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Breakdown of Squid Catches in ICNAF Subarea 3, 1978, with Length and Sex
Composition from Offshore and Newfoundland Inshore Samples

by

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Introduction

Landings of squid in previous years have been reported on by various authors. (Collins and Ennis, 1978, Mercer 1973(a) and Squires 1957). Historically the majority of squid catches in Subarea 3 have been taken by the Newfoundland inshore jigger fishery. This trend continued in 1978, however it is noteworthy that over ten percent of squid catches in 1978 in Subarea 3 were caught by the foreign offshore trawling fishery.

Materials and Methods

Monthly landings of squid by ICNAF division (Fig. 1) were obtained from the Economics and Intelligence Branch, Department of Fisheries and Oceans, Newfoundland Region. Offshore catches of squid in Subarea 3 are reported by the FLASH information system and the trip summaries of developmental charters. The figures for 1978 are not final.

During 1978 samples (averaging between 200 and 250 squid per sample) were obtained from commercial and research catches at Holyrood and St. John's (ICNAF Subarea 3L) Twillingate (ICNAF Subarea 3K) and Hermitage (ICNAF Subarea 3Ps). (Fig. 2). Dorsal mantle lengths were reported to the nearest centimeter, sex was determined and maturity classified according to the scale proposed by Mercer (1973b). The length frequencies reported here are summarized bi-weekly throughout the season. Length-frequency data by sex were adjusted up to total removals for ICNAF Subareas 3K, L, Ps, O for those months that samples were obtained using the length-weight relationship of Mercer (1973c).

Samples were not obtained at any of the inshore sampling localities during May and June. Offshore removals were calculated for August and September from foreign commercial samples.

Landings

Catches in 1978 for Subarea 3 were 44,327 tons. Of that total, 5,050 M.T. or 11% were caught offshore in ICNAF Subarea 3 (Table 1). The bulk of the catch (39,277 M.T.) was landed by the inshore fishery. The inshore catch for 1978 is higher than the previous highest catch of 29,675 tons in 1978. In 1977 there was discarding of squid particularly early in the season because the processing facilities were severely limited. This was also the case in 1978 despite the presence of foreign trawlers inshore which acted as extended wharfage processing plants for Canadian companies.

As a general observation, fishermen conceded that the real abundance of squid in 1977 was greater than in 1978 in spite of what the catches indicate. Although we have little data on 1977 effort, it is fair to say that it was lower early in the season than in 1978. Increased catches in 1978 were probably due to a multitude of factors including increased Canadian processing facilities, extended wharfage processing by foreign trawlers, the revitalization of the art of drying squid, and the greater effort exerted in 1978.

Table 1. Squid catches (metric tons) by division and month in the Newfoundland area, 1978.

| ICNAF DIV | MONTH | | | | | | | TOTALS |
|-----------|-------|--------|----------|-----------|-----------|----------|-------|-----------|
| | May | June | July | August | September | October | Nov. | |
| 2G | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2H | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2J | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3K | 0 | 0.35 | 85.51 | 3,176.31 | 7,430.73 | 1,015.87 | 17.77 | 11,726.54 |
| 3L | 1.10 | 49.42 | 2,035.10 | 5,861.97 | 10,368.95 | 2,793.36 | 44.04 | 21,153.94 |
| 3M | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3N | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3O | 0.40 | 211.40 | 817.26 | 2,560.60 | 1,305.60 | 155.10 | | 5,049.94 |
| 3Ps | 0 | 1.23 | 180.81 | 1,413.67 | 2,089.24 | 888.13 | 6.36 | 4,579.44 |
| 3Pn | 0 | 0 | 3.13 | 837.10 | 698.05 | 122.93 | 0.39 | 1,661.60 |
| 4R | 0 | 0 | 0 | 152.14 | 1.12 | 2.00 | 0 | 155.26 |
| Totals | 1.50 | 262.40 | 3,121.81 | 14,001.37 | 21,893.69 | 4,977.39 | 68.56 | 44,326.72 |

Length Frequencies

Length frequency distributions by sex for Twillingate, Holyrood, St. John's, and Hermitage for bi-weekly periods are shown in Fig. 3, 4, 5, 6. In males the frequencies are broken down by maturity stage. Numbers examined and mean lengths are included in the figures. The change in sex ratios, average mantle length and body weight for each bi-weekly period are shown in Fig. 7, 8, 9, respectively.

The average length of squid increased throughout the season for both males and females at all locations. The late season samples from Holyrood showed little increase in the mean length between bi-weekly periods which may be only a result of the emigration offshore of larger animals.

Frequencies adjusted up to total removals

Length frequencies for samples collected from 3K, L, Ps, O were adjusted up to removals on a monthly basis (Tables 2, 3, 4, 5). Unfortunately, samples were not obtained for all months in which landings were made.

