INTERNATIONAL COMMISSION FOR THE NORTHWEST ATLANTIC FISHERIES

Serial No. 630
(D.c.2)

Document No. 31

ANNUAL MEETING - JUNE 1959

Cod Investigations in Subarea 2 - Labrador, 1950 to 1958

By A. W. May

1. Introduction:

The cod sampling programme for Labrador during this period has been carried on for the most part incidentally to other researches. Thus, it is not regular, and sampling is much better in some years than in others, while in some years none at all was done. During the whole period a total of 1,448 pairs of otoliths were taken and 20,596 length measurements were made. All samples, except those taken by longline, were obtained by the research vessel "Investigator II", and all were taken between mid-July and the end of September. One sample was jigged inshore in 15-20 fathoms and all others were taken offshore by otter trawl in depths ranging from 96 to 200 fathoms. The age readings and length measurements for each year have been combined by ICNAF subdivision and method of capture as summarized below, and as shown in Figure 1.

Year	Subd.	Gear	Otoliths	Length meas.
1950	2G inshore	Jigger	239	239
	2G offshore	Trawl	110	251
	2H	Trawl	117	195
	2J	Trawl	118	579
1951	2J	Trawl	231	465
1952	2J	Trawl	None	2,233
1953	2J	Trawl	124	8,023
	2J	Longline	230	6,630
1954	2J	Trawl	120	450
1957	2J	Trawl	None	85
1958	2J	Trawl	159	1,446

2. Age composition:

In all the samples taken in 1950 the predominating year-classes are those of 1942, 1944 and 1945, these together comprising approximately 70% of each sample. The samples from Subdivision 2G show a greater proportion of 6-year-old (1944 year-class) than 5-year-old fish (1945 year-class), while the reverse is true for the samples from Subdivisions 2H and 2J. There is a comparatively high number of 8-year-old fish (1942 year-class) in the offshore sample of Subdivision 2G, and a high number of 5-year-old fish (1945 year-class) in the sample from Subdivision 2J. Considering all the 1950 samples, the dominant year-class is that of 1945, but this is followed closely by the 1944 and 1942 year-classes. The proportions of all other year-classes are very small in comparison with these three.

