

SOME CHARACTERISTICS OF THE U.S. FISHERY FOR SWORDFISH SINCE 1987

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SUMMARY

Catch and effort from directed fisheries for Atlantic swordfish in the United States are presented by month, gear and ICCAT areas for the years 1987-1991 and preliminary 1992. These statistics allow examination of the effects of regulations implemented by the U.S. based on the 1990 ICCAT recommendation.

RESUME

La prise et effort des pêcheries des Etats-Unis qui visent l'espadon de l'Atlantique sont présentés par mois, engin et zones ICCAT pour la période 1987-91 et 1992 préliminaire. Ces statistiques permettent d'examiner les effets des réglementations instaurées par les Etats-Unis suite aux recommandations de 1990 de l'ICCAT.

RESUMEN

Se presentan por mes, arte y zonas ICCAT, la captura y el esfuerzo de las pesquería dirigidas al pez espada atlántico en Estados Unidos, para el período 1987-1991 y los datos provisionales del año 1992. Estas estadísticas permiten estudiar las repercusiones de las regulaciones establecidas por Estados Unidos, basadas en las recomendaciones de ICCAT en 1990.

INTRODUCTION

Regulations governing U.S. fishermen, consistent with the 1990 ICCAT recommendations, were issued by the U.S. Department of Commerce for conservation of Atlantic swordfish. This paper includes a review of these regulations and provides information on catch and effort from 1987 to 1991. Preliminary 1992 information was included when available.

SWORDFISH REGULATIONS

At the 1990 ICCAT meeting regulatory measures were recommended for the conservation of Atlantic swordfish stocks. The Report of the Standing Committee on Research and Statistics (SCRS) stated: "Taking into account that the SCRS has determined that the present yield of the swordfish stock cannot be maintained over the long term without decreasing fishing mortality or the unlikely continued increase in recruitment over the next few years, and without decreasing fishing mortality over the next years, there is a significant probability of detrimental effects on future yield." The Commission made several recommendations, the first being "that the Contracting Parties whose nationals have been actively fishing for swordfish in the North Atlantic take measures to reduce the fishing mortality of fish weighing more than 25 kg in the area north of five degrees North latitude by 15 percent from recent levels." Note, "recent" has been determined to mean 1988. The second recommendation was that "in order to protect small swordfish, the Contracting Parties take the necessary measures to prohibit the taking and landing of swordfish in the entire Atlantic Ocean weighing less than 25 kg alive weight (125 cm lower jaw fork length) ..."

The Secretary of the U.S. Department of Commerce issued an emergency ruling effective June 12, 1991 for the purpose of regulating the U.S. Atlantic swordfish fishery for the entire western North Atlantic Ocean, including the Gulf of Mexico and the Caribbean (north of 5°N. latitude). The emergency rule:

- (1) established a minimum size limit of 78.7 cm (31 inches) dressed carcass length or 25 kg live weight (41 pounds dressed weight) with a 15 percent allowance for undersized swordfish based on the number of swordfish landed per fishing trip;
- (2) set an annual quota for the U.S. directed swordfish fishery of 3,629 mt whole weight (6.0 million pounds dressed weight), divided equally between the periods January 1 through June 30, 1991, and July 1 through December 31, 1991;
- (3) allocated 24,667 kg whole weight (40,785 pounds dressed weight), for each semi-annual period for the drift gillnet fishery;
- (4) limited the possession of swordfish after a gear-type closure to a bycatch limit of two swordfish per trip except for vessels using or possessing harpoon gear for which no bycatch is allowed;
- (5) set an annual bycatch allocation for swordfish at 544 mt whole weight (0.9 million pounds dressed weight);
- (6) prohibited the sale of swordfish caught in the recreational fishery and restricted the gear in this fishery to rod and reel; and
- (7) provided for NMFS-approved observers on selected permitted vessels.