Table 2. Length frequencies of squid adjusted to total removals from Div. 3K for July-September 1978.

| Length (cm) | July | | August | | September | |
|-------------|---------------------------|----------|---------------------------|-------------|---------------------------|-------------|
| | Total Removals (kg) Males | Females | Total Removals (kg) Males | Females | Total Removals (kg) Males | Females |
| 15.0 | | 291.0 | 15,124.1 | | | |
| 16.0 | 2,331.8 | 4,848.8 | 127,747.5 | | | |
| 17.0 | 8,987.2 | 4,218.4 | 499,243.3 | | | |
| 18.0 | 11,173.3 | 15,128.2 | 499,243.3 | | 20,441.3 | |
| 19.0 | 9,716.0 | 10,667.3 | 30,835.6 | 53,498.0 | 24,529.6 | |
| 20.0 | 2,186.1 | 12,121.9 | 35,240.7 | 438,105.5 | 61,324.0 | |
| 21.0 | | 5,721.6 | | 558,114.6 | 686,828.7 | 236,574.6 |
| 22.0 | | 921.8 | | 477,144.6 | 1,107,920.0 | 1,128,741.7 |
| 23.0 | | 1,066.7 | | 290,624.5 | 596,866.9 | 1,206,931.6 |
| 24.0 | | | | 109,887.9 | 118,559.7 | 866,103.8 |
| 25.0 | | | | 41,930.9 | 132,868.7 | 751,826.2 |
| 26.0 | | | | | | 196,477.2 |
| 27.0 | | | | | | 294,715.9 |
| Totals | 34,394.4 | 54,985.7 | 1,207,434.5 | 1,969,306.0 | 2,749,339.0 | 4,681,371.0 |

Table 3. Length frequencies of squid adjusted to total removals from Div. 3L for July-November 1978.

| Length (cm) | July | | August | | September | | October | | November | |
|-------------|--------------------------|----------------------------|--------------------------|----------------------------|--------------------------|----------------------------|--------------------------|----------------------------|--------------------------|----------------------------|
| | Total Removals (kg) Male | Total Removals (kg) Female | Total Removals (kg) Male | Total Removals (kg) Female | Total Removals (kg) Male | Total Removals (kg) Female | Total Removals (kg) Male | Total Removals (kg) Female | Total Removals (kg) Male | Total Removals (kg) Female |
| 15.0 | 2,503.7 | | | | | | | | | |
| 16.0 | 20,400.7 | 10,180.8 | | | | | | | | |
| 17.0 | 140,486.5 | 78,669.5 | 3,426.2 | | | | | | | |
| 18.0 | 253,153.9 | 166,131.5 | 53,105.7 | 20,418.7 | | | | | | |
| 19.0 | 326,410.8 | 236,008.5 | 155,034.4 | 77,785.6 | | | | 995.3 | | |
| 20.0 | 210,961.6 | 183,716.4 | 696,369.9 | 414,208.5 | 114,459.5 | 18,557.3 | 3,002.8 | 199.1 | 45.3 | 82.3 |
| 21.0 | 102,467.0 | 108,749.0 | 826,564.5 | 702,015.3 | 740,570.3 | 269,923.9 | 49,646.7 | 15,129.2 | 226.6 | 93.5 |
| 22.0 | 72,329.7 | 67,563.2 | 785,450.5 | 793,413.4 | 1,896,270.0 | 1,231,527.6 | 335,916.1 | 69,474.7 | 1,737.4 | 93.5 |
| 23.0 | 11,127.6 | 31,005.0 | 177,304.5 | 573,669.0 | 1,373,514.5 | 1,509,886.6 | 468,240.6 | 377,034.4 | 5,824.2 | 2,394.4 |
| 24.0 | | 6,015.9 | 60,814.6 | 296,557.7 | 462,147.9 | 1,147,176.4 | 249,234.5 | 480,947.8 | 6,670.2 | 5,462.1 |
| 25.0 | | | 55,675.3 | 98,204.4 | 153,751.6 | 607,328.7 | 39,236.9 | 344,785.5 | 2,617.5 | 7,791.2 |
| 26.0 | | 7,404.2 | | 155,571.1 | 31,604.5 | 84,351.3 | | 188,318.2 | 494.8 | 5,884.9 |
| 27.0 | | | | 35,975.9 | | 126,526.8 | | 87,589.8 | | 2,319.5 |
| 28.0 | | | | 20,418.7 | | 278,359.0 | | 44,989.3 | | 1,028.8 |
| 29.0 | | | | | | 38,801.6 | | 22,892.8 | | 766.9 |
| 30.0 | | | | | | | | 10,152.5 | | 284.3 |
| 31.0 | | | | | | | | 5,573.9 | | |
| 32.0 | | | | | | | | | | 116.0 |
| Totals | 1,139,841.5 | 895,444.0 | 2,813,745.6 | 3,188,238.3 | 4,772,318.3 | 5,312,439.2 | 1,145,367.6 | 1,648,082.5 | 17,616.0 | 26,223.9 |