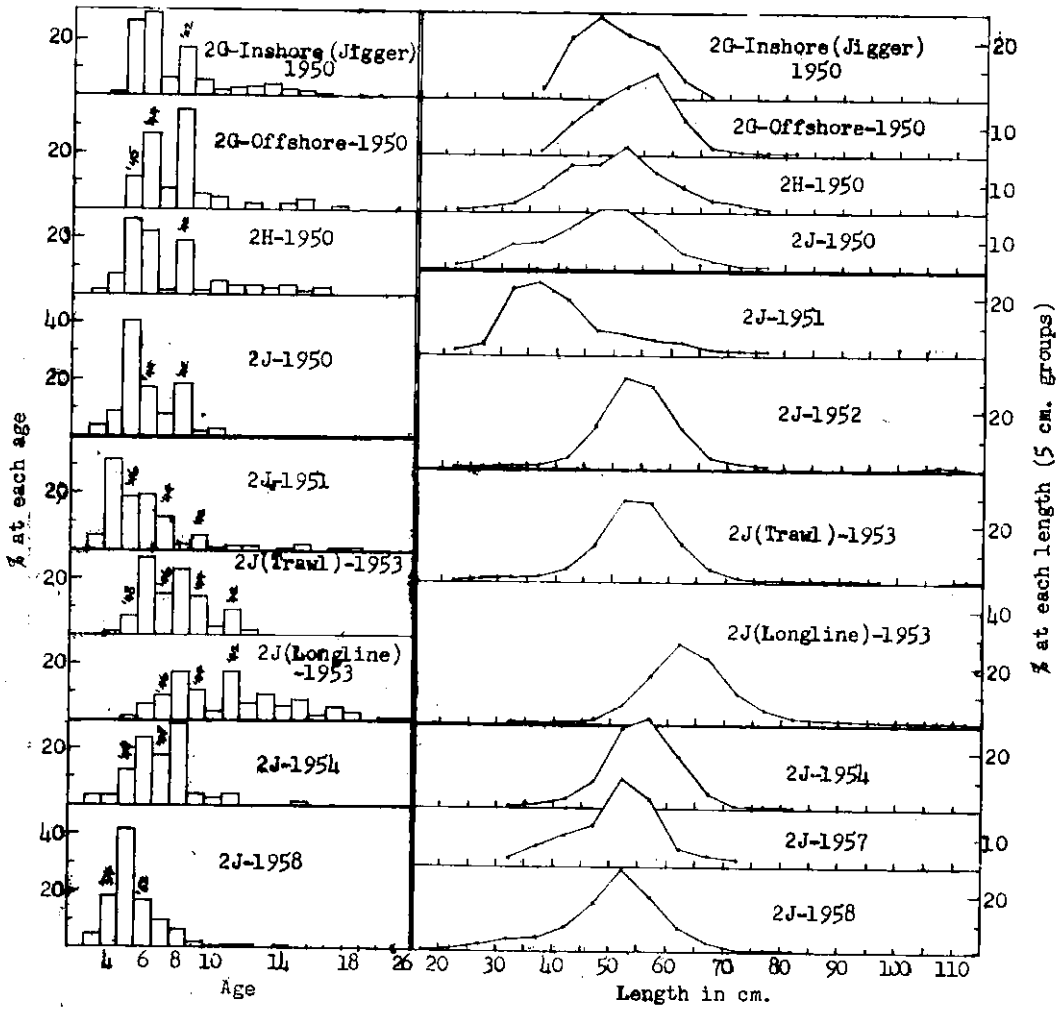

Figure 1. Age and length distributions of Subarea 2 cod combined by subdivision and method of capture. Length distributions are of all fish measured.

In 1951 the 1946 and 1947 year-classes appear in the catches in quantity (in comparison to 1950), and together make up 50% of the samples, with the 1947 year-class more abundant. The 1944 and 1945 year-classes are still present in fair quantity, while the 1942 year-class is not nearly as evident as it was in 1950. The latter three year-classes combined now make up only 35% of the samples. As was noted for Subdivision 2H and 2J in 1950, the 1945 year-class is better represented than the 1944 year-class.

No scales or otoliths were taken in 1952.

In the trawl sample of 1953, the year-class distribution is much the same as it was in 1951. The year-classes of 1942, 1944, 1945, 1946 and 1947 combined account for 88% of the sample. Again the 1947 year-class is better represented than that of 1946, and the 1945 year-class is better represented than that of 1944. The 1942 year-class however, is present in greater quantity (9%) than it was in 1951.

In contrast, in the sample taken by longline in 1953, the 1946 and 1947 year-classes are comparatively poor (14%). The 1945 year-class is again more abundant than the 1944 year-class. The 1942 year-class is very prominent (17%), and the fish of the 1945, 1944 and 1942 year-classes combined (8, 9 and 11 years old) make up 44% of the sample. Fish older than 11 years old make up 37% of the sample, in contrast to only 1.6% of the trawl sample.

In 1953, the 1942, 1944, and 1945 year-classes are present in approximately the same total proportion in both the trawl and longline samples (46% and 44% respectively). However whereas most of the remainder of the trawl sample is composed of the 1946 and 1947 year-classes (42%), most of the remainder of the longline sample consists of fish of year-classes earlier than 1942 (37%).

In the 1954 sample the 1942 year-class is absent and the 1944 and 1945 year-classes are poorly represented. The 1946 and 1947 year-classes are still well represented however (47%), and the 1948 and 1949 year-classes have appeared in fair numbers (35%). Of these, the 1946 and 1948 year-classes are predominant.

No samples were taken in 1955 and 1956, and no scales or otoliths in 1957.

In the 1958 sample the 1953 year-class (age 5) predominates (41.5%), and is followed by the 1954 and 1952 year-classes (age 4 and 17.6%, and age 6 and 16.4% respectively). The 1951 and 1950 year-classes (ages 7 and 8) combined account for 16% of the sample, while all other year-classes are poorly represented or non-existent.

Summary and conclusions:

Although the otolith samples were small, the trend from year to year allows some conclusions to be made. On the whole there are no strongly predominating year-classes, yet some year-classes are more abundant than others, while some are very small. Considering the period 1942 to 1948, it would appear that best survival of new year-classes occurred in 1942 and 1947, followed by comparatively good survival in 1944, 1945, 1946 and 1948. Survival in 1943 seems to have been very poor. The samples taken in 1954 and 1958 are too

small to permit valid conclusions to be drawn concerning survival of year-classes later than 1948.

