

ANNUAL MEETING - JUNE 1966Summary of Research and Status of Fisheries in Subarea 4 during 1965

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Reports on researches carried out in 1965 were submitted by the following member countries: Canada, Federal Republic of Germany, Poland, Spain, UK, USSR and USA. This summary is based on 1966 Research Docs. 3, 30, 33b, 36, 37, 38, 39, 40, 41, 45, 46, 47, 51, 55, 60, 61, 63 and 65.

1. Status of the Fisheries

In general, catches in the subarea continued to increase with total production reaching 777 thousand metric tons. This is 5% more than in 1964 and 23% over the average in the preceding five years. Landings are recorded for 9 member countries: Canada, France, Federal Republic of Germany, Poland, Portugal, Spain, USSR, UK and USA. Eleven thousand metric tons were recorded for undesignated countries. Total groundfish catches increased slightly to 536 thousand metric tons from 517 in 1964 (and 537 in 1963). Total catches of pelagic fish were 193 thousand metric tons.

Cod catches remained stable, down about 2% from 1964, but up almost 3% from the average of the 5 years 1960-64. Cod was much the largest fishery in the subarea constituting practically 30% of the catch. Increased Canadian effort elsewhere in Subarea 4 produced increased landings. Fish sizes in Div.4T remained about the same. Discards remained at about 1% by weight (4T). In addition to Canada with landings of 142 out of 225 thousand metric tons, France, Portugal, Spain and USSR pursued productive fisheries in the area.

Haddock landings were up from 60 to 85 thousand metric tons. This was due almost entirely to increased USSR landings from 5.5 to 45.5 thousand metric tons. This is attributed to increased size and density of haddock stock and the diversion of effort from the silver hake fishery. Canadian catches of haddock declined from 39 to 32 thousand metric tons and the USA from 9 to 4. The decline in US landings is a result of reduced effort.

Redfish landings increased by some 5 thousand metric tons to 68 thousand metric tons. The increase can be assigned to larger landings in the northern Gulf of St. Lawrence (4RS). US calculations show increased abundance with landings per day more than doubling in the area.

Silver hake. The fishery in the subarea is almost entirely carried on by USSR. The catch of 50 thousand metric tons is about 36% less than that for the previous year. The decline is attributed to a season shortened by unfavourable hydrographic conditions as well as to a decline in the abundance of silver hake stocks in the subarea. Further decline in abundance may be anticipated.

Flounder. Interest in flounder fishing led to an increase of 41% to 48 thousand metric tons with little change noted in size distribution of the several species.

Herring. Catches were up by some 40 thousand metric tons. For the most part this is a result of increased Canadian near-shore exploitation in Div.4X. USSR exploitation continued at a relatively low level because of reduced effort.

Swordfish. Landings from the subarea fell off markedly to 1,148 metric tons which is one third of 1964 production. Fishing effort in the subarea decreased a little and the average weights of fish taken has declined. These two factors together do not account for all of the decline in landings.

Mackerel. Fishing showed slight improvement with increased landings along the south coast of Nova Scotia (4WX). Total catch was 11 thousand metric tons.

Nominal Catches in 1964 and 1965 in Subarea 4 by Species and Countries

Thousands of Metric Tons

<u>Species</u>	<u>Year</u>	<u>Total</u>	<u>Canada</u>	<u>France</u>	<u>FRG</u>	<u>Portugal</u>	<u>Spain</u>	<u>USSR</u>	<u>USA</u>
Cod	1964	229	128	20	1	13	55	10	1
	1965	225	142	15	0	15	43	10	1
Haddock	1964	60	39	0	2	0	5	5	9
	1965	85	32	0	0	0	3	45	4
Silver hake	1964	81	0	0	0	0	0	81	0
	1965	50	0	0	0	0	0	50	0
Halibut	1964	2	2	0	0	0	0	0	0
	1965	2	2	0	0	0	0	0	0
Flounders	1964	34	34	0	0	0	0	0	0
	1965	48	39	0	0	0	0	8	0
Herring	1964	140	137	0	0	0	0	3	0
	1965	180	174	0	0	0	0	6	0
Redfish	1964	53	20	0	0	0	0	4	28
	1965	68	36	0	0	0	0	2	30
Sea scallop	1964	11	11	0	0	0	0	0	0
	1965	10	10	0	0	0	0	0	0

0 The tabulation allows comparison between national nominal catches of the more important species in 1964 and 1965

Pollock. The fishery showed a decline of about 10% to about 28 thousand metric tons.

