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Herring larval surveys in the Celtic Sea and Division VIIJ in 1982/83

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ABSTRACT

Surveys for herring larvae in the Celtic Sea were conducted between October 1982 and February 1983 for the fifth successive season. To take account of the amalgamation of the Celtic Sea and Div VIIJ herring for assessment purposes and to ascertain if many larvae drift into the Irish Sea, the survey grid of previous years was modified for the 1982/83 season. However, because of the nature of the larvae distribution it appears reasonable to compare the larvae index for 1982/83 with those of the previous seasons. The increase in indices since 1978/79 has continued up to 1982/83 indicating a steady, but slow, recovery of the spawning stock. Very few larvae appear to drift into the Irish Sea

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). In 1982 herring in the Celtic Sea and Div VIIJ were amalgamated for assessment (Auch 1982). Consequently, for the 1982/83 surveys it was decided to extend the survey grid westwards during the autumn to $10^{\circ}13'W$ so as to cover the Bantry Bay area where it was suspected from commercial catch samples that spawning occurred. Unfortunately due to severe weather conditions coverage extended this far west on only one cruise.

A change was also made to winter (December-February) cruises when sampling in 1982/83 did not extend further west than $8^{\circ}31'W$ because in previous years small class larvae were very rare in that region. In addition, winter coverage was extended northwards on the eastern end of the grid to see if many larvae were drifting into the Irish Sea.

Because some spawning herring were still being caught in early February, which was later than in previous years, an extra cruise was made at the end of February.

METHODS

The sampling methods were the same as in the previous season (Grainger et al 1982) except that whereas before two double oblique tows were made at every station, in 1982/83 this was only done where the water depths was less than 20 fm (37m), otherwise one double oblique tow was made. Whereas the area of coverage was curtailed to some extent by weather, as already stated, coverage on time was very satisfactory with surveys roughly every 14 days.

Calculation of the autumn larval index for <10mm larvae, the winter index for <11mm larvae and the total larval index was exactly as for the previous season (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 1-11. Stations sampled but at which no larvae were taken in that category are marked with a dot.

Small class larvae were most abundant west of Cork Harbour in the autumn and again in late February; lower abundances were observed off Mine Head (Approx $7^{\circ}40'W$) in late October and near Baginbun Bay in January and February. Very few larvae appeared to drift northwards into the Irish Sea.

On the single cruise (12-15/10/82) which extended as far west as Bantry Bay virtually no larvae were taken. Similarly, very few larvae were taken on the winter cruises in the additional area at the eastern end of the grid extending into the Irish Sea. It was unlikely judging from previous year's results that many larvae were present in the area west of $8^{\circ}31'W$ excluded from the winter surveys last season. Therefore, overall the changes in sampling distribution in 1982/83 are unlikely to have made much difference to the numbers of larvae taken and so it is reasonable to compare the larvae index with those from previous years.

The estimated abundance of larvae in each size class on each cruise is given in Table 1. Small class larvae were most abundant in October and November after which they were scarce until late February. Medium and large class larvae were scarcer than in previous years. The autumn index based on <10mm larvae prior to 15 December, the winter index based on <11mm larvae after 15 December and multiplied by 1.465 to allow for the difference in fecundity, and the total index are given in the following table along with those from other seasons (number of cruises in brackets):

Season	Autumn	Winter X 1.465	Total
1978/79*	7163(3)	122(3)	7284
1979/80	9503(5)	3374(5)	12877
1980/81	7601(4)	8932(4)	16533
1981/82	16285(5)	1510(5)	17795
1982/83	14557(5)	5164(6)	19721

* monthly cruises - not good estimates.

Thus, for the fourth year in succession the larval index has increased indicating that there has been a continuous, but slow, increase in spawning stock biomass of the Celtic Sea herring.

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Table 1: Larval abundances in the 1982/83 season

Cruise	mid-date	ABUNDANCE ($\times 10^{-6}$)		
		<10mm,	10-15mm	>15mm
0882	13/10/82	25646	1169	225
1082	27/10/82	8852	2550	0
1282	10/11/82	36245	14510	0
1382	24/11/82	2043	3477	519
1482	9/12/82	0	3660	1658
		<11mm	11-16mm	>16mm
1582	19/12/82	348	1287	927
0183	7/1/83	0	415	709
0283	19/1/83	3605	0	314
0383	2/2/83	942	0	1788
0583	16/2/83	5363	367	253
0683	28/2/82	10890	5650	0

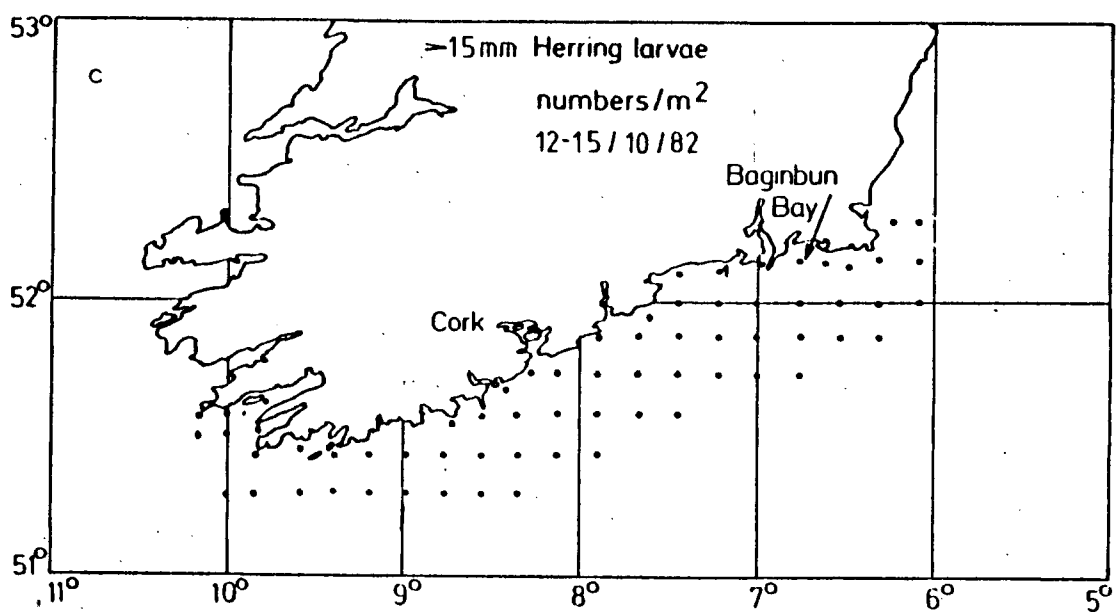
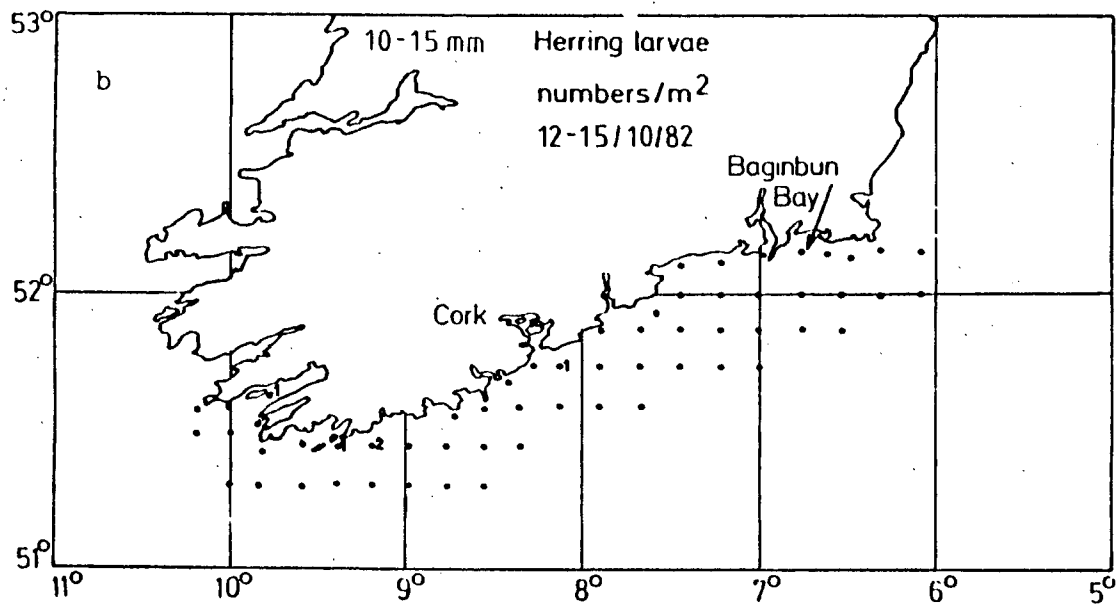
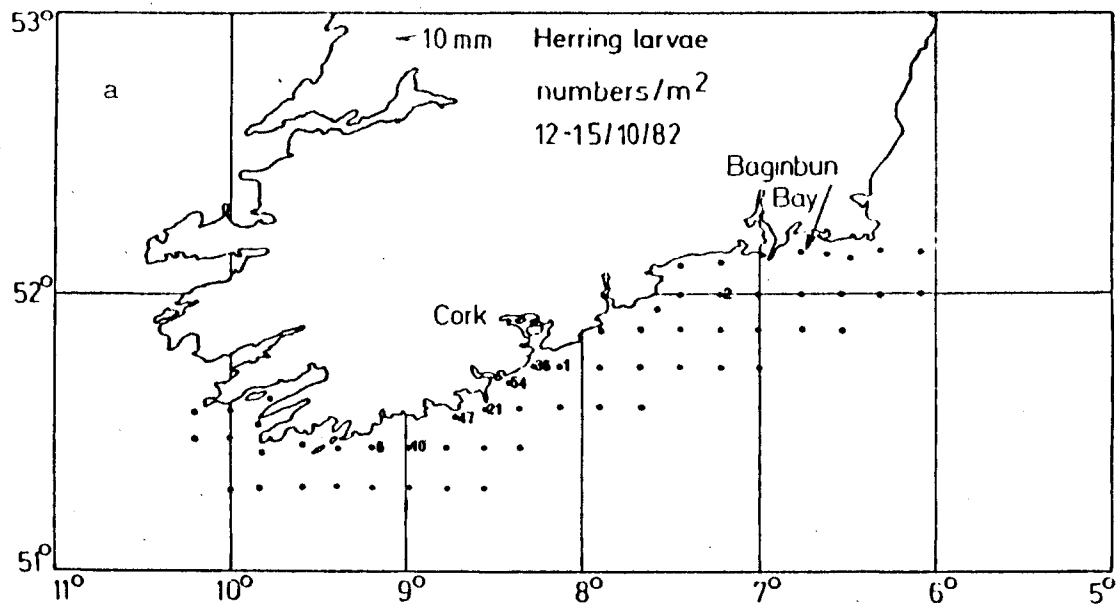


