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SOUTHWEST FISHERIES SCIENCE CENTER

NATIONAL MARINE FISHERIES SERVICE

SOUTHWEST FISHERIES SCIENCE CENTER

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JUNE 1991

SUMMARY OF THE 1989-90 U.S. SOUTH PACIFIC ALBACORE FISHERIES DATA

By

Gary M. Rensink

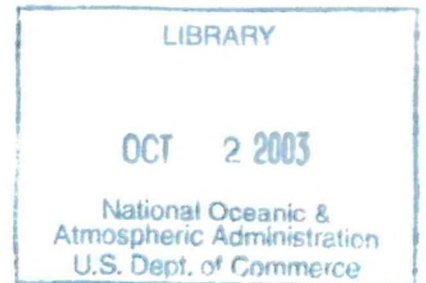
ADMINISTRATIVE REPORT LJ-91-14



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SUMMARY OF THE 1989-90 U.S. SOUTH PACIFIC
ALBACORE FISHERIES DATA

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INTRODUCTION

Three types of gear are used to fish for albacore in the south Pacific. Longline vessels from Japan, Taiwan, Korea, Australia, New Caledonia and Tonga fish during the entire year (Table 1). Drift gillnet vessels from Japan and Taiwan, as well as jig vessels from the United States, New Zealand, and French Polynesia fish from November through May. The 1989-90 U.S. south Pacific albacore fishing season lasted from late November until early April.

U.S. vessel captains voluntarily completed logbooks distributed by the Western Fishboat Owners Association (WFOA), the Southwest Fisheries Science Center laboratory in Honolulu, and the National Marine Fisheries Service (NMFS) Southwest Regional office in American Samoa. Completed albacore logbooks were collected, or data were abstracted from vessel logs, by NMFS representatives in American Samoa, who also sampled landings for sizes of fish. New Zealand observers on board one U.S. jigboat and 5 New Zealand jigboats also measured sizes of fish during the season.

This report summarizes the U.S. data for the 1989-90 fishing season, and compares it to data from previous seasons. Available data from New Zealand, and the longline and gillnet fisheries are also presented for comparison.

BACKGROUND

The U.S. first started albacore fishing in the south Pacific in 1986, when two vessels conducted an exploratory fishing/research survey operation (Lauris 1986; Majors, Perrin, and Miller 1988), and the fleet has grown steadily since to 38 vessels in 1989-90 (Figure 1). Likewise, landings have increased from 100 mt in 1986 to 3,882 mt in 1989-90 (Figure 2).

The average U.S. jigboat fishing for albacore in the south Pacific during the 1989-90 season was 60-70 feet (18-21 m) long with a hold capacity of 50+ short tons (45+ mt). Vessels traveled to American Samoa from Hawaii and the U.S. Pacific coast, then ran 7-10 days to reach the fishing grounds, and normally spent 20-30 days fishing. The majority of albacore landings were made in American Samoa (Table 2), and a smaller number in Tahiti and Fiji. Twelve vessels transhipped to a container ship at sea, which subsequently landed the fish in American Samoa.

COVERAGE RATES

Samplers collected catch and fishing effort statistics from vessel logbooks, and measured fork lengths of individual fish (length-frequency data) from landed catches. Coverage rates for catch-and-effort and length-frequency statistics were calculated as the ratio of sampled landings in weight to total landings. Length-frequency samples taken from each vessel were usually 50 fish. Therefore, if a vessel was sampled, the total landing was considered covered.

Catch-and-effort and length-frequency statistics from the 1989-90 south Pacific fishery were collected from U.S. jigboats landing in American Samoa, and from a New Zealand observer on-board one U.S. vessel (Table 2). Catch-and-effort sampling coverage increased from 43% for the 1988-89 season to 86% in 1989-90. Length-frequency coverage increased from 68% in 1988-89 to 80% in 1989-90.

TOTAL CATCH AND EFFORT

The 1989-90 U.S. south Pacific albacore fishery began in mid-November and continued through mid-April. The number of U.S. vessels participating in the fishery remained at 38 during the 1989-90 season as in the 1988-89 season. An estimated 2,400 days fishing (raised from sampled effort using percentage coverage) were expended by the U.S. fleet during both the 1988-89 and 1989-90 seasons. Catches were highest in January 1990 (35°-40°S and 160°-165°W) and in March 1990 (35°-40°S and 145°-150°W) (Figures 3a-3f). Catches from the 1989-90 season continued an upward trend for the U.S. fishery, reaching 3,882 mt. This is an increase of 5% from 1988-89 catches of 3,700 mt (Table 1). However, the region-wide troll catches declined 10% due to a smaller New Zealand catch (Figure 4). During November, U.S. jigboats operated for the first time west of the international date line and in the Tasman Sea, fishing roughly 35 days for an estimated catch of 25 mt.

Other surface fisheries in the south Pacific showed downward trends in catches of albacore (Table 1, Figure 4). Gillnet catches for Japan and Taiwan showed a marked decline, with a combined total of 7,567 mt during the 1989-90 season, a 69% decrease from 1988-89 catches. This was largely due to a significant drop in the size of their driftnet fleets operating in the region from 1988-89 levels (Japan: 64 to 19 vessels, Taiwan: 95 to 32 vessels (estimates)). New Zealand jigboat catches of 4,129 mt in 1989-90 represented a 21% decrease from the 5,202 mt caught during 1988-89. Provisional longline catches show a decline of 35% from 31,997 mt in 1988 to 20,600 mt in 1990 (Table 1, Figure 4), while sampled data show catch rates generally declining between 1988 and 1990 (SPC 1991).

CATCH PER UNIT EFFORT

The estimated catch per unit effort (CPUE) was calculated from information in U.S. fishing logbooks as the number of sampled fish caught divided by the total number of sampled days fished. The CPUE for the U.S. south Pacific albacore fleet increased 17%

from 236 fish per day fished in 1988-89 to 275 fish per day fished in 1989-90 (Figure 5). The highest catch rates, an average of 291 fish per day, occurred in March approximately 1,200 miles south of Rapa Island (Figure 6). Catch rates in the Tasman Sea averaged just over 15 fish per day, with a high of 38 fish per day occurring in the middle of the sea.

LENGTH FREQUENCY

Over 5,000 albacore were measured for fork length (tip of snout to fork of the tail) from the landings of vessels participating in the 1989-90 U.S. south Pacific fishery, and by a New Zealand observer on board a U.S. vessel for 3 days (Table 3). An additional 62,750 fish were measured on-board New Zealand vessels. U.S. and New Zealand length-frequency distributions for the 1989-90 season were almost identical (Figure 7), even though the New Zealand jigboats that gathered length-frequency information primarily fished south of where the U.S. fleet operated. Overall, the average size of albacore measured decreased for the third straight year, from 68.9 cm (15.0 lbs) in 1988-89 to 67.4 cm (14.0 lbs) in 1990 (Figure 8). Fish sizes ranged from 41 to 108 cm (Figure 9), and generally showed a tri-modal distribution (corresponding to 2-, 3-, and 4-year-old fish (Clemens 1961)) that varied with the area in which they were caught (Figure 10).

SUMMARY

Highlights for the 1989-1990 U.S. south Pacific albacore fishery include 1) an increase in landings from 3,700 mt in 1988-89 to 3,882 mt, 2) an increase in catch per unit effort from 236 fish per day fished in 1988-89 to 275 fish per day fished, and 3) a continued decrease in the average size of fish caught from 68.9 cm (15.0 lbs.) in 1988-89 to 67.4 cm (14.0 lbs.).

The gillnet/jigboat interactions lessened during the 1989-90 season. Korea did not operate gillnet boats in the South Pacific during the 1989-90 season. Japan completely withdrew the remainder of its driftnet fleet from the south Pacific after the 1989-90 season, leaving Taiwan with the only drift-net fleet (an estimated 14 vessels) still operating in the south Pacific for the 1990-91 season. The Taiwanese drift-net fleet has planned to withdraw at the close of the 1990-91 season.

ACKNOWLEDGEMENTS

We thank the captains and crews of the U.S. south Pacific albacore fishing fleet, and William Perkins of the Western Fishboat Owners Association for their cooperation and continuing support of this program. We also thank Gordon Yamasaki of the American Samoa Laboratory of the NMFS Southwest Region, and members of his staff for distributing logbooks and collecting albacore fishing information during the fishing season. We also appreciate the length-frequency and landings data provided to us from the scientists of New Zealand, Fiji, and French Polynesia.

Atilio Coan Jr., Gary Sakagawa, and Michael Laurs of the Southwest Fisheries Science Center reviewed drafts of this report and provided useful comments. Christina Perrin provided programming support for the compilation of data used in this report. Roy Allen illustrated the maps, and Karen Handschuh illustrated figures and typed the final draft of the manuscript.

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- Majors, Anthony P., Christina H. Perrin, and Forrest R. Miller. 1988. Summary of the 1987 north and south Pacific albacore fisheries data. NOAA-NMFS-SWFSC Admin. Report LJ-88-21. 55 p.
- South Pacific Commission 1991. Regional Tuna Bulletin, Third Quarter 1990. 39 p.

Table 1. Catches of south Pacific albacore in metric tons by fisheries, 1952-1990.

