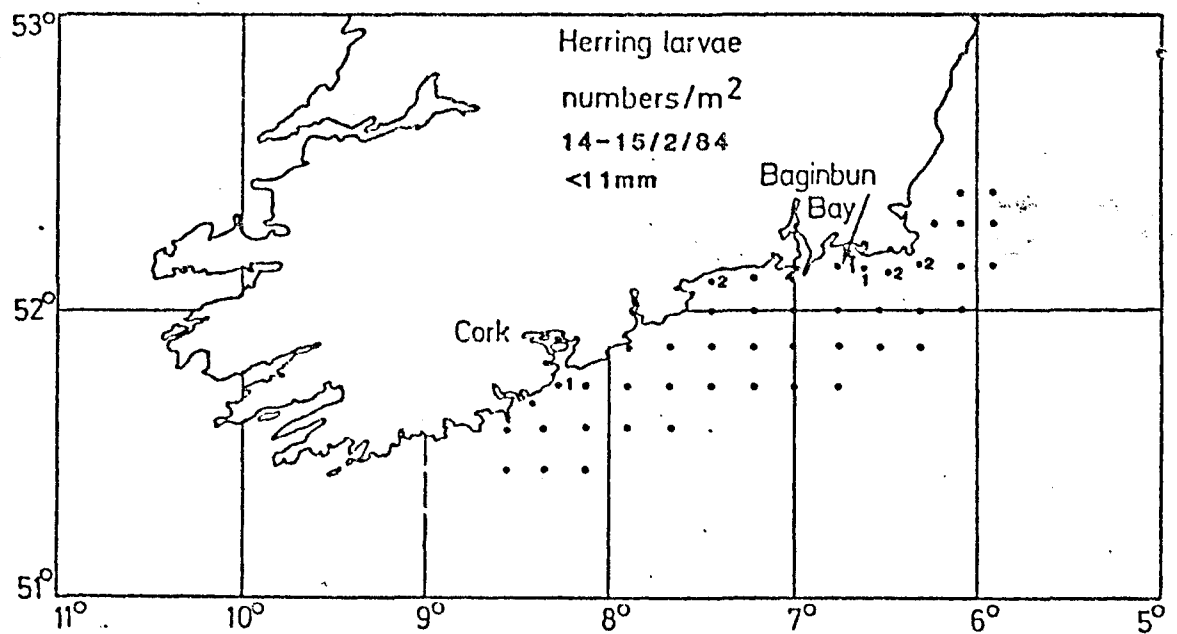


Figure 10