The Secretary of the U.S. Department of Commerce published a final rule for 1992 U.S. catch levels for Atlantic swordfish August 4, 1992. The final rule:

- (1) Established a total U.S. allowable catch (TAC) of 4,572 mt whole weight (7.56 million pounds, dressed weight), for 1992.
- (2) Subdivided the TAC into a 4,234 mt whole weight (7.0 million pound) directed-fishery quota and a 338 mt whole weight (0.56 million pound) bycatch quota.
- (3) Further subdivided the directed-fishery quota into semiannual (Jan.-June and July-Dec.) gear quotas as follows:
 - (a) Longline and harpoon - 2,088 mt whole weight (3,452,417 pounds, dressed)
 - (b) Drift gillnet - 28,778 kg whole weight (47,583 pounds, dressed)
- (4) Established a bycatch limit of five swordfish per trip for vessels in the squid trawl fishery.

SWORDFISH LANDINGS

Monthly landings of swordfish by U.S. permitted vessels in the western Atlantic increased from 1987 to 1989 and decreased from 1990 to 1992 in the western Atlantic (Figure 1c). This pattern occurred in areas both north and south of 35° N (latitude) (Figures 1a and 1b). 1992 data are preliminary and represent the period January 1st to August 30th as reported by September 15th, 1992.

FIG. 1a. U.S. SWORDFISH LANDINGS

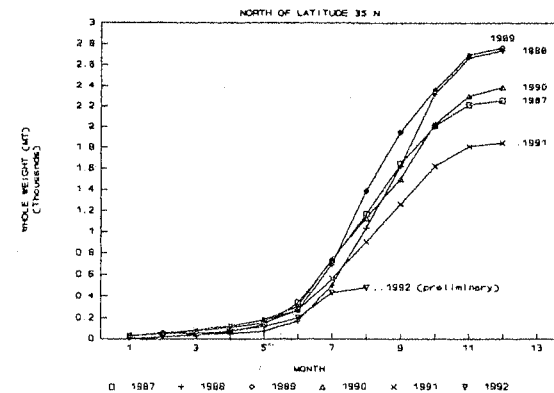


FIG. 1b. U.S. SWORDFISH LANDINGS

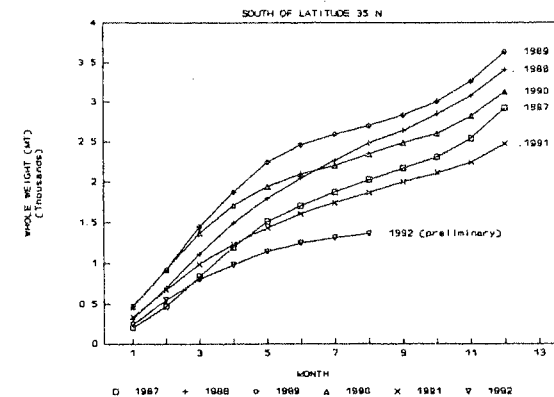
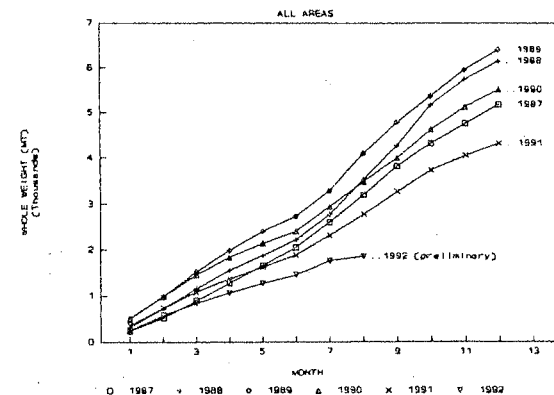
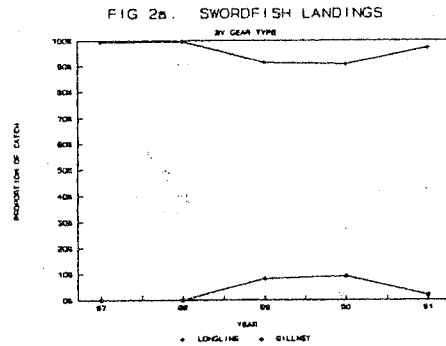


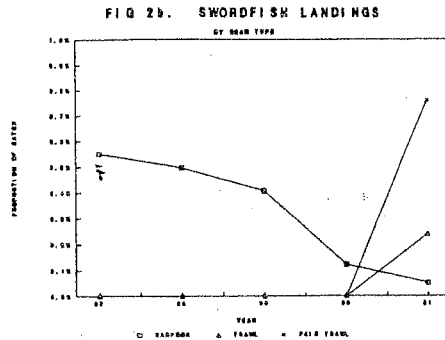
FIG. 1c. U.S. SWORDFISH LANDINGS



Over 90% of swordfish landings in the U.S. fishery are made by longline and gillnet gear. The proportion of the annual catch of swordfish by gillnet gear increased between 1988 and 1989 while the proportion of longline catch decreased. This trend was reversed after 1990 (Figure 2a).



