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Update of biomass estimates from Canadian research
vessel surveys in NAFO Divisions 4TVWX to 1980

by

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ABSTRACT

Research vessel biomass estimates on the Scotian Shelf and in the southern Gulf of St. Lawrence from 1970-80 are presented. Figures for 1980 continue the trend of relatively large estimates for some commercially important species during the last few years. No major changes in species composition were apparent.

RÉSUMÉ

L'auteur présente les estimations de biomasse obtenues par navire de recherche sur le plateau néo-écossais et dans le sud du golfe du Saint-Laurent de 1970 à 1980. Les données recueillies en 1980 indiquent que la tendance vers une biomasse relativement élevée observée en ces dernières années chez certaines espèces commercialement importantes se poursuit. Il ne semble pas y avoir de changements majeurs dans la composition par espèce.

INTRODUCTION

Research vessel biomass trends from 1970 to 1979 in NAFO Divisions 4TVWX were presented by Koeller (1980). This report incorporates the 1980 estimates obtained from the July A.T. Cameron cruise on the Scotian Shelf and September E.E. Prince cruise in the Gulf of St. Lawrence.

METHODS

Methods used during these surveys and in calculating biomass estimates remained unchanged (see Halliday and Kohler 1971, and Koeller 1980). The stratification scheme used is shown in Figure 1.

RESULTS AND DISCUSSION

Biomass estimates for the main species and species groups are summarized in Tables 1-2 and in Figs. 2-3.

Total finfish biomass (i.e. squid excluded) on the Scotian Shelf and in the Gulf of St. Lawrence remained well above the 11-yr mean (Tables 1 and 2, Fig. 4). Total finfish biomass increased in all Divisions on the Scotian shelf, but decreased in the Gulf of St. Lawrence, primarily due to a decrease in the estimate for plaice.

On the Shelf as a whole, cod and haddock estimates continued above the mean with both species showing increases from the previous year (Table 1, Figs. 5 and 6). Cod increases were, however, restricted to Div. 4V with decreases in the other two divisions on the Shelf. Dogfish and "other finfish" were the only other groups to show substantial increases, the latter due to relatively large pollock catches. Flatfish showed a small increase, due to larger plaice catches, also in Div. 4V. White hake, silver hake, redfish, skate and squid decreased from estimates in 1979, all to below the 11-yr mean (Table 1, Fig. 7-14).

In the Gulf of St. Lawrence cod continued to increase, but at a slower rate than from 1977 to 1979 (Table 2, Fig. 5). Plaice and squid showed substantial decreases in the Gulf, both to below the 11-yr mean, while skate and "other finfish" decreased only slightly. With the exception of pelagics, all other species or species groups increased from 1979 to a level above the mean (Table 2, Fig. 7-14). Pelagic species remained well below the mean despite an increase in 1980 (Figs. 15 and 16).

REFERENCES

- Halliday, R. G., and A. C. Kohler. 1971. Groundfish survey programmes of the St. Andrews Biological Station, Fisheries Research Board of Canada - objectives and characteristics. ICANF Res. Doc. 71/35.
- Koeller, P. A. 1980. Biomass estimates from Canadian research vessel surveys on the Scotian Shelf and in the Gulf of St. Lawrence from 1970 to 1979. CAFSAC Res. Doc. 80/18.

Table 1. Minimum biomass estimates from Canadian research vessel surveys - Div. 4VWX (mt x 10⁻³).