Table 4. Length frequencies of squid adjusted to total removals from Subdiv. 3Ps for July-September 1978.

| Length (cm) | July | | August | | September | |
|-------------|--------------------------|----------------------------|--------------------------|----------------------------|--------------------------|----------------------------|
| | Total Removals (kg) Male | Total Removals (kg) Female | Total Removals (kg) Male | Total Removals (kg) Female | Total Removals (kg) Male | Total Removals (kg) Female |
| 15.0 | 350.5 | | | | | |
| 16.0 | 744.7 | 480.6 | | | | |
| 17.0 | 3,876.9 | 2,271.7 | | | | |
| 18.0 | 7,907.0 | 10,899.0 | 1,531.6 | | | |
| 19.0 | 14,740.8 | 25,251.2 | 15,316.0 | 9,486.9 | | 2,717.1 |
| 20.0 | 6,527.1 | 27,741.3 | 47,939.2 | 50,801.1 | 39,365.7 | 26,038.6 |
| 21.0 | 1,555.1 | 31,913.4 | 124,672.5 | 143,834.4 | 153,724.1 | 49,360.2 |
| 22.0 | 459.9 | 24,574.0 | 70,300.0 | 267,164.7 | 160,541.6 | 237,291.2 |
| 23.0 | | 12,647.4 | 18,685.6 | 194,329.4 | 31,008.7 | 277,368.0 |
| 24.0 | | 5,002.2 | 4,288.5 | 206,264.6 | 14,294.8 | 374,277.0 |
| 25.0 | | 3,145.5 | | 158,982.9 | | 287,557.0 |
| 26.0 | | 720.8 | | 69,928.0 | | 295,481.8 |
| 27.0 | | | | 16,831.7 | | 132,910.2 |
| 28.0 | | | | 6,273.6 | | 9,283.3 |
| 29.0 | | | | 7,038.7 | | |
| Totals | 36,162.0 | 141,501.6 | 282,733.4 | 1,130,936.0 | 398,935.0 | 1,692,284.4 |

Table 5. Length frequencies of squid adjusted to total removals from Div. 30 for August-September 1978.

| Length (cm) | August | | September | |
|-------------|---------------------------|-----------------------------|---------------------------|-----------------------------|
| | Total Removals (kg) Males | Total Removals (kg) Females | Total Removals (kg) Males | Total Removals (kg) Females |
| 15.0 | | 1,941.2 | | |
| 16.0 | 5,139.0 | 1,941.2 | | |
| 17.0 | 30,834.3 | 8,735.2 | 1,570.1 | |
| 18.0 | 222,006.8 | 80,558.3 | 19,888.5 | 1,463.9 |
| 19.0 | 486,153.9 | 369,791.8 | 162,771.8 | 64,412.5 |
| 20.0 | 359,733.3 | 392,115.2 | 278,962.6 | 184,941.9 |
| 21.0 | 191,172.6 | 138,793.2 | 194,698.1 | 139,072.4 |
| 22.0 | 70,180.5 | 118,411.0 | 43,440.7 | 97,106.7 |
| 23.0 | 24,667.4 | 32,029.2 | 16,748.2 | 79,539.7 |
| 24.0 | 8,222.5 | 7,764.7 | | 20,982.9 |
| 25.0 | 9,250.3 | | | |
| Totals | 1,408,099.0 | 1,152,081.0 | 718,080.0 | 587,520.0 |

Acknowledgements

We would like to thank Don E. Waldron for providing length frequencies from the offshore foreign fishery in Subarea 3.