Harpoon, trawl and pair trawl gears land less than two percent of the annual catch of swordfish per year. The proportion of swordfish caught using harpoons has decreased since 1987. The most rapid decrease occurred between 1989 and 1990. The proportion of swordfish landings by trawl and pair trawl fisheries increased between 1990 and 1991 (Figure 2b).



SWORDFISH EFFORT - BY MONTH

Monthly effort (in total hooks reported through the mandatory U.S. logbook system) has decreased south of 35° N since 1989 (Figure 3b) but a decreasing trend in effort is not seen north of 35° N (Figure 3a). Combined area reported nominal effort is less in 1990 and 1991 than 1989 but greater than 1988. The 1992 effort is similar to 1989 effort up to month 6.

FIG. 3a. REPORTED NOMINAL EFFORT

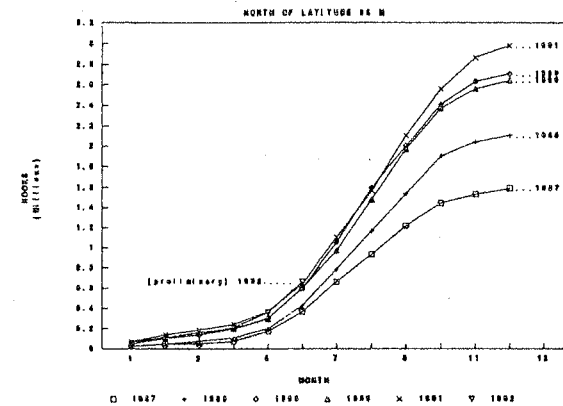


FIG. 3b. REPORTED NOMINAL EFFORT

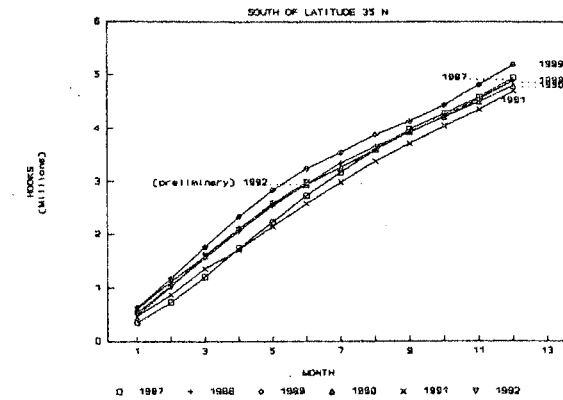
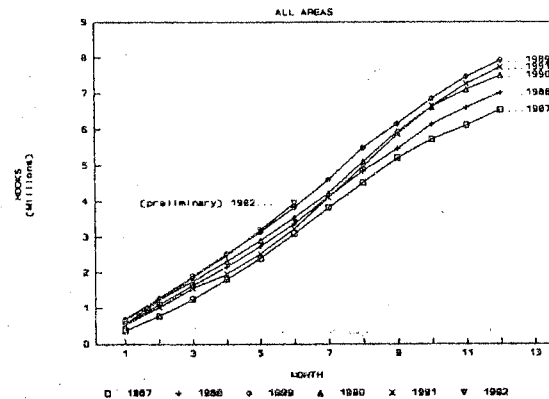


FIG. 3c. REPORTED NOMINAL EFFORT



FISHING AREAS

The ICCAT fishing areas reported include the Caribbean (CAR), Gulf of Mexico (GOM), Florida East Coast (FEC), South Atlantic Bight (SAB), Mid Atlantic Bight (MAB), Northeast Coastal (NEC), Northeast Distant (NED), (Figure 4).