YEAR	JAPAN		TAIWAN		KOREA		USA	AUSTRALIA		NEW ZEALAND	NEW CALEDONIA		TONGA		GRAND TOTAL
	LONG LINE	GILL NET	LONG LINE	GILL NET	LONG LINE	GILL NET	JIG	SPORT	LONG LINE	JIG	LONG LINE	LONG LINE	LONG LINE		
1952	210														210
1953	1,091														1,091
1954	10,200														10,200
1955	8,420														8,420
1956	6,220														6,220
1957	9,764														9,764
1958	21,558														21,704
1959	19,344														19,800
1960	23,756														24,366
1961	25,628														25,958
1962	38,880														39,479
1963	33,500														34,867
1964	21,435														24,346
1965	19,305														25,710
1966	23,401														34,218
1967	16,640		11,751		13,717										42,108
1968	7,707		12,424		10,138										30,269
1969	5,559		9,595		9,963										25,117
1970	6,560		14,689		11,599			(200)							33,048
1971	4,339		15,887		14,482			(200)							34,908
1972	2,796		16,814		14,439			(200)							34,249
1973	2,381		17,742		17,452			(200)							37,775
1974	1,847		17,283		12,194			(200)		898					32,422
1975	1,045		17,071		9,015			(200)		646					27,977
1976	1,906		13,700		12,212			(200)		25					28,043
1977	2,240		21,932		13,176			(200)		621					38,169
1978	2,520		20,942		10,989			(200)		1,686					36,337
1979	2,350		15,086		8,682			(200)		814					27,132
1980	2,488		18,180		10,852			(200)		1,468					33,188
1981	4,856		14,595		14,793			(200)		2,085					36,529
1982	4,900		12,689		12,586			(200)		2,434					32,904
1983	4,928	32	12,119		6,669			(200)		744				95	24,817
1984	3,607	1,581	11,155		5,730			(100)		2,773				152	25,098
1985	3,746	1,928	9,601		14,267			(100)		3,253				253	33,148
1986	4,466	1,936	11,913		18,799			(100)	40	1,911				230	39,680
1987	4,085	919	15,009		6,646			(100)	200	1,227				267	31,764
1988	6,894	4,271	17,120	11,000	6,896			(100)	200	330				230	51,135
1989	3,883	13,263	(14,000)	11,000	5,040	184		(100)	(590)	5,202				196	57,724
1990	4,000	5,567	(11,000)	(2,000)	(4,500)	0	3,882	(100)	200	(4,129)				200	36,178

NOTES: 1 Primary sources of figures are SPAR 3 Report's Table 1 and Table 2.

2 Gillnet and Jig figures are for fishing season (i.e. 1989 figures are from the 1988-89 fishing season), Longline figures are annual.

3 U.S. jigboats did not fish prior to January during the 1986 and 1987 seasons. The 1988 and 1989 U.S. catch figures contain unknown amounts of non-U.S. catch.

4 Estimates and provisional totals are shown in parentheses.

¹Minimum totals from reported landings in American Samoa.

Table 2. Sampling coverage for the U.S. South Pacific albacore fishery by landing location for 1988-89 and 1989-90 fishing seasons.

Landing Location	Total Landings (mt)	Landings Sampled (mt)	Coverage	Number of Landings	Sampled Landings
<u>1988-1989</u>					
Catch and Effort:					
California	245.0	40.4	16%	1	1
A. Samoa	2,377.5	1,488.5	63%	53	34
Fiji	324.8	65.4	20%	7	1
Tahiti	752.7	0.0	0%	21	0
TOTAL	3,700.0	1,594.3	43%	82	36
Length-Frequency:					
California	245.0	0	0%	1	0
A. Samoa	2,377.5	1,894.3	80%	53	46
Fiji	324.8	0	0%	7	0
Tahiti	752.7	638.7	85%	21	17
TOTAL	3,700.0	2,533.0	68%	82	63
<u>1989-1990</u>					
Catch and Effort:					
California	139.8	139.8	100%	1	1
A. Samoa	3,581.3	3,213.8	90%	84	65
Fiji	101.7	0	0%	3	0
Tahiti	60.1	0	0%	1	0
TOTAL	3,882.9	3,353.6	86%	89	66
Length-Frequency:					
California	139.8	139.8	100%	1	1
A. Samoa	3,581.3	2,977.5	83%	84	66
Fiji	101.7	0	0%	3	0
Tahiti	60.1	0	0%	1	0
TOTAL	3,882.9	3,117.2	80%	89	67

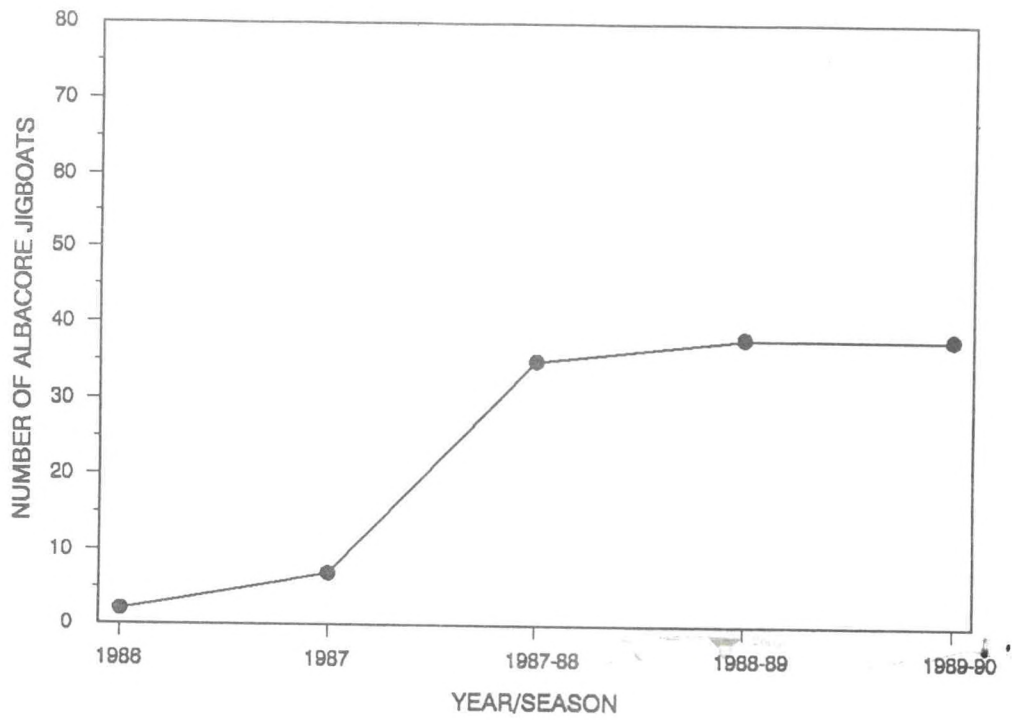


Figure 1. Number of U.S. jigboats fishing in the south Pacific by year/season. (See note #3 from Table 1)

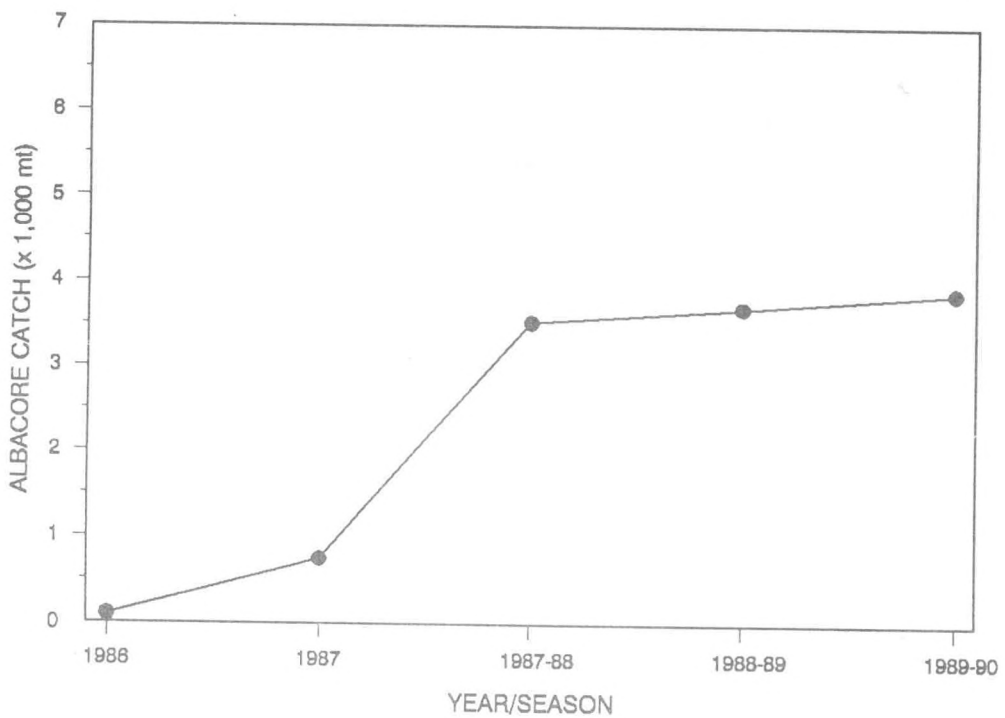


Figure 2. U.S. albacore catch (metric tons) in the south Pacific by year/season. (See note #3 from Table 1)