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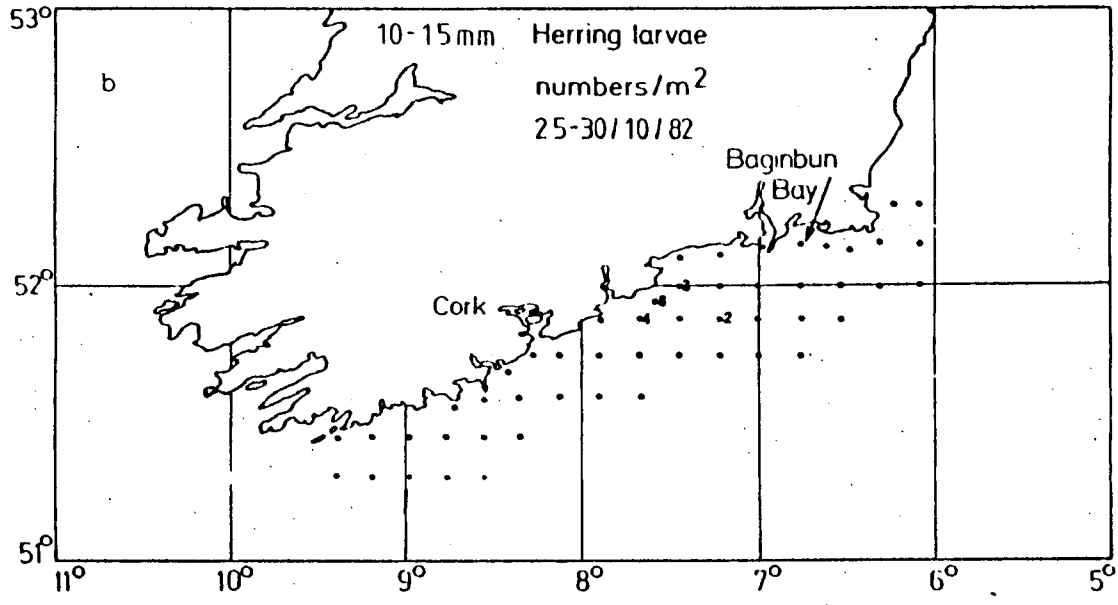
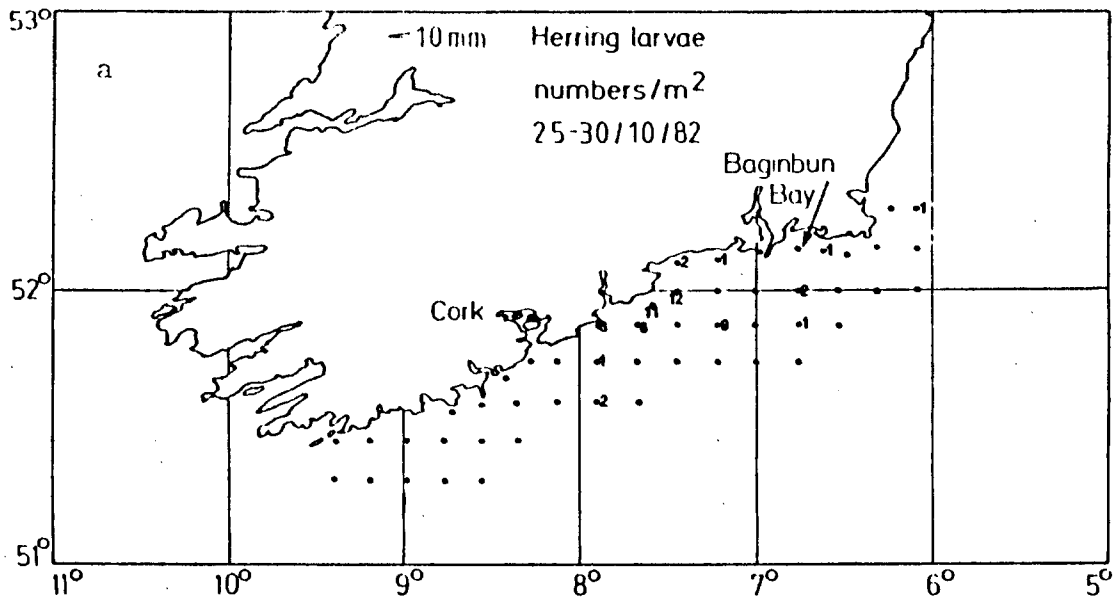


