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Some data on catches and biology of haddock (*Melanogrammus aeglefinus* L.)  
from Georges Bank and Sable Island Bank

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1. Introduction

The amount of haddock in the total annual catch of all species from ICNAF Area exceeds, on the average, 7%, which makes more than 165,000 tons. Of particular importance is this species in the fishing grounds of Nova Scotia and Georges Bank. In the period of the last 12 years there are noted considerable fluctuations in the catches. The main cause of those fluctuations is the variable strength of the population of haddock and the influence of increase or decrease of total fishing potential, operating on these fishing grounds.

2. Material

Our investigations covered two main regions: Georges Bank and Sable Island Bank. Sampling, commenced in 1964 and carried out until 1967, was as a rule performed in the summer and autumn during research cruises of R/V *Wieczno*. The year 1966 was an exception as the material was collected in December. In 1967 the material was collected aboard the factory trawler m/t *Aries*. During the whole period of the investigations 4,260 fish were examined for age and the state of gonads. Also, length measurements were performed on 38,332 specimens. The fish for analysis were taken from the catches, made with bottom trawl (cod trawl). The age was read from the cross-sections of otoliths.

3. Catches

The further northeastward from Nova Scotia and Georges Bank the less haddock is found in the catches. From ICNAF statistical data it appears that, of the total catch of haddock, 10.8% is caught on the southwest slopes of the Great Newfoundland Bank, 36.7% near Sable Island Bank and 52.5% on Georges Bank. From the statistical data it may be noted that the catches are not subject to any noticeable seasonal fluctuations. Table 1 shows the catch per month in percent for the whole year.

Table 1. Mean annual catch in percent per month.

Months											
I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
6.0	7.5	10.6	11.1	8.8	8.8	8.9	9.0	8.8	8.6	6.8	5.1

From these figures it appears that, in the spring months (March, April), there is a slight increase in catches, which is connected with spawning. There is very little difference in haddock landings in the period from May to October, while relatively poor fishing results are obtained from November to February.

In our fishing operations, the best yields were from the southwest slopes of Georges Bank and southwest slopes of Sable Island Bank. Best results were obtained in summer in the former area and in autumn in the latter area. It was observed that as the water grew warmer the haddock migrated northward.

No dense or stable concentrations of haddock were encountered in both seasons, summer or autumn. The maximum yield per one hour trawling reached 700 to 1,000 kg (near Sable Island Bank in December 1966).

4. Length, age and sexual maturity

Length composition is shown in Fig. 1. In 1964 most of the fish were represented by the 14-28 cm length classes. These length-classes were apparently prevalent on Georges Bank. In the region of Sable Island Bank fish up to 50 cm in length were noticeably abundant. In 1965 larger fish appeared in both regions, among which predominated specimens of 30 to 40 cm. In 1966 the fish found in both regions were of greater lengthrange. The predominant length-classes were 28 to 50 cm. In 1967 the fish were of smaller size; the predominant length-classes being 33 to 39 cm.

Age

Age-groups and year-classes have been determined on the basis of otolith readings; the data are given in Table 2. In the region of Georges Bank, the 1962 year-class was of particular importance. It was very abundant and as early as 1964 was predominant among other year-classes. The participation of this year-class was exceptionally high in 1965, but dropped again in 1966.

According to the composition of length-classes it is probable that the 1962 year-class was still of considerable importance in the catches in 1967. The age composition shows different participation of various age-groups in the years 1964-1966. Thus, for instance, in 1964 the older fish played a larger role than in subsequent years when they occurred in rather small amounts in the catches.

Table 2. The age composition (%) of haddock from Georges Bank in 1964 to 1966.

Age-groups	Years		
	1964	1965	1966
I	36.4*	4.6	1.1
II	18.6	73.8*	4.2
III	2.2	17.3	38.9*
IV	4.7	1.7	20.5
V	4.7	1.1	6.5
VI	2.2	0.9	9.0
VII	2.9	0.2	8.4
VIII	3.6	0.1	6.2
IX	4.7	0.1	1.0
X	4.4	-	1.2
XI	5.5	0.1	1.0
XII	5.5	0.1	1.0
XIII	2.5	-	0.8
XIV	1.8	-	-
XV	0.4	-	0.2

\*1962 year-class

Table 3 gives data on age-groups of haddock from Sable Island Bank.

Table 3. Age composition (%) of haddock from Sable Island Bank in 1964 to 1966.

Age-groups	Years		
	1964	1965	1966
0	3.5	3.4	11.2
I	13.4	8.6	12.4
II	25.5	13.7	26.7
III	16.9	35.4	25.1
IV	14.7	10.9	17.2
V	9.1	7.5	3.6
VI	8.2	7.4	1.0
VII	5.2	6.8	1.3
VIII	2.2	4.4	0.8
IX	1.3	0.9	0.3
X	-	0.9	0.1
XI	-	0.1	0.3

In the region of Sable Island Bank the age composition of the catches in the three successive years was slightly different. In 1964 age-group II was prevalent, while in 1965 - age-group III. In 1966 the predominant role is more or less equally shared by age-groups II and III.

Maturity

The maturity of haddock was determined according to Maier's scale. Data obtained from the two regions are given in Tables 4 and 5.

Table 4. Sexual maturity (%) of haddock from Georges Bank.