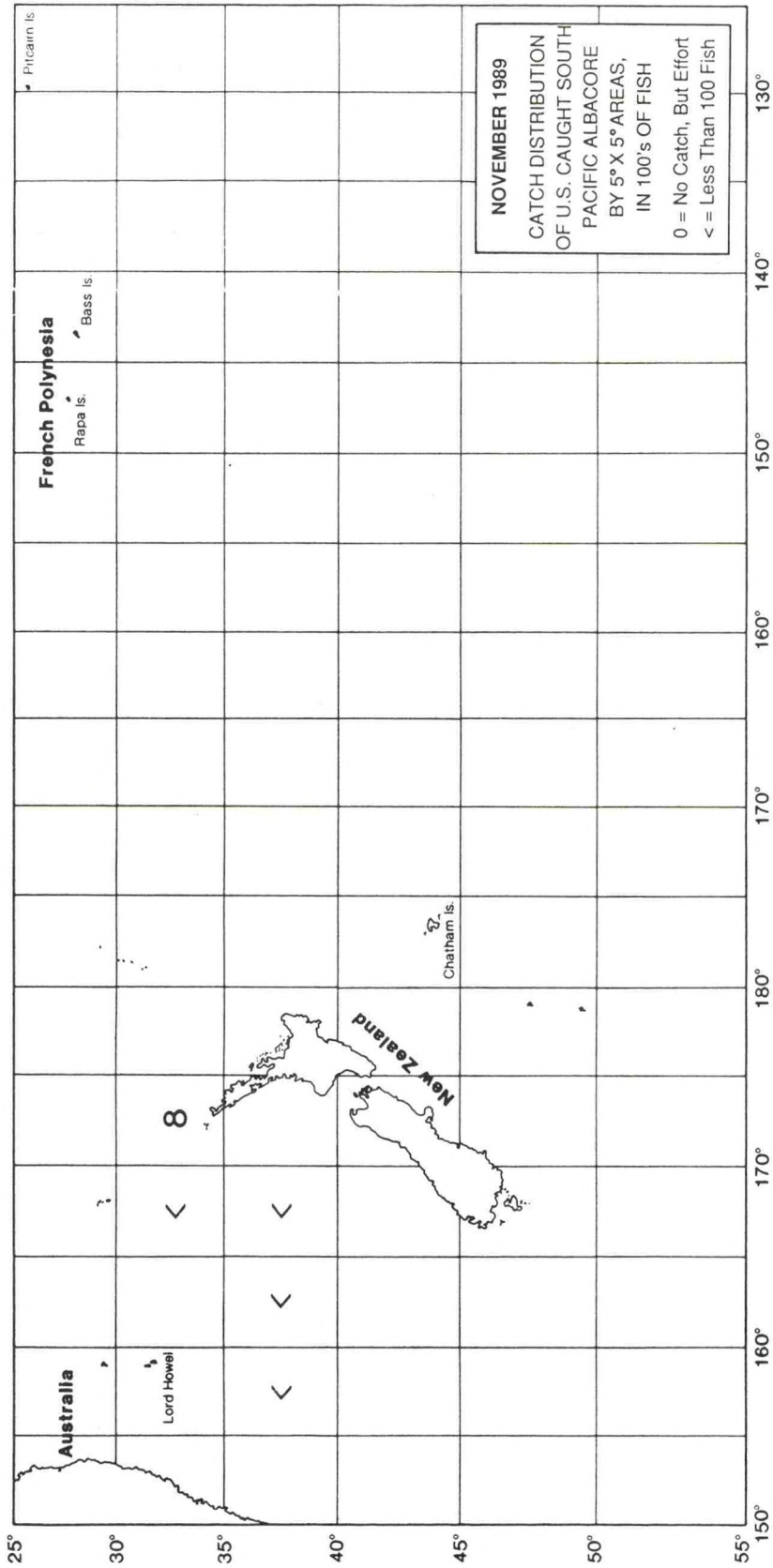


Figure 3a. U.S. albacore catch (numbers of fish) for jigboats by 5° quadrangle in the south Pacific, November 1989.

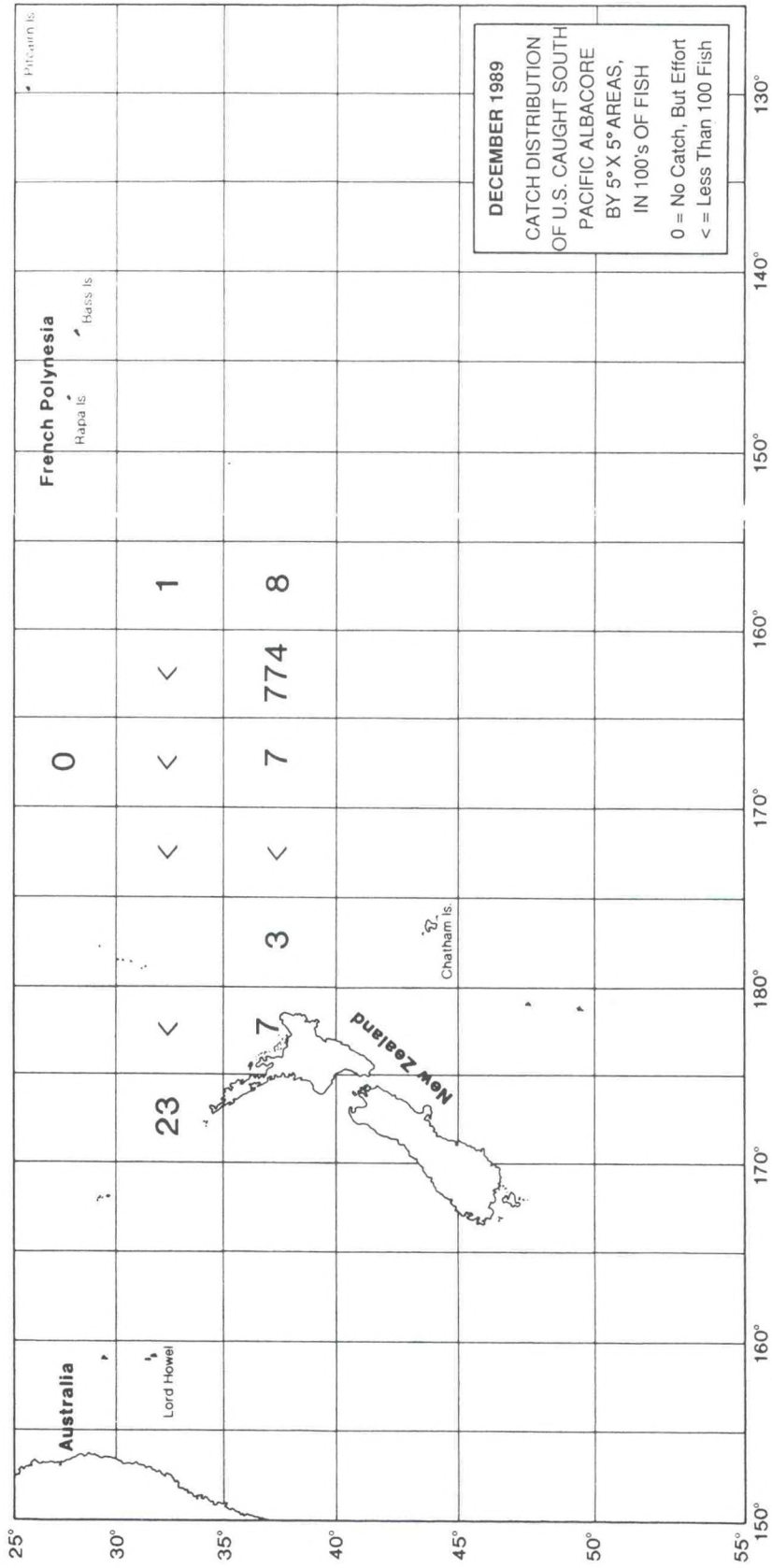


Figure 3b. U.S. albacore catch (numbers of fish) for jigboats by 5° quadrangle in the south Pacific, December 1989.