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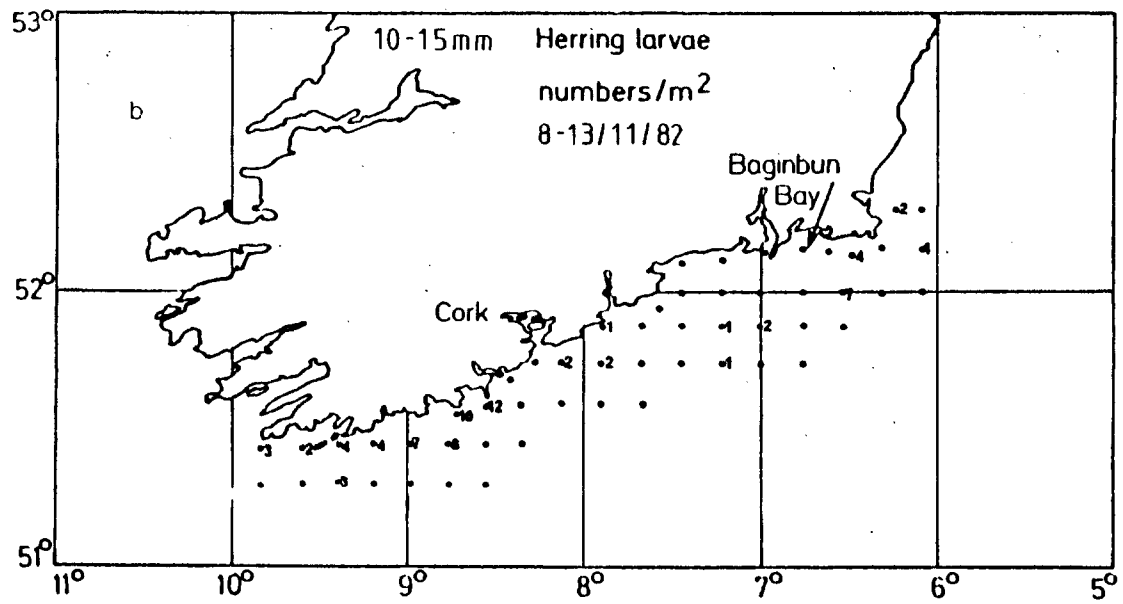
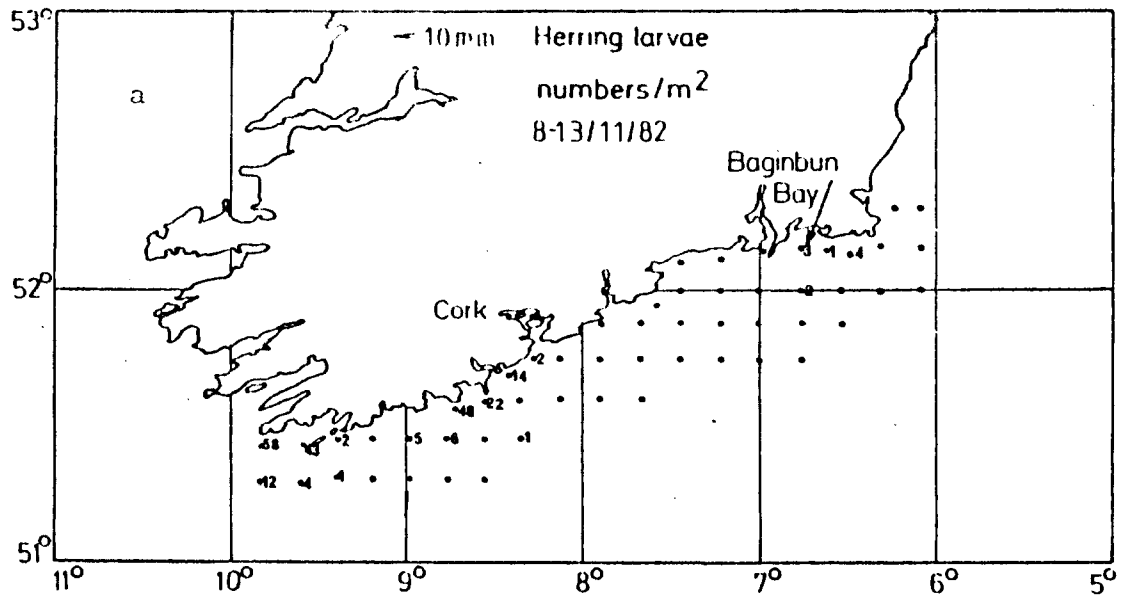