Sea scallops. Landings from Subarea 4 were down somewhat in whole weight landed to 10 thousand metric tons from 11 thousand tons. Landings were divided about equally between the southern Gulf of St. Lawrence (4T) and grounds off southwest Nova Scotia (4X and 4W). Increased fishing success was shown in 4T.

Miscellaneous species. Landings are recorded of almost 50 thousand metric tons of over 20 additional species. This includes 14 thousand metric tons of hake, reported as red hake, by Canada in 4T and 4X and by USSR in 4W.

II. Work Carried Out

1. National programs

(a) Canada: *A.T. Cameron* and other research vessels. Oceanographic conditions at coastwise stations and at the established Halifax section. Cod populations in 4T. Egg and larva studies in 4T-R. Haddock year-class strength. Age, growth and validation studies in witch. Preliminary studies on yellowtail, argentines, silver hake, cusk and mackerel. Tagging of witch and herring and other species. Herring ages, growth and fatness. Potential scallop recruitment (Res.Doc.66/30). Studies on the Canadian halibut fishery (Res.Doc.66/60). Length-weight relationships for American plaice and yellowtail (Res.Doc.66/63). Stock assessments of harp seals in the Gulf of St. Lawrence, and studies on hood seals (Res.Doc.66/61). Studies of landed fish size in relation to fishing practices (Res.Docs.66/59 and 66/62).

(b) Federal Republic of Germany: *R/V Walther Herwig*. Hydrography. Research sampling of cod (4Vn-s) and haddock. Locating fish concentrations. Tagging cod (Res.Doc.66/33b).

(c) Poland: *R/V Wieczno*. Hydrographic observations and plankton sampling. Water temperatures on fishing grounds. Cod, redfish, American plaice, yellowtail, silver hake and argentines were sampled from commercial catches. Selectivity and economic studies (Res.Doc.66/36). Size and sexual maturity of redfish (Res.Doc.66/45), of size, age and sexual maturity of American plaice (Res.Doc.66/46) and of cod (Res.Doc.66/47).

(d) Spain: Discard observations, tag recoveries (Res.Doc.66/38).

(e) UK: Continuous plankton recorder survey (Res.Doc.66/40).

(f) USSR: Six research and exploratory vessels. Five sections across the shelf. Length and age composition of commercial and experimental silver hake catches (Res.Doc.66/39). Relationship between hydrographic conditions and distribution of silver hake (Res.Doc.66/51).

(g) US: Cooperative (with Canada) study of 4X haddock. Life history of argentines (Res.Doc.66/41).

2. Hydrography:

Canadian observations showed surface temperatures to be well below average in all areas with general decreases in temperature from 1964 to 1965. The greatest reduction in temperature was along the coast of western and southwestern Nova Scotia (4XW). It was least around the Magdalen Islands (4T). Bottom temperatures in the Bay of Fundy (4X) followed the cooling trend. USSR observations in 4XW showed the cooling which began in 1963 to continue into 1965 although the volume of warm water increased in 1965.

Circulation studies by Canada were intensified. They were mainly on the bottom drift over the Scotian Shelf (4VWX) and surface and bottom drifts in the Gulf of St. Lawrence (4RT). For the most part increased effort in hydrographic research was directly related to fisheries studies.

3. Plankton:

Egg and larva studies were carried out by Canada in 4TR to study the mechanisms involved in the recruitment of cod in the divisions.

4. Cod:

Routine surveys during September with small-meshed nets in the southern Gulf of St. Lawrence (4T) by Canada showed the cod length distribution to be little changed from the previous year, although catch per tow decreased by 45%. The 1961 year-class is best represented and is expected to be dominant in 4T during 1966.