<u>Species</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>	<u>1974</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>\bar{X} (1970-80)</u>
Cod	113.0	142.4	113.2	249.3	80.2	81.7	96.0	133.7	164.3	142.2	161.0	134.3
Haddock	63.2	65.9	33.4	38.5	83.6	59.1	54.0	206.5	115.7	147.3	199.2	97.0
White hake	67.7	12.5	20.8	42.3	35.6	48.8	22.3	35.5	31.8	20.2	17.6	32.3
Silver hake	23.5	7.9	15.3	38.2	36.1	7.5	18.6	8.2	11.0	36.3	10.1	19.3
Redfish	172.3	186.3	229.3	196.5	89.6	245.4	83.5	171.6	276.0	73.3	40.4	160.4
Flatfish	81.0	80.8	79.2	81.7	133.2	101.6	116.6	112.3	70.7	104.4	107.8	97.2
Skates	48.2	34.3	47.8	77.8	52.2	87.6	41.9	50.3	43.3	40.9	34.4	50.8
Dogfish	43.6	141.9	26.0	35.9	51.7	7.2	8.6	163.1	2.5	24.7	82.5	53.4
Other finfish	97.3	52.8	81.3	96.3	86.7	89.6	94.2	167.7	118.9	96.2	146.6	102.5
Squid	1.9	14.7	3.2	8.9	9.5	24.8	203.7	46.6	11.2	70.3	10.8	36.9
Total	711.7	739.5	649.5	865.4	658.4	753.3	739.4	1095.5	845.4	755.8	810.4	784.0
Div. 4V (Strata 40-52)	187.1	250.9	198.0	169.6	173.4	169.3	231.3	221.6	163.4	201.1	229.3	199.6
Div. 4W (Strata 53-66)	244.7	149.6	120.3	337.6	191.2	330.2	173.5	282.8	461.5	263.1	277.7	257.5
Div. 4X (Strata 70-95)	279.9	339.0	331.2	358.2	293.8	254.7	334.6	591.1	220.5	291.6	303.4	324.4

Table 2. Minimum biomass estimates from Canadian research vessel surveys - Div. 4T (mt x 10⁻³).

<u>Species</u>	<u>1970*</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>	<u>1974</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>\bar{X} (1971-80)</u>
Cod	104.0	79.8	77.3	85.6	72.1	54.8	70.5	88.6	146.3	217.5	230.4	111.5
Plaice	36.1	58.8	61.8	75.7	116.7	120.5	192.4	173.2	118.6	187.6	112.7	114.0
Other flatfish	5.4	10.7	13.2	12.1	31.5	15.2	42.4	17.4	23.9	19.9	23.9	19.6
Redfish	-	34.0	43.2	44.1	43.9	19.5	14.0	30.0	32.4	16.1	37.3	28.6
White hake	1.7	4.3	6.0	15.8	26.3	10.8	8.6	6.6	20.9	19.4	19.7	12.7
Skates	2.3	8.5	5.8	9.8	8.3	5.7	3.8	6.6	4.1	7.0	5.4	6.1
Pelagics	21.5	56.3	22.1	20.8	19.7	29.5	9.0	8.9	35.6	5.0	6.5	21.4
Other finfish	4.3	7.2	5.8	2.8	8.5	5.8	10.4	7.8	6.7	8.3	6.9	6.8
Squid	-	0.4	0.02	0.04	-	1.0	16.9	15.3	30.8	15.1	6.7	7.8
Total	175.3	260.0	235.2	266.7	327.0	262.8	368.0	354.4	419.3	495.9	449.5	328.5

*Strata 15, 25, 29 and 31-39 inclusive were not surveyed in 1970.

