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Growth of Cod in Divisions 2J, 3K and 3L, 1971-83

by

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Introduction

Average lengths-at-age of cod in Divisions 2J, 3K and 3L were examined to determine if recent decreases in overall weights-at-age (Redbook, 1983, p. 38) were merely a reflection of changes in the season and method of capture of the catches.

Materials and Methods

All material was taken from research sources. For the periods 1971-83, 1978-83 and 1977-83, stratified age samples were adjusted to random length frequencies (Spring, fall, fall) for Divisions 3L, 3K and 2J respectively.

Results

From a comparision of average lengths-at-age for each division for the periods above with calculated lengths-of-age from von Bertalanffy curves for the period 1960-62 (May *et al.* 1965), it is clear that substantial increases have occurred in Divisions 2J and 3K and more modest increases in Division 3L (Fig. 1, 2, 3).

For Divisions 2J and 3K,where the change in growth was more pronounced, growth of groups of year-classes were examined. Year-classes 1974-82 were smaller at ages 7, 8 and 9 than year-classes 1962 (1963 in Div. 3K) - 1971. Further, year-classes 1972 and 1973 were intermediate between the other year-class groups (Fig. 4, 5). It is most interesting to note that the biomasses of cod in this period, according to data of Gavaris and Bishop (1983), (Fig. 6) declined markedly from 1962 to 1976 and then showed a similarly rapid increase to 1980 and probably to 1982.

Discussion

For the period 1960-62 for which von Bertalanffy curves were derived by May *et al.* (1965), the biomass of cod in Divisions 3J, 3K and 3L was about 2 million

tons. As biomass declined to about 0.4 million tons in 1975-77, growth was accelerated. In 1976 or 1977, when the 1972 and younger year-classes started to enter the fishery, biomasses started to increase. The increase has apparently been accompanied by a decrease in length-at-age for these year-classes. When the growth curve for 1977-78 is compared to that of 1982-83 for Div. 2J, the difference in average length-at-age is apparent for ages 7-11. A similar phenomenon occurs in Div. 3K (Fig. 7). Such curves suggest that the upturn in average length-at-age for older age groups in May *et al.* (1965) may have been due to growth changes occurring in intermediate ages first when population biomass changed.

References

MAY, A. W. A. T. PINHORN, R. WELLS and A. M. FLEMING. 1965. Cod Growth and Temperature in the Newfoundland Area. *ICNAF Spec. Publ.* Vol. 6, pgs. 545-555.

GAVARIS, S. and C. A. BISHOP. 1983. Assessment of the Cod Stock in Divisions 2J3KL. *NAFO SCR Doc.* 83/VI/54, 20 pgs.