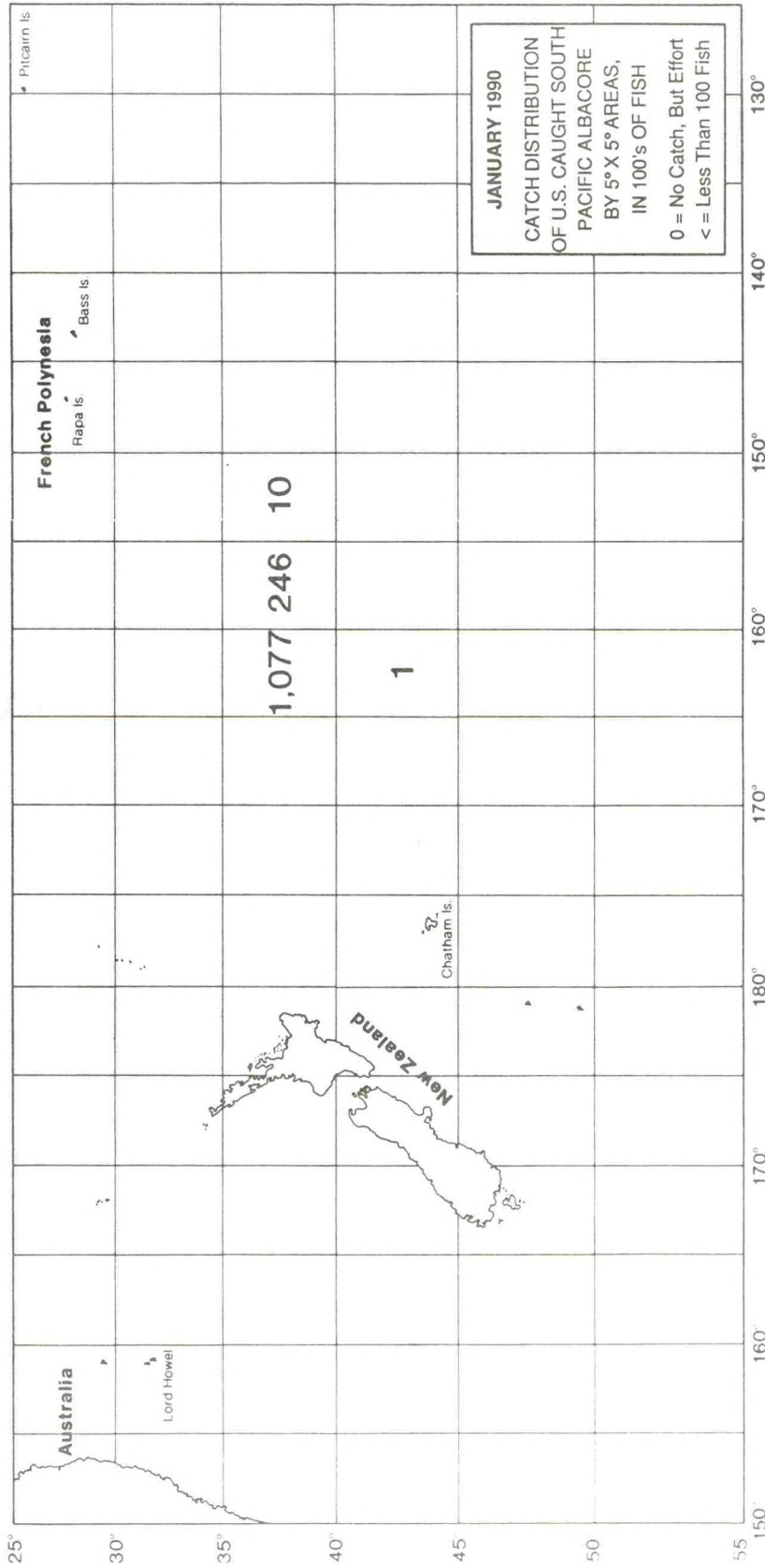


Figure 3c. U.S. albacore catch (numbers of fish) for jigboats in the south Pacific, January 1990.

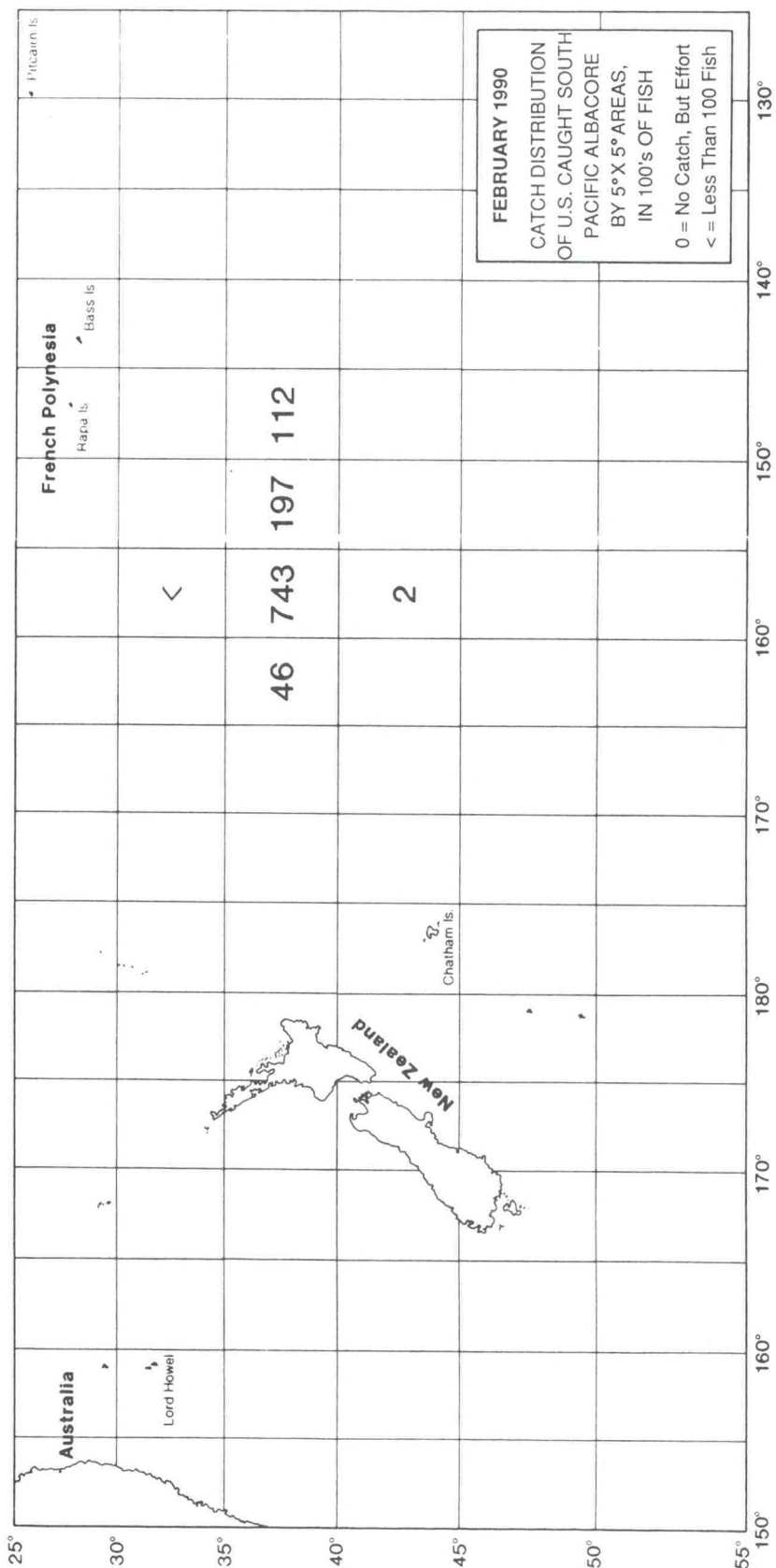


Figure 3d. U.S. albacore catch (numbers of fish) for jigboats in the south Pacific, February 1990.

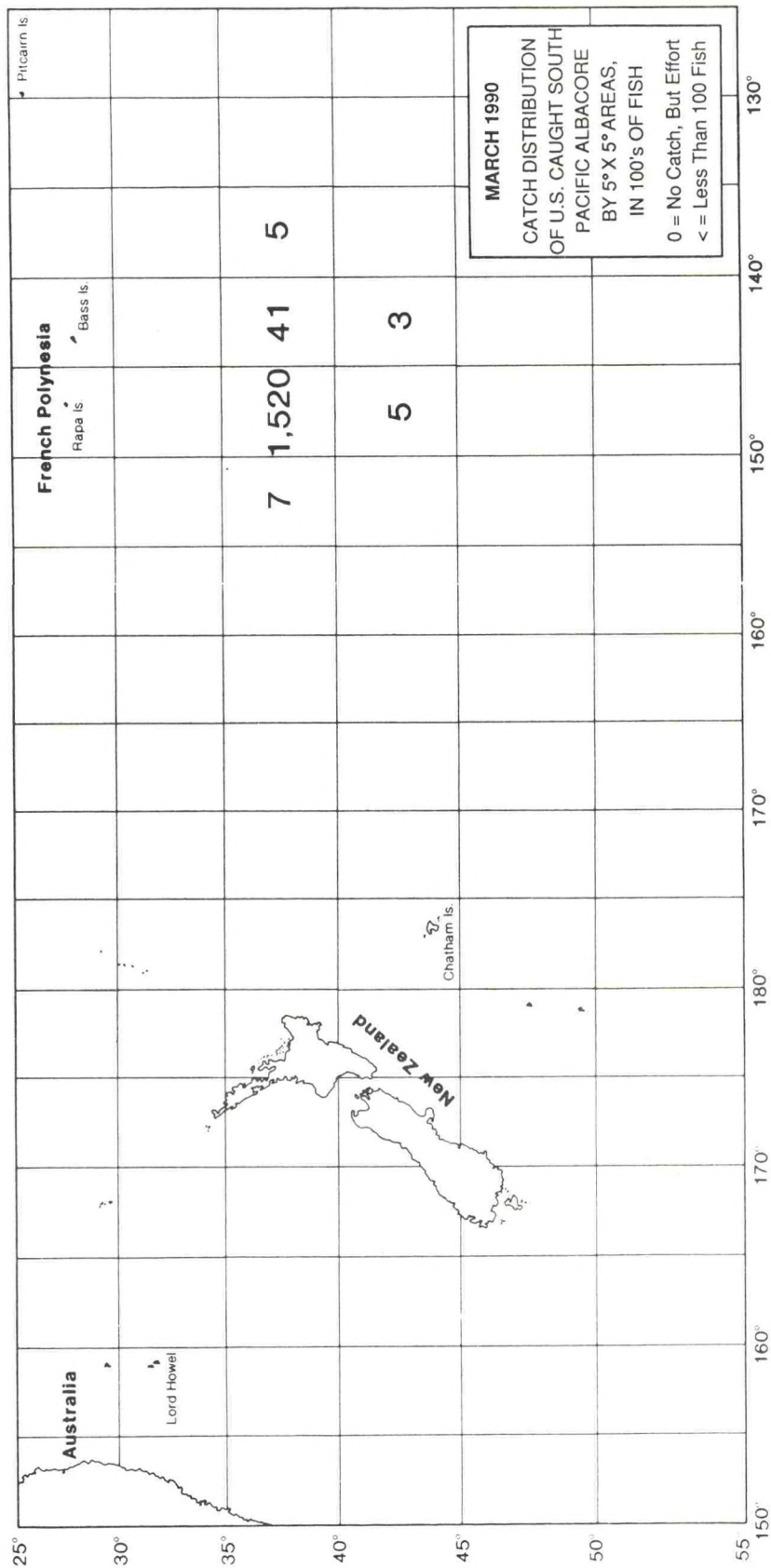


Figure 3e. U.S. albacore catch (numbers of fish) for jigboats in the south Pacific, March 1990.

