SOUTHWEST FISHERIES SCIENCE CENTER

NATIONAL MARINE FISHERIES SERVICE SOUTHWEST FISHERIES SCIENCE CENTER P.O. BOX 271 LA JOLLA, CA 92038

APRIL 1992

SUMMARY OF THE 1990-91 U.S. SOUTH PACIFIC ALBACORE FISHERIES DATA

By

Gary M. Rensink

ADMINISTRATIVE REPORT LJ-92-11

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INTRODUCTION

Albacore were targeted by three different fisheries in the south Pacific Ocean during 1990-91. Longline vessels from Taiwan, Korea, Japan, Australia, New Caledonia, Tonga, Fiji, French Polynesia, and New Zealand fished during the entire year of 1991. Drift gillnet vessels from Taiwan, as well as troll vessels from the United States, New Zealand, French Polynesia, and Fiji fished a season lasting from November 1990 through April 1991.

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. Catch-effort and size composition data were also collected from vessels landing in Tahiti by local scientists.

This report summarizes the data from the U.S. fleet for the 1990-91 fishing season, and compares it to similar data from previous seasons. Available data from 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 (Laurs 1986), and the fleet has grown steadily since to 58 vessels in 1990-91 (Figure 1). Likewise, landings have increased from 89 mt in 1986 (Rensink 1991) to 5,494 mt in 1990-91.

The average U.S. troll vessel (jigboat) fishing for albacore in the south Pacific during the 1990-91 season was 60-70 feet (18-21 m) long with a hold capacity of 50+ short tons (45+ mt) of fish. Vessels traveled to American Samoa or Tahiti (French Polynesia) from Hawaii and the U.S. West Coast, then ran 7-10 days to reach the fishing grounds. The average vessel then spent 60 days fishing, offloading catches 2-4 times to transshipping vessels at sea before returning to port with the last load. The transhipping vessels offloaded

the albacore at canneries in American Samoa except for one instance to canneries in Thailand. The remainder of the albacore were landed directly in American Samoa and French Polynesia (Table 1).

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 were calculated as the ratio of sampled landings in weight to total landings. Length-frequency samples taken from each vessel were usually 50 fish, and if a vessel was sampled the total landing was considered covered.

Catch-and-effort and length-frequency statistics from the 1990-91 south Pacific fishery were collected from U.S. jigboats landing in American Samoa and Tahiti (Table 1). Catch-and-effort sampling coverage decreased from 86% for the 1989-90 season to 70% in 1990-91. Length-frequency coverage decreased from 80% in 1989-90 to 64% in 1990-91. These drops in coverage were due to an increase in transshipments at sea, and difficulties in sampling small loads delivered from each transshipment vessel in American Samoa. No sampling occurred in Thailand.

TOTAL CATCH AND EFFORT

The 1990-91 U.S. south Pacific albacore fishery began in November and continued through the end of April. The number of U.S. vessels participating in the fishery increased to 58 during the 1990-91 season from the 38 during the 1989-90 season. An estimated 4,500 days fishing (raised from sampled effort using percentage coverage) were expended by the U.S. fleet during the 1990-91 season, compared to 2,400 days fishing during the 1989-90 season. The increase in effort was due to the larger fleet, and the presence of transshipment vessels that allowed the troll fleet to stay at sea longer. Catches were highest in January 1991 (35°-40°S and 160°-165°W) (Figures 2a-g). Catches from the 1990-91 season continued an upward trend for the U.S. fishery, reaching 5,494 mt. This is an increase of 41% from 1989-90 catches of 3,898 mt (Table 2). Region-wide troll catches for the 1990-91 season were 7,087 mt, an increase of 37% from the 5,178 mt landed during the 1989-90 season (Figure 3).

Other troll and the gillnet fisheries in the south Pacific have shown variable trends during the last 3 seasons in catches of albacore (Table 2, Figure 3). Gillnet catches showed a marked decline, with a total of 821 mt during the 1990-91 season, a 89% decrease from 1989-90 catches. This was largely due to the entire Japanese driftnet fleet leaving the region after the 1989-90 season, and because of a drop in the size of the Taiwanese driftnet fleet (from approximately 12 vessels during 1989-90 to 9 vessels during 1990-91). The entire Taiwanese driftnet fleet also left the region after the completion of the 1990-91 fishing season. New Zealand troll catches declined slightly for the third straight season to 2,464 mt in 1990-91 from the 2,525 mt caught during 1989-90, although over the past decade the

landing totals have been relatively stable. French Polynesian troll catches continued to improve, increasing from 359 mt to 451 mt for the 1989-90 and 1990-91 seasons respectively, while a Fijiian vessel reported landing troll-caught albacore for the first time, totaling 103 mt. Final 1991 longline catch figures for the entire south Pacific are not yet available (Table 3), but foreign longliners landing in American Samoa showed an improvement for 1991 (260 landings totaling 20,121 mt) compared to 1990 (280 landings totaling 17,879 mt).

CATCH PER EFFORT

The estimated catch per effort (CPE) 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 CPE for the U.S. south Pacific albacore fleet decreased from 256 fish (1.6 metric tons) per day fished in 1989-90 to 197 fish (1.5 metric tons) per day fished in 1990-91 (Figure 4). The smaller drop in the metric tons CPE than for the number of fish CPE was due to more larger fish being caught in the 1990-91 season than in 1989-90 season. The highest catch rates, an average of 383 fish per day, occurred in February 1991 approximately 1,500 miles south of Rapa Island (Figure 5).

Approximately 85% of the U.S. albacore catch occurred from January to March, and roughly 99% of the catch came from an area between 35-45°S and 135-165°W during the 1990-91 season. CPE for this time period/area was 230 fish (1.7 metric tons) per day, 17% higher than the overall CPE (Figure 6), and 25% lower than the 308 fish (2.0 metric tons) per day recorded for the same time period/area the previous year.

LENGTH FREQUENCY

Over 10,000 albacore were measured for fork length (tip of snout to fork of the tail) from the landings of vessels participating in the 1990-91 U.S. south Pacific fishery. Overall, the average size of albacore measured increased from 14.0 pounds (6.35 kg) in 1989-90 to 16.6 pounds (7.53 kg) in 1990-91 (Figure 7). This was primarily due to many large (>25 lbs.) albacore that were caught in April. Fish sizes ranged from 38 to 109 cm (Figure 8), and the size distribution was primarily of age 2, 3, and 4 year-old fish lumped together with no distinctive modes. Size distributions varied according to geographic locations, with the larger fish caught from 35-40°S and 140-160°W (Figure 9). These size distributions may not represent the actual population because some vessels might not have landed the smaller fish.

SUMMARY

Highlights for the 1990-91 U.S. south Pacific albacore fishery include an increase in landings from 3,898 mt in 1989-90 to 5,494 mt, a decrease in catch per effort (CPE) from 256 fish per day fished in 1989-90 to 197 fish per day fished, and an increase in the average size of fish caught from 14.0 pounds (6.35 kg) in 1989-90 to 16.6 pounds (7.53 kg).

The gillnet/jigboat interactions lessened during the 1990-91 season because Japan completely withdrew the remainder of its driftnet fleet from the south Pacific after the 1989-90 season, and Taiwan decreased its fleet size from 12 to 9 vessels. The Taiwanese driftnet fleet withdrew from the region at the close of the 1990-91 season, leaving the south Pacific gillnet-free for the 1991-92 albacore season.

ACKNOWLEDGEMENTS

I 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. I 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. I also acknowledge the length-frequency and landings data provided by Stephen Yen in French Polynesia, and landings data from Fiji by Dr. Tim Adams.

Atilio Coan Jr., Dr. Gary Sakagawa , and Dr. Norman Bartoo of the Southwest Fisheries Science Center reviewed drafts of this report and provided useful comments. Jacqueline Tran provided programming support in generating the maps, and Karen Handschuh illustrated figures and typed the final draft of the manuscript.

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Laurs, R. Michael. 1986. U.S. albacore trolling exploration conducted in the south Pacific during February-March, 1986. NOAA-TM-NMFS-SWFSC-66. 30 p.

Rensink, Gary M. 1991. Summary of the 1989-90 U.S. south Pacific albacore fisheries data. NOAA Admin. Report LJ-91-14. 21 p.

Table 1. Sampling coverage for the U.S. South Pacific albacore fishery by landing location for 1989-90 and 1990-91 fishing seasons.

