ANNUAL MEETING - JUNE 1967AGE, LENGTH AND MATURITY OF ADULTHERRING IN SUBAREAS 4 and 5, 1966

by

H. C. Boyar  
U.S. Bureau of Commercial Fisheries  
Biological Laboratory  
Boothbay Harbor, Maine

Comparisons were made of year class contribution, length and gonadal development of adult herring collected in 1966 from subareas 4 and 5. Thirty-eight samples (2051 herring) from Georges Bank, 52 samples (3754 herring) from Coastal Gulf of Maine and 19 samples (1423 herring) from Nova Scotia were obtained for study.

Gonadal development: Differences in gonadal development of herring from the 3 areas were slight (Figure 1). During the first 4 months of the year, the majority of fish were recovering from the previous year's spawning. From May through July, most of the fish had matured and by August and September the majority of fish were full. Spawning fish, first collected during late August, were the first indication of autumn spawning in Coastal Gulf of Maine and Nova Scotia. Although no samples for August were obtained from Georges Bank, the onset of spawning probably occurred slightly later, sometime in early September (no larval herring were collected during our early September cruise). The peak of spawning on Georges Bank and Coastal Gulf of Maine was in October. The peak of spawning in Nova Scotia, as indicated by the abundance of full fish in September, must have also occurred in October. Spawning fish decreased in number by November, but were still evident during early April on Georges Bank and in early May in Coastal Gulf of Maine.

Year Class Contribution: On Georges Bank fish of the 1960 and 1961 year classes (age-groups VI and V, respectively) dominated the samples throughout the year (Figure 2). Herring of the 1962 year class were well represented in 4 of the 6 months of sampling. Most of the fish of the 1963 year class were collected during April along the Southeast and Southwest Part of the Banks, where herring congregate during the spring. We fished the same waters in June, but obtained few fish of the 1963 year class. The 1959 year class was not abundant in our samples except for September, and was not present in the sample collected in November. In 1966, the 1961 year class dominated the samples on the Banks, and was followed in percentage occurrence by the 1960, 1962, 1963, 1959 and 1958 year classes.

In Coastal Gulf of Maine, the 1960 year class dominated the samples in 7 of 11 months. The 1963 year class was dominant during 3 months and the 1961 year class for 1 month. Fish of the 1962 year class were well represented in 9 of 11 months while fish of the 1963 year class were well represented in 5 of 11 months. Members of the 1959 year class occurred more frequently in Coastal Gulf of Maine than on Georges Bank. The 1960 year class dominated the samples in 1966, followed in percentage occurrence by the 1961, 1959, 1963, 1962 and 1958 year classes. This is the first time in the past 7 years that fish

of age-group VI have dominated samples from a given area, and is also the third year that fish of the 1960 year class dominated the samples from Coastal Gulf of Maine.

In Nova Scotia, the 1960 year class dominated the samples during 4 months, the 1961 year class for 1 month. Fish of the 1962 year class were abundant in the samples obtained during March and June but decreased by July through September. Fish of the 1963 year class which were relatively abundant in the samples from Georges Bank and Coastal Gulf of Maine were poorly represented in the samples from Nova Scotia. Herring of the 1959 and 1958 year classes were low in abundance from May through July, but increased in frequency during August and September. The 1960 year class dominated the samples, followed in occurrence by the 1961, 1959, 1958, 1957 and older, 1962 and 1963 year classes. This is the third successive year that the 1960 year class has dominated the samples and the first year in the past 7 years that fish of age-group VI have dominated the samples from Nova Scotia. Fish of the 1959 year class continued to increase in frequency of occurrence since 1964. The percentage occurrence of fish of the 1959 and 1958 year classes from Nova Scotia was greater than the percentage occurrence of fish of these year classes either from Georges Bank or Coastal Gulf of Maine.

Length frequency distributions: In 1966, herring on Georges Bank ranged in length from 18.0 to 34.3 cm; herring from the Coastal Gulf of Maine ranged in length from 19.0 to 36.2 cm; and herring from Nova Scotia ranged in length from 20.8 to 37.4 cm. The mean lengths of fish of a given age-group of the various year classes for a particular month do not appear to differ between areas (Table 1). For example, the mean lengths of fish of the 1960 year class (age-group VI) on Georges Bank, Coastal Gulf of Maine, and Nova Scotia in September were 30.5, 30.7 and 30.6 cm, respectively.