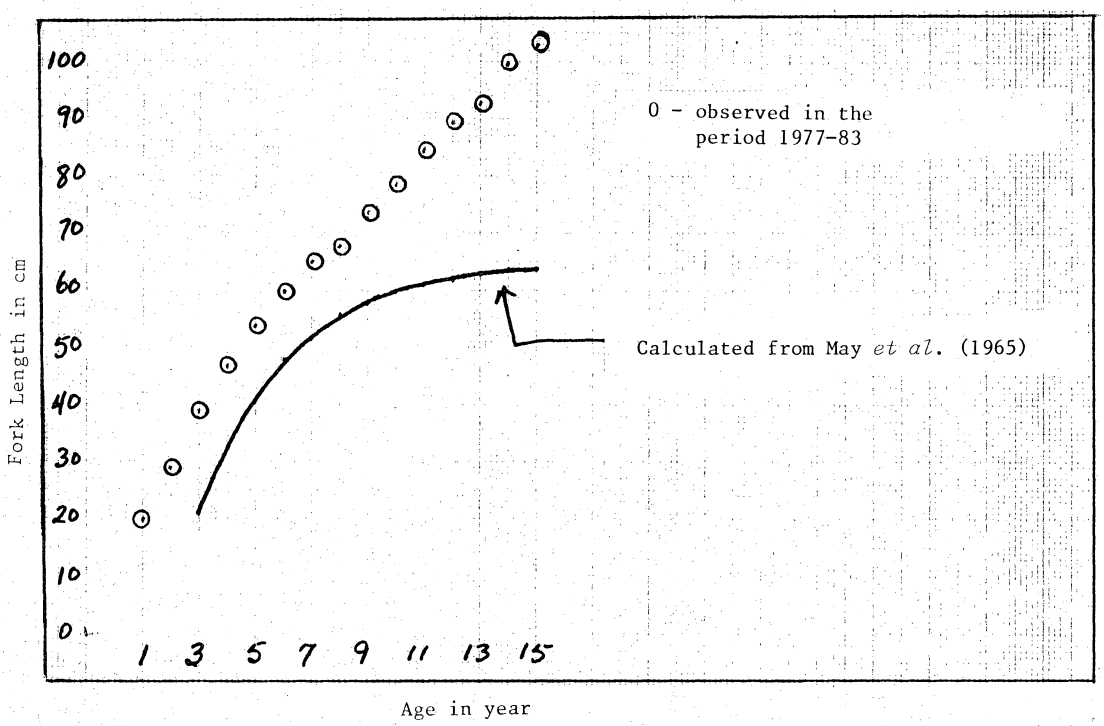

Fig. 1. Average length-at-age in the period 1977-83 compared to the period 1960-62 for cod in Div. 2J.

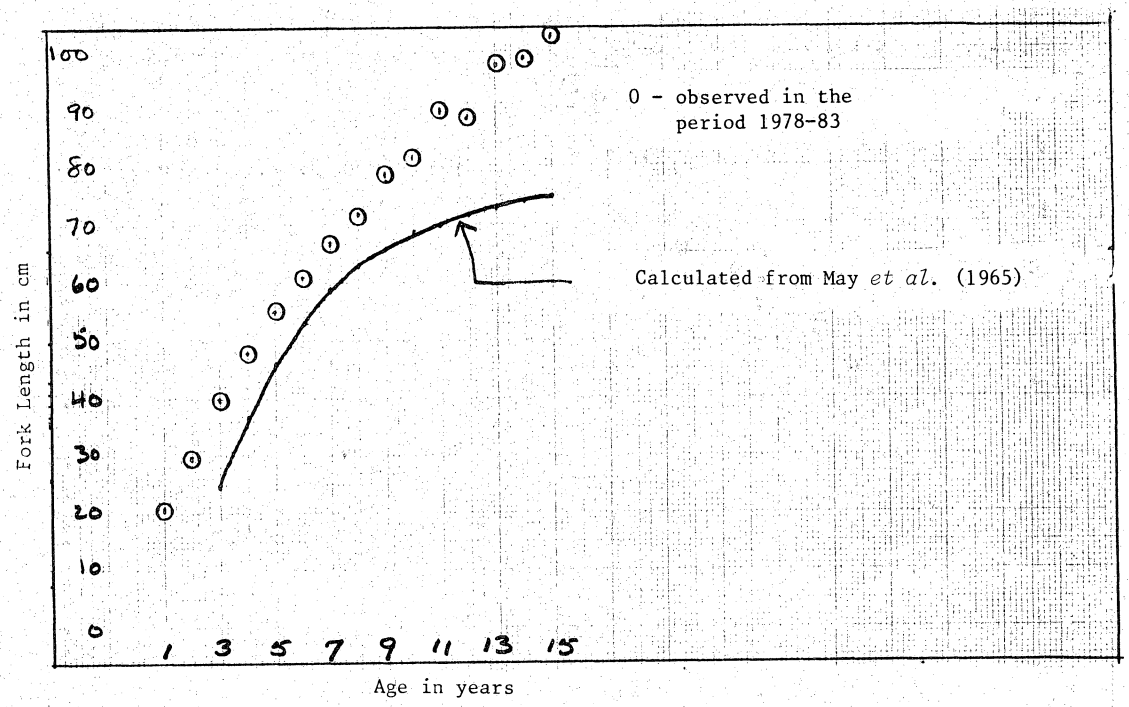

Fig. 2. Average length-at-age in the period 1978-83 compared to the period 1960-62 for cod in Div. 3K.