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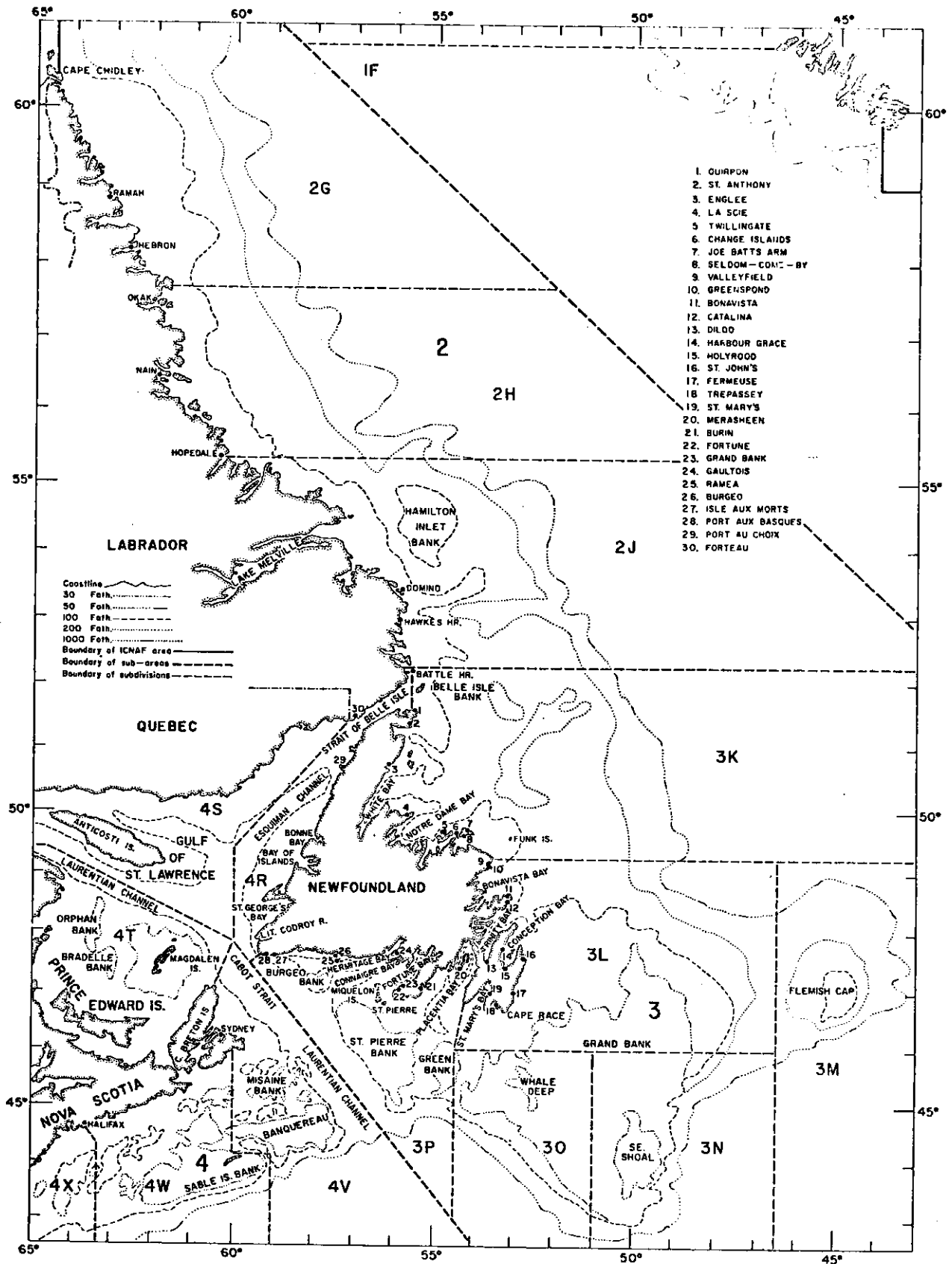


Fig. 1. Map of Northwest Atlantic ICNAF Subareas.