Years	Stage of Maturity							
	I	II	III	IV	V	VI	VII	VIII
1964	38.4	55.4	-	-	-	-	-	6.2
1965	6.1	93.4	-	-	-	-	-	0.5
1966	9.3	45.5	37.6	7.2	0.2	-	-	0.2
1967	12.1	86.9	10.0	-	-	-	-	-

Catches from Georges Bank were made up mainly of fish with gonads in maturity stage II. In 1964 there was also considerable amount of fish with gonads in stage I, which can be attributed to the large number of juvenile individuals in the catches.

Table 5. Sexual maturity (%) of haddock from Sable Island Bank.

Years	Stage of Maturity							
	I	II	III	IV	V	VI	VII	VIII
1964	23.8	64.9	-	-	2.6	2.6	2.2	3.9
1965	24.7	60.6	1.1	2.2	1.9	2.0	2.6	4.9
1966	42.0	20.2	28.1	9.7	-	-	-	-

In Table 5 we note that there prevailed some analogical tendencies in the region of Sable Island Bank, except that there occurred some amount of fish of all stages of maturity, which were not found in the region of Georges Bank in spite of similar periods of observations. An increased proportion of fish in stages III and IV in both areas in 1966, as shown above, is the result of collecting material at a later period (November and December).

(over)

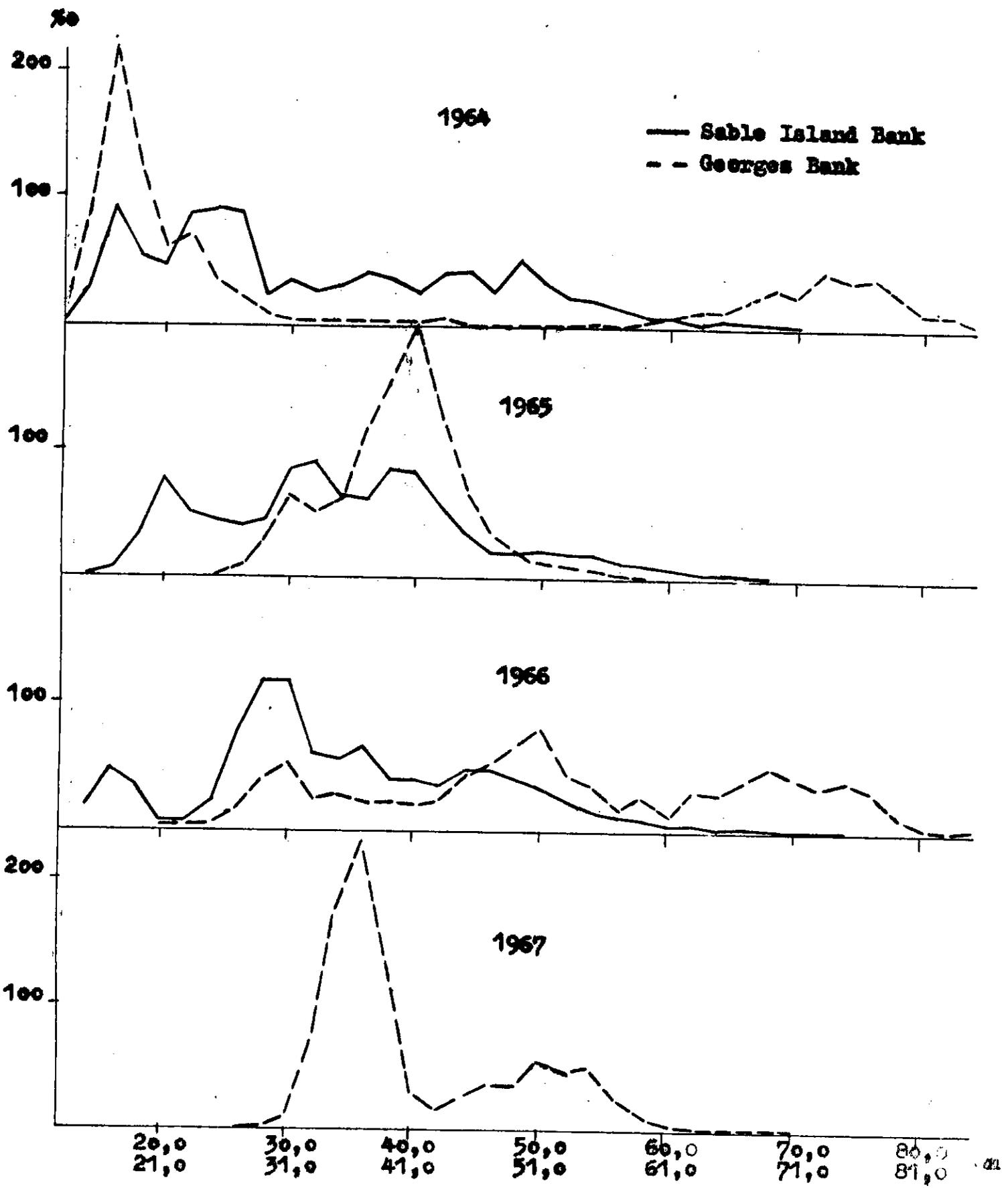


Fig. 1. Length of haddock caught on Sable Island Bank and Georges Bank.