

DRIFT OF CAPELIN LARVAE -A POPULATION SINK?

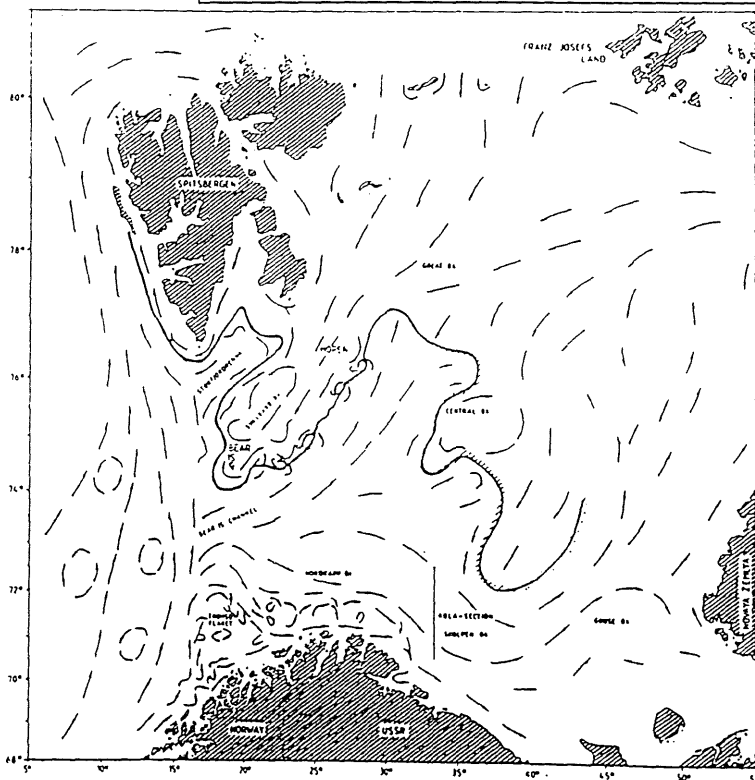
by

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HYPOTHESIS:

In years of westerly spawning, the larvae will be partly dispersed in water masses carried to areas outside the Barents Sea. These larvae are expatriated and lost from the Barents Sea capelin stock.