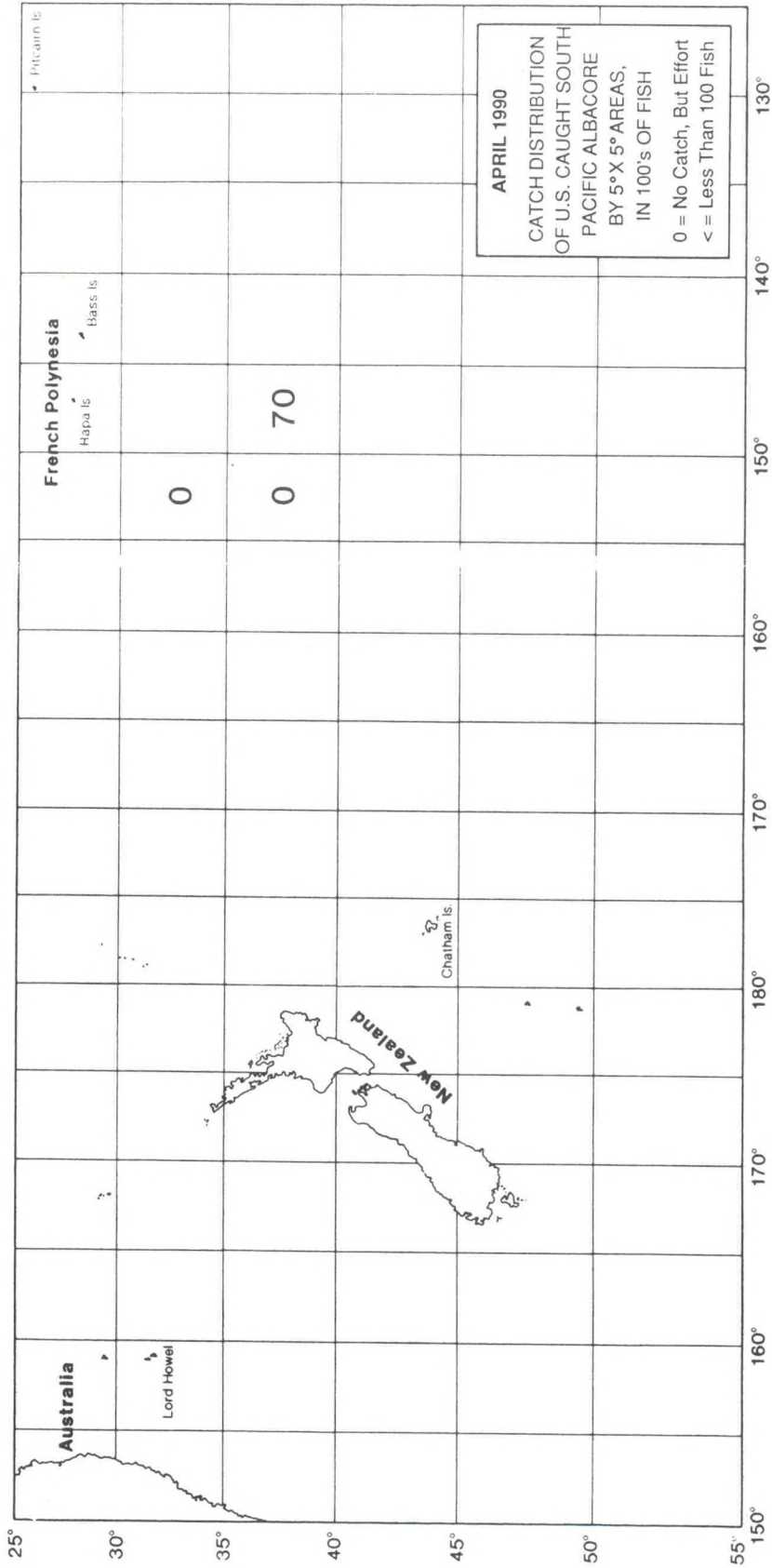


Figure 3f. U.S. albacore catch (numbers of fish) for jigboats by 5° quadrangle in the south Pacific, April 1990.

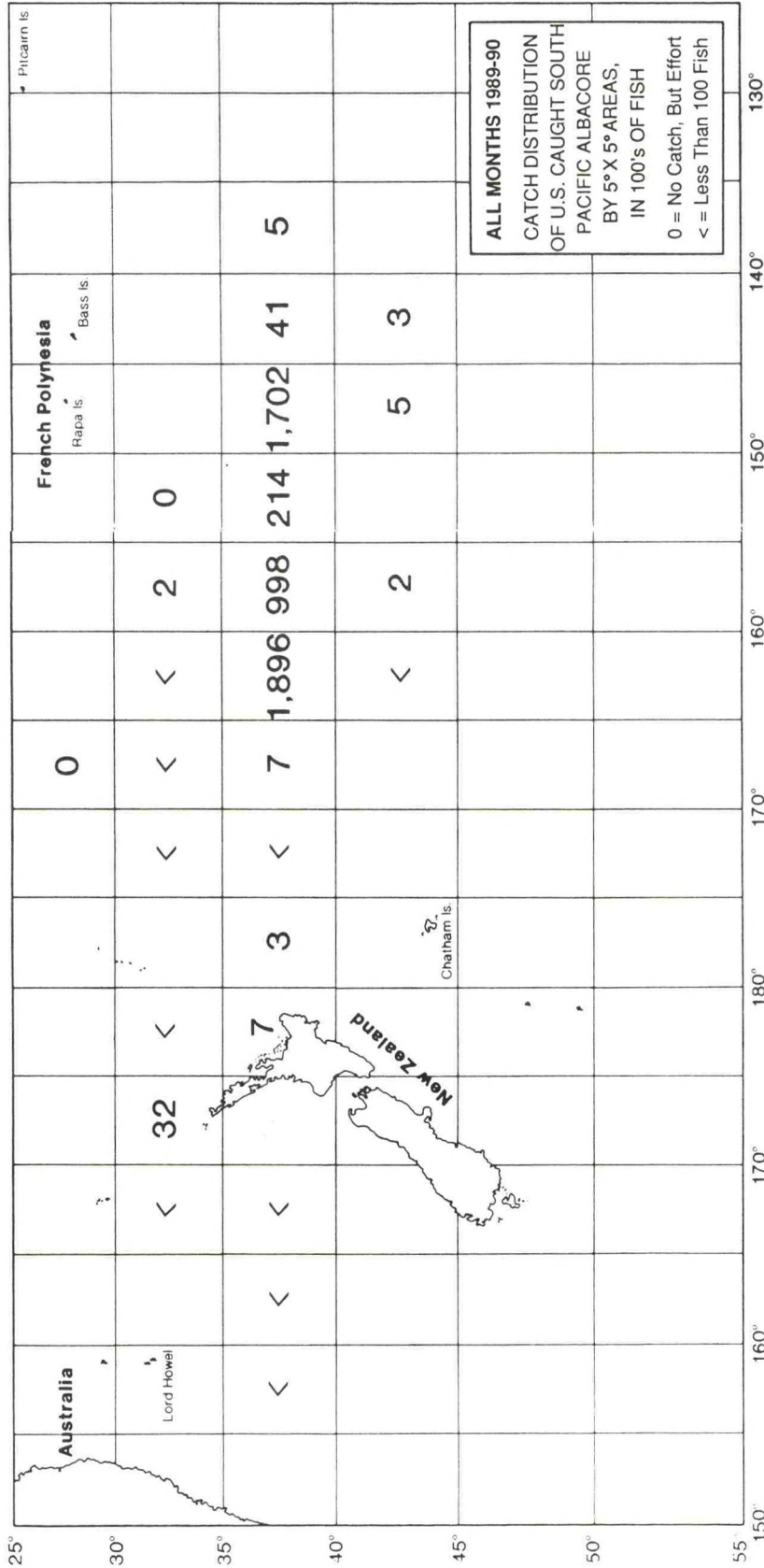


Figure 3g. U.S. albacore catch (numbers of fish) for jigboats by 5° quadrangle in the south Pacific, 1989-90 season.