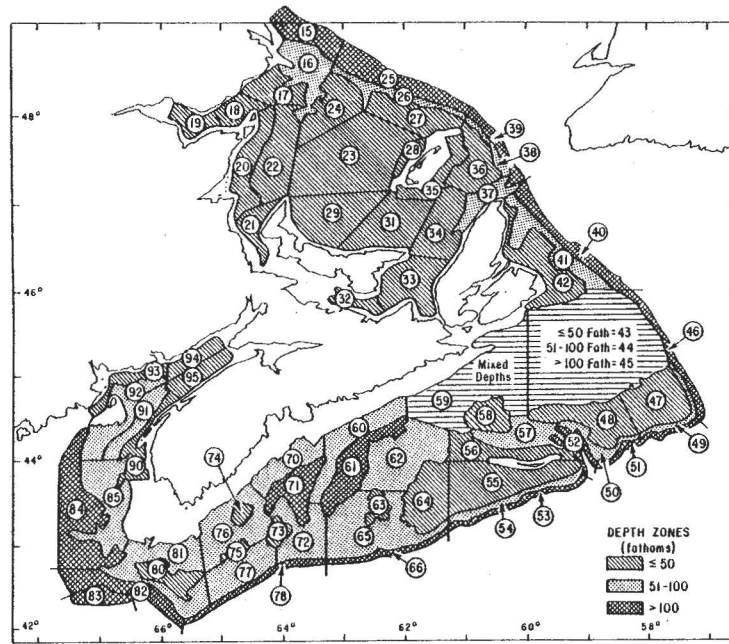


Figure 1. Stratification scheme for ICNAF Div. 4T, V, W and X.

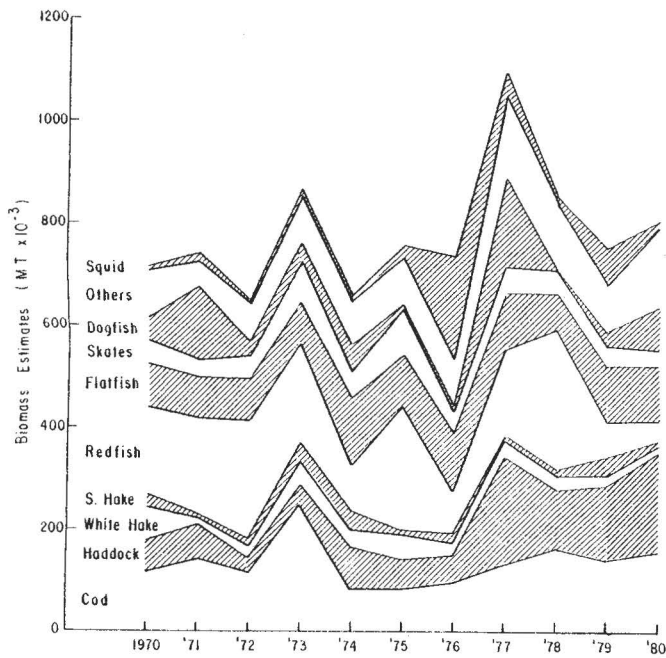


Figure 2. Survey biomass estimates - Scotian Shelf.

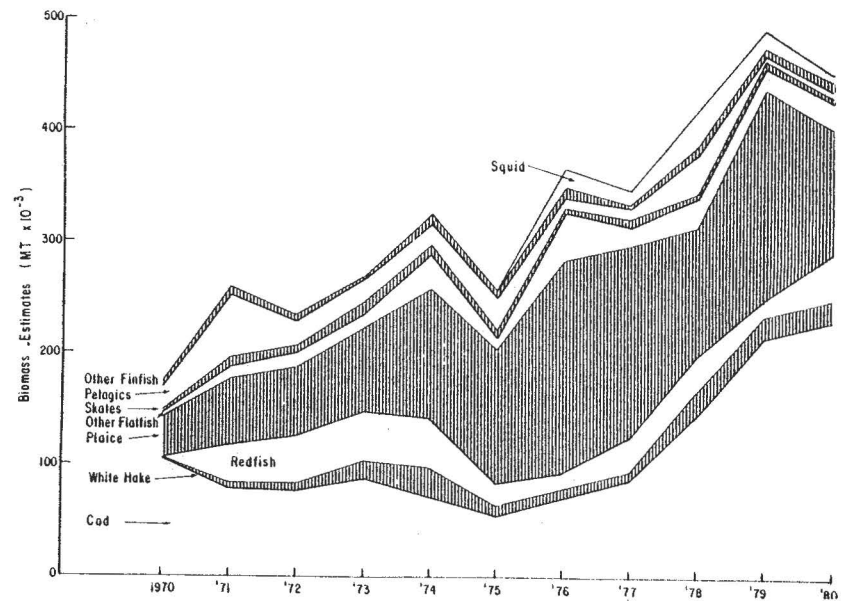


Figure 3. Survey biomass estimates - Gulf of St. Lawrence.