3. Length distributions:

The length distributions (Figure 1) are for all fish measured, combined by area and method of capture.

The length distribution of fish taken in Subdivision 2G (inshore) in 1950 shows a peak in the 45-49 cm. group, with a lesser peak in the 55-59 cm. group, corresponding to the abundance of the 1944 and 1945, and the 1942 year-classes respectively. In the offshore sample from Subdivision 2G the peak is in the 55-59 cm. group corresponding to the 1942 year-class. The length distributions from Subdivisions 2H and 2J are also indicative of the abundance of the 1945, 1944 and 1942 year-classes, though here there is overlapping of the length distributions. These three year-classes are represented by the large proportion of fish between 40 and 59 cm. in length.

Most of the fish taken in 1951 are in the 30-49 cm. range, corresponding to the 1947, 1946, and 1945 year-classes. The 1942 year-class is evident in the range of 55-64 cm.

The length distribution of fish taken in 1952 shows a predominance of fish in the 50-59 cm. range. Although no age determinations were made for fish taken in this year, an indication of the most abundant year-classes may be obtained from the length distribution. The fact that most of the fish are 50-59 cm. in length indicates the presence in quantity of 6 to 8-year-old fish (1946, 1945 and 1944 year-classes).

It is evident from the 1953 length distributions (separated by method of capture) as well as from the age distributions, that older and larger fish are taken by longline. The length distribution of trawl-caught cod shows the predominance of fish of length 50-59 cm. (1947, 1946 and 1945 year-classes), in contrast to the predominance in the longline length distribution of fish 60-69 cm. in length (some 1945 and 1944, 1942 and older year-classes). Also, in the longline length distribution 23.5% of the fish are above 70 cm. in length in contrast to only 1.9% above 70 cm. for those fish taken by trawl.

The length distribution of fish taken in 1954 shows the predominance of fish of length 50-59 cm., corresponding to age-groups 6, 7 and 8 (1948, 1947 and 1946 year-classes).

No information is available for 1955 and 1956.

In the length distribution of fish taken in 1957, the peak is in the 50-54 cm. group. This corresponds to fish of ages 6 and 7, in this case the 1951 and 1950 year-classes. However the number of fish measured in this year (85) is not sufficient to be able to draw any conclusions from the length distribution.

In 1958 the peak is in the 50-54 cm. group, again pointing to a predominance of 6 and 7-year-old fish (1952 and 1951 year-classes). This probably gives a better picture of the age composition than was obtained from otolith readings, since the number of fish from which otoliths were taken (159) is small in comparison to the number represented in the length distribution (2,446).

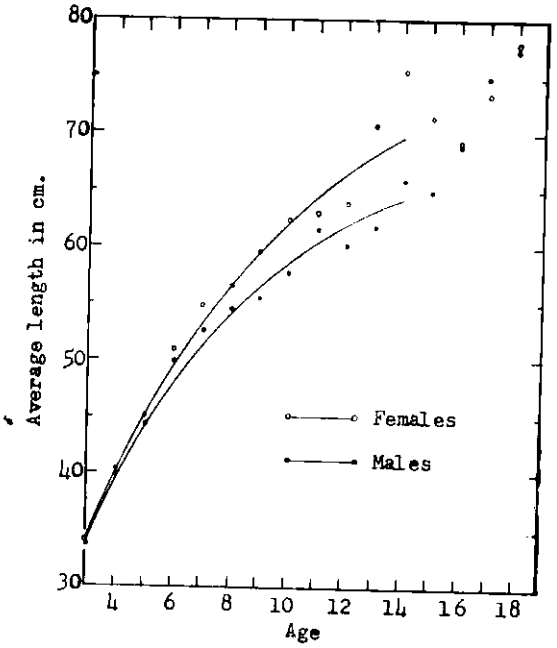

Figure 2. Subarea 2 cod, 1950 to 1958. Growth curves for males and females, ages 3 to 18 years.

4. Growth:

Although some variation in growth was evident from year to year, and from one area to another, the samples were considered too small to allow any conclusions to be made as to the nature and causes of these variations. The average growth curves for males and females for all years, and Subdivisions 2G, 2H and 2J combined, are shown in Figure 2. The growth of females exceeds that of males from the fifth year.

5. Sex composition:

The females predominate in all but one of the samples. The percentage of females varies from 51.6% to 68.3% of the samples except in 1958, where it is 49.1%.