Landing Location	Total Landings (mt)	Landings Sampled (mt)	Coverage	Number of Landings	Sampled Landings
1989-1990					
Catch and Effort:					
California	139.8	139.8	100%	1	1
A. Samoa	3,580.3	3,213.8	90%	84	65
Fiji	117.7	0.0	0%	3	0
Tahiti	60.1	0.0	0%	1	0
Thailand	0.0	0.0	n/a	0	0
TOTAL	3,897.9	3,353.6	86%	89	66
Length-Frequency:					
California	139.8	139.8	100%	1	1
A. Samoa	3,580.3	2,977.5	83%	84	66
Fiji	117.7	0.0	0%	3	0
Tahiti	60.1	0.0	0%	1	0
Thailand	0.0	0.0	n/a	0	0
TOTAL	3,897.9	3,117.2	80%	89	67
1990-1991					
Catch and Effort:					
California	0.0	0.0	n/a	0	0
A. Samoa	4,217.5	3,139.2	74%	161	102
Fiji	0.0	0.0	n/a	0	0
Tahiti	586.9	432.6	74%	20	12
Thailand	689.5	276.3	40%	27	10
TOTAL	5,493.9	3,848.1	70%	208	124
Length-Frequency:					
California	0.0	0.0	n/a	0	0
A. Samoa	4,217.5	3,103.5	74%	161	123
Fiji	0.0	0.0	n/a	0	0
Tahiti	586.9	389.1	66%	20	11
Thailand	689.5	0.0	0%	27	0
TOTAL	5,493.9	3,492.6	64%	208	134

Table 2. Catches of south Pacific albacore in metric tons by fishery, 1952-1991.

	LONGLINE	POLE AND LINE		SPORT	DRIFTNET			TROLL					OTHER	GRAND TOTAL
YEAR	TOTAL	JAPAN	AUSTRALIA	AUSTRALIA	JAPAN	TAIWAN	KOREA	NEW ZEALAND	UNITED STATES	CANADA	FRENCH POLYNESIA	FIJI		
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	21,704													21,704
1959	19,800													19,800
1960	24,366	45												24,111
1961	25,958													25,958
1962	39,479													39,749
1963	34,867	16												34,883
1964	24,346													24,346
1965	25,710													25,710
1966	34,218													34,218
1967	42,108							5						42,113
1968	30,269							14						30,283
1969	25,117							?						25,117
1970	32,848		200					50						33,098
1971	34,755		200					?						34,955
1972	34,059		200					248						34,527
1973	37,830		200					484						38,514
1974	31,561		200					898						32,659
1975	27,203		200					646						28,049
1976	27,818		200					25						28,043
1977	37,348		200					621						38,169
1978	34,451		200					1,686						36,337
1979	26,118		200					814						27,132
1980	39,184	19	100					1,468						33,107
1981	34,244	8	100					2,085						36,437
1982	30,281	1		50				2,434						32,766
1983	23,771	2		50	32			744					3	24,702
1984	20,739			50	1,581			2,773					7	25,150
1985	27,919			50	1,928			3,253					11	33,161
1986	35,603			50	1,936			1,911	89					39,589
1987	28,755			50	919			1,227	751					31,702
1988	31,936			50	4,271	1,000		330	3,253	140			1	40,981
1989	(24,221)			50	13,263	8,520	172	5,161	3,068	162	90			(54,707)
1990	(25,652)			50	5,667	(1,859)	0	2,525	3,898		359			(40,010)
1991	(23,275)			50	0	(821)	0	2,464	5,494		451	103		(32,658)

NOTES: 1 Primary source of figures is SPAR 4 Report's Annex 3 and Annex 4.
2 Longline, Pole & Line, and Sport figures are annual.
3 Driftnet and Troll figures are seasonal (i.e. the 1990 figure is for the 1989-90 season).
4 Estimates and provisional totals are shown in parentheses.
5 Other figures are from local American Samoa landings of unknown gear types.

Table 3. Catches of south Pacific albacore longline fisheries in metric tons by nation, 1952-1991.

YEAR	JAPAN	KOREA	TAIWAN	FRENCH POLYNESIA	TONGA	NEW CALEDONIA	AUSTRALIA	NEW ZEALAND	FIJI	TOTAL
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	146								21,704
1959	19,344	456								19,800
1960	23,756	610								24,366
1961	25,628	330								25,958
1962	38,880	599								39,479
1963	33,500	1,367								34,867
1964	21,435	2,911								24,346
1965	19,305	6,405								25,710
1966	23,401	10,817								34,218
1967	16,640	13,717	11,751							42,108
1968	7,707	10,138	12,424							30,269
1969	5,559	9,963	9,595							25,117
1970	6,560	11,599	14,689	+						32,848
1971	4,386	14,482	15,887	+						34,755
1972	2,806	14,439	16,814	+						34,059
1973	2,636	17,452	17,742	+						37,830
1974	2,084	12,194	17,283	+						31,561
1975	1,117	9,015	17,071	+						27,203
1976	1,906	12,212	13,700	+						27,818
1977	2,240	13,176	21,932	+						37,348
1978	2,520	10,989	20,942	+						34,451
1979	2,350	8,682	15,086	+						26,118
1980	2,488	10,852	18,180	+						39,184
1981	4,856	14,793	14,595	+						34,244
1982	4,900	12,586	12,689	+	106					30,281
1983	4,828	6,669	12,119	+	143	12				23,771
1984	3,607	5,730	11,155	+	135	112				20,739
1985	3,746	14,267	9,601	+	174	131				27,919
1986	4,466	18,799	11,913	+	206	179	40			35,603
1987	4,085	8,646	15,009	+	252	563	200			28,755
1988	6,894	6,896	17,120	+	242	584	200			31,936
1989	(5,148)	(9,000)	8,563	(<100)	195	566	(630)	19		(24,221)
1990	(5,148)	(9,000)	9,546	(<100)	191	641	(680)	46	(<300)	(25,652)
1991	(5,148)	(4,000)	(12,250)	(<100)	(200)	(589)	(655)	(33)	(<300)	(23,275)

NOTES: **1** Primary sources of figures are SPAR 4 Report's Annex 3 and Annex 4.
2 Longline figures are annual.
3 Estimates and provisional totals are shown in parentheses.
4 "+" denotes small catches of unknown size.
5 Korean and Taiwanese estimates for 1991 are estimated using the respective 1990 American Samoa:South Pacific ratios and the 1991 American Samoa landings totals. The Tonga 1991 figure is actual, all other 1991 estimates are averages from the previous 1-4 years.

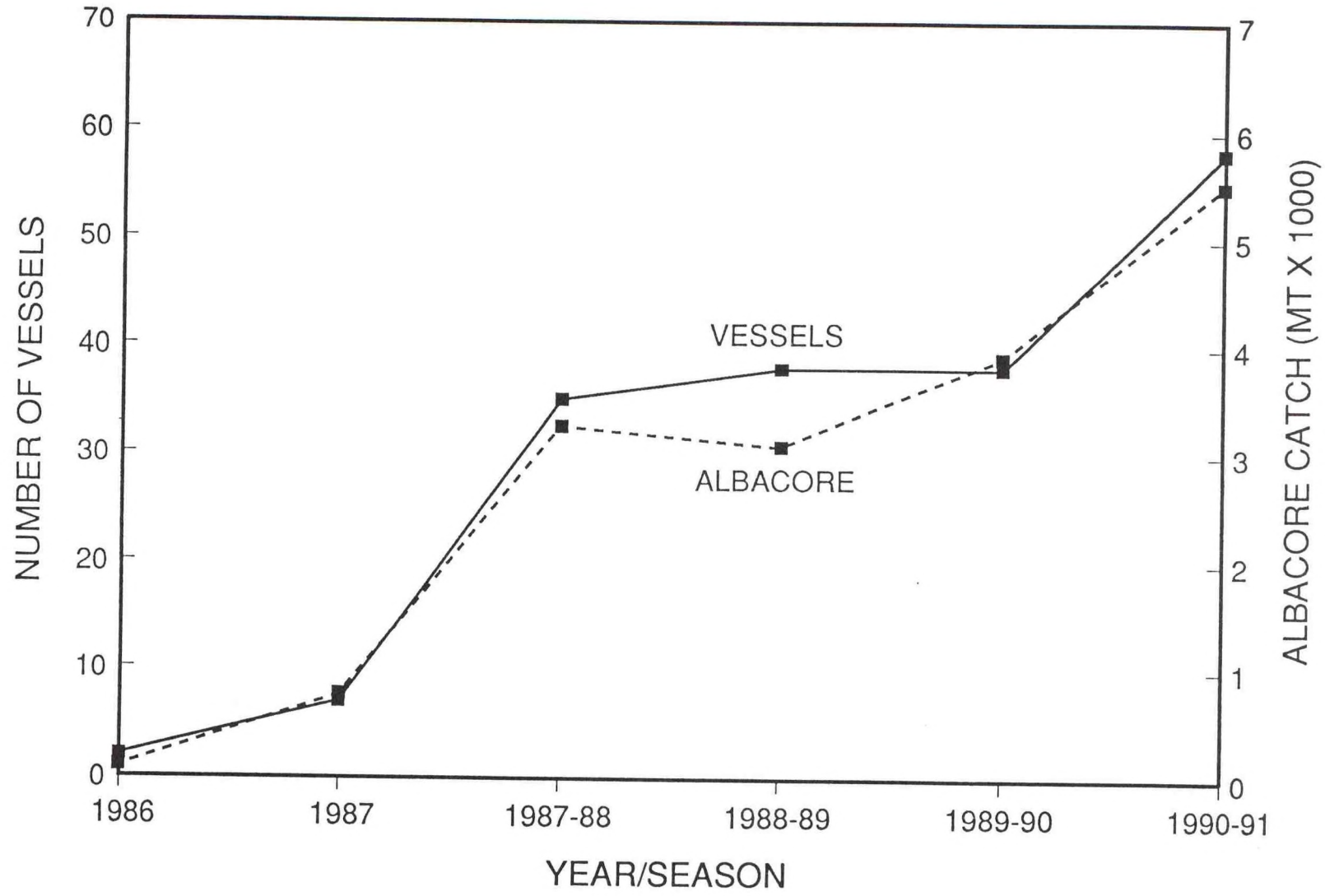

Figure 1. Number of U.S. troll vessels and albacore catch (metric tons) in the south Pacific by year/season.

