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Eggs and larvae of cod and haddock, temperatures and salinities on Browns Bank, Georges Bank, and Nantucket Shoals, February 26 - March 11, 1973.

by

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Preface

During the February - March 1973 survey for juvenile herring conducted by RV 'Walther Herwig' (Fed. Rep. Germany) in areas from southwest Nova Scotia to Hudson Canyon, plankton tows were made at the same time in almost the same area. This document reports observations made on the abundance and distribution of eggs and larvae of cod and haddock.

Methods

From 26/2/73 through 11/3/73 oblique plankton tows were made at 49 stations with paired 60-cm-Bongo-nets. The mesh sizes were 0.3 mm and 0.5 mm respectively. Temperature and salinity data were taken at nearly all plankton stations and at additional hydrography stations not shown in Figure 1.

A statistical analysis of flowmeter readings and filtration efficiency showed a greater filtration efficiency of the 0.5-mm-net, the filtration difference between the two nets not being indicated by flowmeter readings. This has to be taken into account when studying Figures 2-7 where the numbers of eggs or larvae per

10 m² of sea surface are shown, estimated by multiplying the numbers per 10 m² by the maximum depth of tow.

Results

More advanced, i.e. distinguishable stages of cod eggs were rarely found on Nantucket Shoals and in small numbers on Georges Bank (Figure 2), whereas those of haddock could be found frequently on Nantucket Shoals and on Georges Bank except on Georges Shoals (Figure 3). Early stages of both species, that could not be distinguished, were abundant all over both areas (Figure 4). The egg diameters were

	average	range
cod	1.57 mm	1.13 mm - 1.75 mm
haddock	1.54 mm	1.25 mm - 1.63 mm
not distinguishable	1.46 mm	.88 mm - 1.75 mm

Since eggs of other species like the four-bearded rockling, the summer flounder and the American dab that were found too, had diameters less than 1.13 mm and more than 2.13 mm respectively, opaque eggs were identified as cod/haddock eggs by diameter when within 1.13 mm - 1.75 mm (Figure 4).

Larvae of cod and haddock were caught all over Georges Bank and Nantucket Shoals. Larval haddock was less abundant than cod and not to be seen on Georges Shoals. The mean lengths of cod and haddock were 4.76 mm and 3.88 mm respectively.

In general, the numbers of eggs and larvae of cod and haddock as well as of other fish decreased towards the eastern and south-eastern edge of Georges Bank. Influence of winds and currents on drifting of eggs and larvae past the slope could therefore not be ascertained.

The length frequency distributions of larval cod of several pooled stations on Georges Bank (21, 23, 26, 29, 53, 54, 58, 60, 70, 72, 76) and on Nantucket Shoals (105, 107, 110, 111, 112, 122, 123) are shown in Figure 6. Only larvae that are larger than 3.2 - 3.3 mm are caught by the 0.5-mm-net, whereas the 0.3-mm-net caught larvae smaller than that too. Assuming that shifting of maxima towards greater length of Nantucket Shoals larval cod was not due to later sampling, it seems to indicate earlier hatching on Nantucket Shoals.

Comparatively large numbers of newly hatched larvae and few distinguishable eggs of cod suggest that the peak of hatching had been exceeded at the time of sampling. Therefore most of the young stage eggs may be haddock.

Hydrography

Like in late summer and autumn 1972 (Res.Doc.73/115) hydrographic data indicate four distinct areas: Georges Bank, the area west and south of Nova Scotia, the mixed-water zone in the Gulf of Maine, and a small area south of Cape Cod. The distributions of temperatures and salinities are given in charts (Figure 8) for 0 m, 10 m, and 30 m. Vertically the water was mixed to the bottom in the entire area except on the southern edge of Nantucket Shoals where warming towards the bottom was observed.