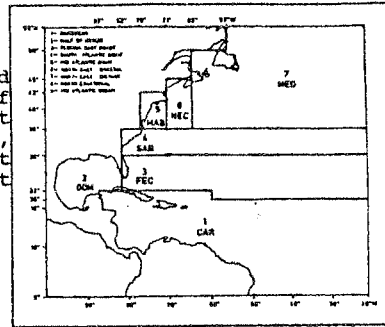


Figure 4. Map designating the seven fishing areas.

SWORDFISH EFFORT - BY MONTH AND AREA

Graphs of reported monthly nominal effort for 1987-1991 and 1992 (preliminary, from January to June) for each of the seven ICCAT areas are displayed in Figures 5a-5g. Reported effort was consistently lower in 1991 than 1988 in the Caribbean and the Northeast distant areas. No constant differences in effort between 1988 and 1991 were seen in the Florida East Coast or the South Atlantic Bight. In the Northeast Coastal, Mid Atlantic Bight and Gulf of Mexico 1991 effort tended to be higher than 1988.

FIG. 5a. REPORTED NOMINAL EFFORT

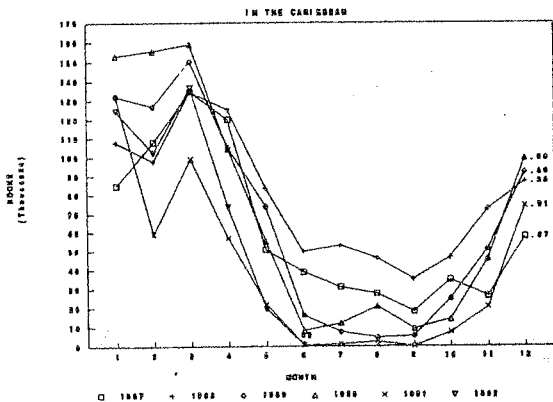


FIG. 5b. REPORTED NOMINAL EFFORT

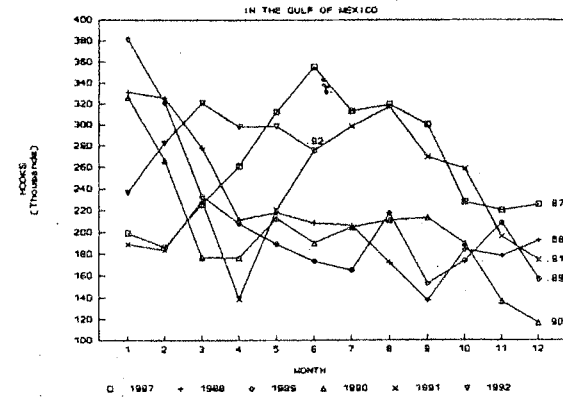


FIG. 5c. REPORTED NOMINAL EFFORT

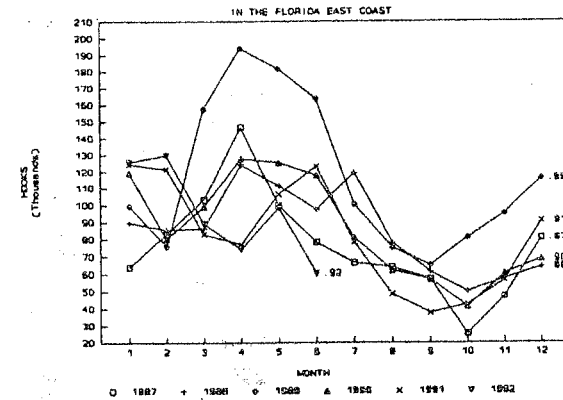


FIG. 5d. REPORTED NOMINAL EFFORT

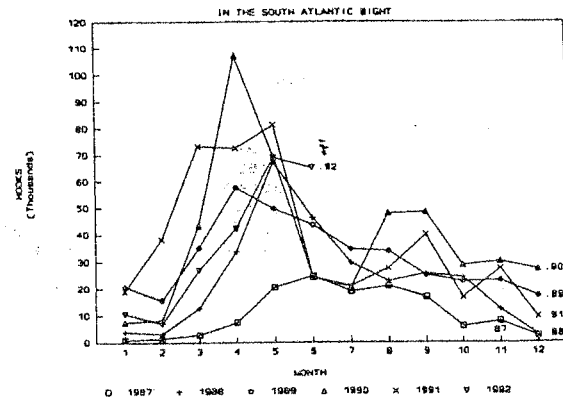


FIG. 5e. REPORTED NOMINAL EFFORT

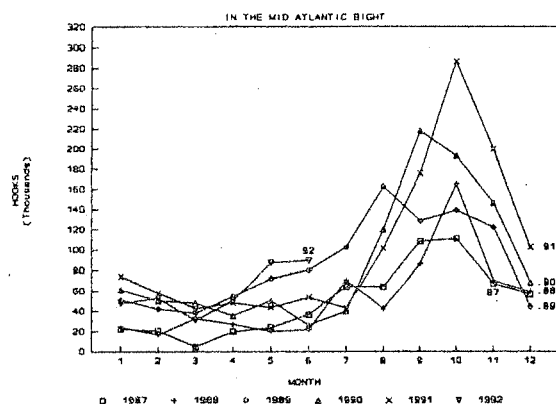


FIG. 5f. REPORTED NOMINAL EFFORT

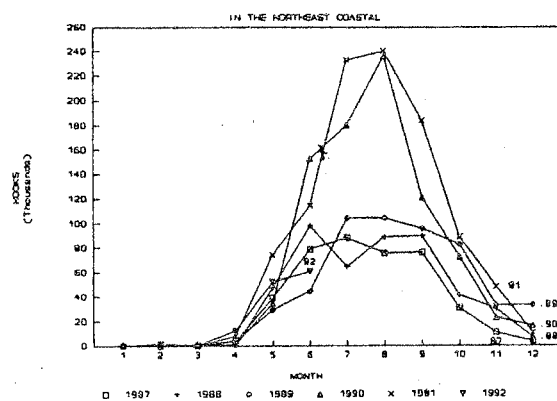
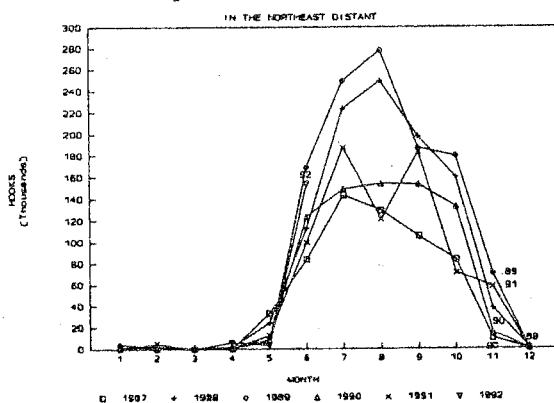


FIG. 5g. REPORTED NOMINAL EFFORT



SWORDFISH EFFORT - BY YEAR

