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Changes in Average Length-at-age of Cod on the Flemish Cap

by

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Introduction

The time interval required for cod to achieve a size adequate for maturation to begin is of importance in the definition of spawning stock size. The Flemish Cap stock in 1982 was perceived to be at a severely reduced level. If stock density were a factor in limiting growth of individual cod on the Flemish Cap, changes in average length-at-age may well be evident.

Materials and Methods

Research vessel cruises of limited scope were conducted in 1949-51, 1964 and 1968 by Canadian research vessels. Samples of cod were selected at random for detailed examination including the collection of otoliths (Anderson, J. T. and A. K. Chumakov, 1980). Age determinations were made by the author and average lengths-at-age calculated (Tables 1 and 2). Average lengths-at-age were available for the period 1977-82 from Wells (1983a).

Results

Average lengths-at-age for 1949-51, 1964 and 1968 are shown separately in Fig. 1. It seems clear that there is a distinct difference between the period 1949-51 and 1964 and 1968.

In Fig. 2 where the average lengths-at-age for the 1980-82, 1964, 1968 and 1949-51 periods are compared, a further increase is evident. In this figure the average lengths for the July-September periods are plotted one-half year to the right of those of the January-February period. Also in this figure the 1982 lengths-at-age are plotted since there appears to be some increase in growth over the period 1980-82.

While stock sizes for recent years are not available, it is perhaps not unreasonable to suppose that the stock in 1980-82 is at a much reduced level as compared to that in 1949-51. Wells (1983b) has estimated the total mortality in the late 1970's or early 1980's to be about 33%. Catches in 1949-51 period and in the period for some years before were probably low and stock sizes reasonably high. On a qualitative basis, the perceived change in stock sizes corresponds to the changes observed in average lengths-at-age.

References

- ANDERSON, J. T., and A. K. CHUMAKOV. 1980. Historical Data Summary for the Flemish Cap Project. (Division 3M). NAFO SCR Doc. No. 80/IX/152, Serial No. N224, 18 p.
- WELLS, R. 1983a. An Examination of Age Compositions estimated for Cod of the Flemish Cap in the period 1977-82. NAFO SCR Doc. No. 83/VI/26, Serial No. N677, 13 p.
- WELLS, R. 1983b. Distribution and Abundance of Cod in the Flemish Cap, 1977-83. NAFO SCR Doc. No. 83/VI/29, Serial No. N681, 8 p.

Table 1. Average length-at-age of cod taken on the Flemish Cap in the period July-August 1949-51. Data for ages with fewer than 10 age determinations in total have been omitted.

Age	Average length				Number of fish			
	Aug 1949	Jul 1950	Aug 1951	1949-51	1949	1950	1951	Total
2	29.84			29.84	31			31
3	34.42	39.25		34.78	50	4		54
4	42.50	44.79	40.00	44.54	6	104	3	113
5	48.43	51.25	49.00	48.92	21	4	10	35
6	52.16	53.08	54.40	52.62	55	36	5	96
7	55.21	56.75	61.00	57.24	14	65	16	95
8	63.63	56.33	59.11	59.31	8	9	38	55
9	62.50	62.50	62.13	62.29	2	10	16	28
10	64.00	67.86	63.89	64.67	2	7	27	36

Table 2. Average length-at-age of cod taken on the Flemish Cap in the period July-September 1964 and 1968. Data for ages with fewer than 10 age determinations in total have been omitted.

Age	Average length				Number of fish			
	Jul 1964	Sep 1964	Jul-Aug 1968	1964,68	1964	1964	1968	1964,1968
1		19.25	22.00	19.46	-	12	1	13
2	28.00	29.74	-	29.70	1	43	-	44
3	40.00	39.50	39.89	39.74	3	36	55	94
4	50.56	46.96	50.17	48.49	27	56	18	101
5	54.12	52.86	59.41	58.51	17	21	215	253
6	59.89	63.70	66.12	64.32	54	89	164	307
7	64.53	66.95	62.42	65.00	17	57	40	114
8	66.25	73.60	67.79	68.79	4	10	38	52
9	71.50	-	66.18	67.00	2	-	11	13
10	88.43	73.82	80.55	80.15	7	11	29	47
11	79.00	72.00	81.00	78.36	5	3	6	14