Poland found cod from Subarea 4 to be shorter (47.5 cm) than those from Subarea 3 (57.9 cm). Scatarì (4V) cod averaged 19.73 fin rays in the first dorsal fin in comparison with 21.68 from Flemish Cap Bank. Off Nova Scotia 1961 and 1963 year-class cod were found most prevalent.

5. Haddock

A Canadian cruise in 4W in March and early April showed none of the year-classes 1958-62 to be outstanding with the Canadian fishery relying mainly on 1959 as both 1958 and 1960 are notably weak. The 1965 survey showed the 1963 year-class to be relatively strong.

For the United States fishery also, the 1959 year-class provided most of the catch. Haddock abundance on Browns Bank is expected to decline until 1967 when the 1963 year-class enters the fishery.

6. Silver Hake

Canadian studies of silver hake distribution found them in large quantities only near the western end of Sable Island (4W) in early August. Best catches were from depths of 35 m and the fish were mainly between 25 and 46 cm long.

USSR observations on commercial and experimental catches in 4W showed average lengths to be increased from 30.4 cm in 1963 to 31.3 cm in 1964, and 32.2 cm in 1965. The percentage of four-year-olds in the catch is increasing and the catch per unit of effort is falling off, suggesting a decrease in recruitment in year-classes later than 1960.

Analysis of USSR 1963-64 data on the relationship between hydrographic conditions and the distribution of silver hake showed that the influence of warm Atlantic water on Georges Bank and off the Nova Scotia Shelf was much weaker in 1964 than in 1963. In 1964 the resulting lower temperatures on the southern slope of Georges Bank in early spring were more favourable for maturing hake and less favourable for spawning than in 1963.

7. Halibut:

A Canadian analysis shows that fishing on the halibut stock now exploits immature fish more than formerly. This may affect spawning and subsequent recruitment in undesirable ways.

8. Flounders:

Results from Canadian tagging on witch show only local recoveries. Back-calculations from witch otoliths showed good correspondence with length-at-age from length distributions.

Results of analysis by Poland showed that American plaice are larger, older, and more numerous in Subarea 3 than in Subarea 4.

9. Herring:

Herring otoliths from the Passamaquoddy region of 4X showed 3% opaque nuclei associated with spring spawning. Fish were young with II's representing 78% of the catch. Off southwest Nova Scotia (4X) 4% were spring spawning type and the 1961 year-class dominated. Trials with a spaghetti tag provided 4.1% recoveries but showed no long migrations.

10. Argentines:

Canadian surveys showed argentines most abundant between 180 and 365 m along the edge of the Scotian Shelf (4WX). They were 2 to 7 years of age and 20 to 25

cm long. In deep water basins on top of the Shelf, they were older, 6 to 11 years, and longer, 30 to 38 cm.

Poland found argentines producing up to 4 metric tons per hour's trawling on the Scotian Shelf in August and September. In spring on Sambro Bank (4W) two size groups of fish were observed at 17-19 cm and 27-28 cm. Sampling showed half the fish to be between the ages 4-7 and some to be old (30 years) and large (50 cm).

11. Cusk:

Canadian preliminary life-history studies on cusk in 4WX showed depth and size distribution, age distribution, size at age, size at maturity, and spawning season.

12. Mackerel:

Canadian sampling is extending knowledge of the mackerel population. In 4XW mackerel sizes decrease with the advance of the season. This is caused by a migration up the coast into the Gulf of St. Lawrence (4T) with larger fish migrating first. The 1961 year-class dominated the catch. Spawning in 4T was mainly in July.

13. Redfish:

A survey by Poland showed that redfish of size suitable for profitable operations for factory ships were not available in quantity in Subarea 4.

14. Sea scallops:

In 4T Canadian sampling of inshore scallop beds gave good catches of small scallops on several grounds, suggesting prospects for subsequent good recruitment to the fishery.

15. Seals:

Canadian analysis of population data on harp seals in the Gulf of St. Lawrence (4TRS) indicates that the current controlled take of about 90,000 young with 15,000 older individuals is close to the highest possible sustained yield.