Table 1 is a summary of hooks fished (hooks reported) and number of permitted vessels by year from 1987 to 1992. Number of reported hooks fished includes reports from all gear types, all areas and records with unknown areas or unknown dates. Numbers of permitted vessels are broken down into numbers of vessels that obtained permits during each year (active), number of vessels reporting at least one fishing trip (fished), and the number of vessels that reported catching at least one swordfish during the year (swordfish). Data for 1992 are preliminary and include data only up to July.

TABLE 1. NUMBERS OF PERMITTED VESSELS

YEAR	ACTIVE	FISHED	CAUGHT SWORDFISH	HOOKS REPORTED
1987	616	290	273	6,540,874
1988	684	390	339	7,015,808
1989	721	457	416	7,941,675
1990	610	419	363	7,500,450
1991	549	342	308	7,735,397
*1992	514	269	247	4,286,643

* preliminary and incomplete through July 1992, reported as of September 1992.

SWORDFISH EFFORT - LOCATION

The location of reported fishing effort by year for 1987-1992 is shown in Figures 6a-6f. The general pattern for reported sets is similar across the six years. There was some exploratory expansion of the fishery towards the eastern portion of the Florida East Coast (FEC) area in 1989, not found in other years. In 1990, effort was less concentrated around the Virgin Islands and Puerto Rico, and more concentrated in the area of 10°N 50°W in the Caribbean (CAR), as well as on the Continental Shelf off the west and northwest coast of Florida in the Gulf of Mexico (GOM).