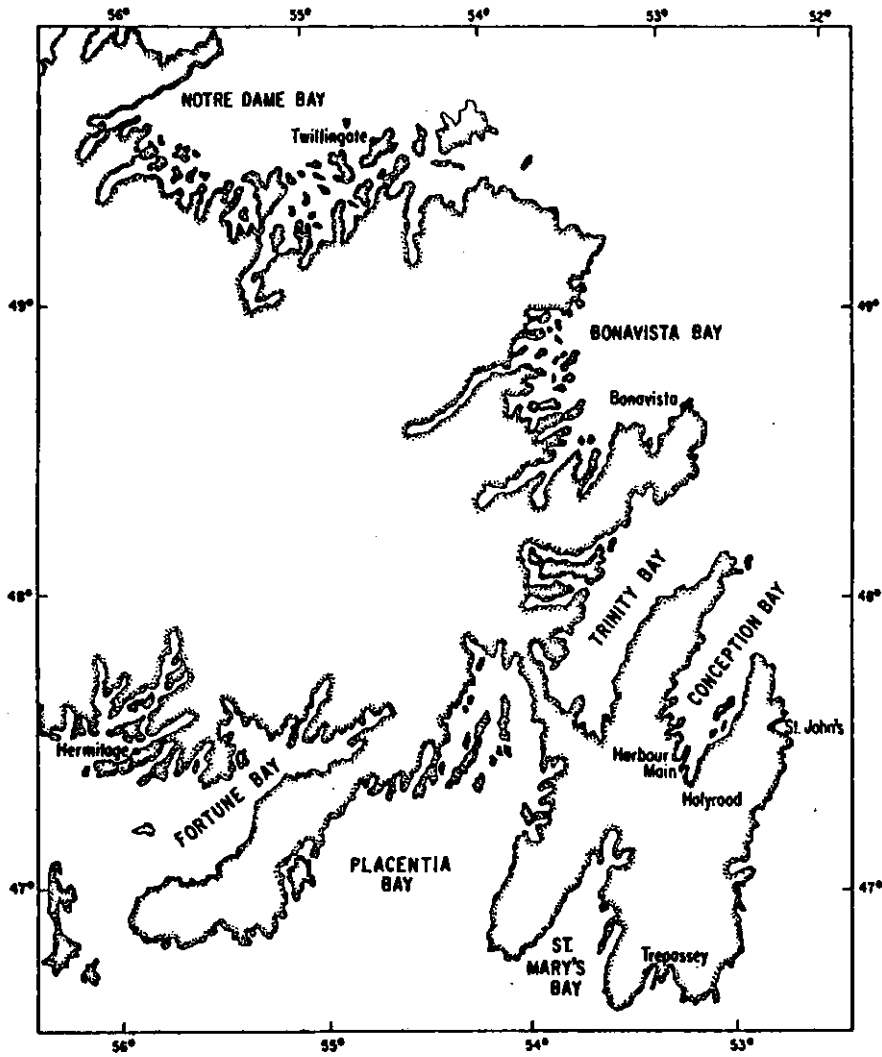


Fig. 2. Map of eastern Newfoundland showing inshore sampling locations.

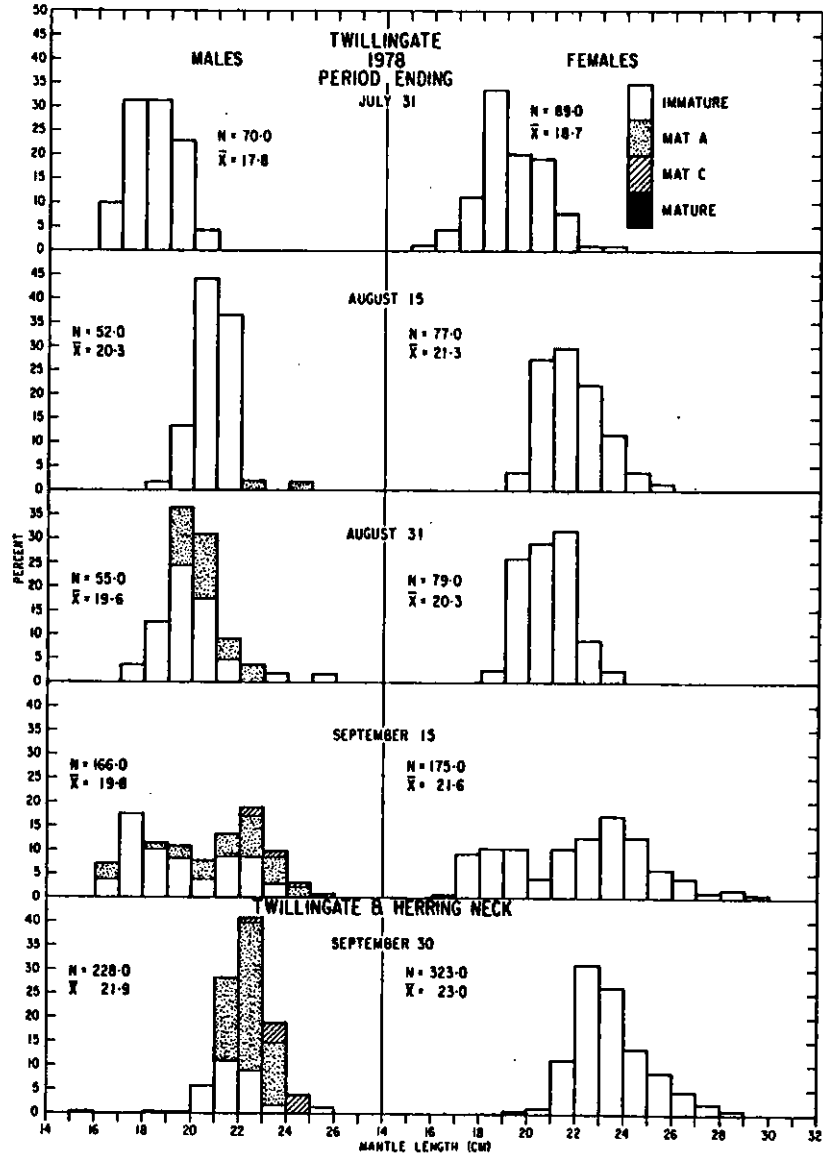


Fig. 3. Length frequencies and maturity stages by sex for bi-weekly periods in 1978 at Twillingate.