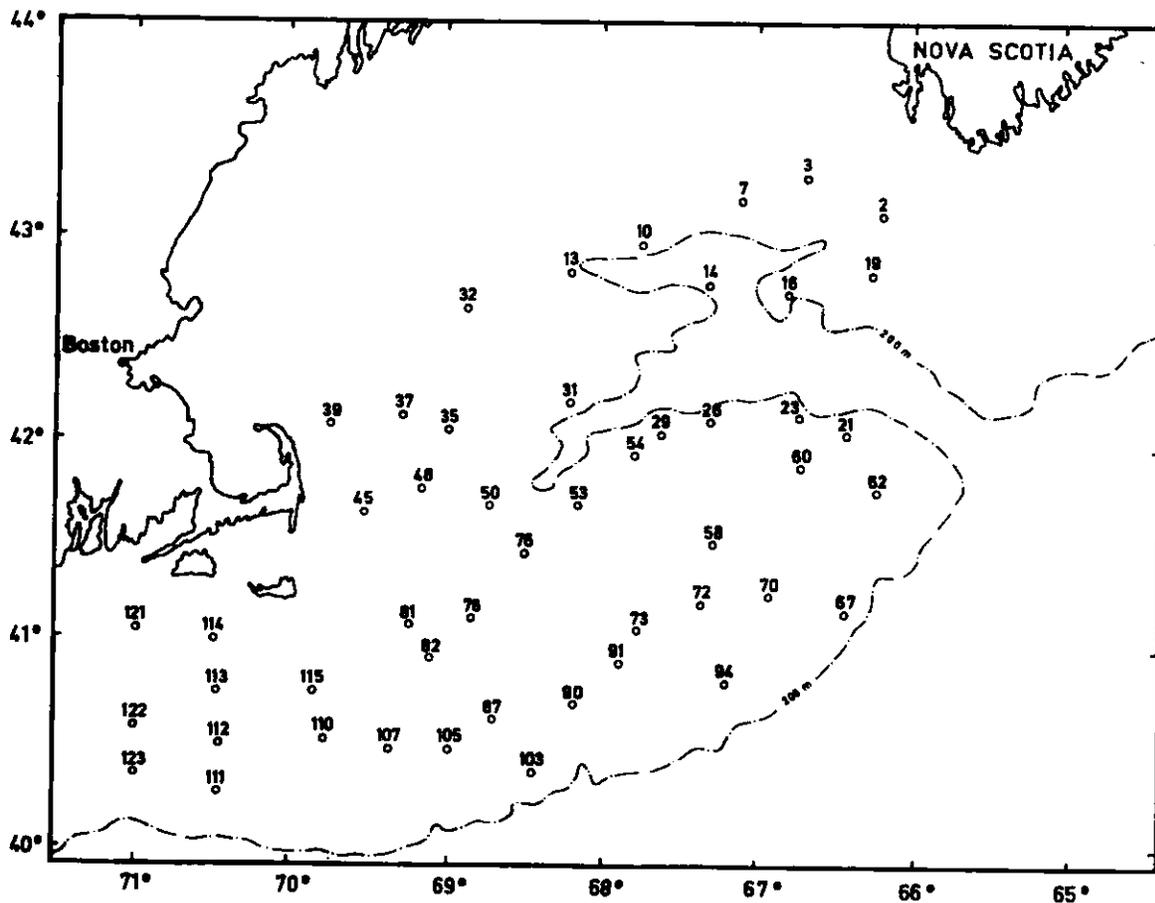


Figure 1 : Cruise track

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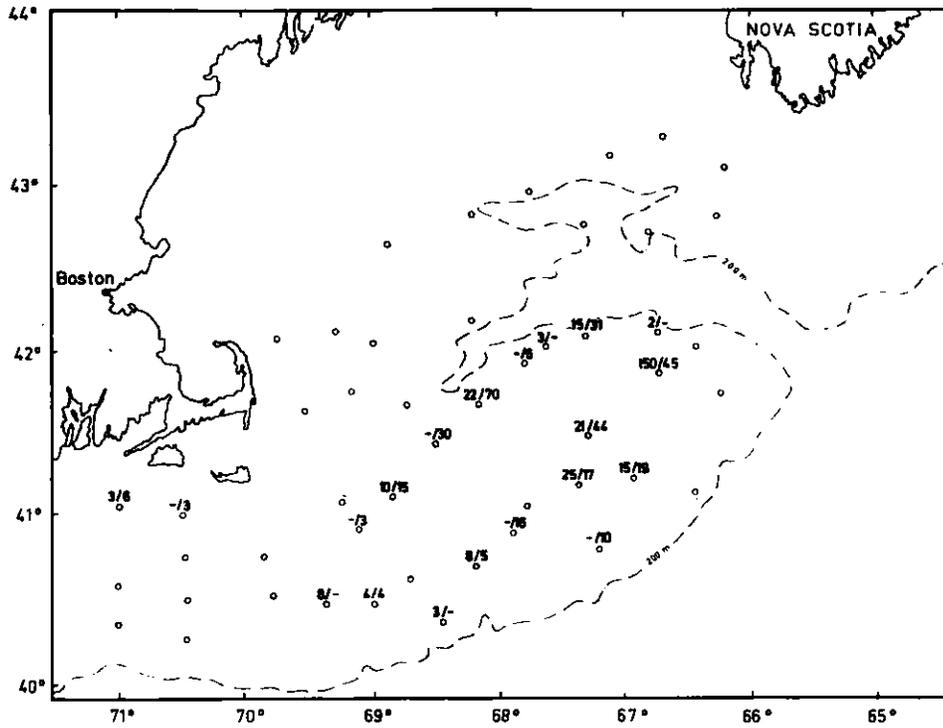