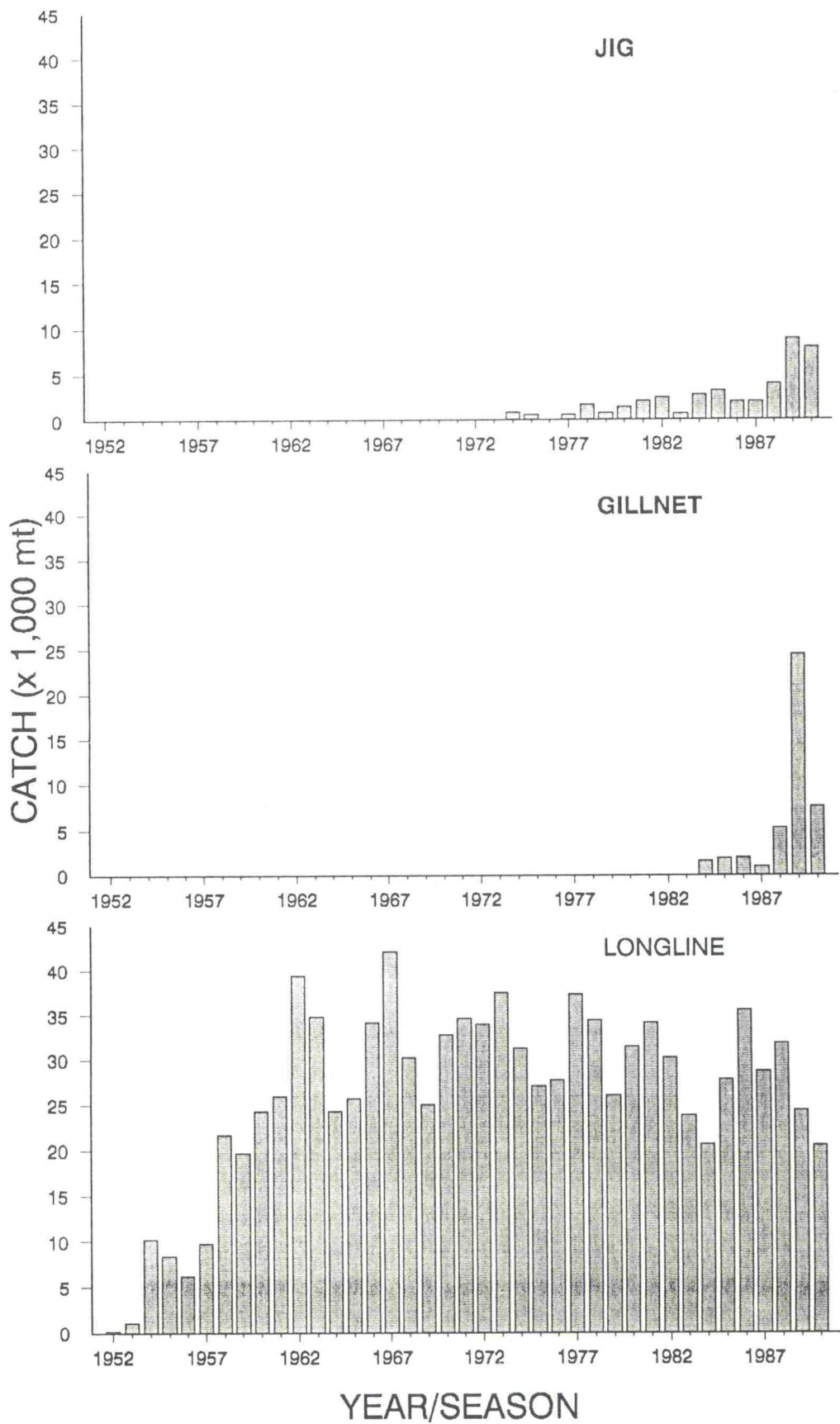


Figure 4. South Pacific albacore catch (metric tons) by gear and year/season. (See note #3 from Table 1).

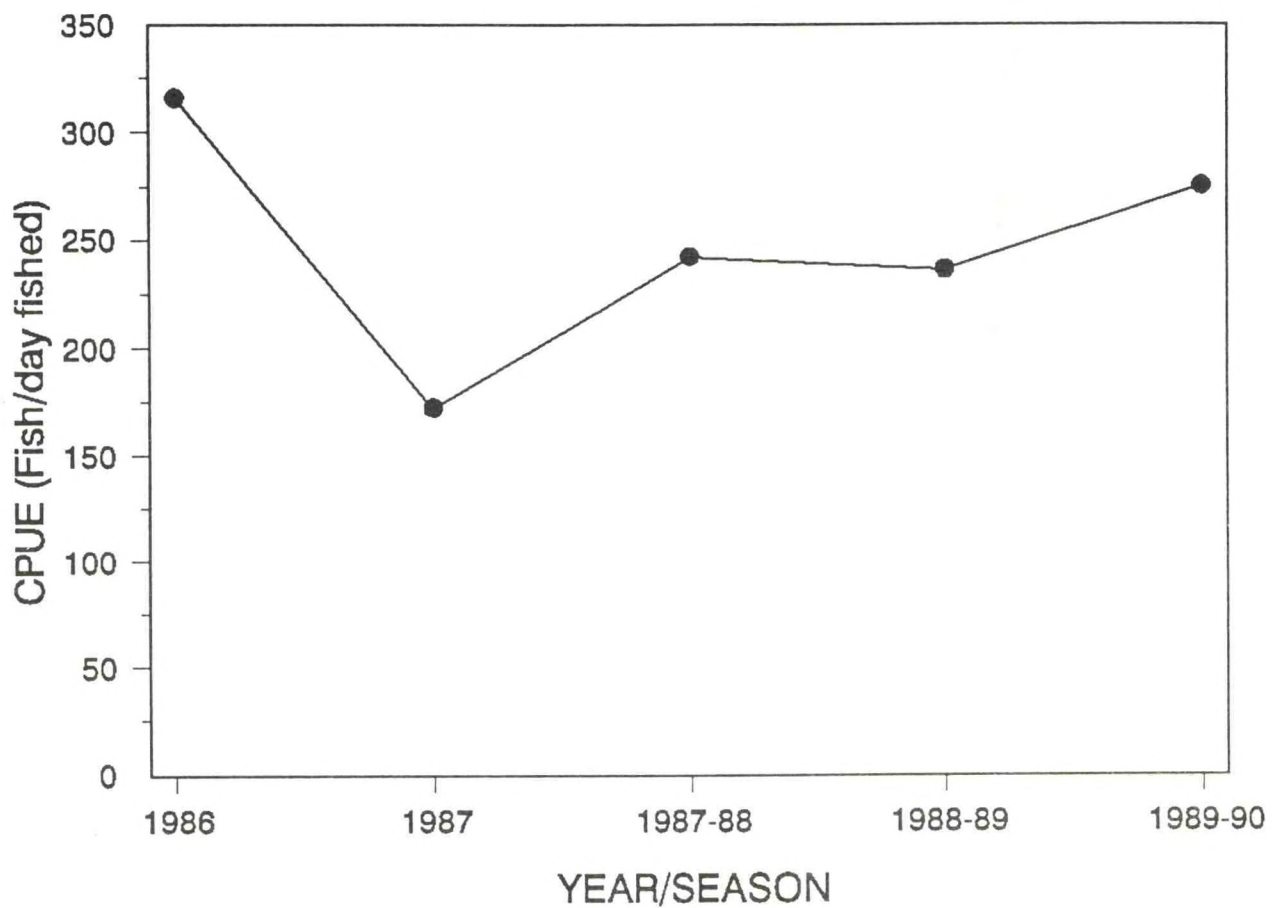


Figure 5. U.S. south Pacific albacore jigboat CPUE by year/season.
(See note #3 from Table 1)