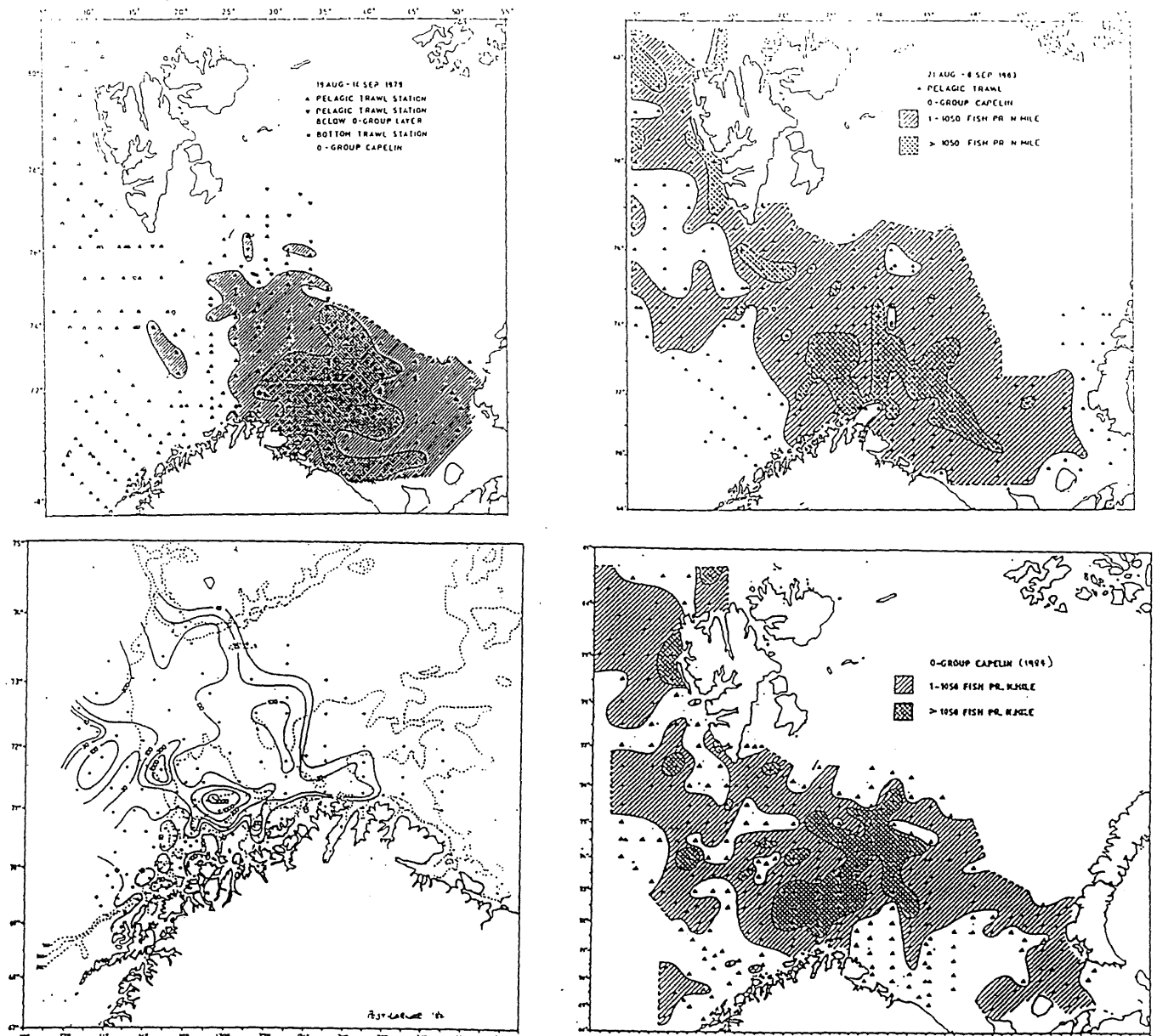
LARVAL TRANSPORT BY CURRENT: The currents transporting the larvae from the coast vary along the coast and from one year to another. A general pattern of the surface current-pattern (Fig.1) shows that in the area to the west of 16° E, the currents in general will lead to the area west of Spitsbergen. The amount of larvae entering into this branch of the current will be dependent on the location of the spawning areas as well as the wind-driven upper-layer current.

In years with a western spawning, some of the larvae are observed to be distributed to the west of 16° E, in the north-flowing West-Spitsbergen current. In years of eastern spawning, the larvae are observed in the eastern and south-eastern parts of the Barents Sea.

OBSERVATIONS: The extreme western and eastern limits of the spawning of capelin near the Norwegian and Soviet northern coasts have been observed at about 16 E and 34 E respectively. Only a part of this area is actually used for spawning each year, and this spawning area is shifted east or west in response to hydrographical events.

In the period 1965 to 1987, only in 1969, 1971, 1983 and 1984 was a significant part of the capelin larvae distributed in this western area. These years were characterized either by spawning both in western and eastern areas (1969 and 1971), or by a westerly spawning (1983-84).

In the period 1951-1971, a correlation between spawning area and strength of the recruiting year-class was found (Gjørøster, 1972). Only in one year was a westerly spawning associated with a good recruitment. Moreover, easterly spawning was never associated with poor recruitment. Before 1965 information on distribution of larvae is lacking, but both in 1969 and 1971 strong year-classes emerged, although a proportion of the larvae drifted to areas outside the Barents Sea. In 1983 and 1984, however, the recruitment failed, and in these years the larval distribution showed a significant displacement towards the western areas.



The hypothesis of expatriation of significant parts of the stock in years of western larval distribution, leading to recruitment failure, is probably too simplistic. However, the observations in 1983 and 1984, and the general observation that the displacement of the spawning areas to the west and the strength of the resulting yearclasses are inversely correlated, shows that the hypothesis cannot be ruled out as one of several factors controlling the year-class strength in this capelin stock.