Figure 2 : Eggs of cod per 10 m² in 0.3 mm / 0.5 mm net

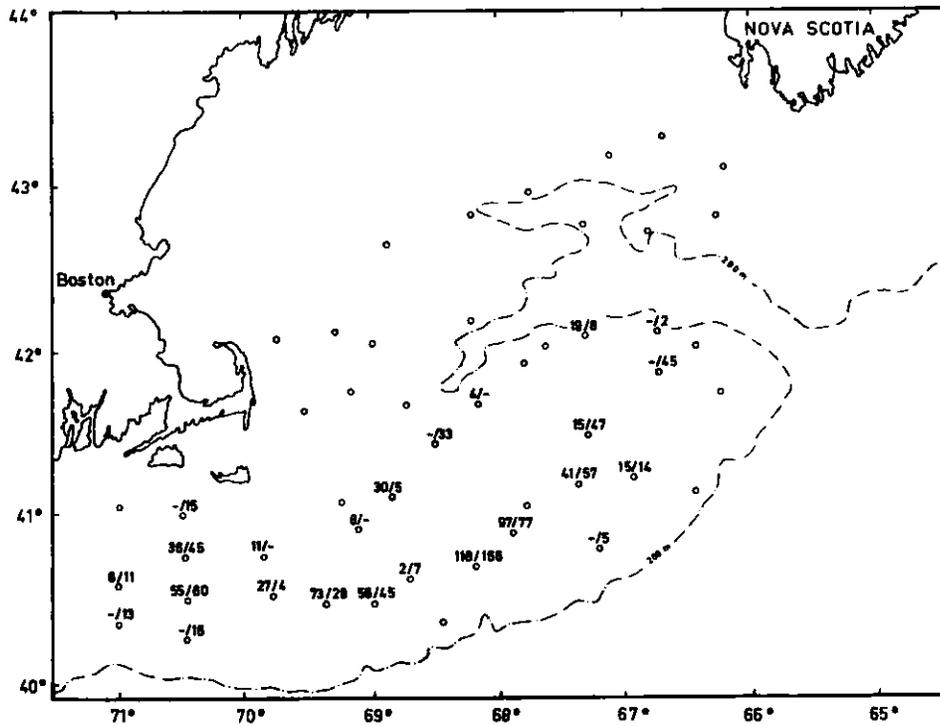


Figure 3 : Eggs of haddock per 10 m² in 0.3 mm / 0.5 mm net

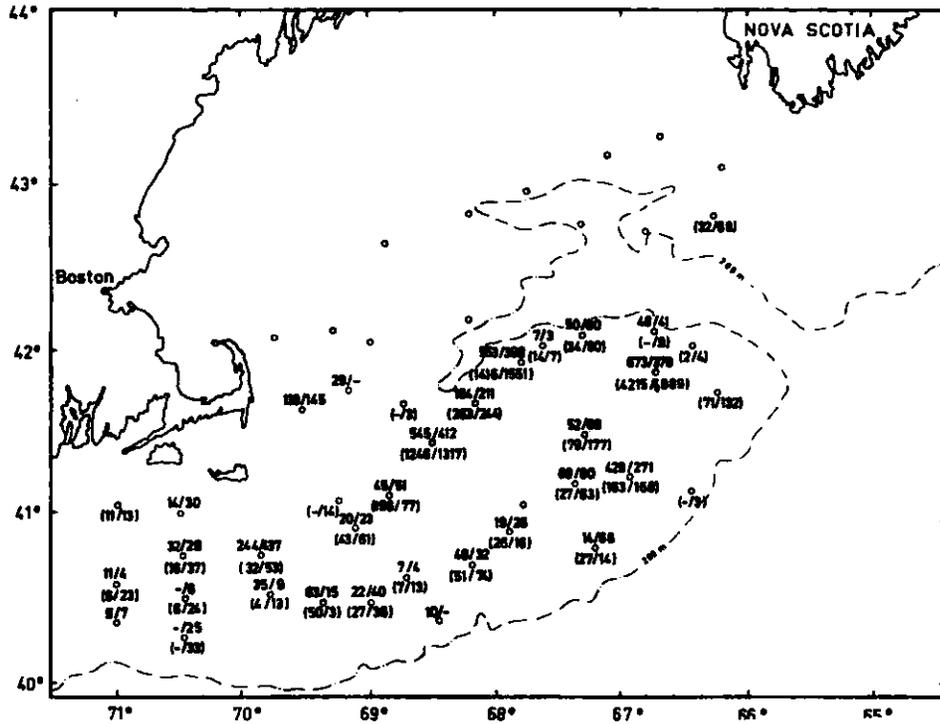


Figure 4 : Young stages of cod and haddock eggs, and opaque eggs (in brackets) per 10 m² in 0.3 mm / 0.5 mm net