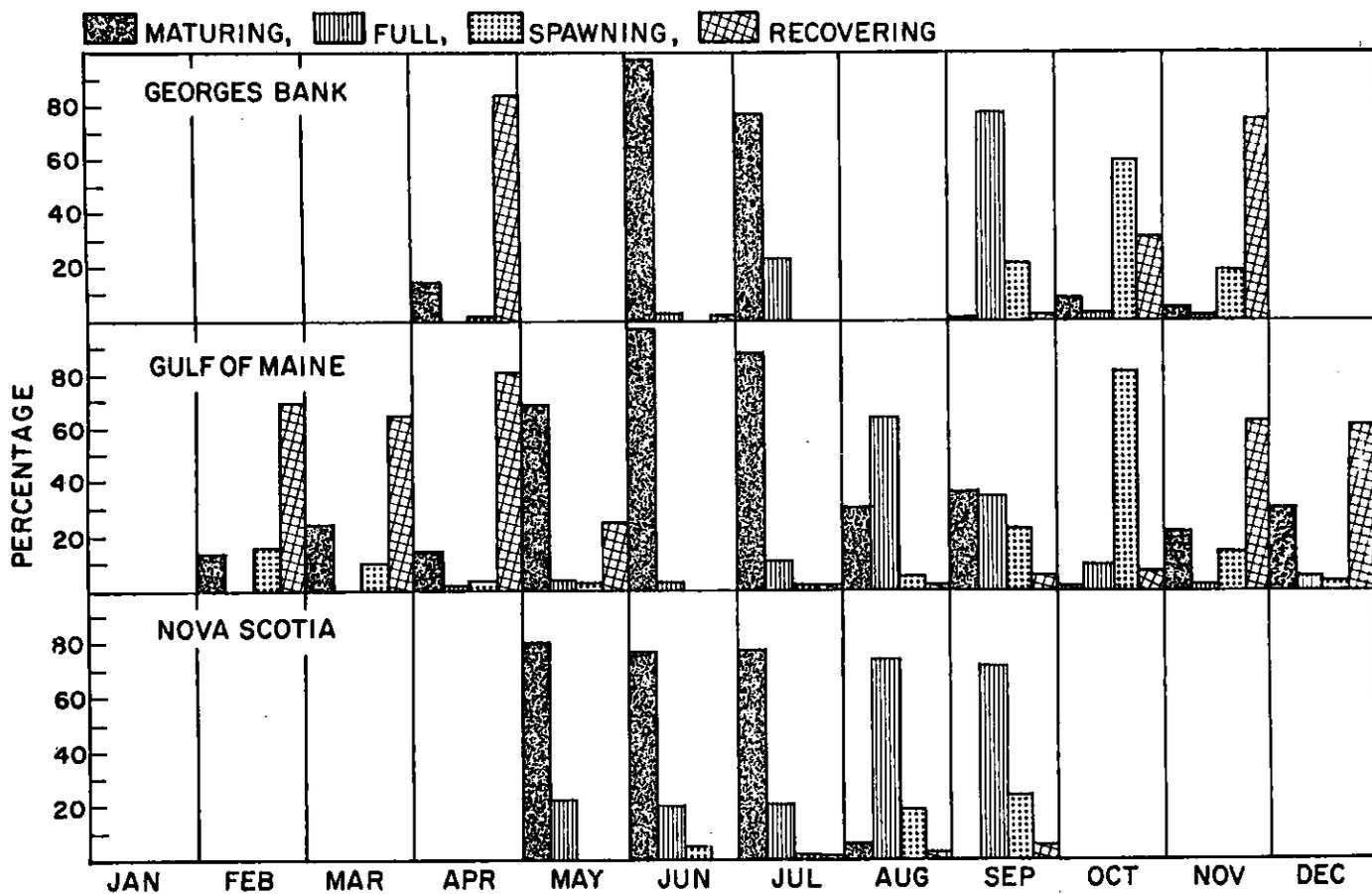


Figure 1. Gonadal stages of herring from Georges Bank, Coastal Gulf of Maine and Nova Scotia, 1966.