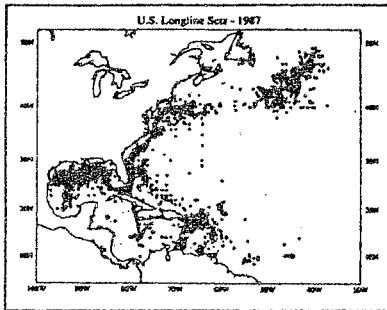


Figure 6a. Map showing the location of reported fishing effort in 1987.

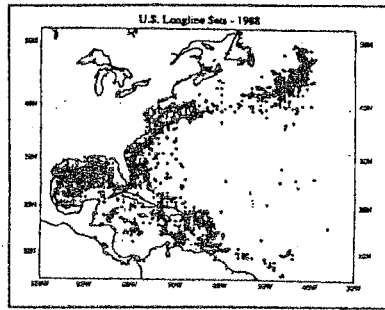


Figure 6b. Map showing the location of reported fishing effort in 1988.

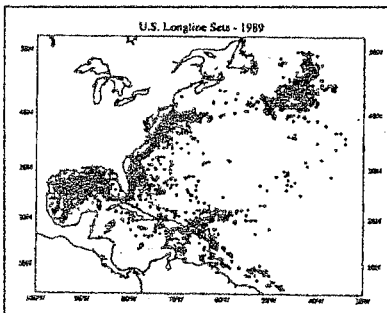


Figure 6c. Map showing the location of reported fishing effort in 1989.

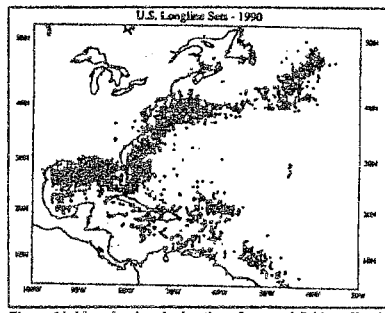


Figure 6d. Map showing the location of reported fishing effort in 1990.

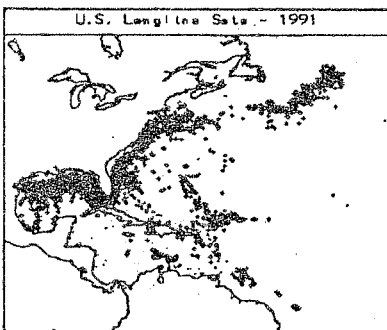


Figure 6e. Map showing the location of fishing effort in 1991.

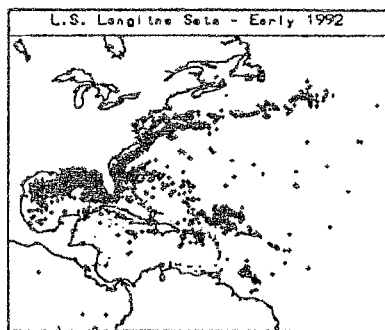
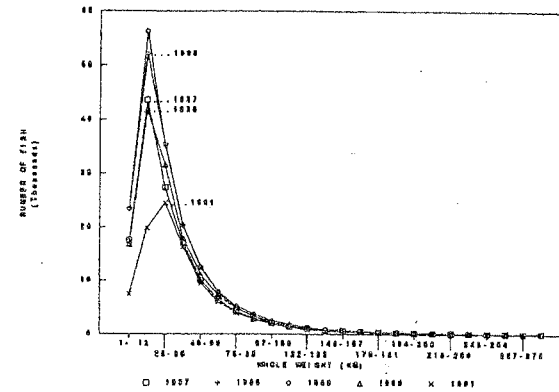


Figure 6f. Map showing the location of reported fishing effort in 1992.

SWORDFISH < 25 KG WHOLE WEIGHT - NUMBER AND PERCENT LANDED

The number of fish landed by U.S. fishermen weighing less than 25 kg whole weight (41 lbs dressed) has decreased since 1989 (Figure 7a). From 1987 to 1991 the highest number of fish landed were in the 13-24 kg category. In 1991 this peak shifted to the 25-36 kg category. Half of the intervals were not labeled on the x axis in Figures 7a and 7b because space was not available.