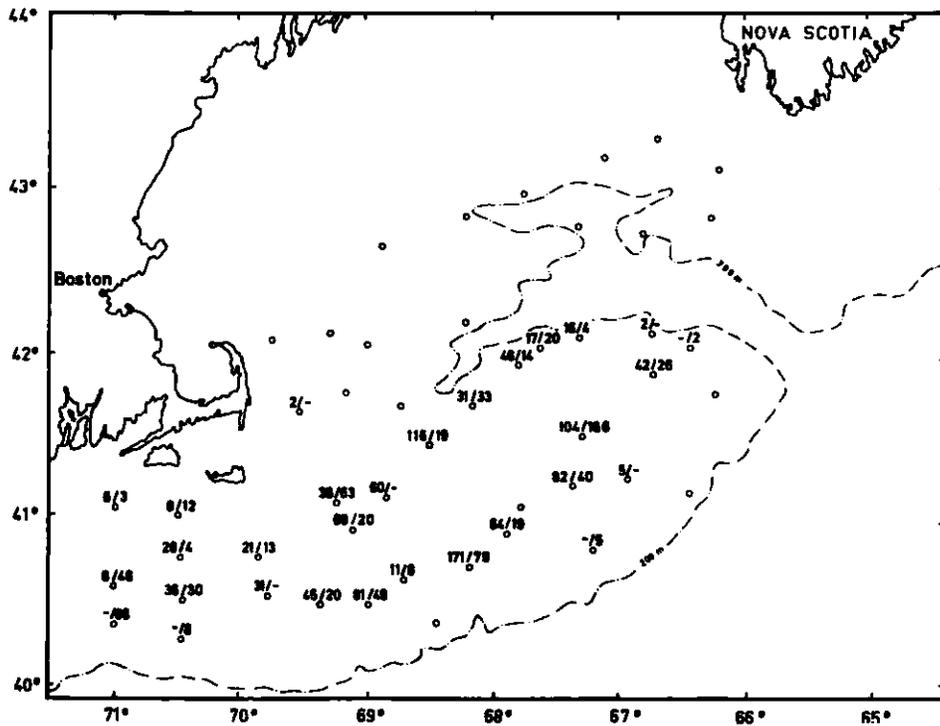


Figure 5 : Larvae of cod per 10 m² in 0.3 mm / 0.5 mm net

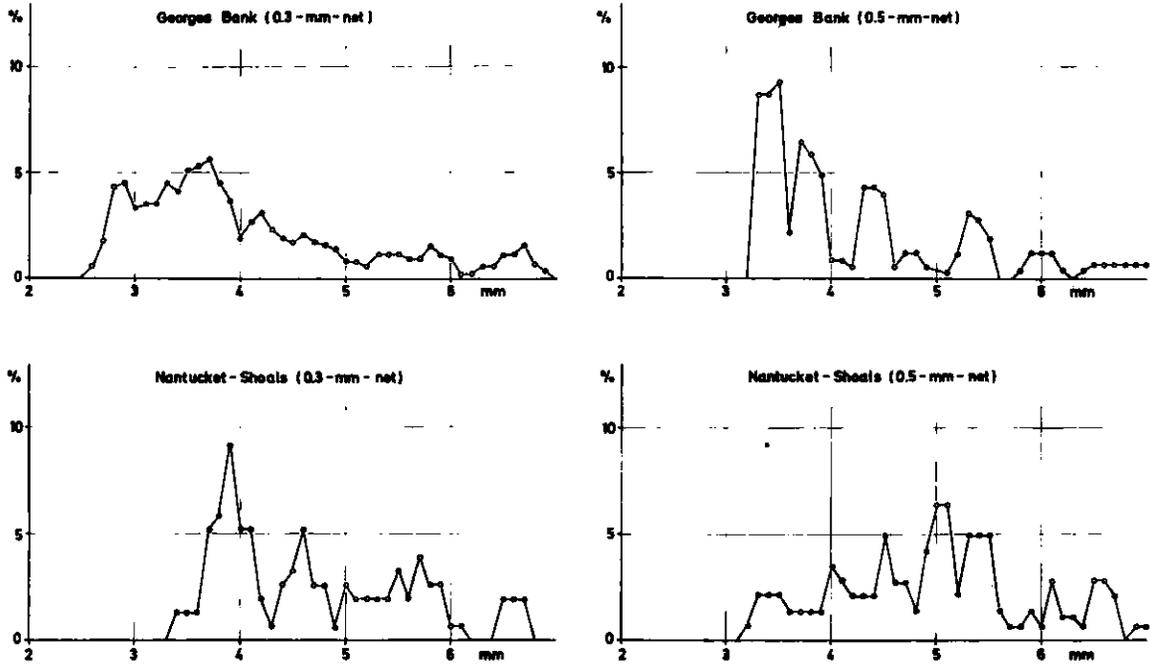