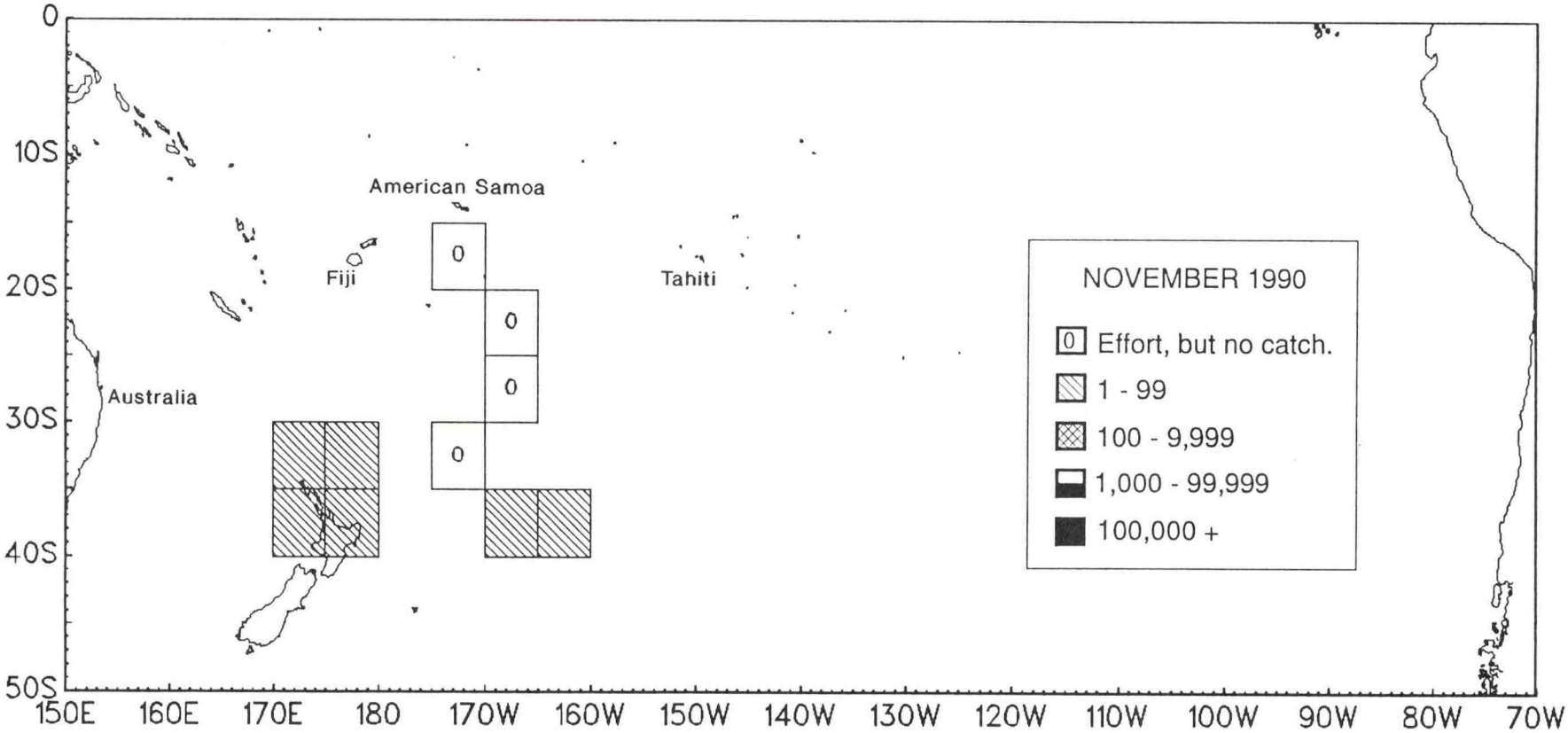

Figure 2a. Sampled U.S. albacore catch (numbers of fish) by 5° quadrangle in the south Pacific, November 1990.

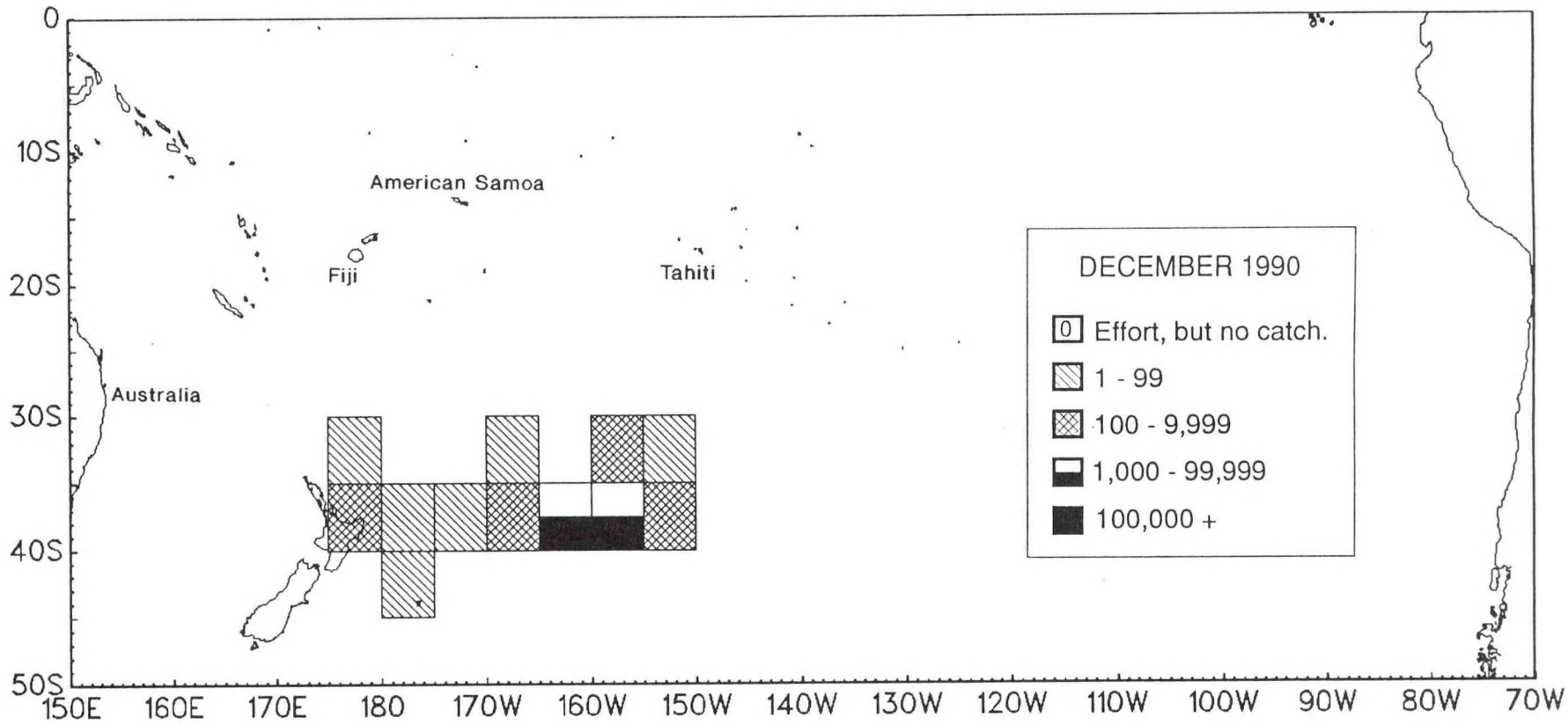

Figure 2b. Sampled U.S. albacore catch (numbers of fish) by 5° quadrangle in the south Pacific, December 1990.