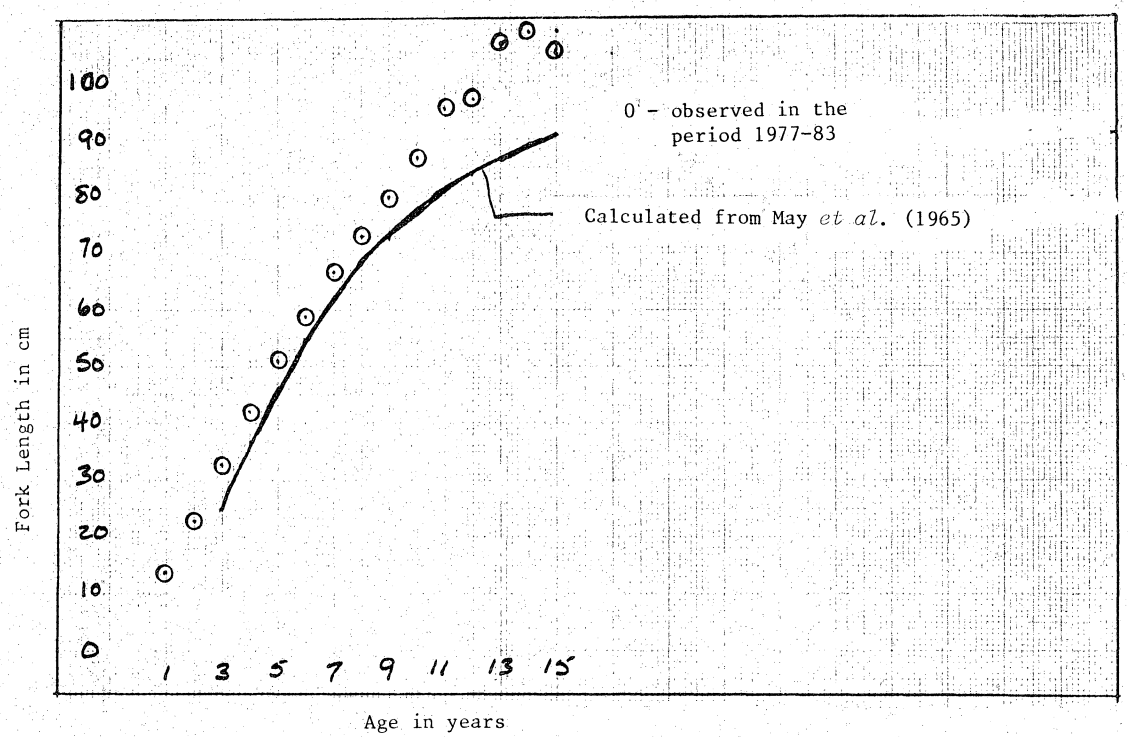

Fig. 3. Average length-at-age in the period 1977-83 compared to the period 1960-62 for cod in Div. 3L.

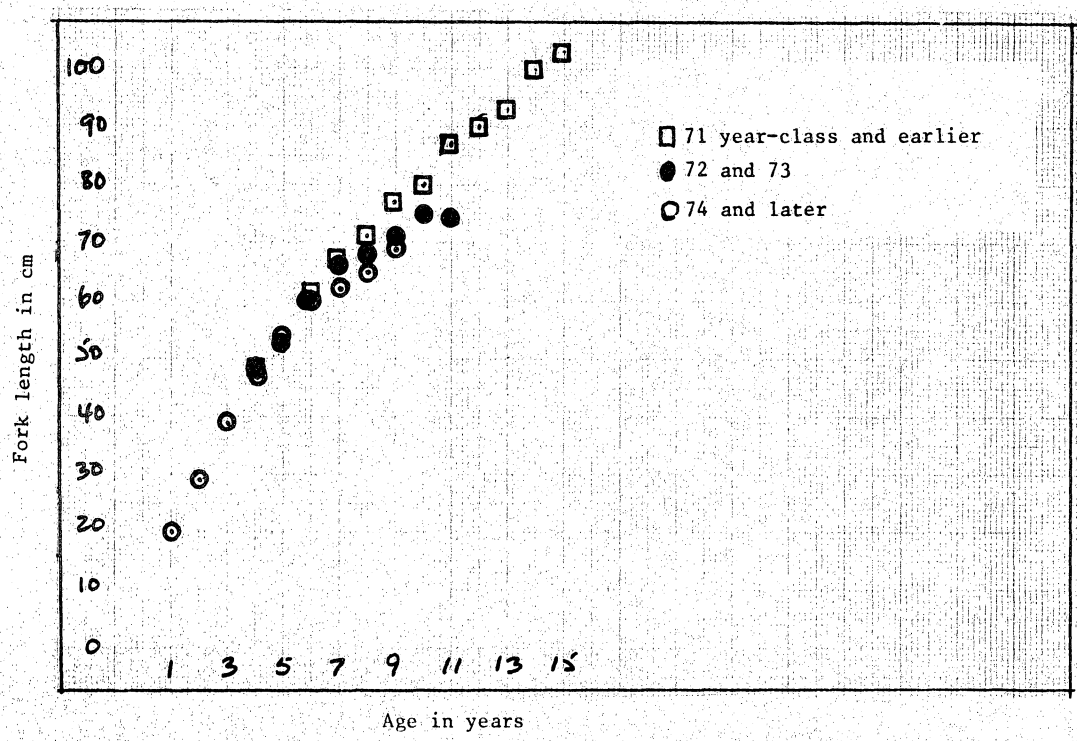

Fig. 4. Average length-at-age for groups of year-classes (1962-71, 1972-73, 1974-82) for cod in Div. 2J sampled in 1977-83.