Figure 6 : Length frequency distribution of larval cod . Range 2-7 mm

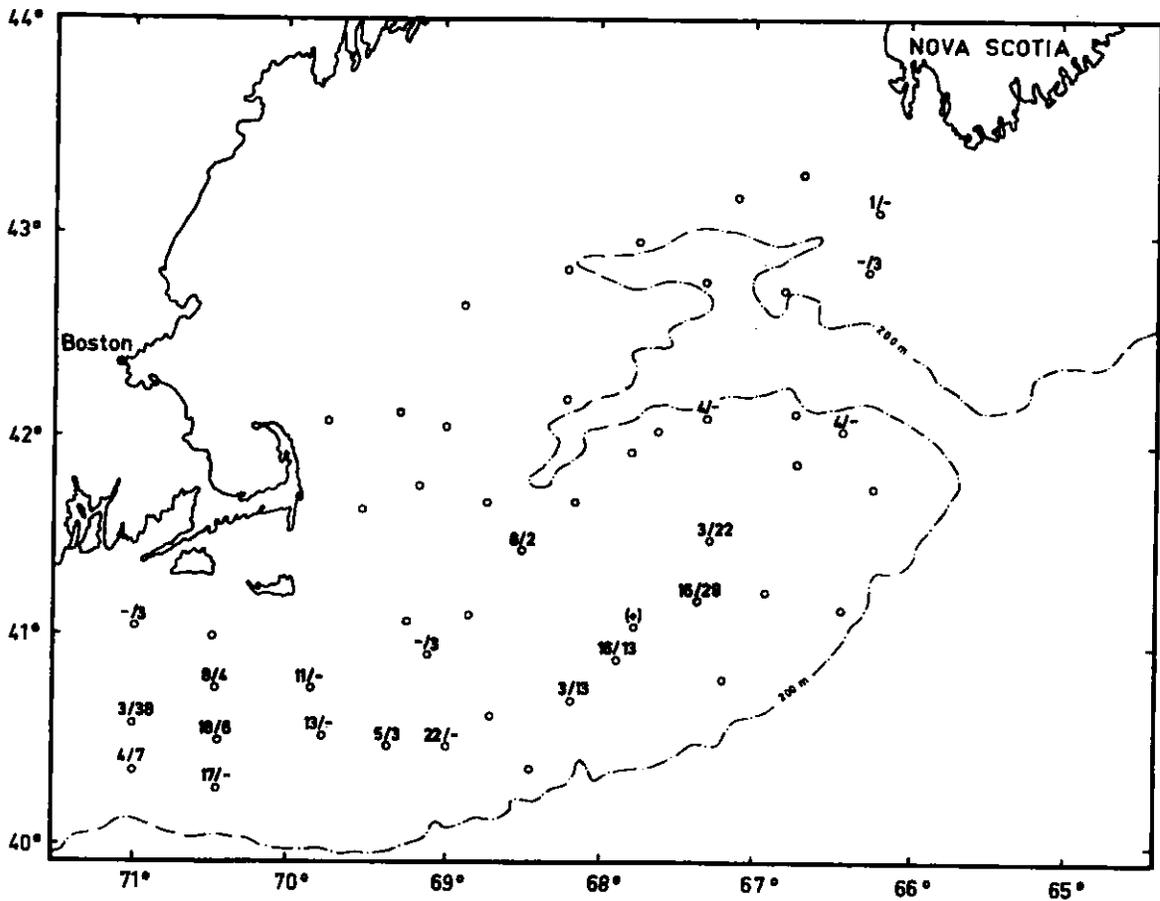


Figure 7 : Larvae of