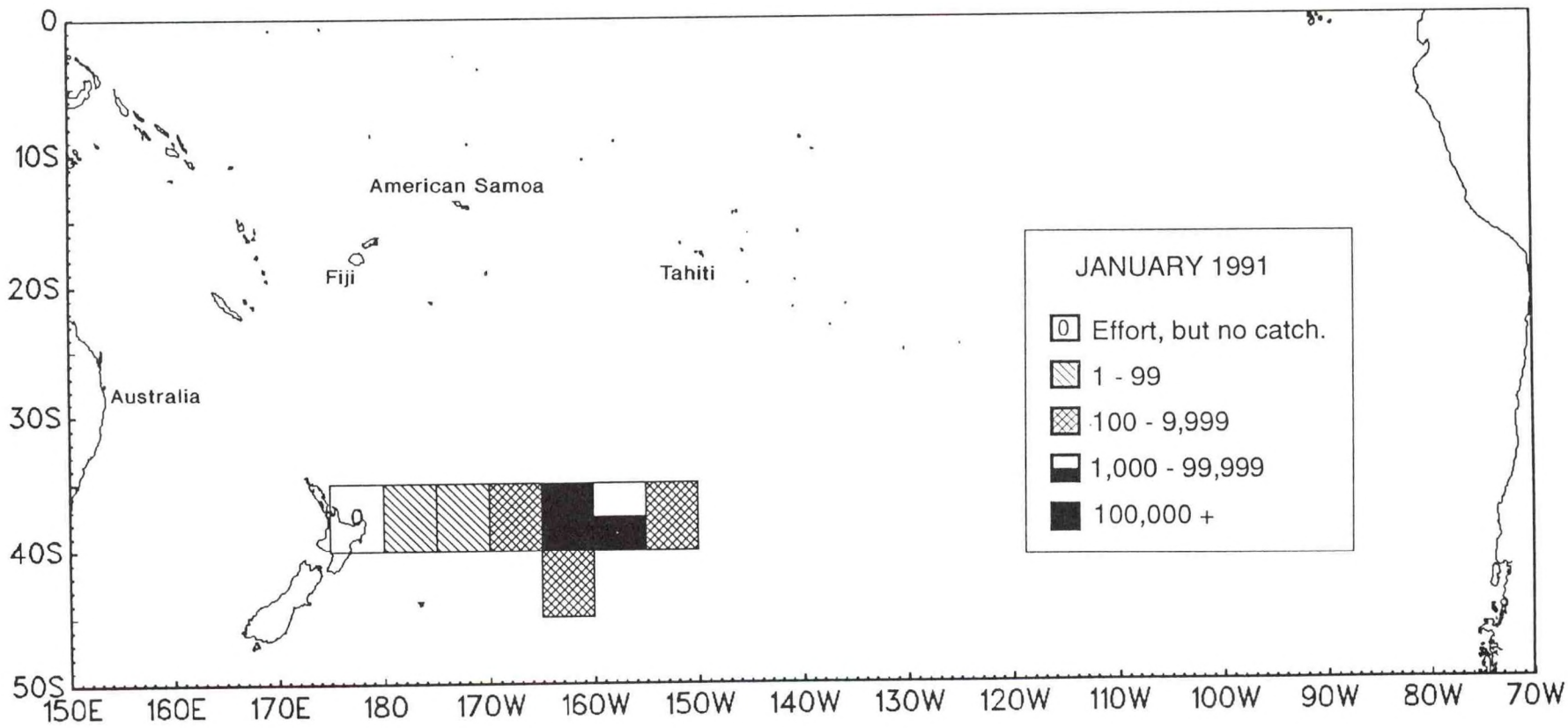

Figure 2c. Sampled U.S. albacore catch (numbers of fish) by 5° quadrangle in the south Pacific, January 1991.

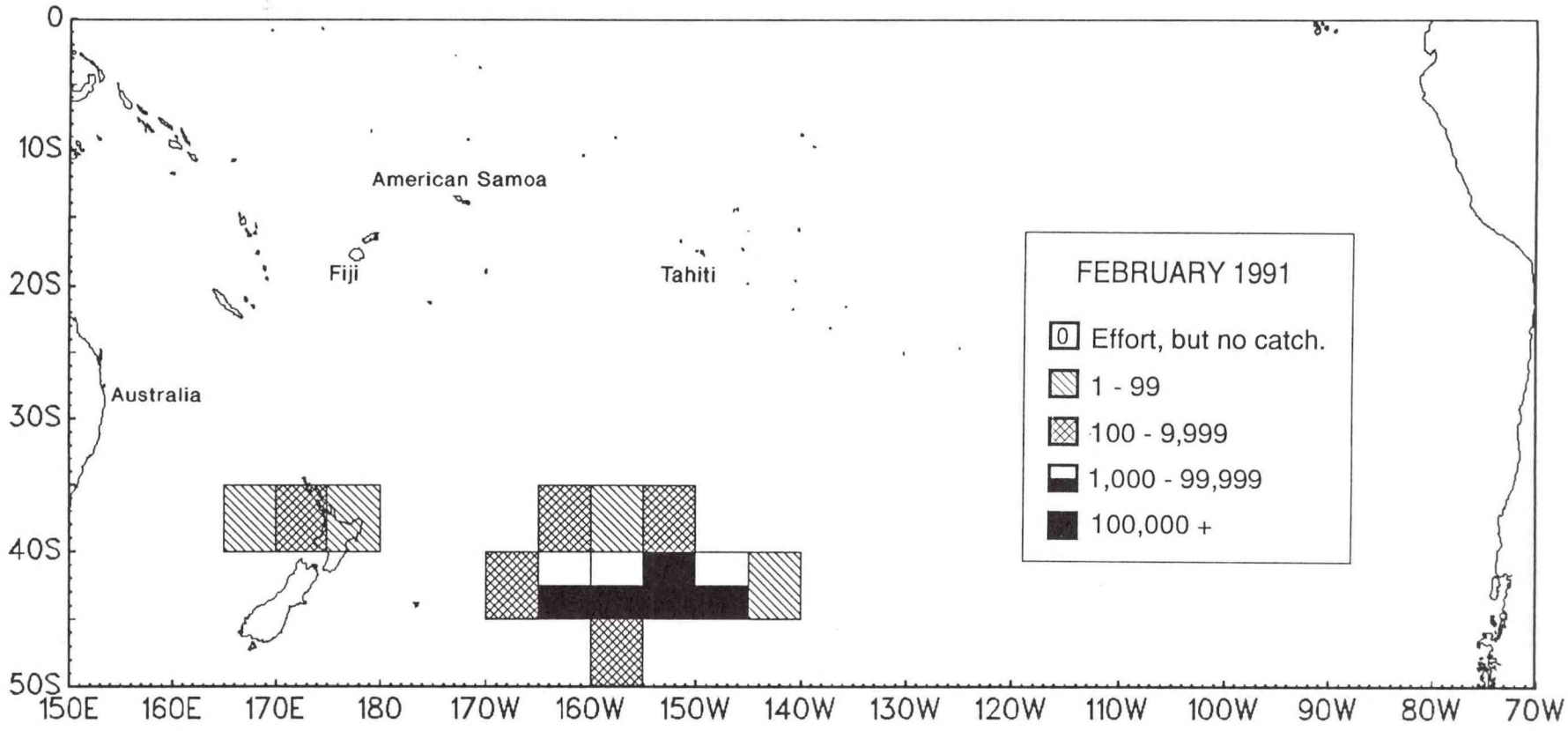

Figure 2d. Sampled U.S. albacore catch (numbers of fish) by 5° quadrangle in the south Pacific, February 1991.