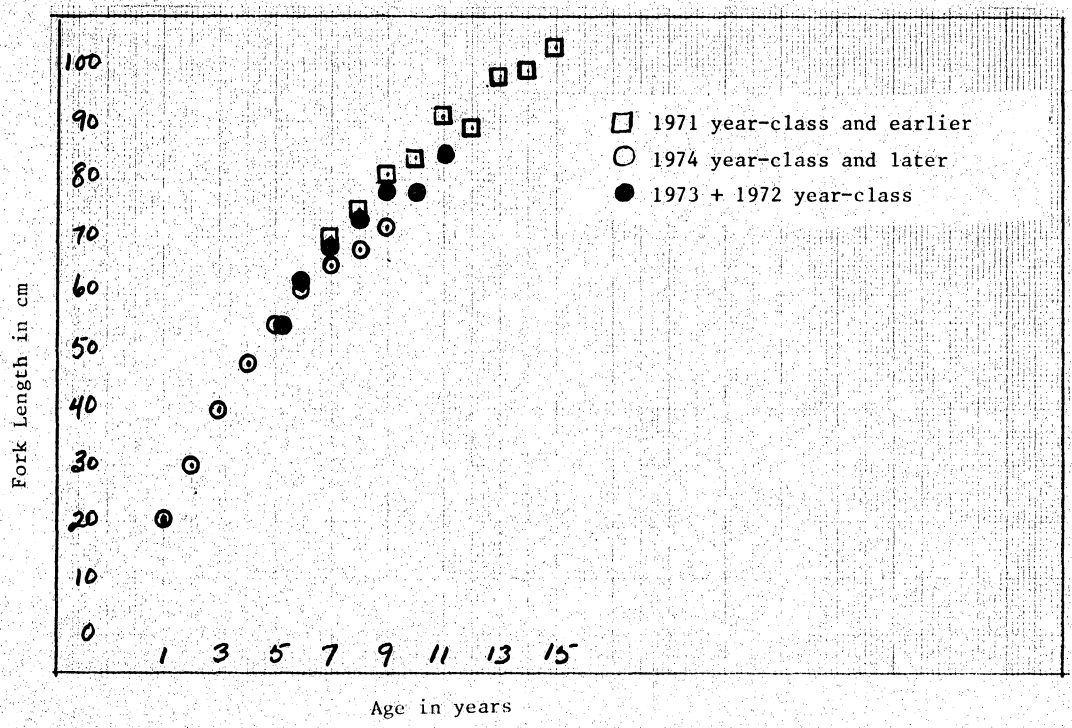

Fig. 5. Average length-at-age for groups of year-classes (1963-71, 1973-1972, 1974-82) for cod in Div. 3K sampled in 1978-83.

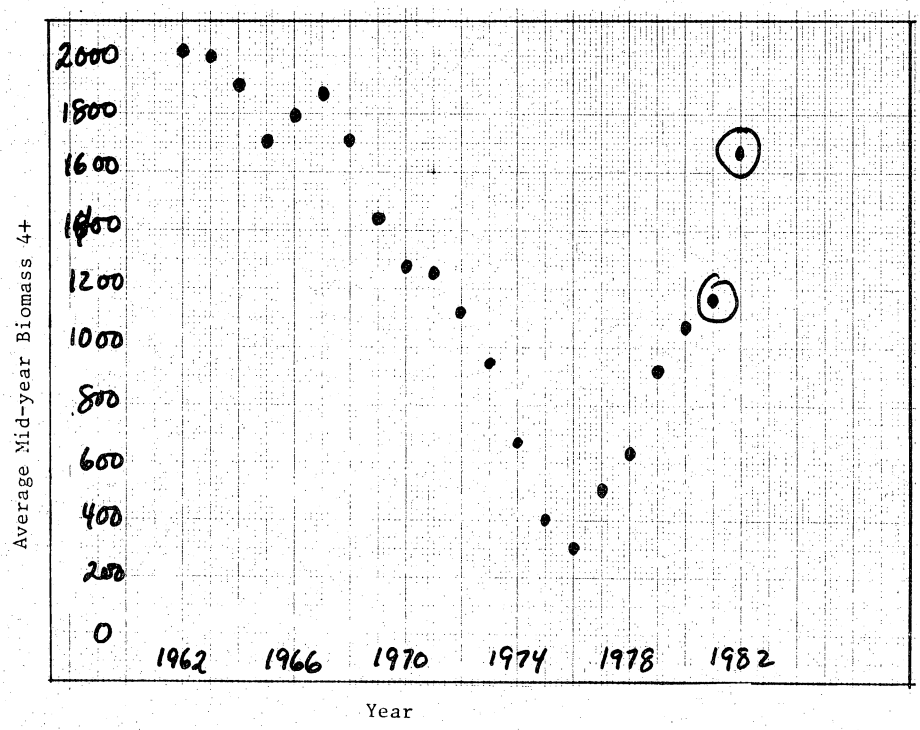

Fig. 6. Biomass of (age 4-17) population of cod in Divisions 2J, 3K and 3L in the period 1962-82. The biomass estimates for 1981 and 1982 are provisional.