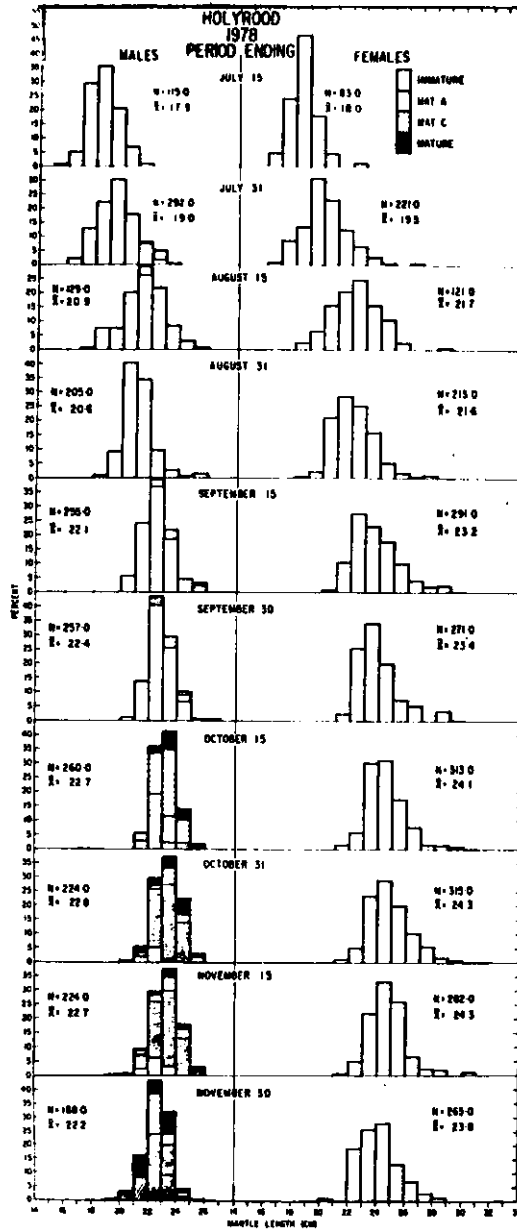


Fig. 4. Length frequencies and maturity stages by sex for bi-weekly periods in 1978 at Holyrood.

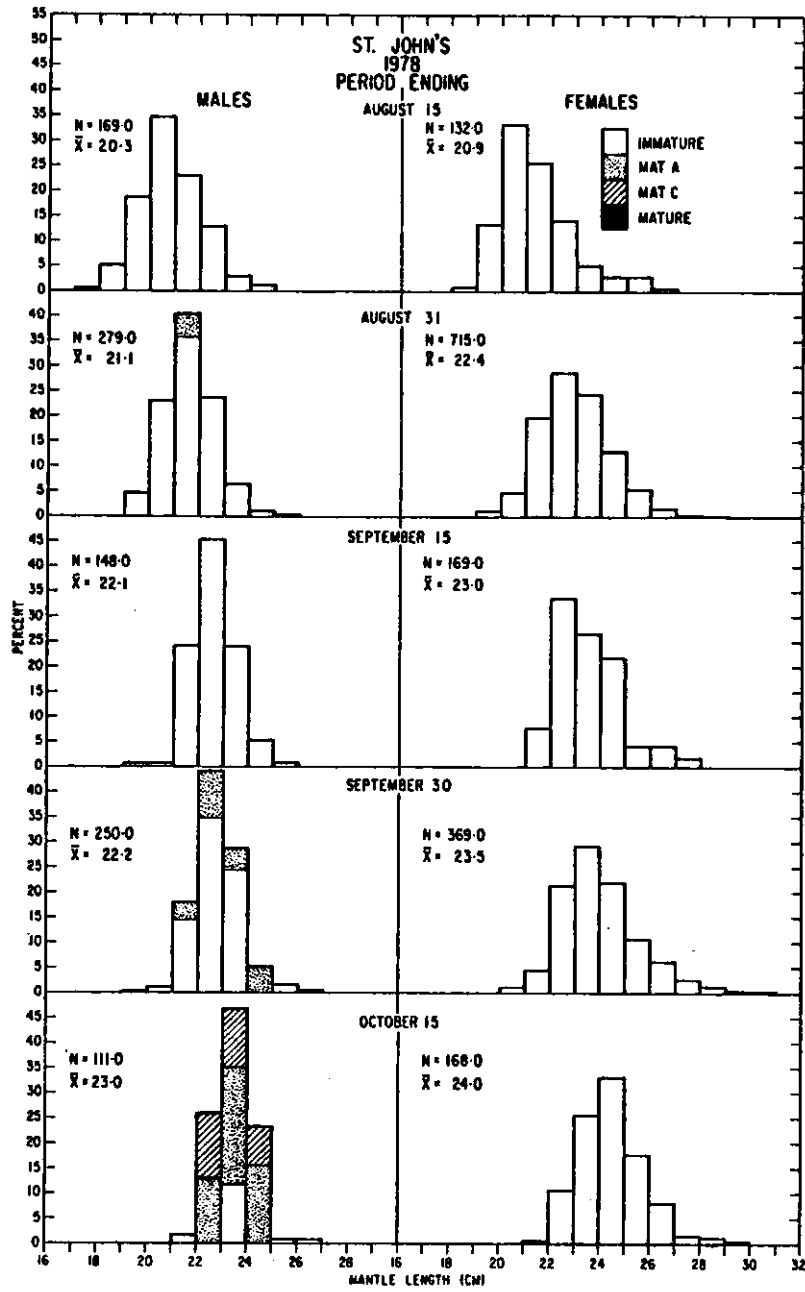


Fig. 5. Length frequencies and maturity stages by sex for bi-weekly periods in 1978 at St. John's.