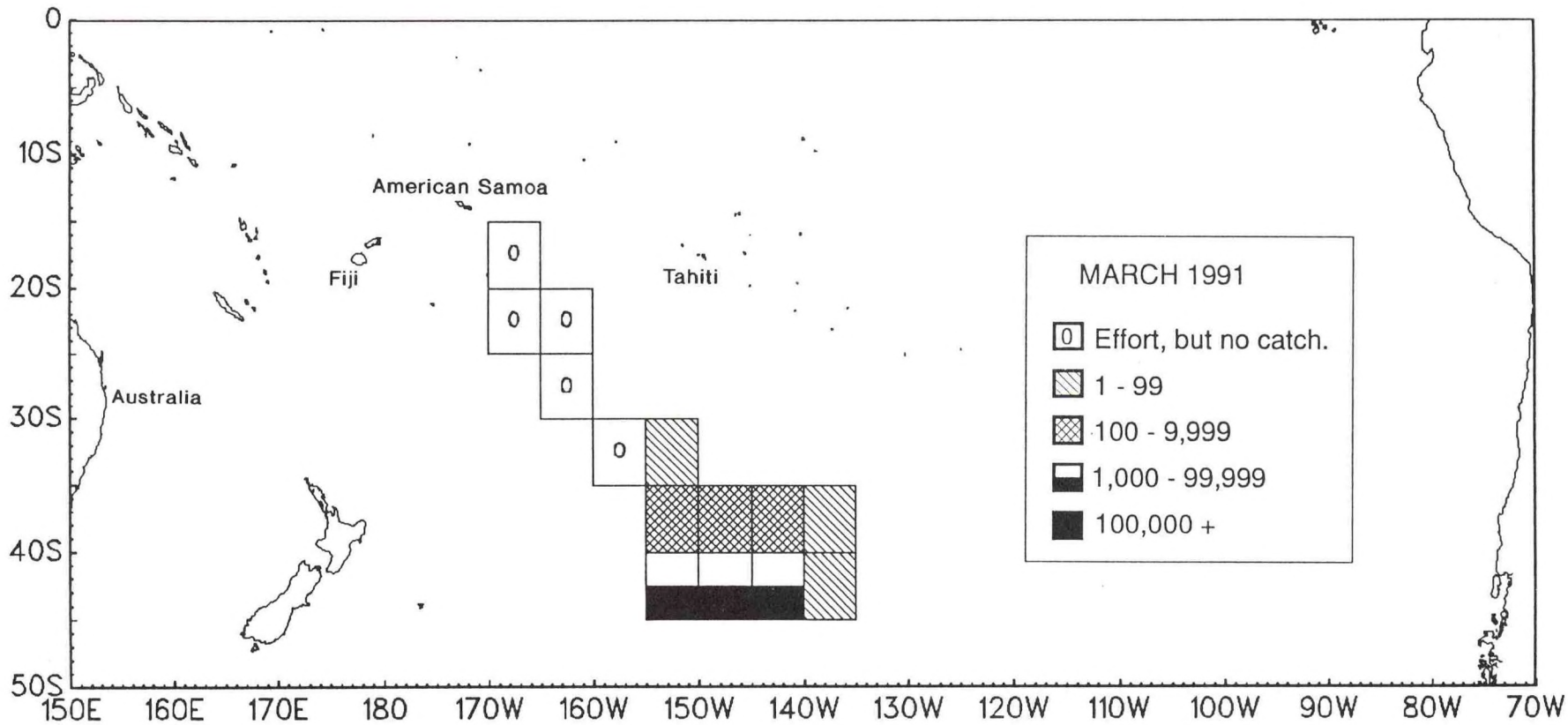

Figure 2e. Sampled U.S. albacore catch (numbers of fish) by 5° quadrangle in the south Pacific, March 1991.

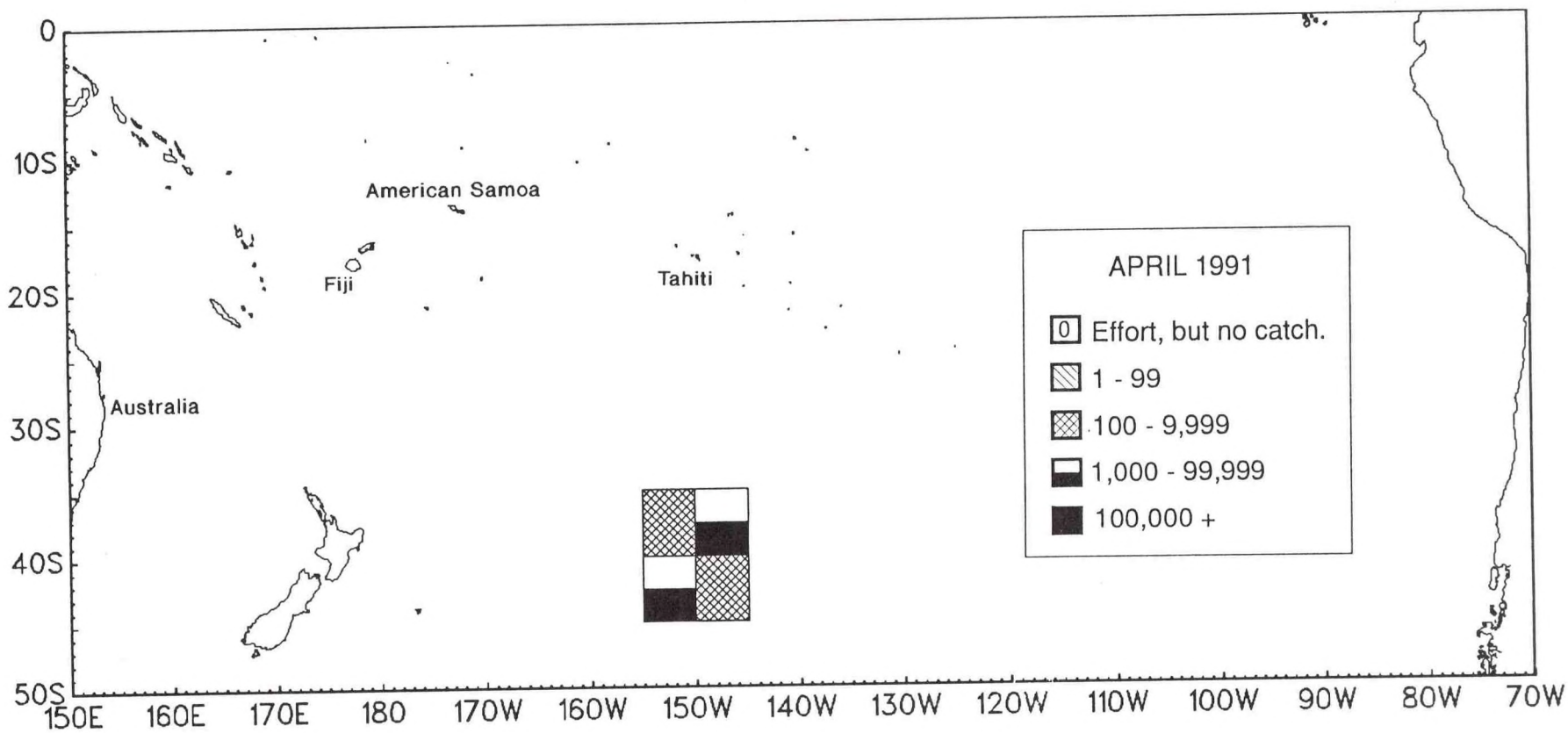

Figure 2f. Sampled U.S. albacore catch (numbers of fish) by 5° quadrangle in the south Pacific, April 1991.

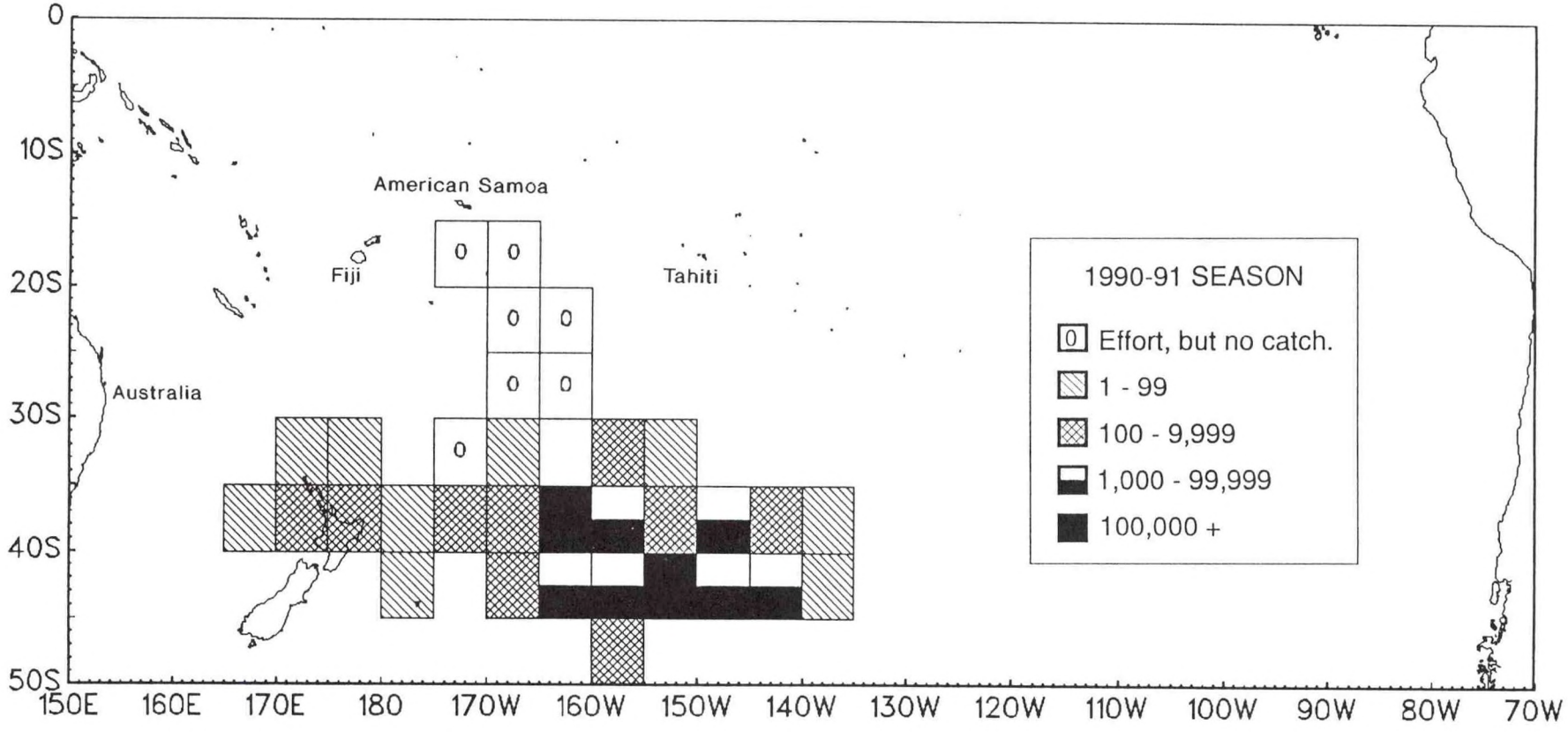

Figure 2g. Sampled U.S. albacore catch (numbers of fish) by 5° quadrangle in the south Pacific, 1990-91 season.