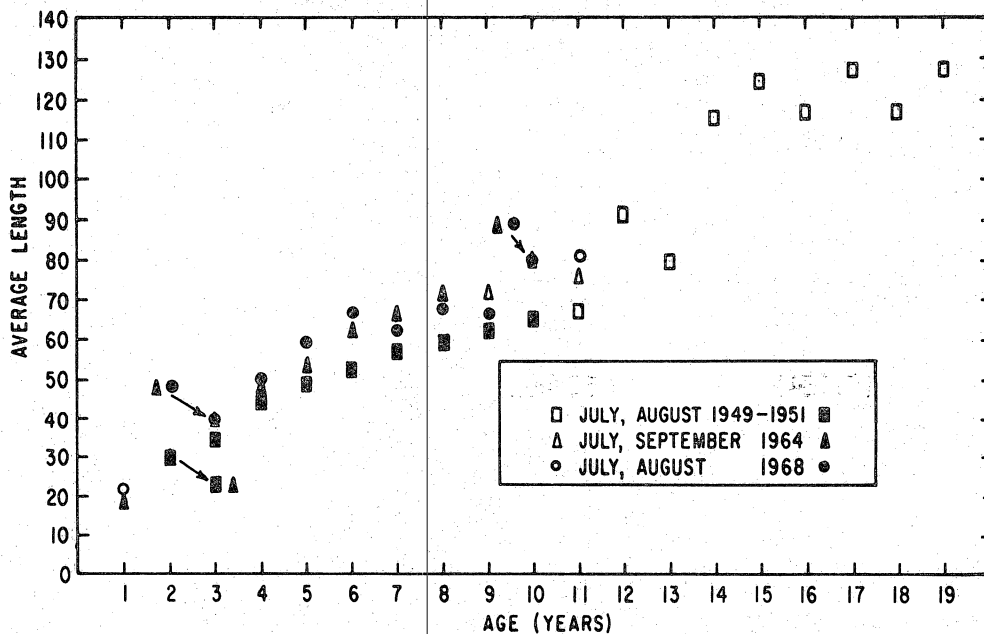


Fig. 1. Average length-at-age of cod on the Flemish Cap in 1949-51, 1964 and 1968.

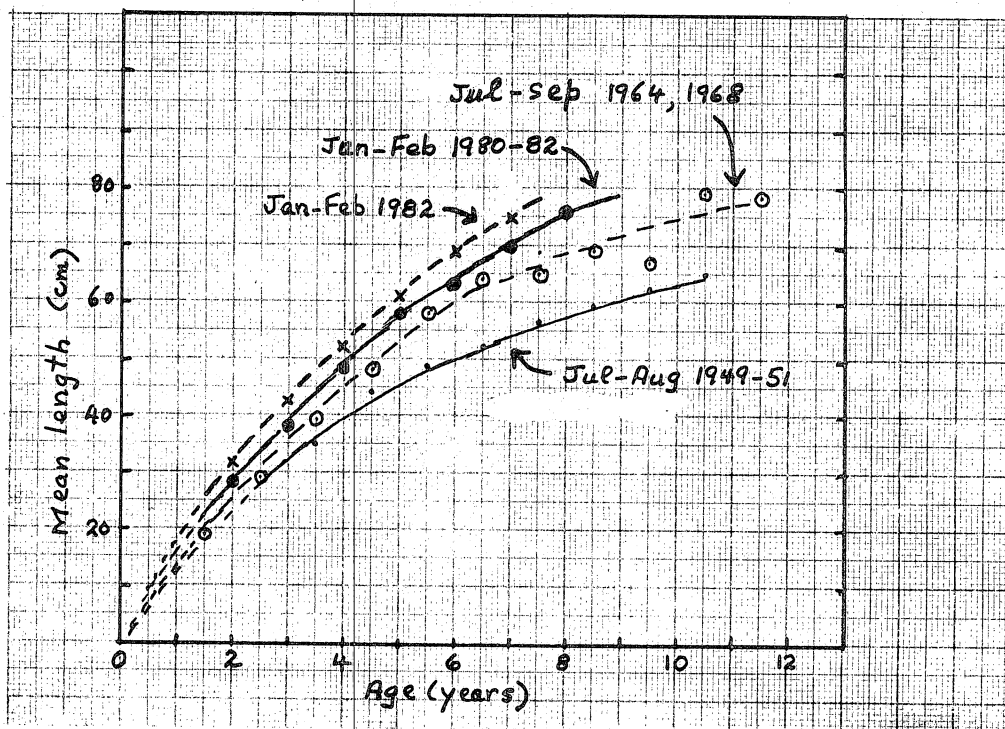


Fig. 2. Average length-at-age of cod on the Flemish Cap in the periods 1949-51, 1964, 1968 and 1980-82.