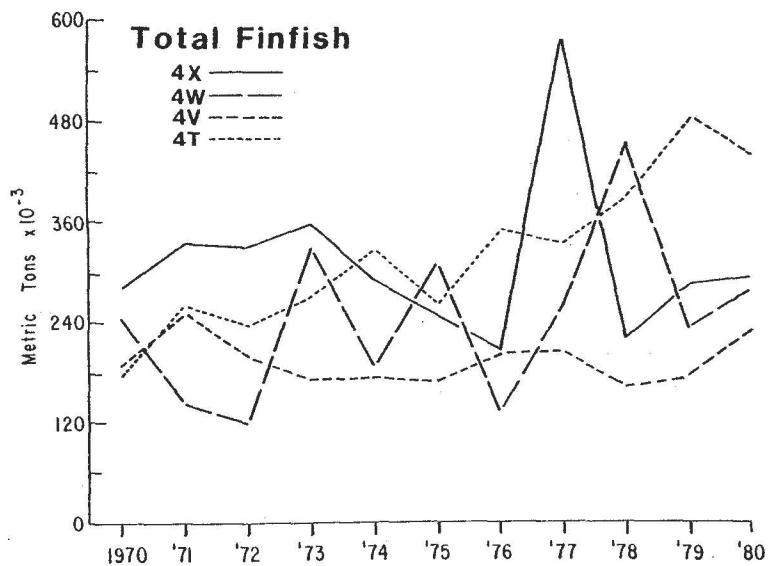


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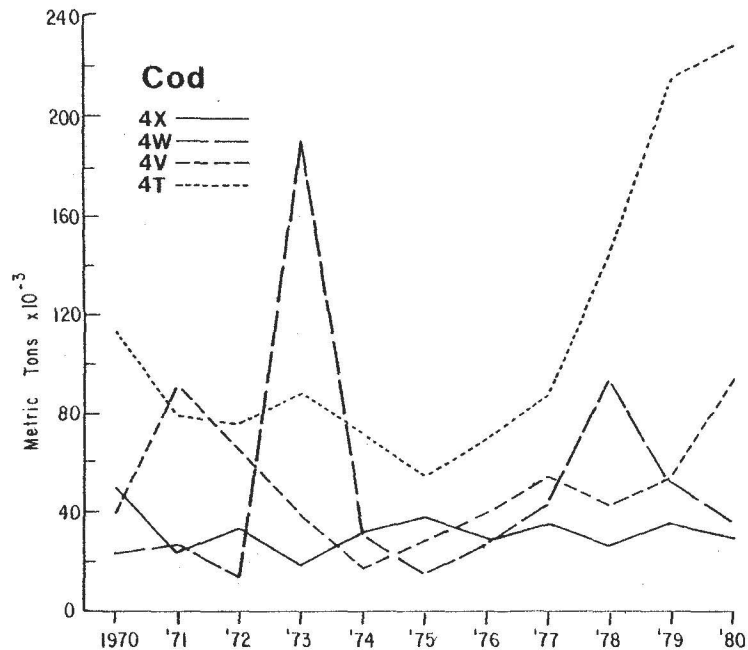