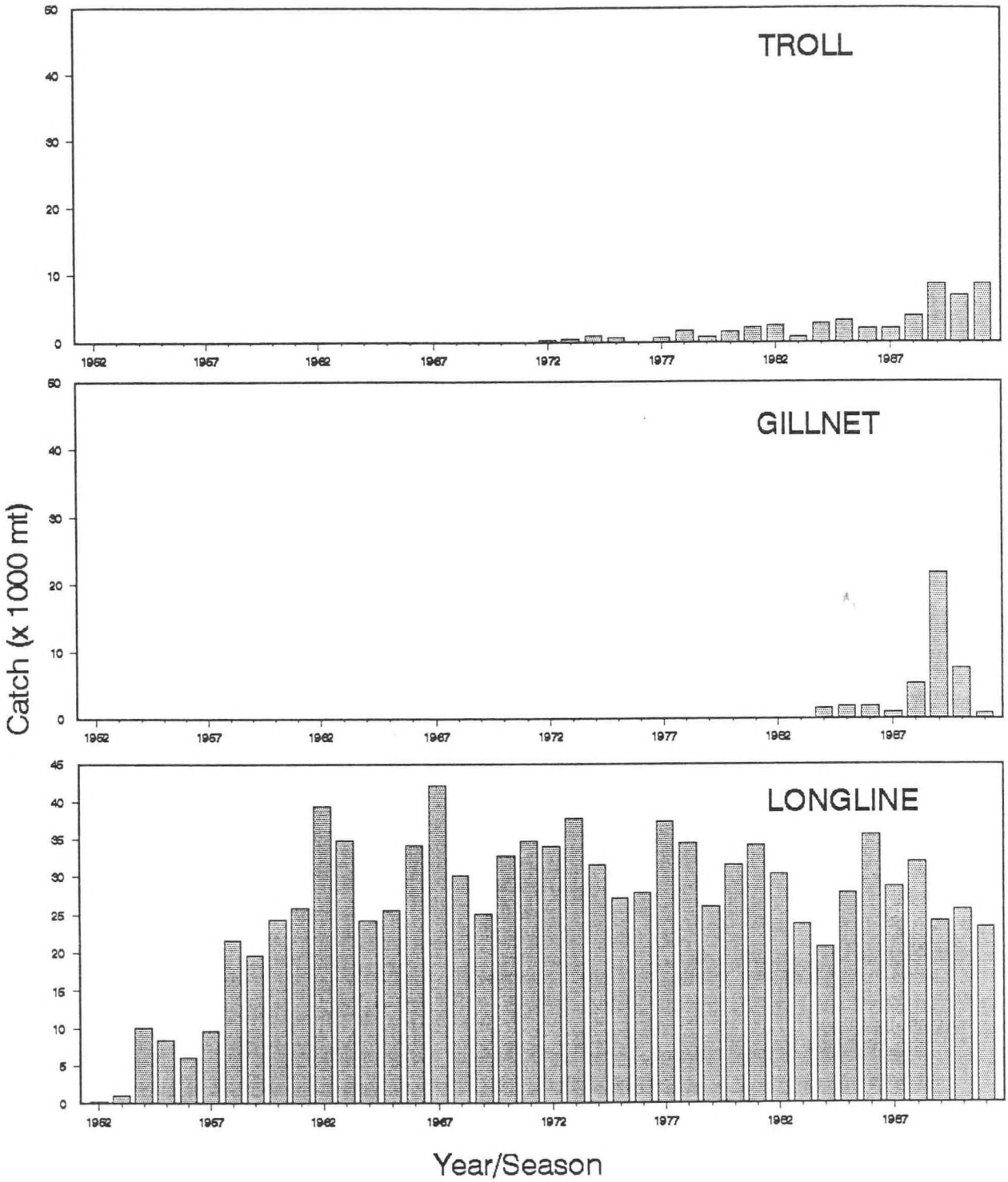

Figure 3. South Pacific albacore catch (metric tons) by gear and year/season.

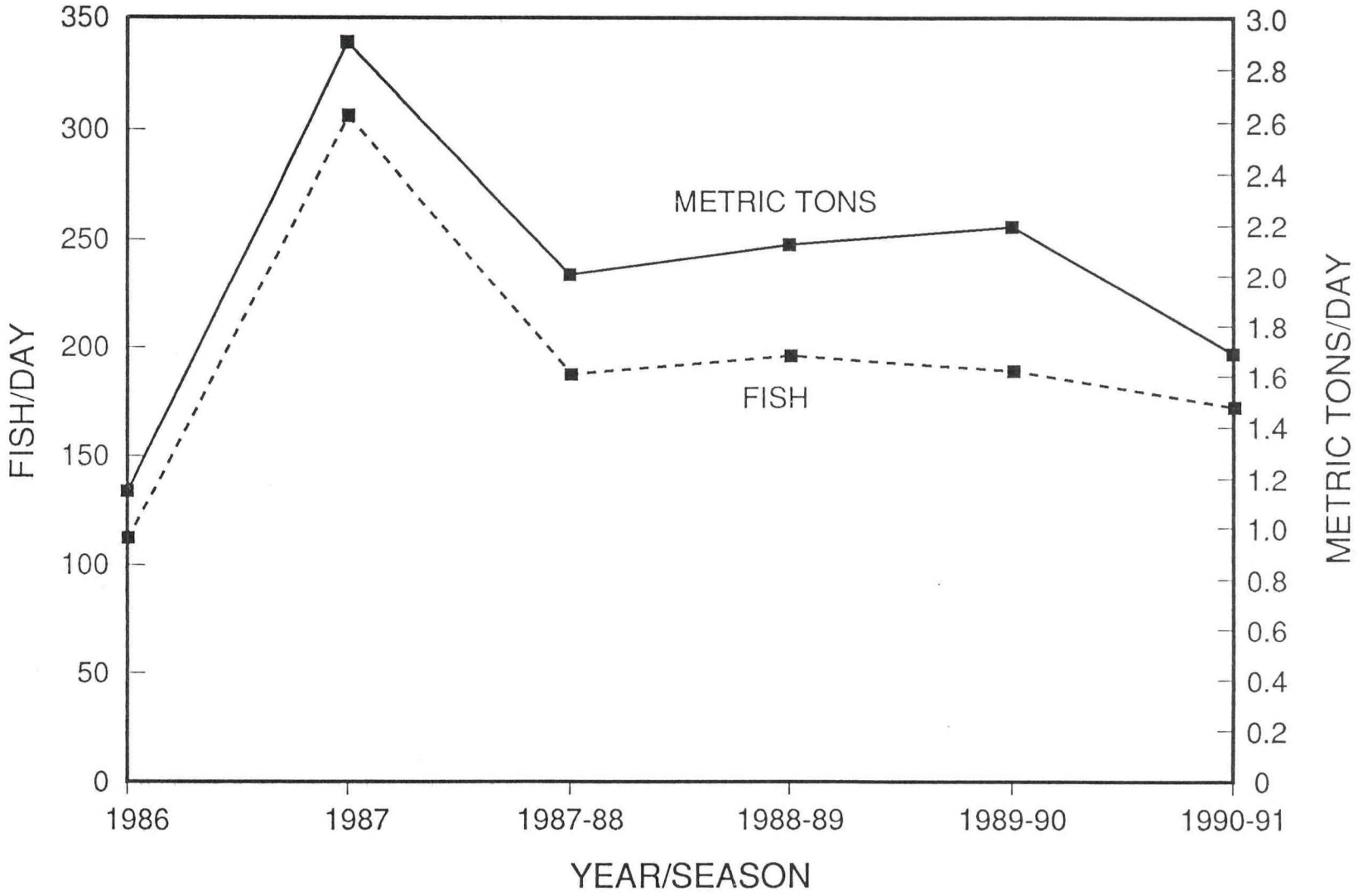

Figure 4. U.S. south Pacific albacore Catch per Effort (CPE) by year/season.