haddock per 10 m² in 0.3 mm / 0.5 mm net

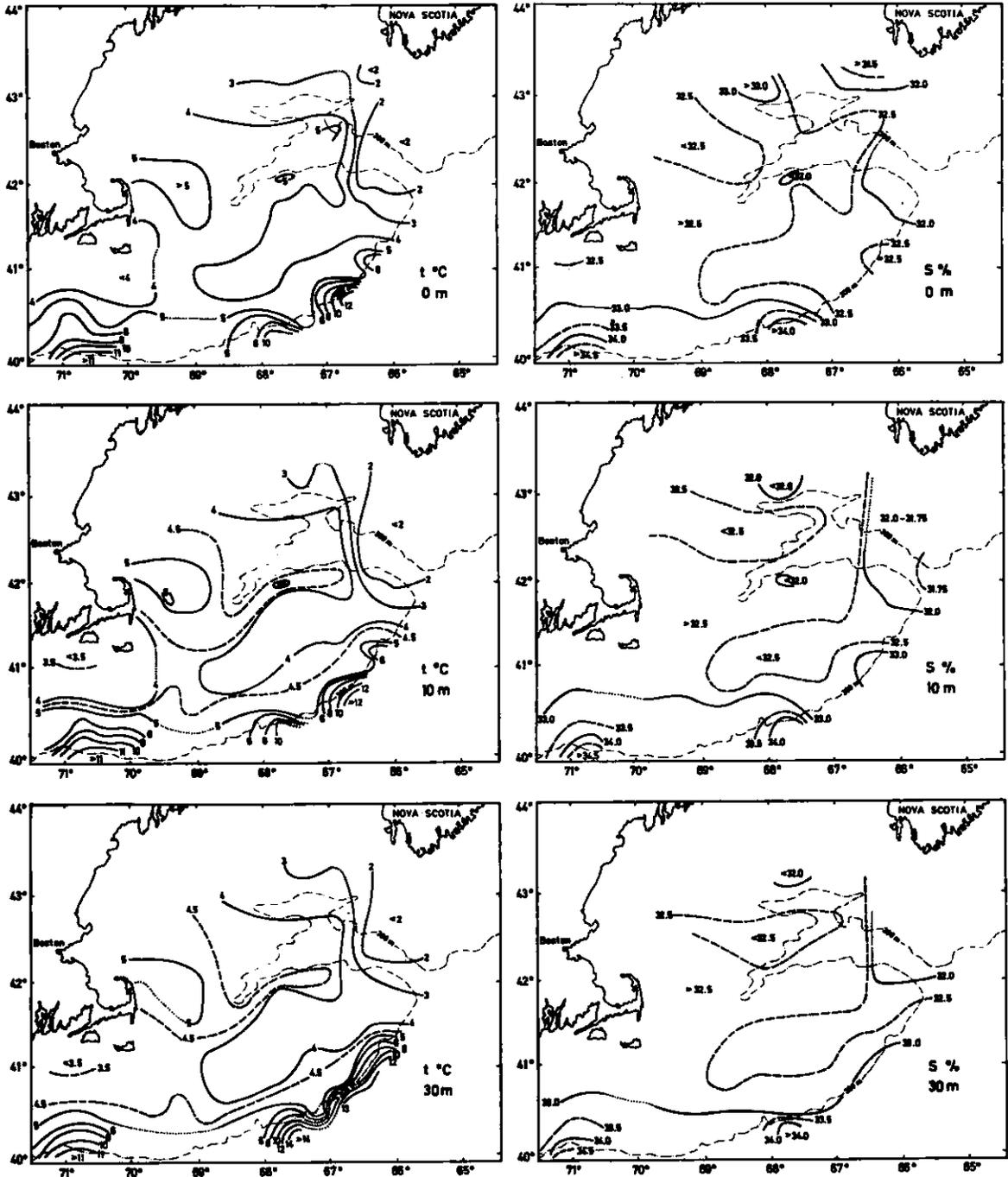


Figure 8: Temperatures and salinities at 0 m, 10 m and 30 m