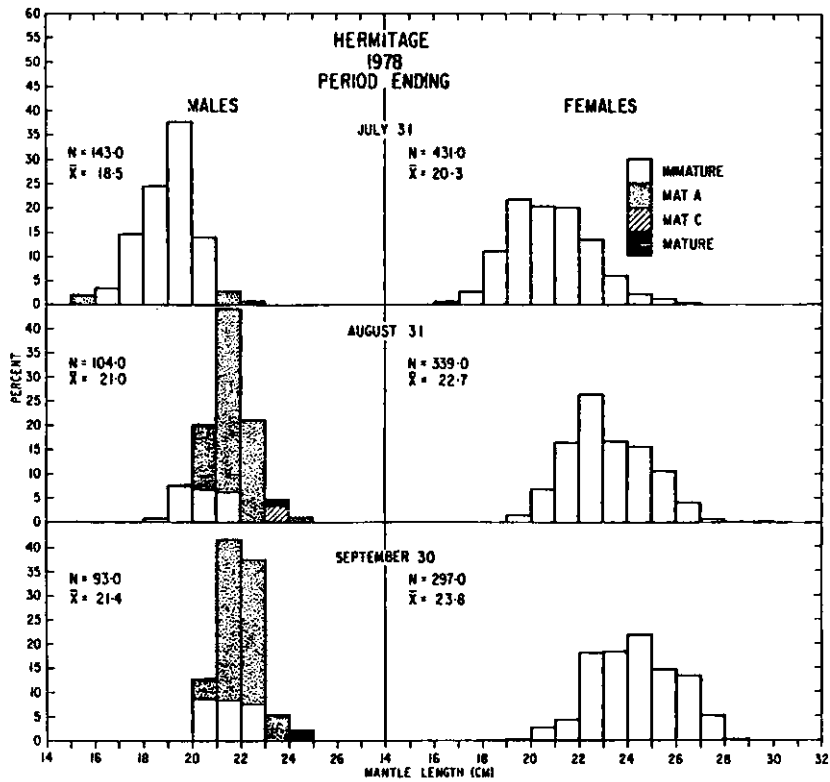


Fig. 6. Length frequencies and maturity stages by sex for month end in 1978 at Hermitage.

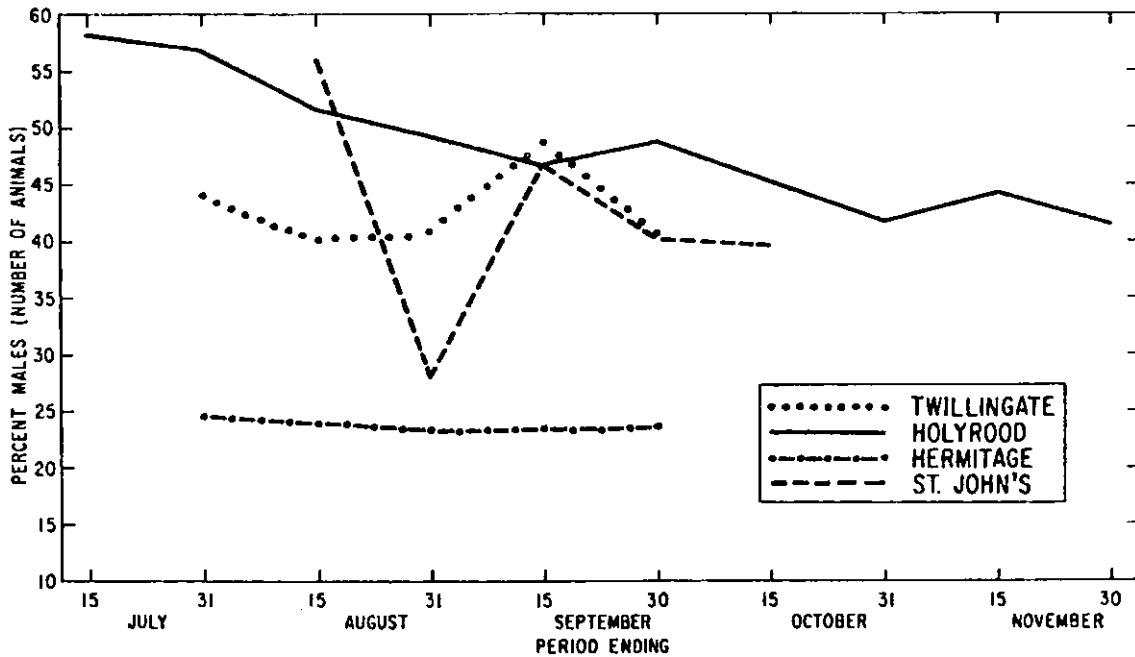


Fig. 7. Percent males over the fishing season at four inshore sampling locations in 1978.