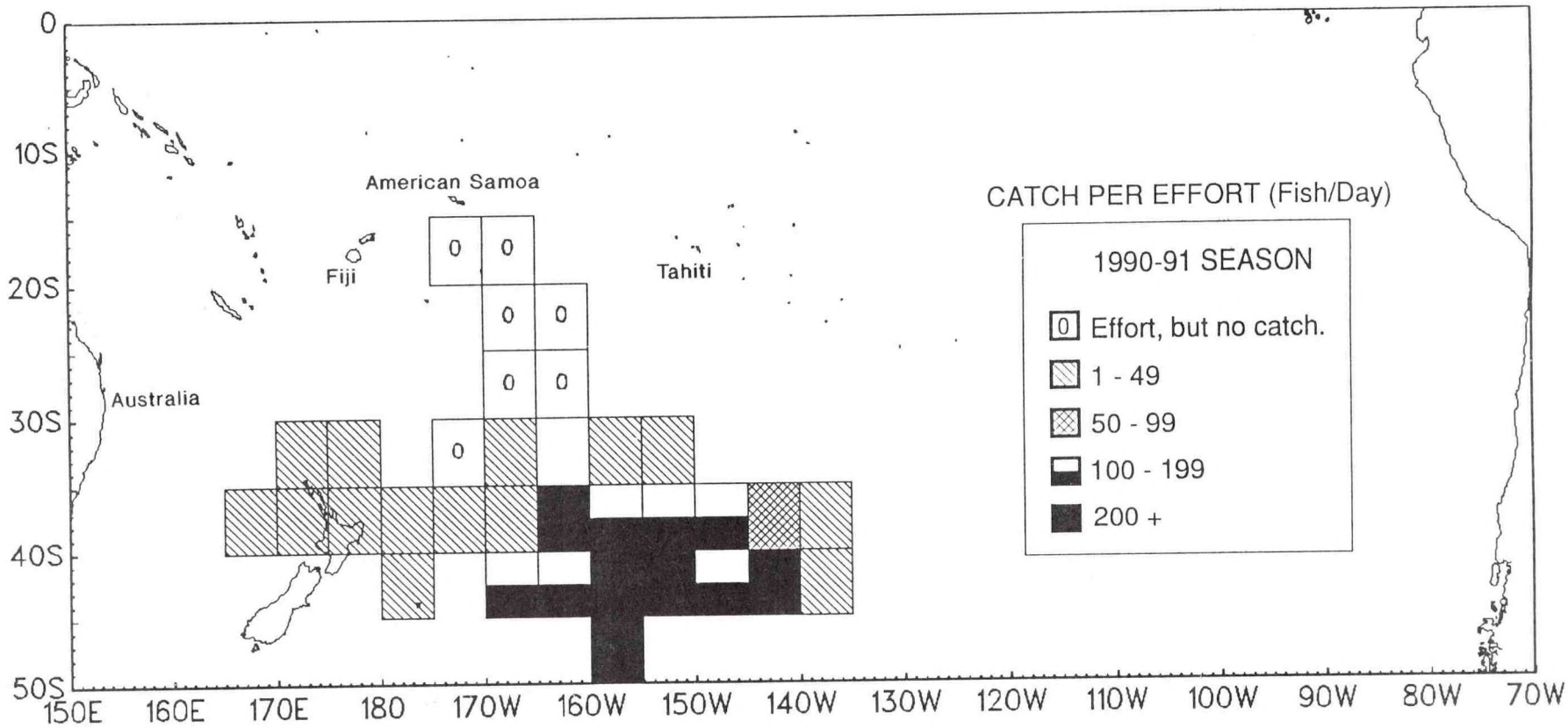

Figure 5. U.S. south Pacific albacore Catch per Effort (CPE) by 5° quadrangle, 1990-91 season.

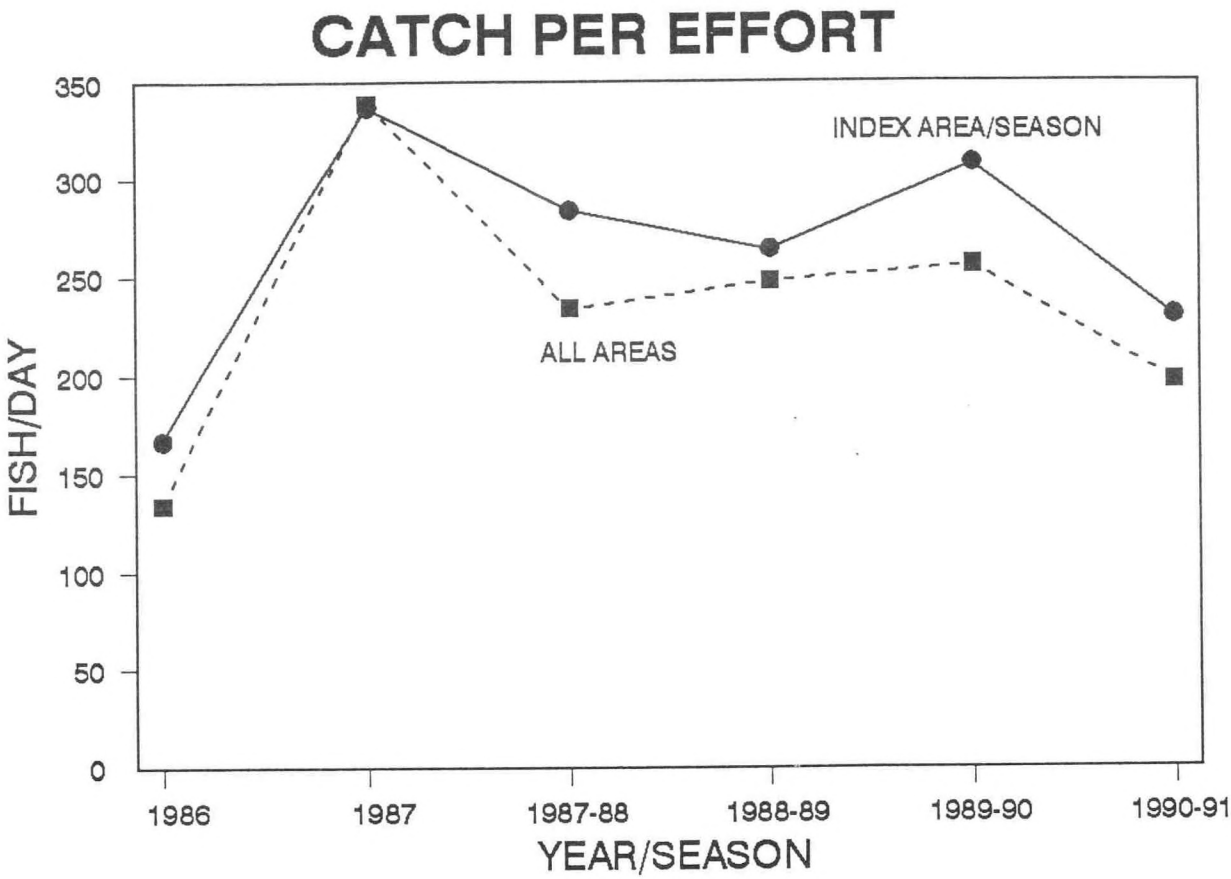

Figure 6. U.S. south Pacific albacore overall Catch per Effort (CPE), and CPE for the Index Area/Season (35-45° S and 135-165° W during January-March) by year/season.