FIG 7a. ANNUAL CATCH AT SIZE



Percent of fish landed less than dressed 25 kg whole weight has decreased since 1989 (Figure 7b). From 1987 to 1991 the highest number of a fish landed were in the 13-24 kg category. In 1991 this peak shifted to the 25-36 kg category.

FIG 7b. PERCENT OF ANNUAL CATCH AT SIZE

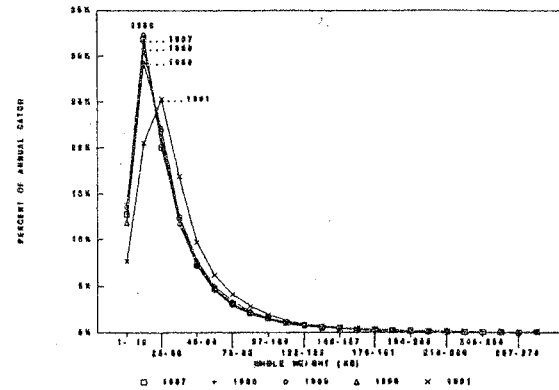


FIG. 8f. PERCENT U.S. CATCH < 25 KG

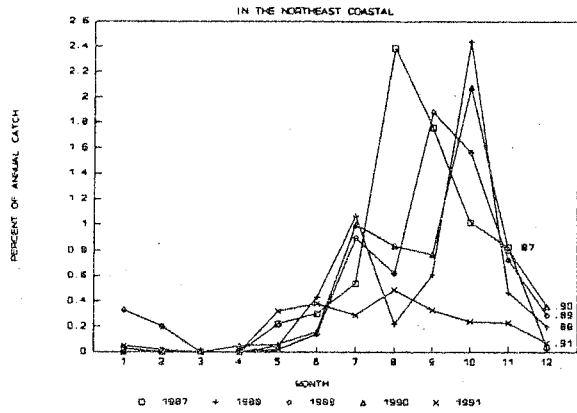
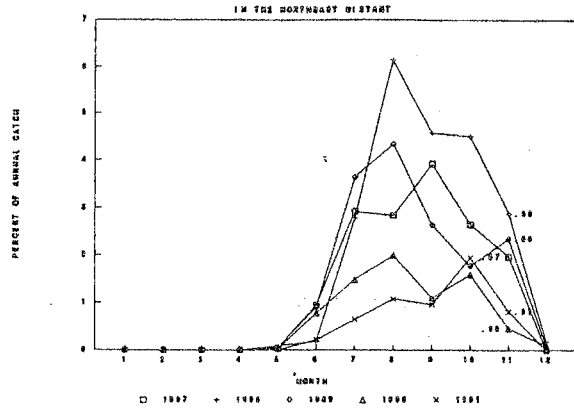


FIG. 8g. PERCENT U.S. CATCH < 25 KG



SWORDFISH SIZE FREQUENCY

The proportion of swordfish less than 25 kg whole weight reported in size frequency samples from U.S. longline vessels consistently decreased from the second half of 1990 to the first half of 1992 in all areas except the Northeast Distant (Figures 9a-9b).

FIG. 9a. SIZE FREQUENCY SAMPLES

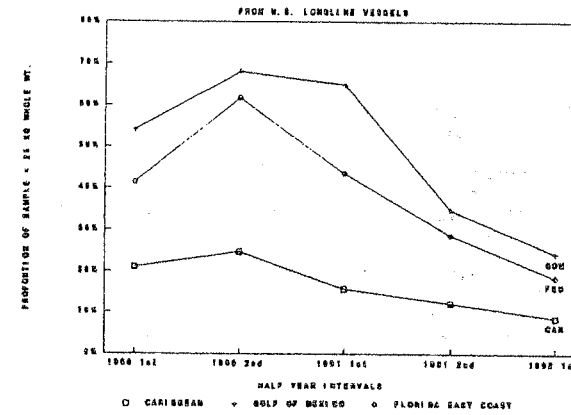


FIG. 9b. SIZE FREQUENCY SAMPLES