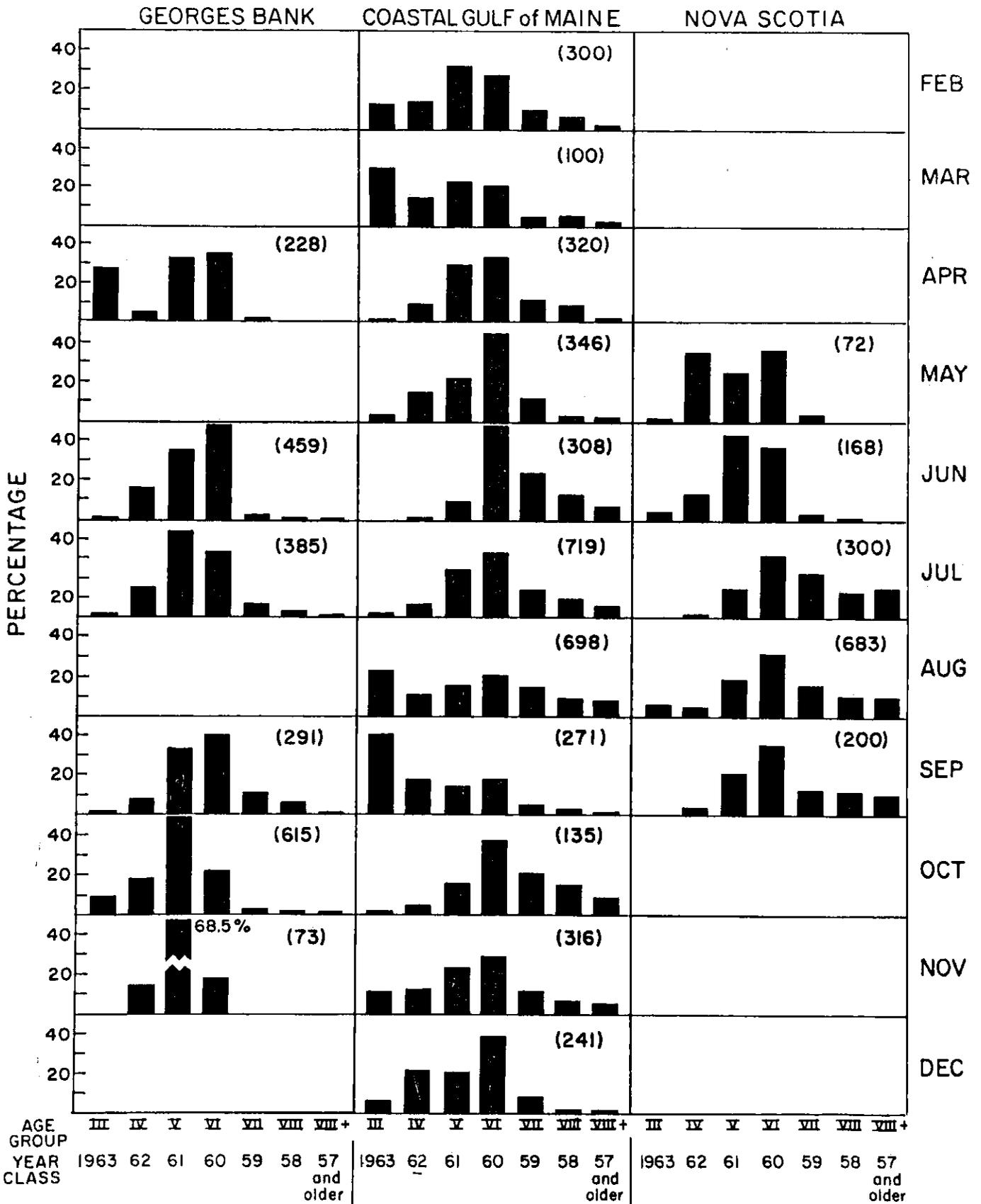


Figure 2. Age composition of herring from Georges Bank, Coastal Gulf of Maine and Nova Scotia, 1966. Number of fish sampled in parentheses.

Table 1. Mean lengths by month of herring of various year classes from Georges Bank(GB), Coastal Gulf of Maine(GM), and Nova Scotia(NS), 1966.

YEAR CLASS	AGE-GROUP	AREA	MEAN LENGTHS BY MONTH											
			FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEP.	OCT.	NOV.	DEC.	
1963	III	GB	--	--	20.9	--	23.7	25.7	--	25.8	24.9	--	--	
		GM	22.6	22.6	22.1	22.0	--	25.0	25.7	24.6	25.7	25.7	25.4	
		NS	--	--	--	23.9	22.7	--	23.4	--	--	--	--	
1962	IV	GB	--	--	25.7	--	27.2	27.9	--	28.0	27.7	27.2	--	
		GM	26.1	25.8	24.9	26.7	27.0	27.4	27.8	27.6	27.6	27.8	27.5	
		NS	--	--	--	26.4	27.4	28.3	27.7	28.7	--	--	--	
1961	V	GB	--	--	27.8	--	28.5	29.2	--	29.4	29.1	29.2	--	
		GM	27.7	27.5	28.0	28.3	28.6	29.4	29.4	29.4	29.4	29.4	29.4	
		NS	--	--	--	28.3	28.9	29.5	29.4	29.6	--	--	--	
1960	VI	GB	--	--	29.3	--	29.9	30.4	--	30.6	30.5	30.3	--	
		GM	29.3	29.3	29.4	29.9	30.3	30.3	30.9	30.7	30.8	30.9	30.9	
		NS	--	--	--	29.9	30.2	30.8	30.8	30.6	--	--	--	
1959	VII	GB	--	--	30.4	--	31.9	31.9	--	32.0	32.1	--	--	
		GM	31.0	31.2	31.2	31.7	31.7	31.8	32.1	32.1	32.1	32.2	32.2	
		NS	--	--	--	31.2	31.5	32.1	32.1	32.0	--	--	--	
1958	VIII	GB	--	--	--	--	32.7	32.9	--	33.0	33.0	--	--	
		GM	32.1	32.3	32.5	32.9	33.0	32.9	33.1	33.1	33.1	33.2	33.1	
		NS	--	--	--	--	32.6	33.1	33.2	33.3	--	--	--	
1957 and older	VIII+	GB	--	--	--	--	33.8	33.6	--	34.0	33.9	--	--	
		GM	33.5	33.4	33.3	34.3	34.2	34.1	34.4	34.0	34.4	34.1	34.7	
		NS	--	--	--	--	--	34.5	34.7	34.7	--	--	--	