Figure 5

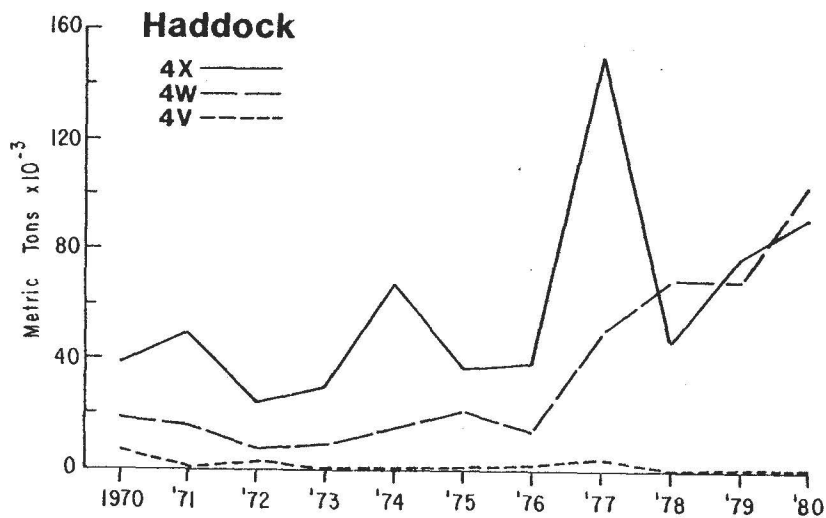


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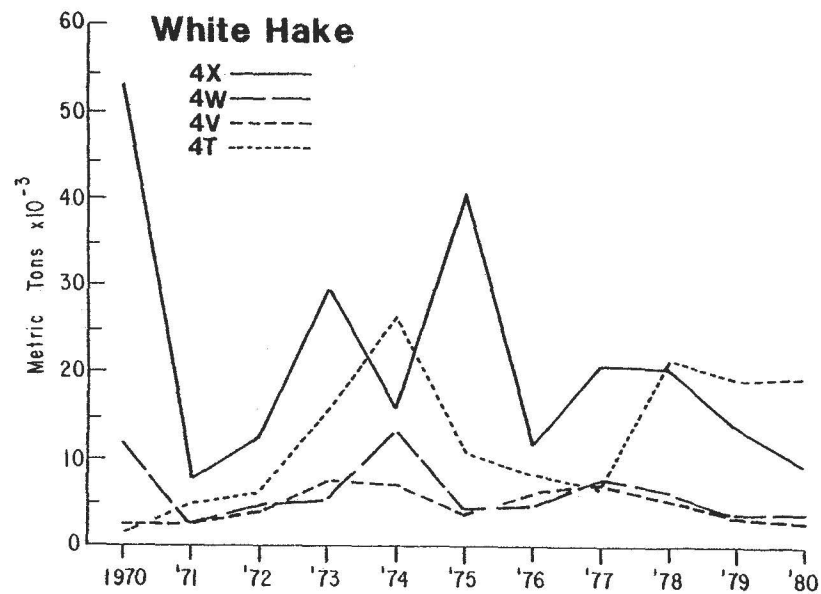


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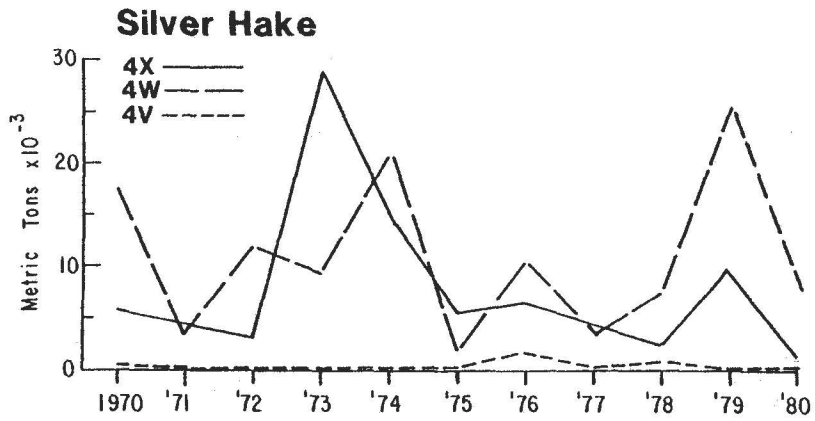