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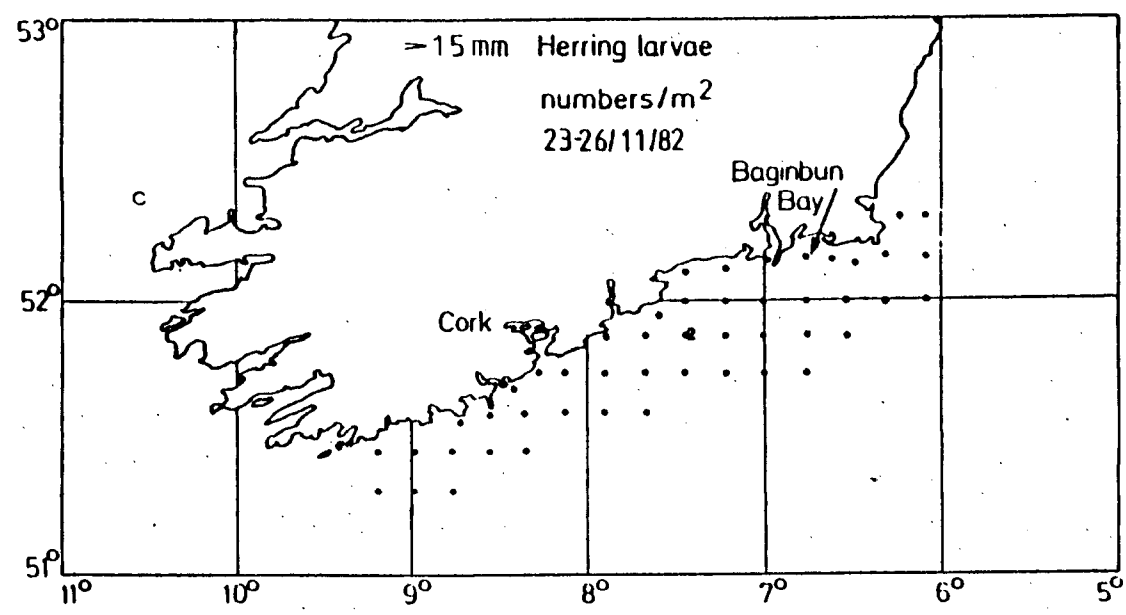
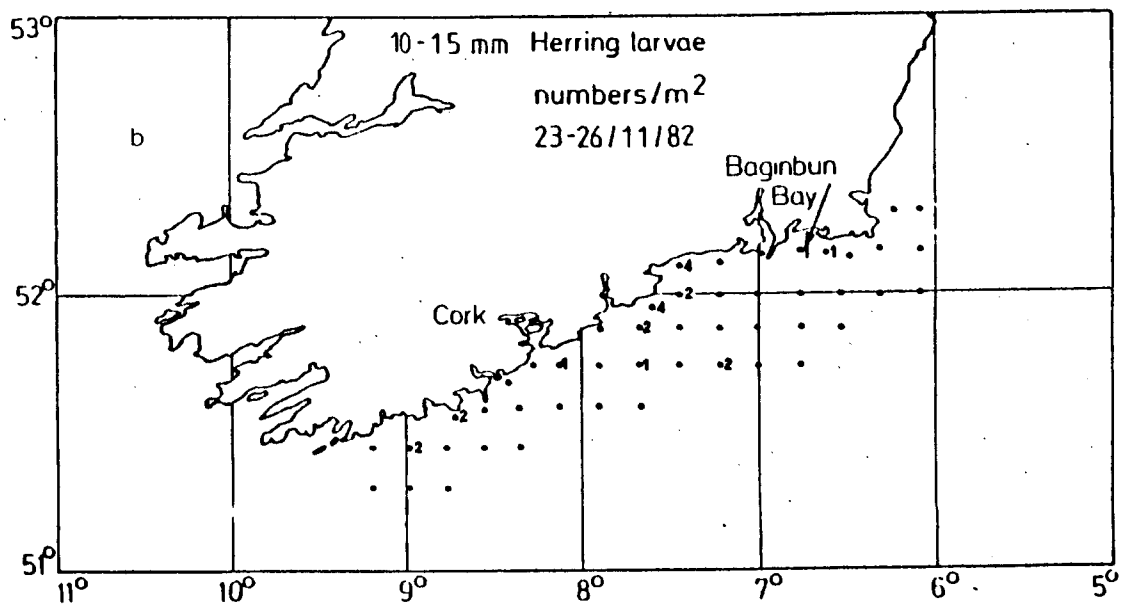
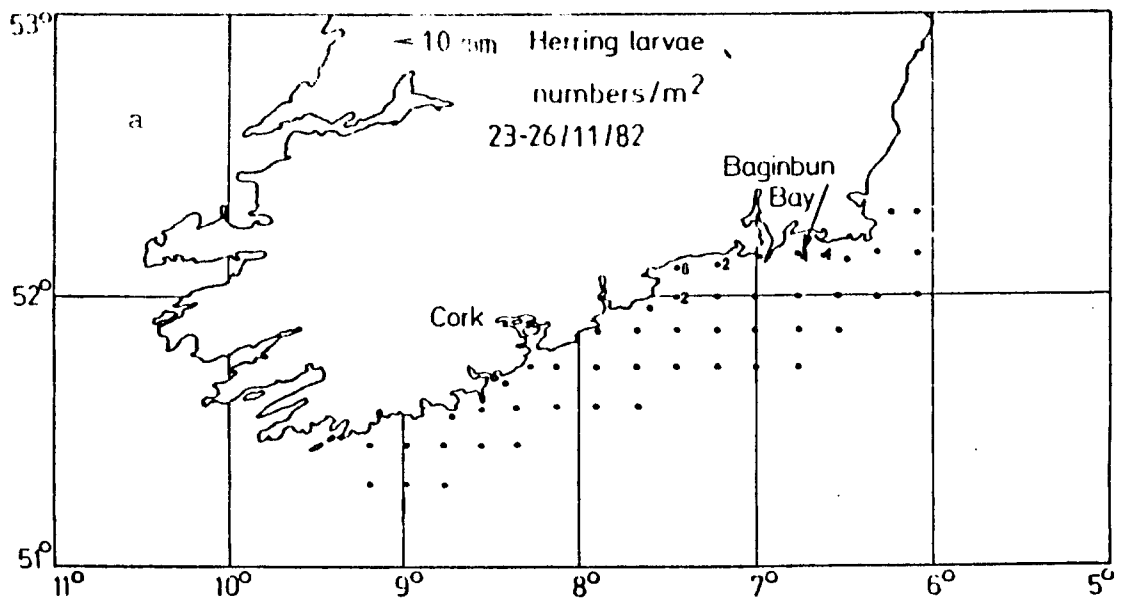


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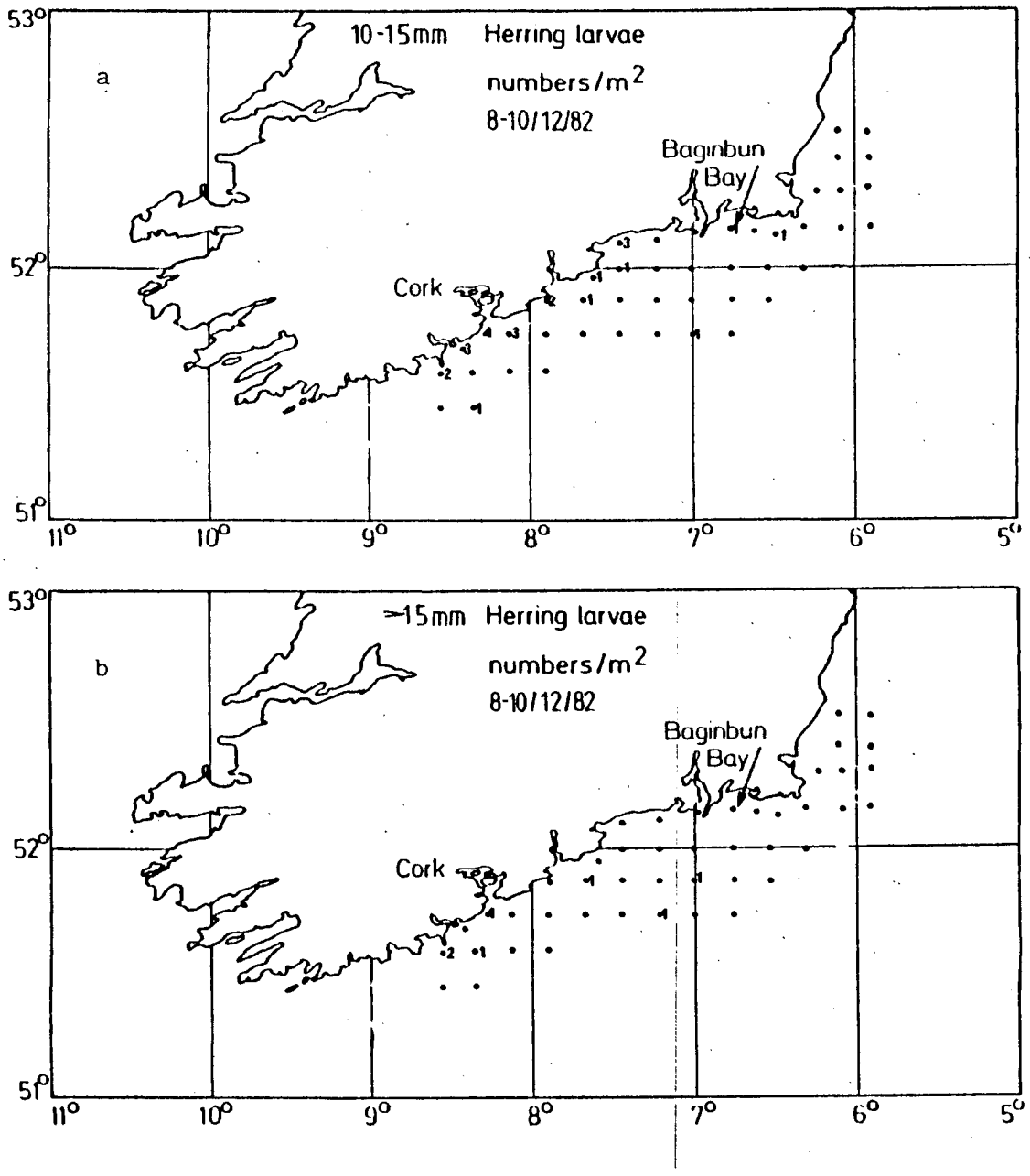