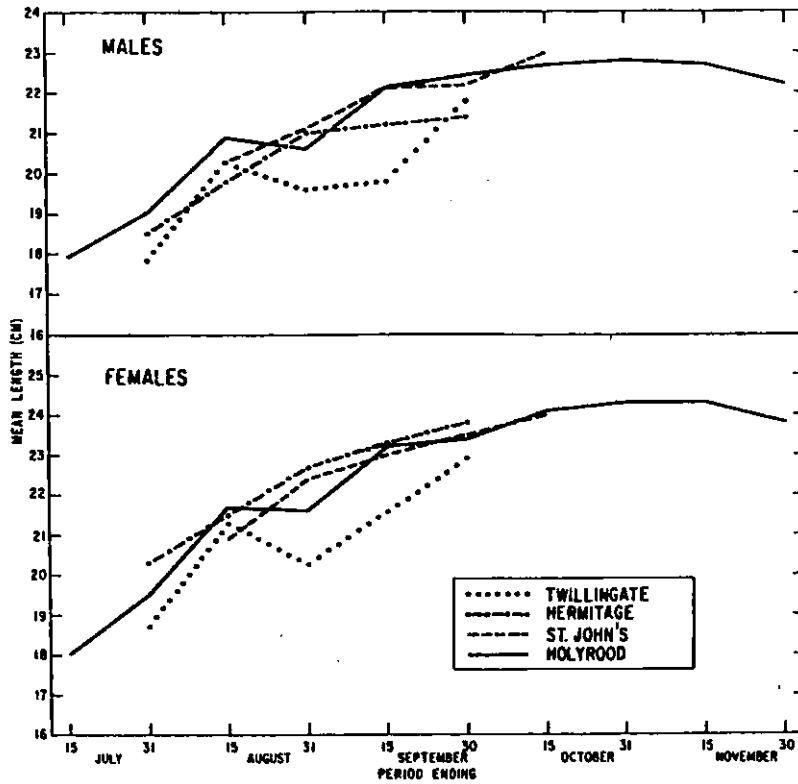


Fig. 8. Mean lengths by sex over the fishing season at four inshore sampling locations in 1978.

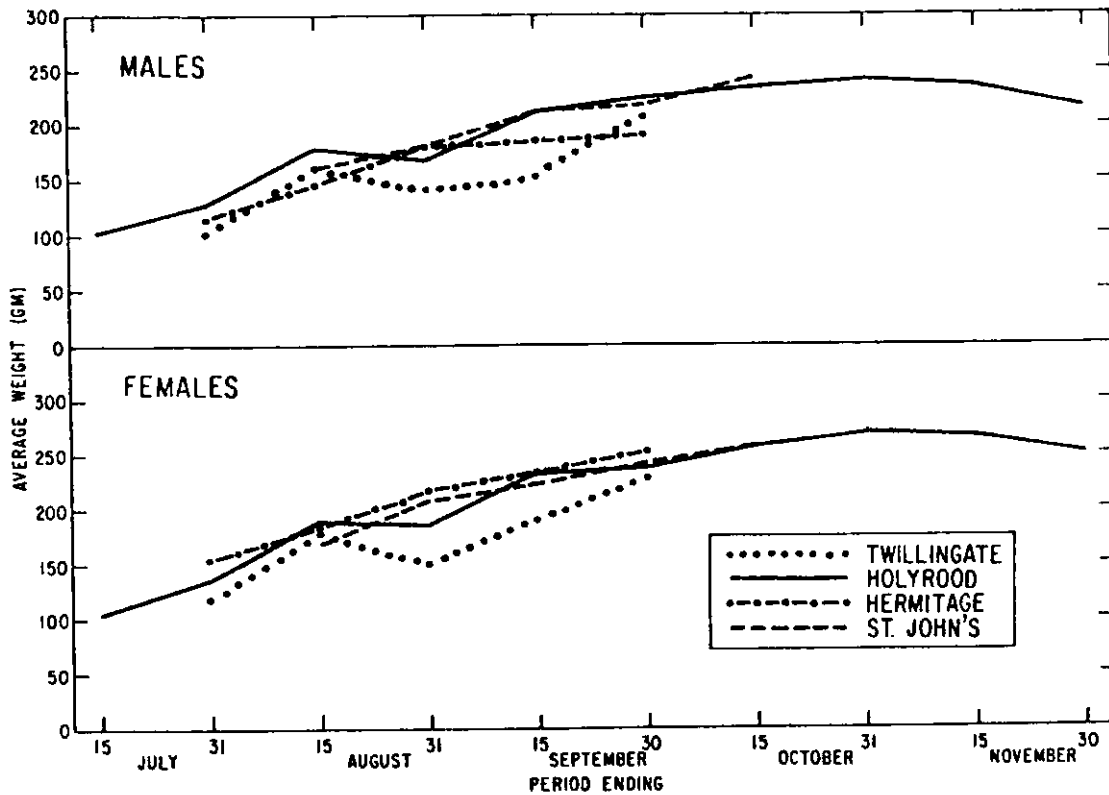


Fig. 9. Mean weights by sex over the fishing season at four inshore sampling locations in 1978.