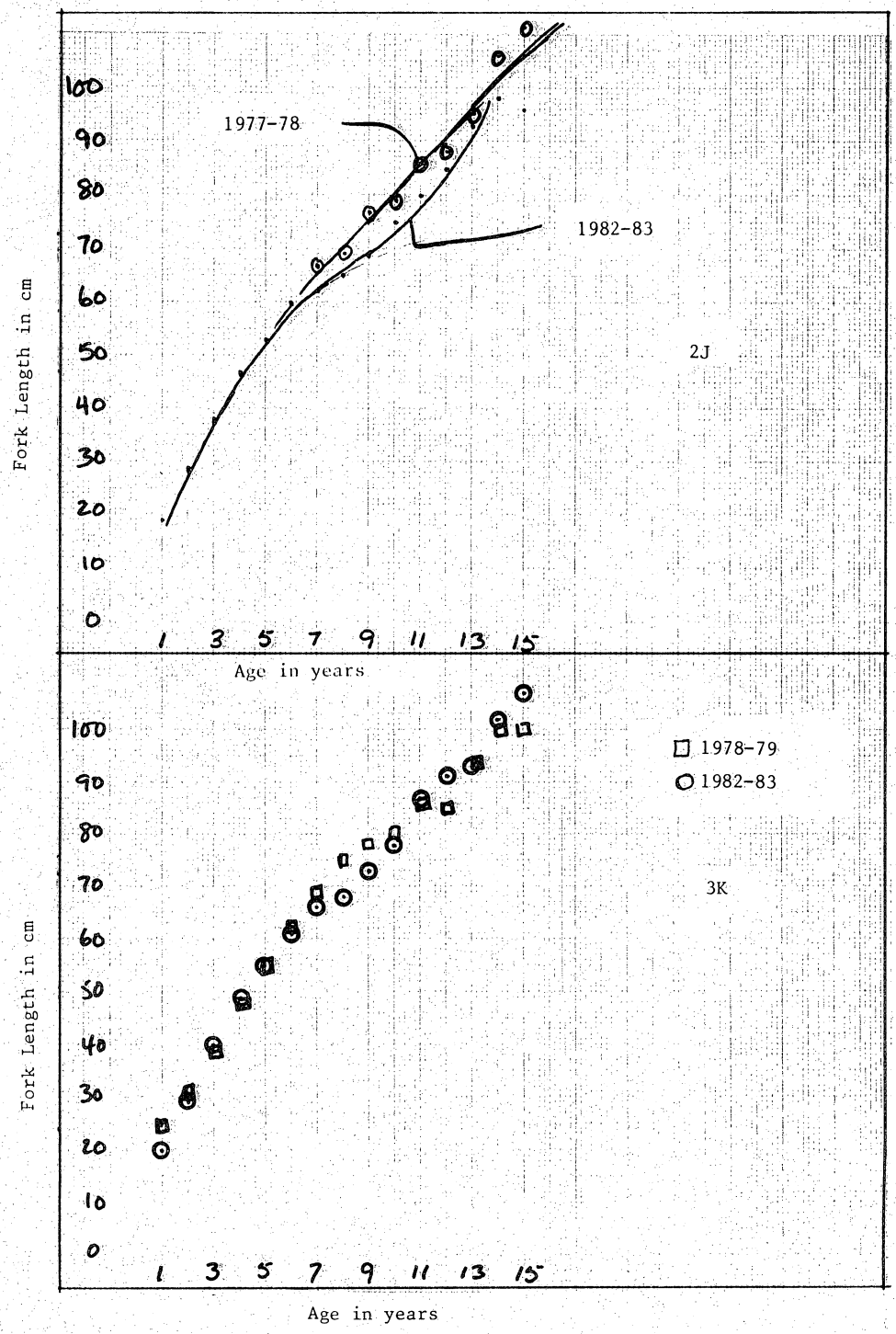

Fig. 7. Comparison of length-at-age averages for the two periods 1977-78 and 1982-83 for Div. 2J; and 1978-79 and 1982-83 for Div. 3K.