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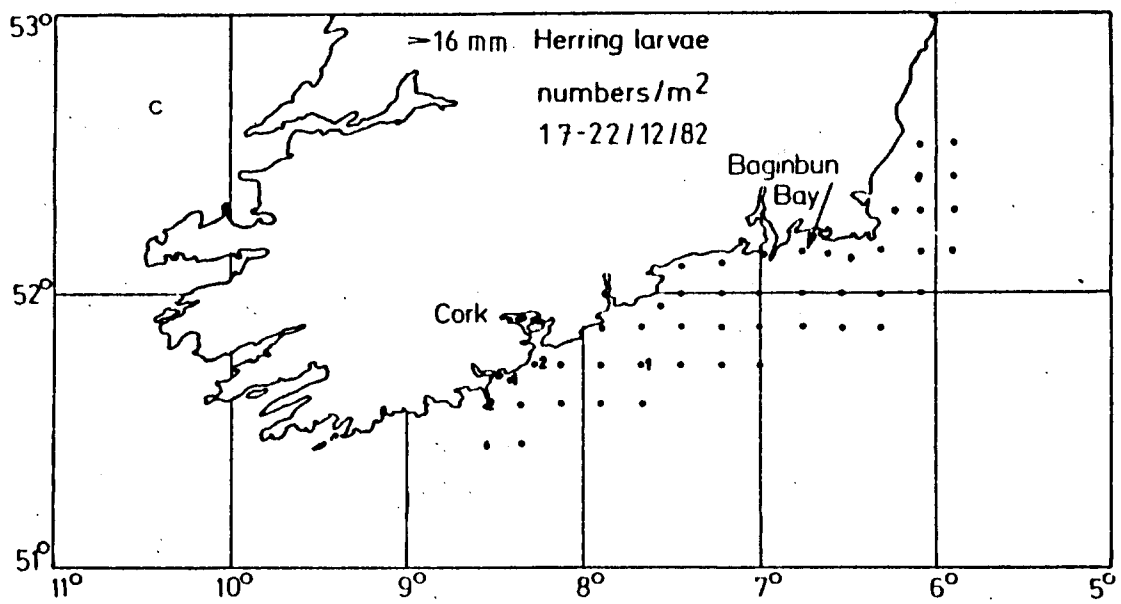
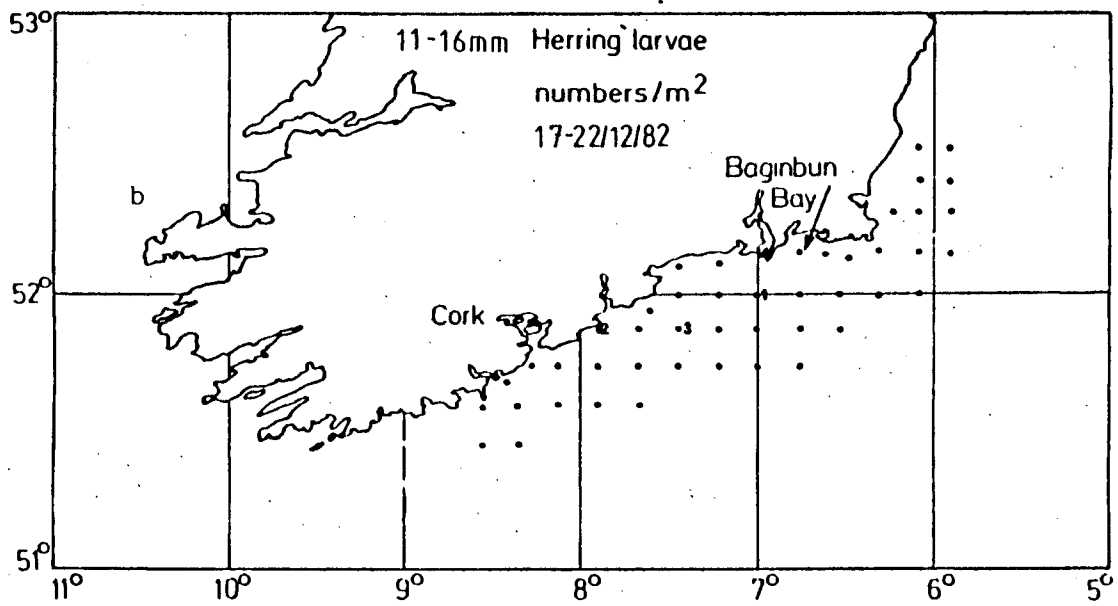
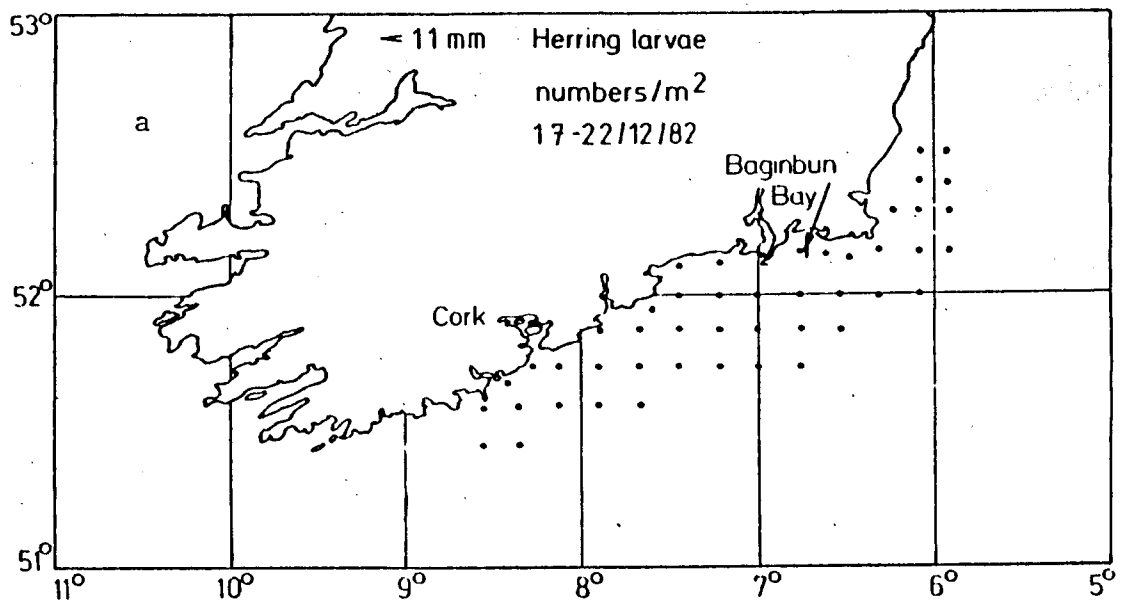