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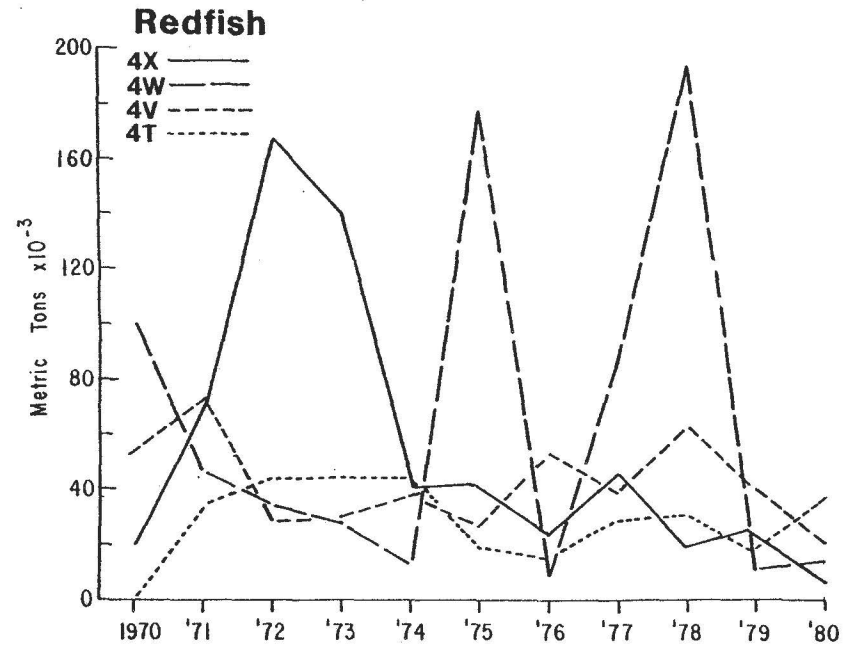


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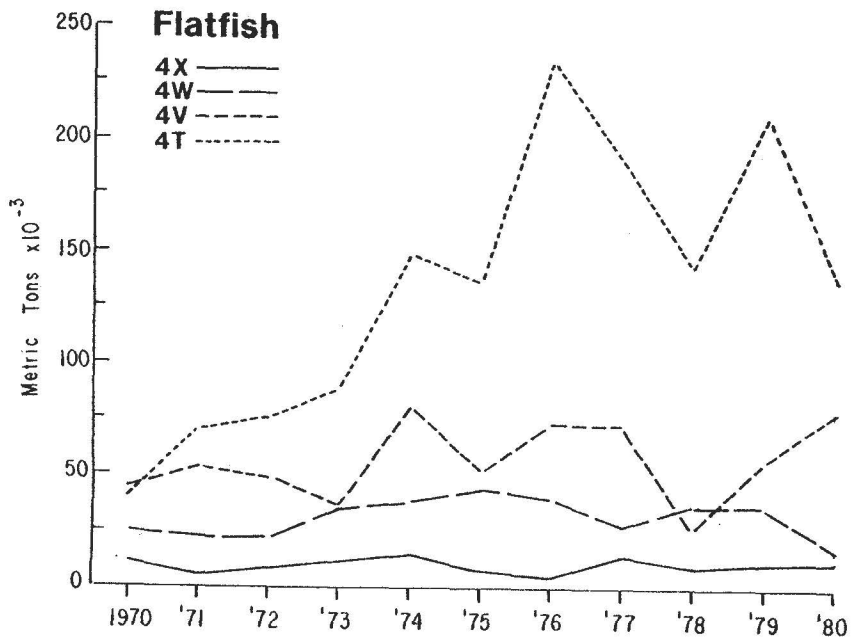


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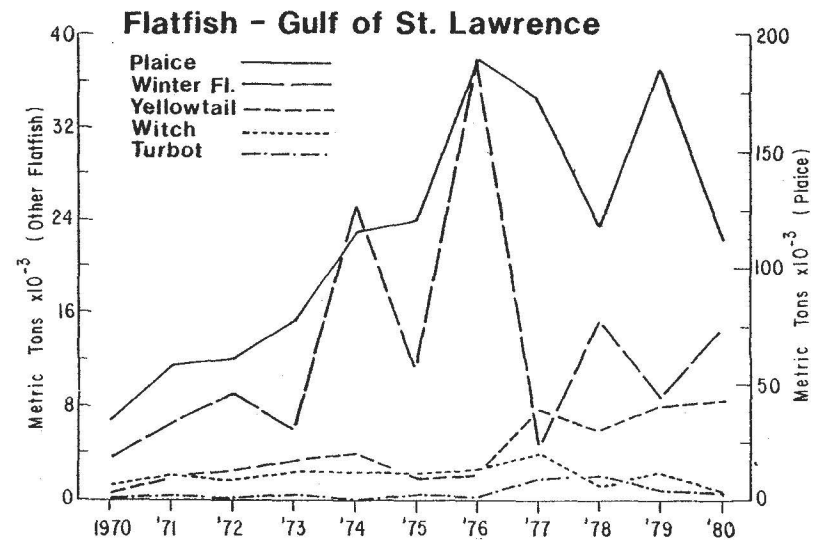