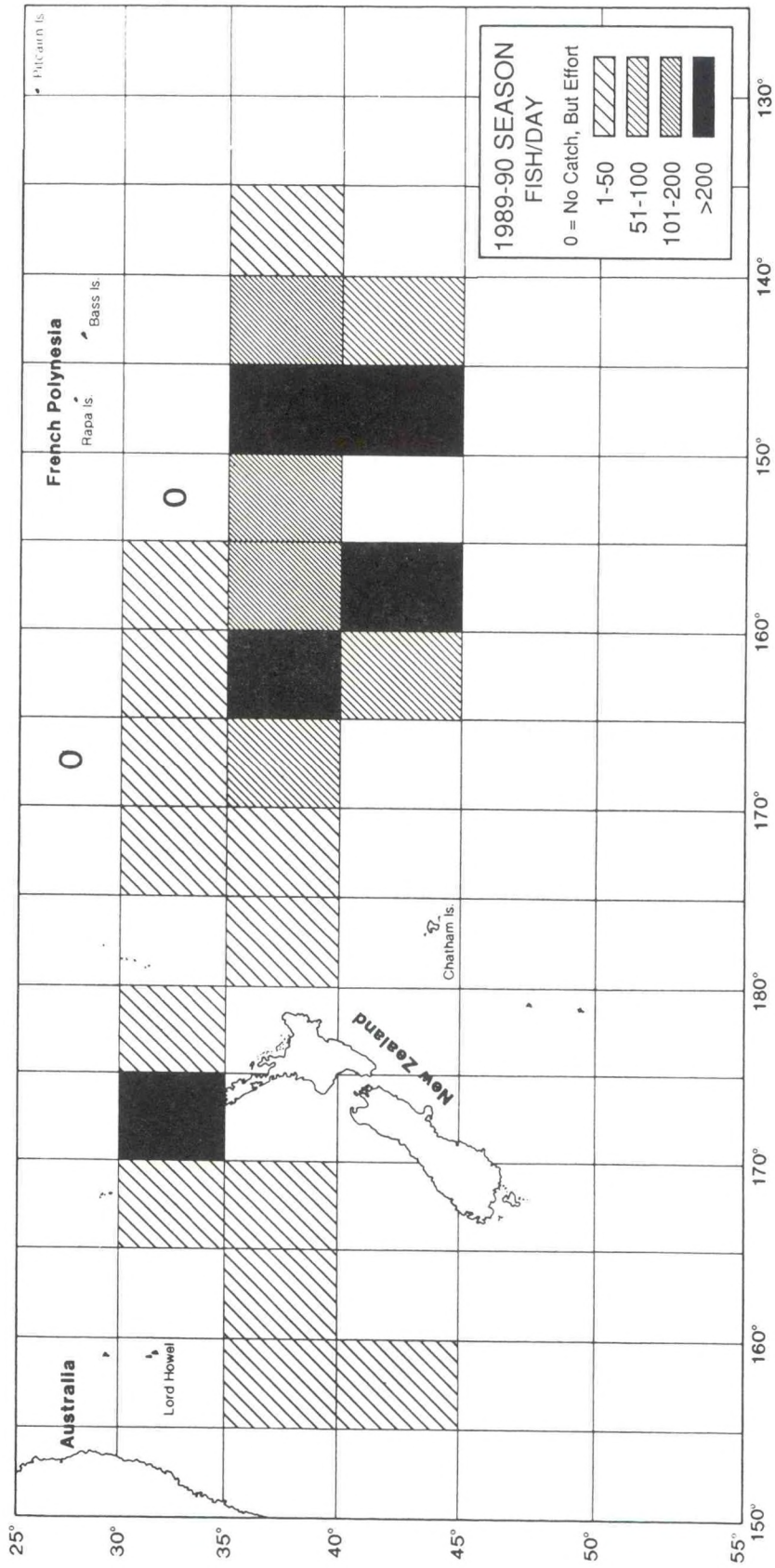


Figure 6. U.S. south Pacific albacore jigboat CPUE by 5° quadrangle, 1989-90 season.

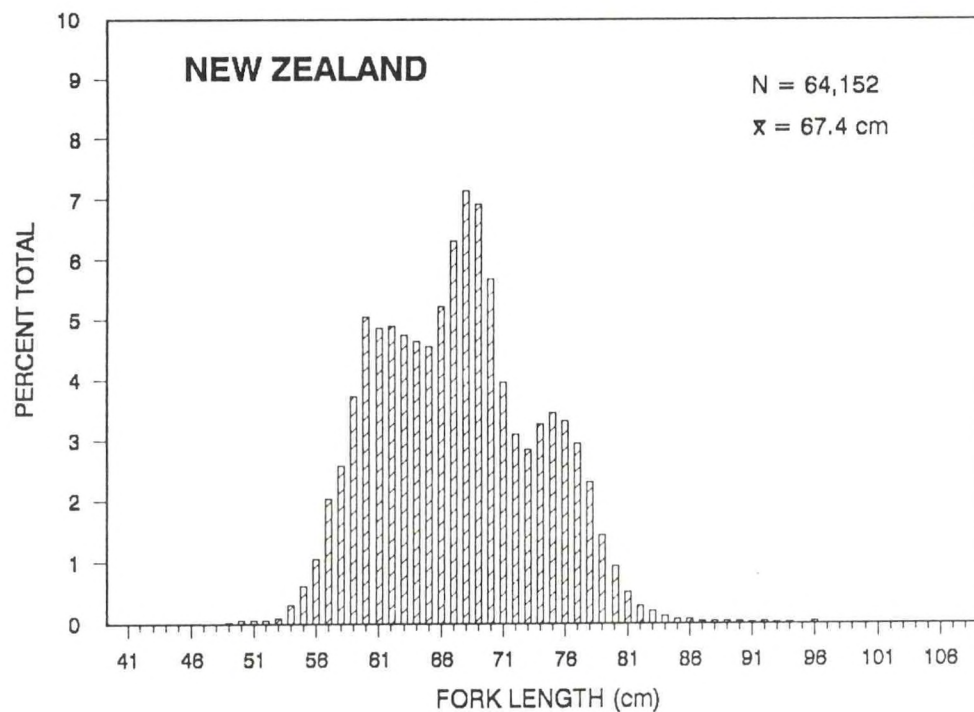
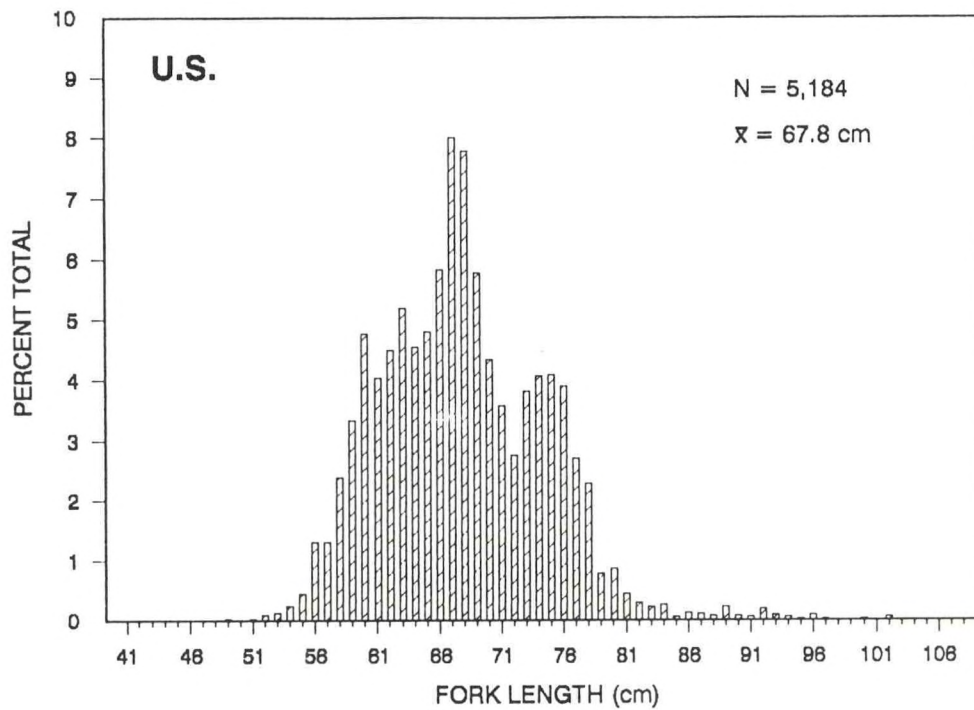


Figure 7. Length-frequency histograms of south Pacific albacore caught by U.S. and New Zealand jigboats in the 1989-90 season (N = number of fish measured, \bar{x} = average length).

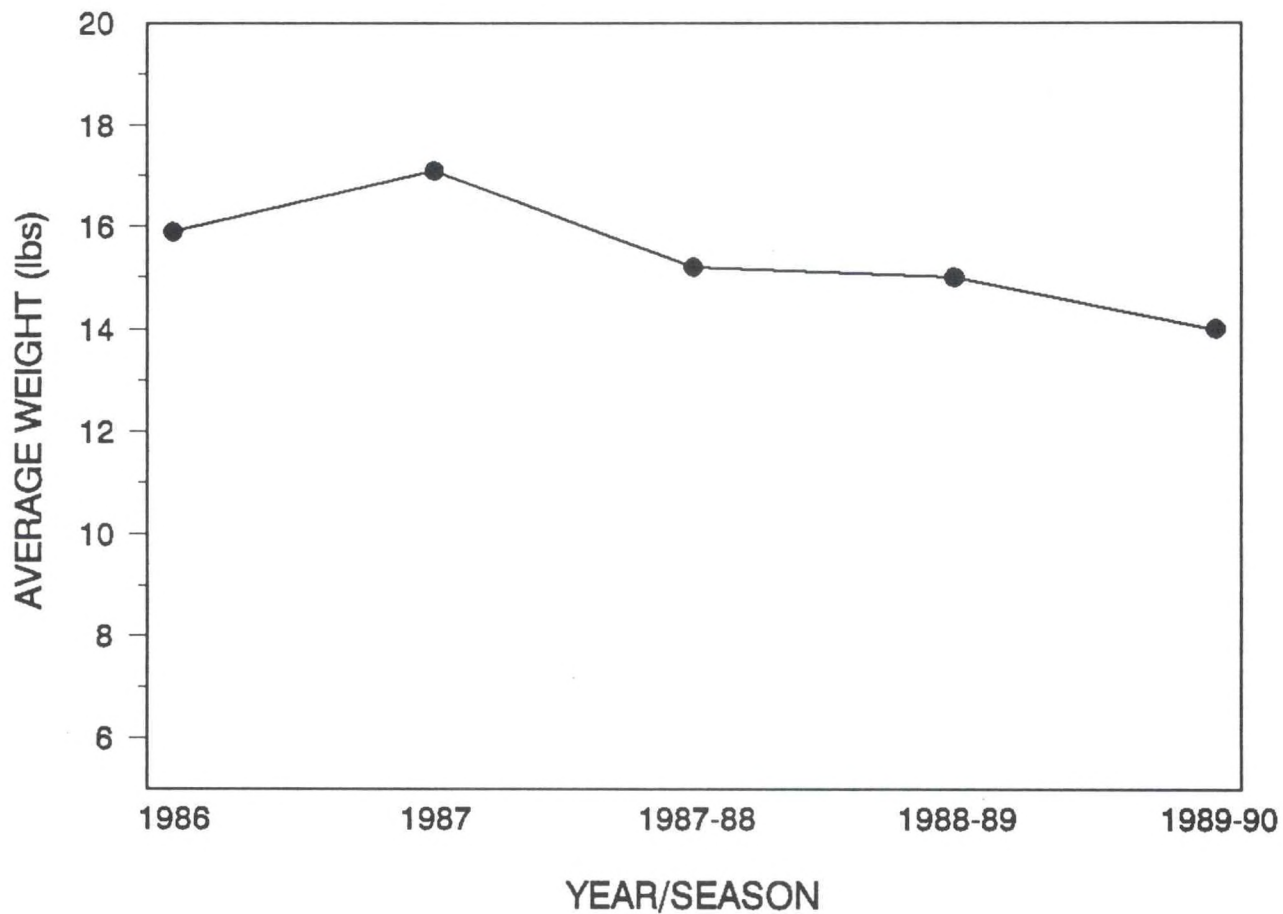


Figure 8. Average weight (lbs.) of south Pacific albacore caught by the U.S. jigboat fleet by year/season. (See note #3 from Table 1)