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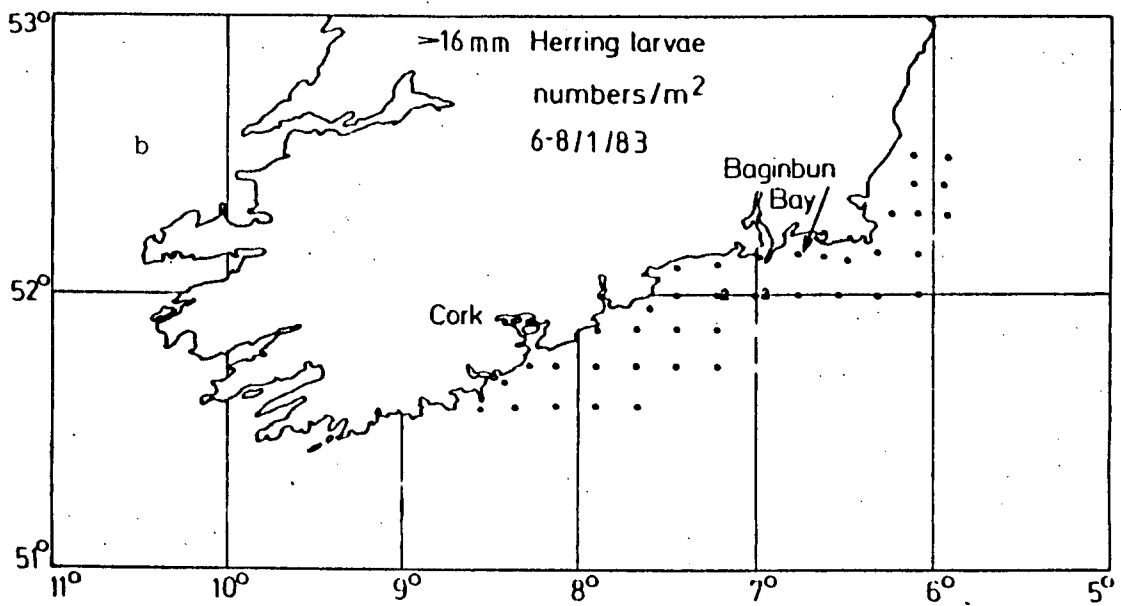
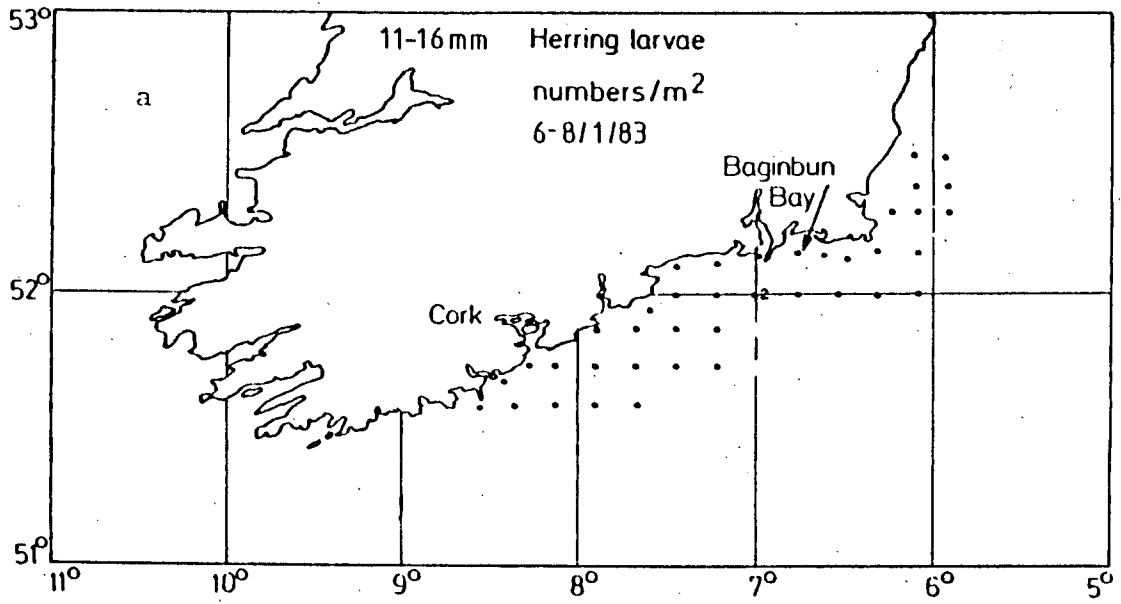


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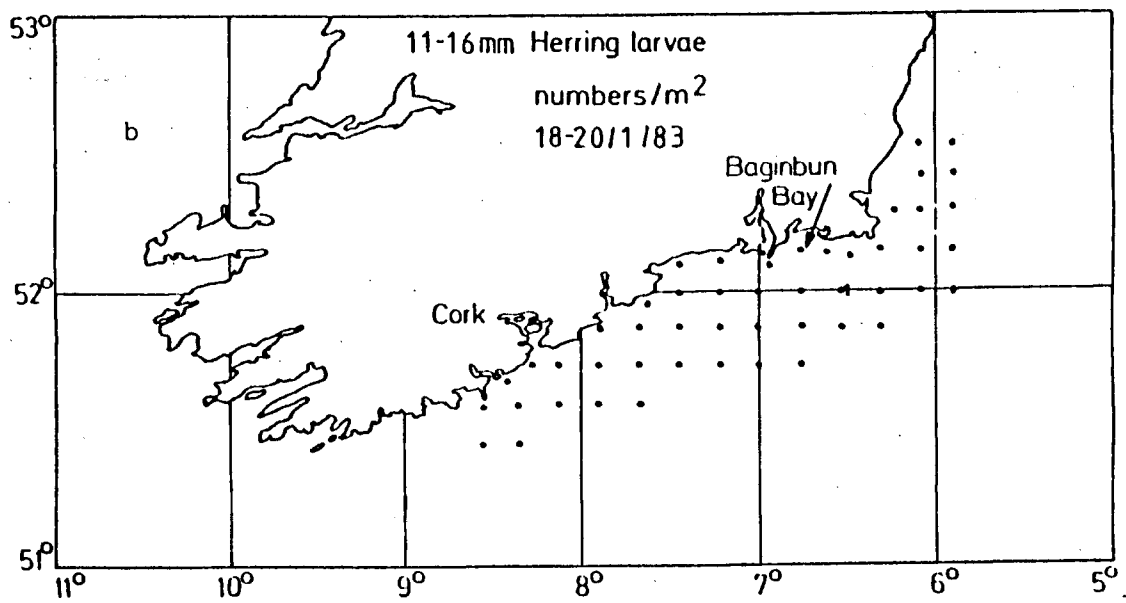
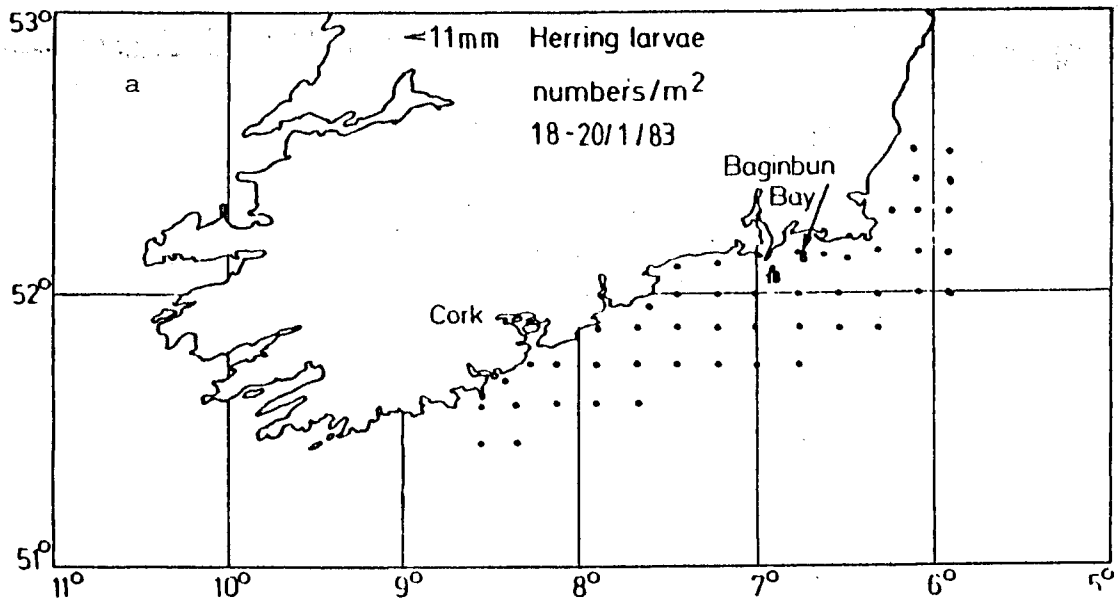