Figure 11

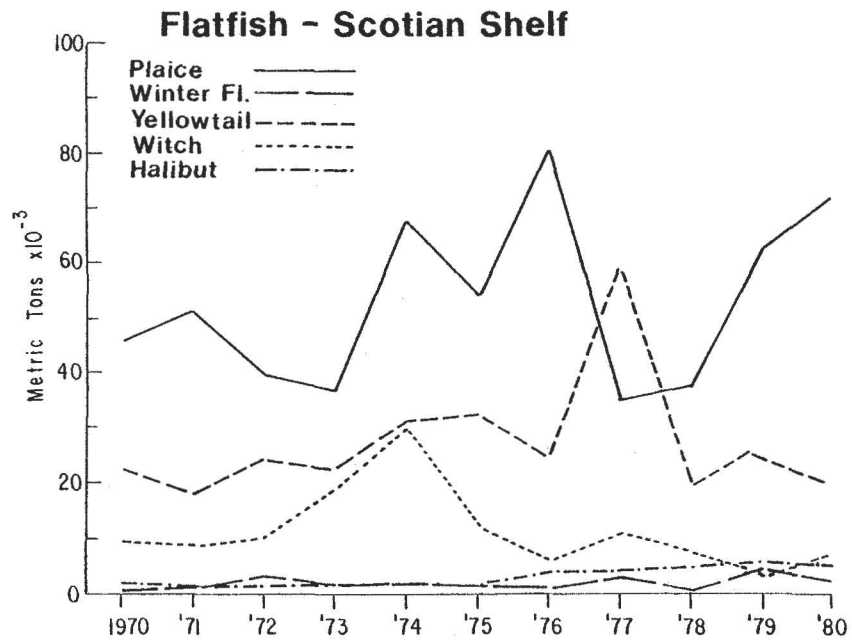


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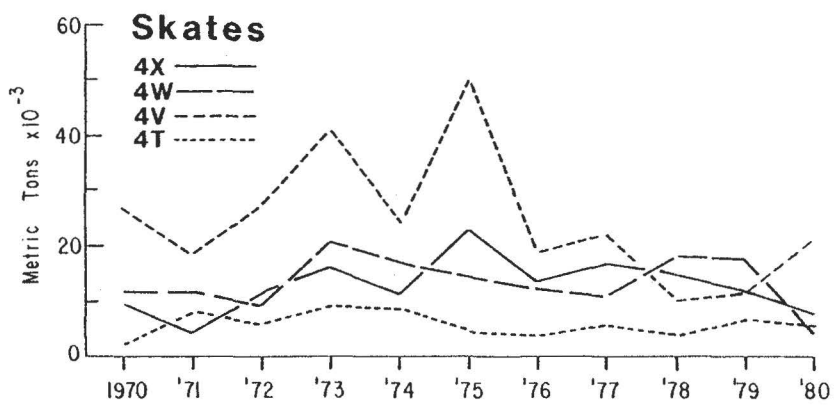