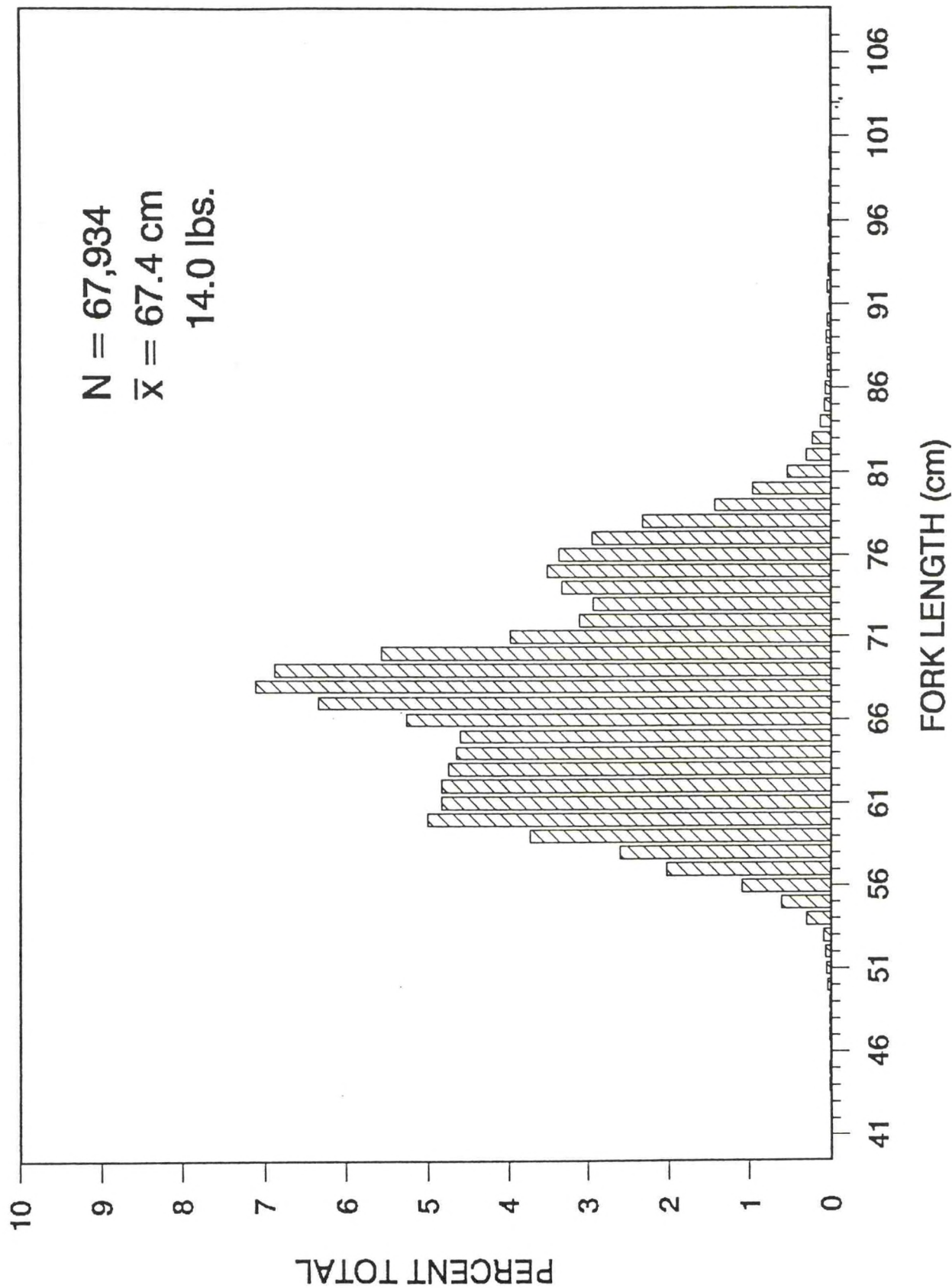


Figure 9. Overall length-frequency histogram of south Pacific albacore caught by U.S. and New Zealand jigboats in the 1989-90 season. (N = number of fish measured, \bar{x} = average length)

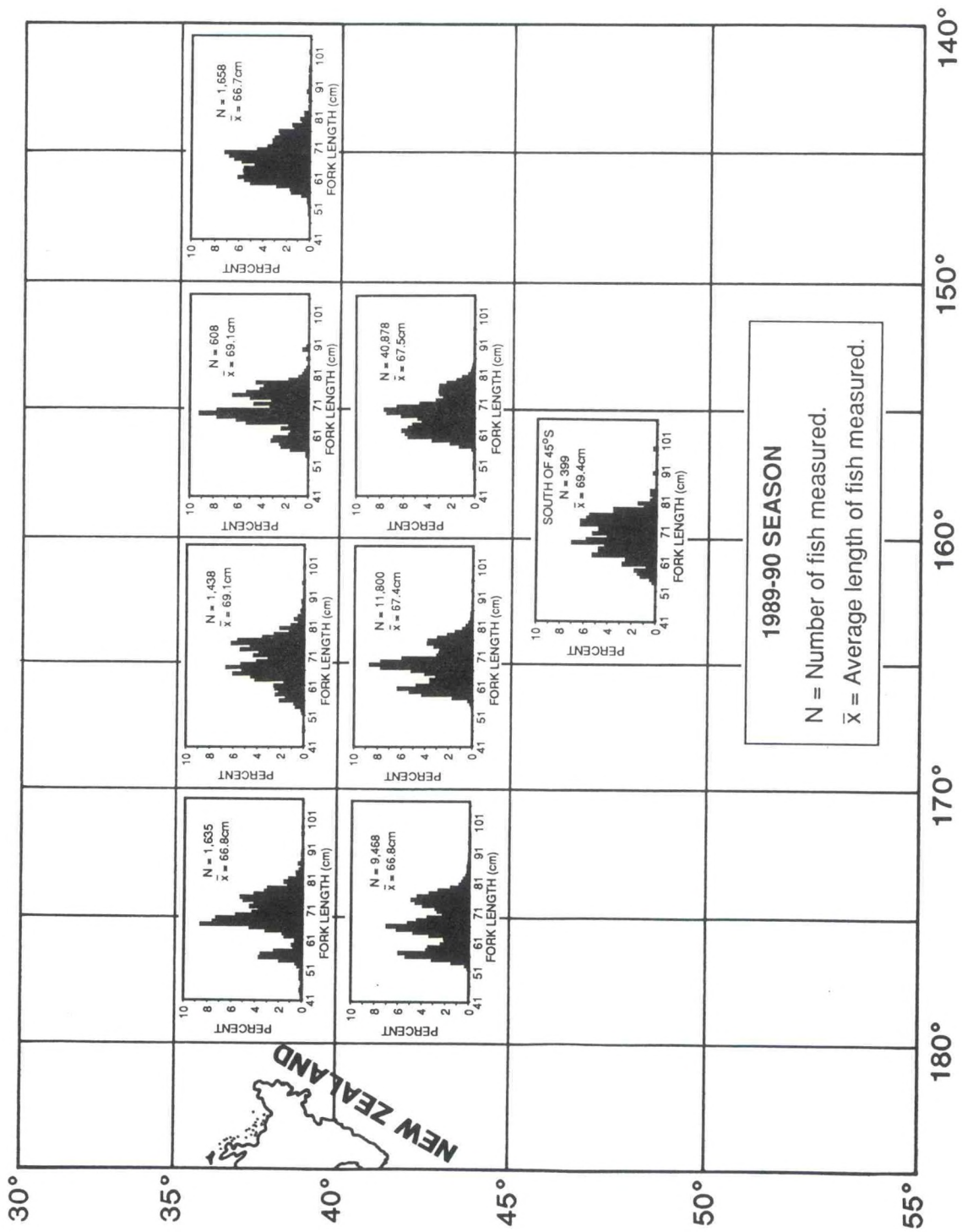


Figure 10. Length-frequency histograms of south Pacific albacore caught by U.S. and New Zealand jigboats by 5° X 10° area in the 1989-90 season.