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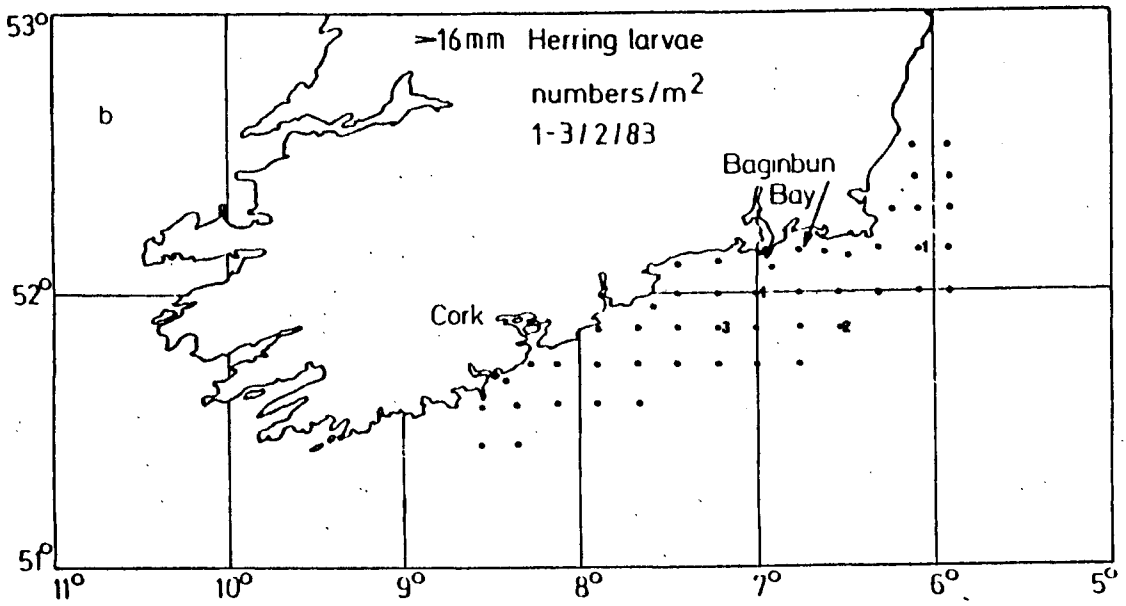
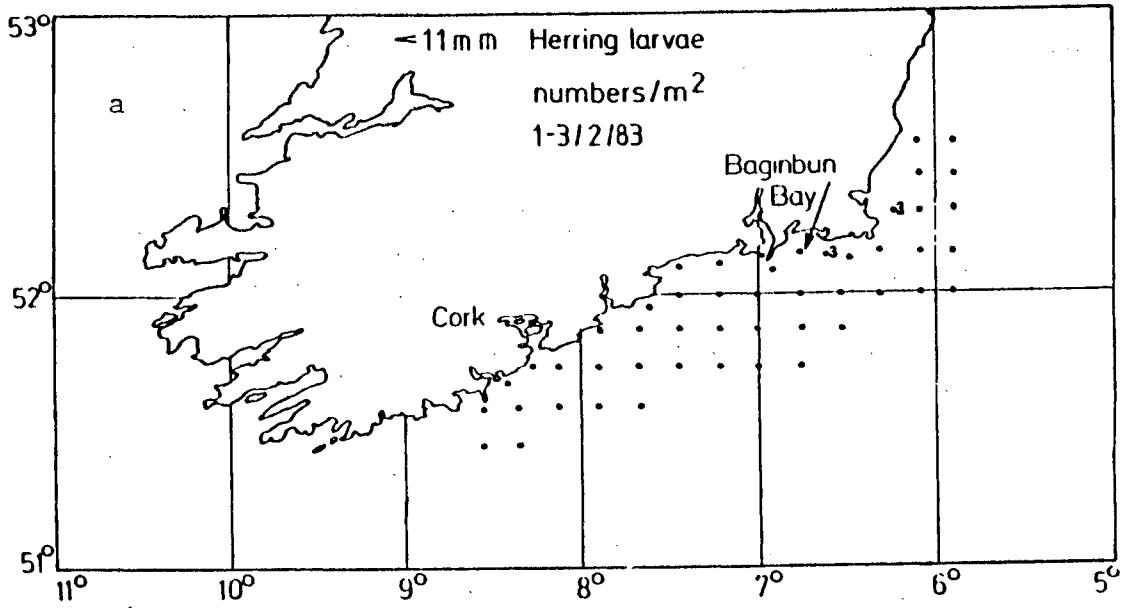


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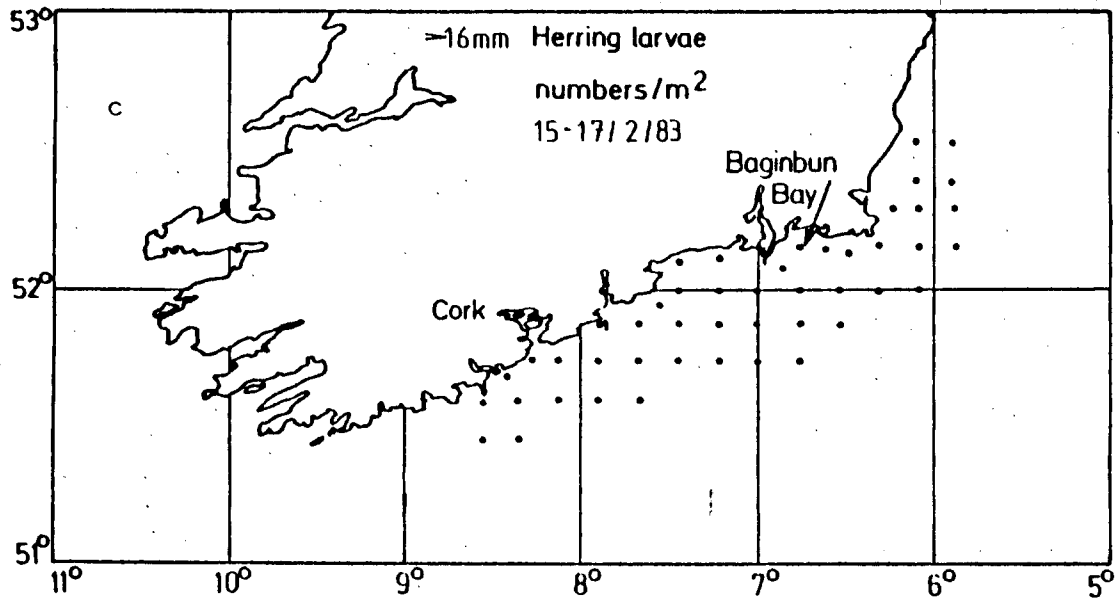
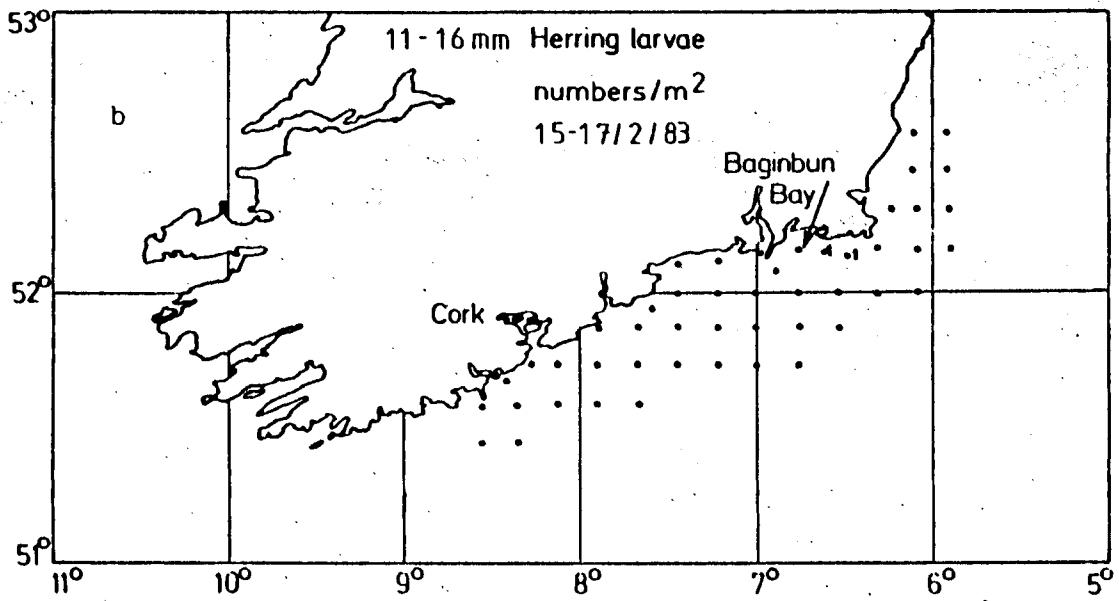
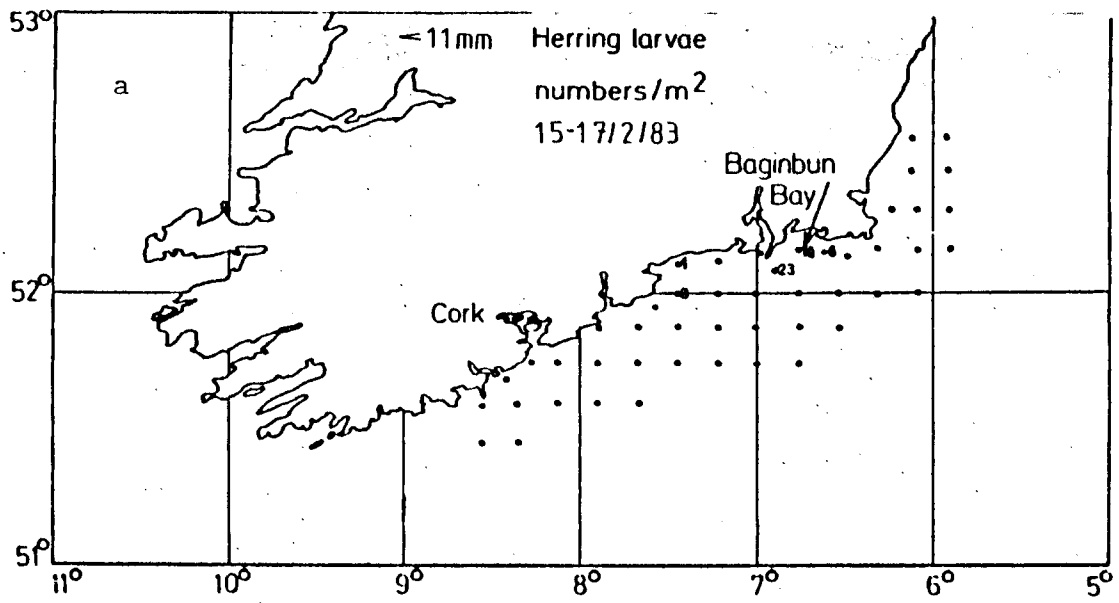