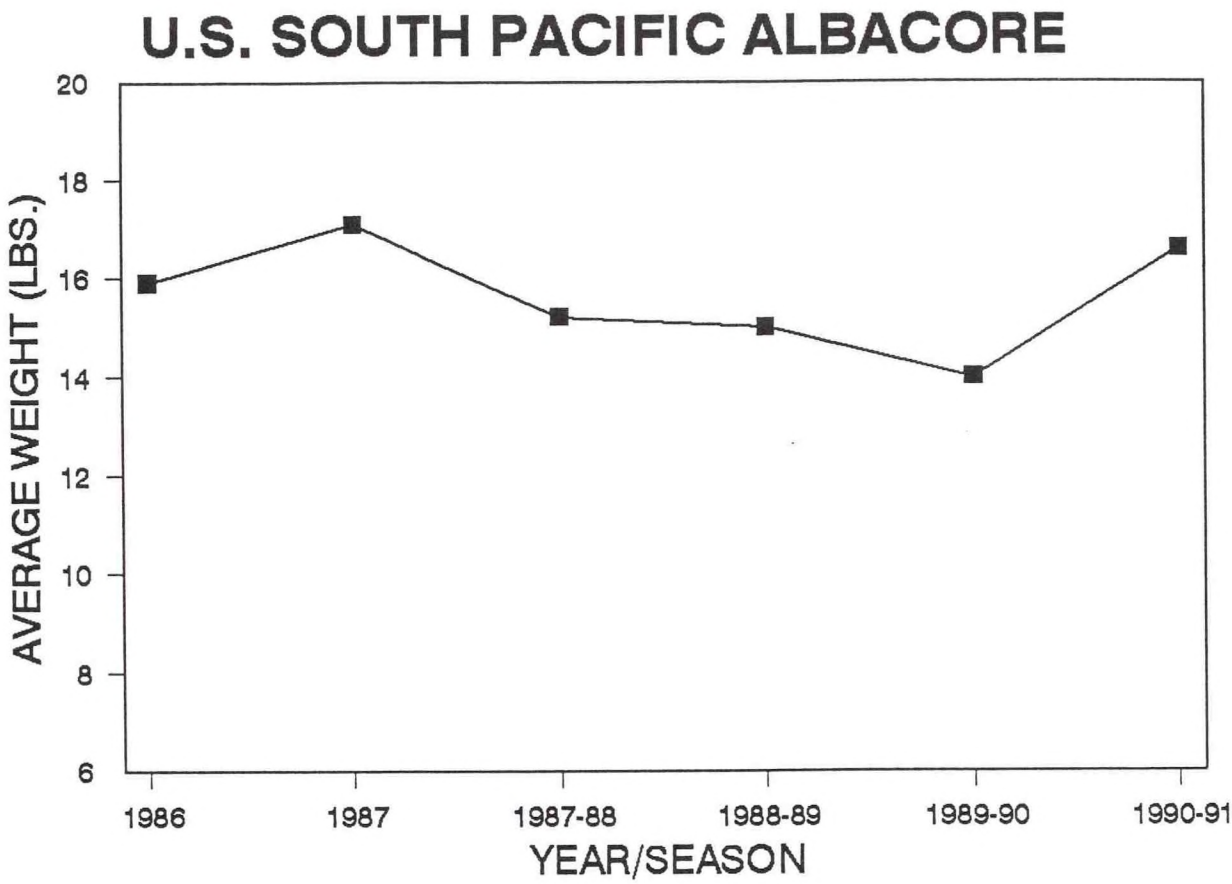

Figure 7. Average weight (pounds) of south Pacific albacore caught by U.S. vessels in the 1990-91 season.

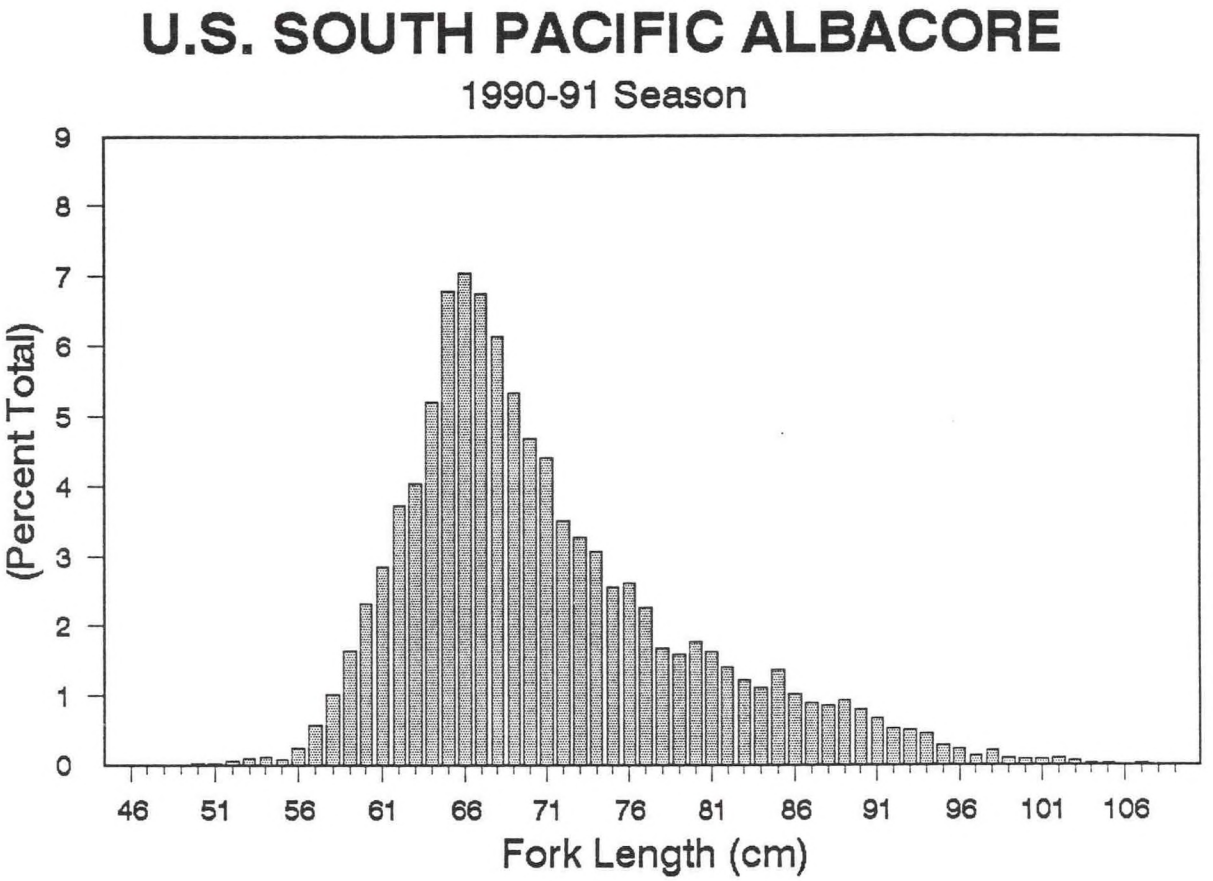

Figure 8. Length-frequency histogram of south Pacific albacore caught by U.S. vessels in the 1990-91 season.

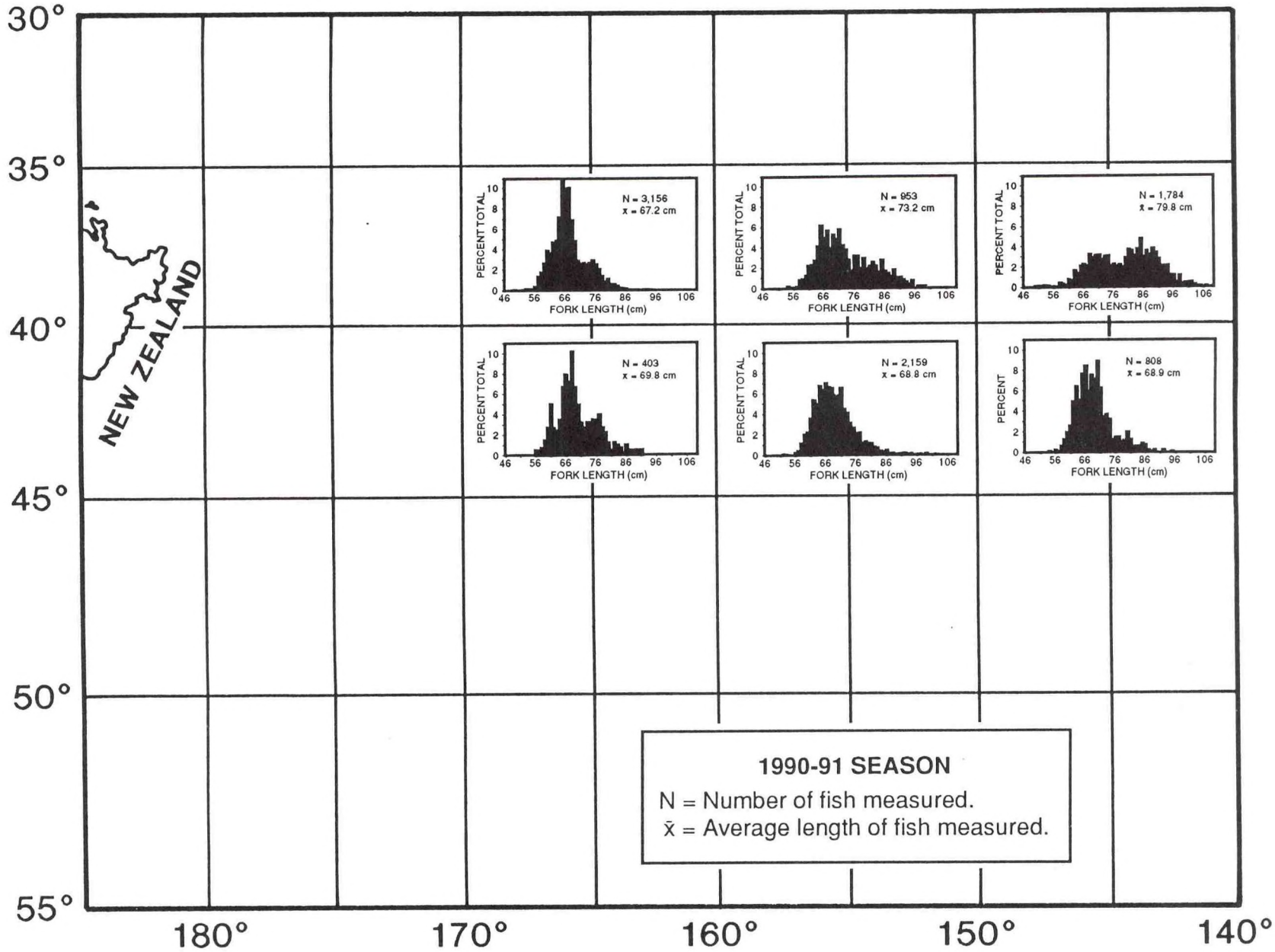

Figure 9. Length-frequency histograms of south Pacific albacore caught by U.S. vessels by 5° X 10° area in the 1990-91 season.