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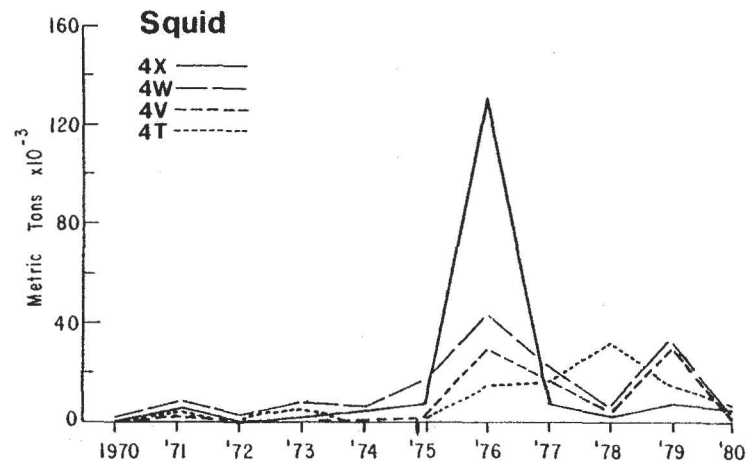


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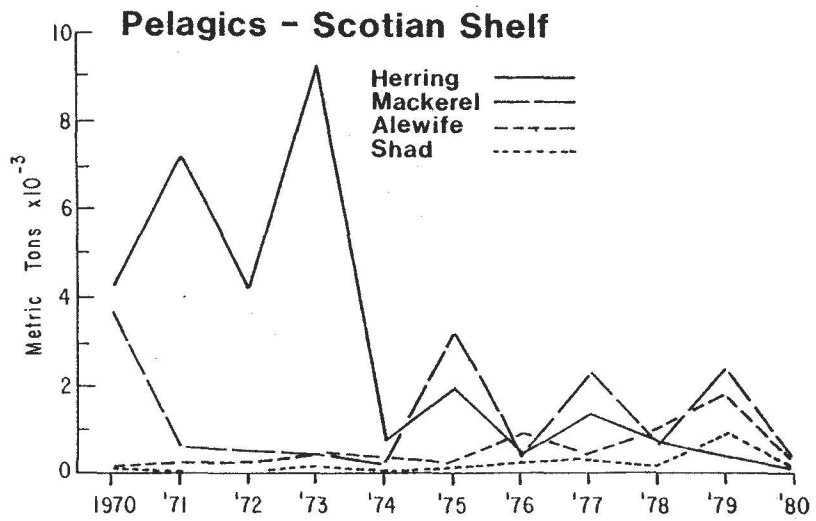


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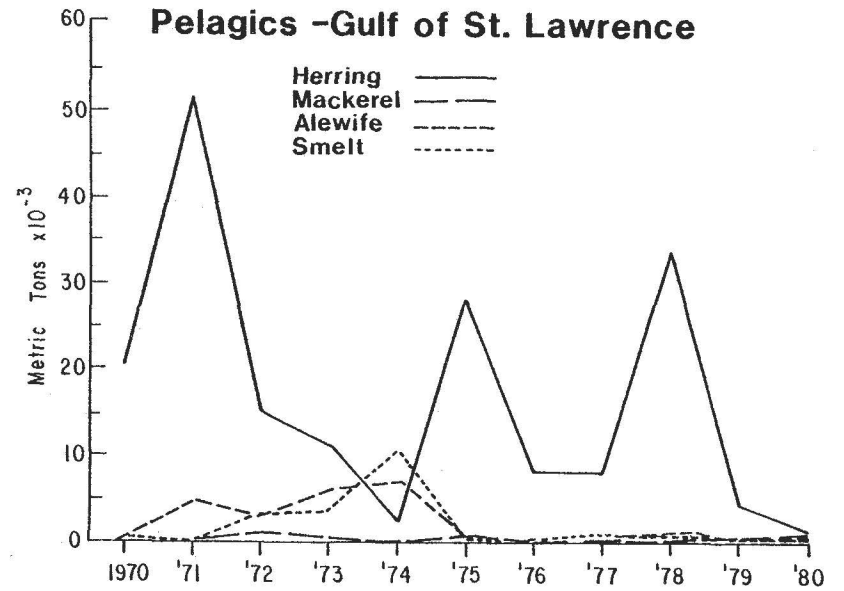


Figure 16