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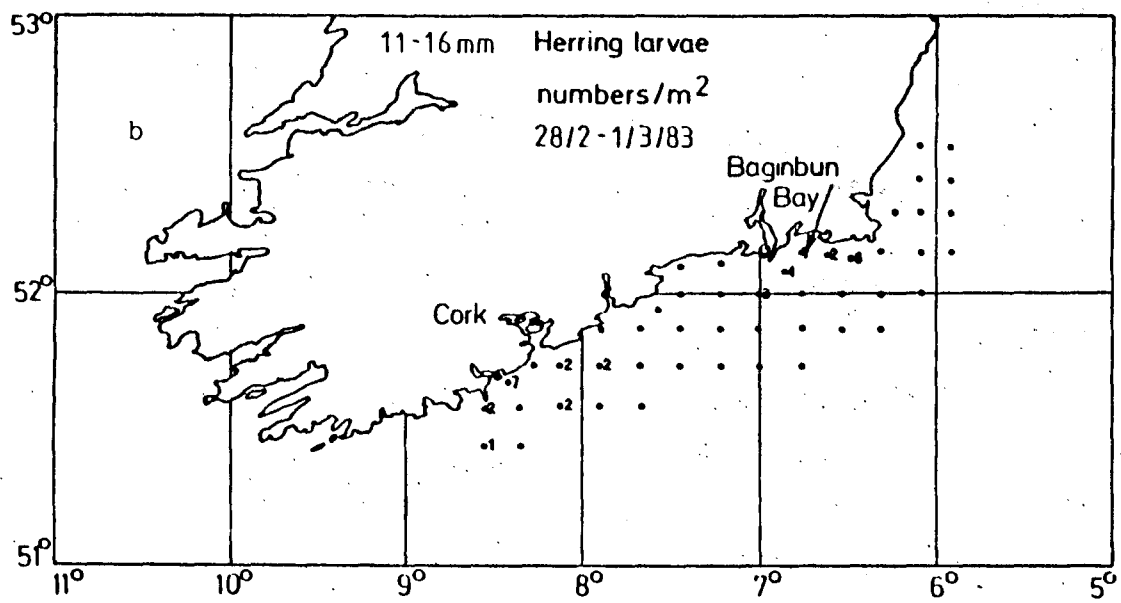
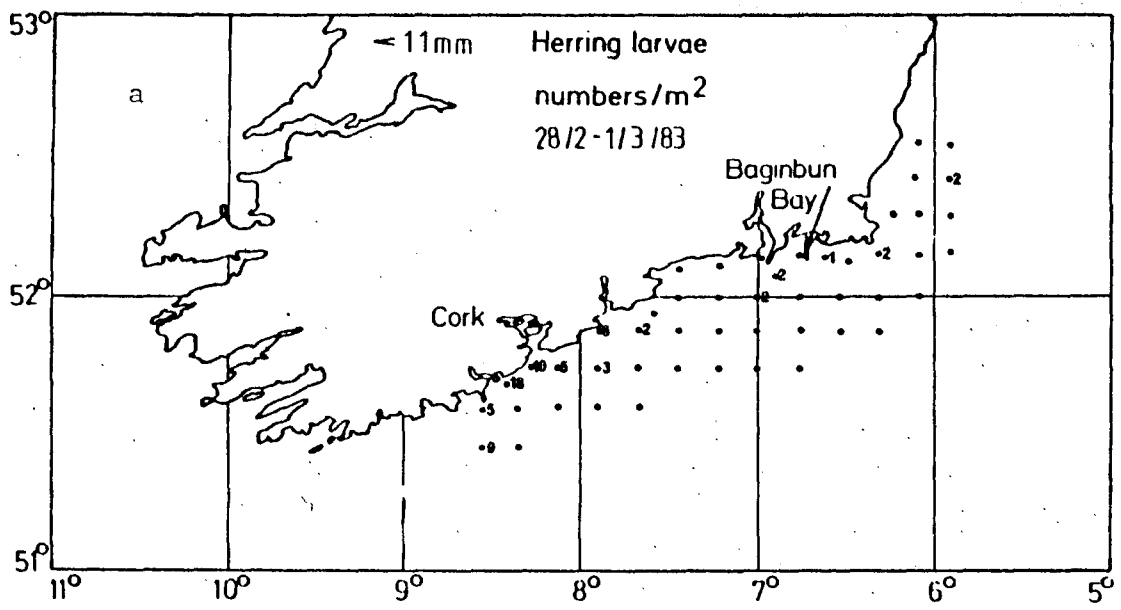


Figure 11