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JUNE 1983

SUMMARY OF THE 1982 NORTH PACIFIC ALBACORE FISHERY DATA

by

Anthony P. Majors, Atilio L. Coan, Jr.,
Norman Bartoo, and Forrest Miller

ADMINISTRATIVE REPORT LJ-83-14

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June 1982

Administrative Report No. LJ-83-14

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INTRODUCTION

As part of a continuing data collection project initiated in 1973, over 800 logbooks were distributed to fishermen participating in the 1982 United States North Pacific albacore fishery. When these fishermen landed their catches, logbooks were collected and length-frequency samples of the catches taken. In some cases, when logbooks were unavailable, fishermen were interviewed to obtain data on areas fished. Cooperating groups involved in the distribution of logbooks and the collection of these data include California Department of Fish and Game, Oregon Department of Fish and Wildlife, Washington Department of Fisheries, Pacific Marine Fisheries Commission and Western Fishboat Owners Association.

For this report, data collected from the 1982 U. S. North Pacific albacore fishery were summarized and briefly compared with those collected in 1981. Catch data for foreign fisheries, Canada, Japan, and Taiwan were also included for comparison purposes.

SAMPLING COVERAGE

The best available measure of sampling coverage for the 1982 U. S. North Pacific albacore fishery was the ratio of sampled landings to the total reported landings. Although this measure may not be as precise as the ratio of sampled catch to total catch, it was used because estimates of total sampled catch in weight were not available.

During the 1982 U. S. North Pacific albacore fishing season, an estimated 2,987 individual vessel landings of albacore were recorded at ports throughout California, Oregon, Washington and Hawaii. Of these landings, 15% (452) were sampled for catch and effort (log information collected from logbooks or interviews), and 13% (395) were sampled for length-frequency of the catch. The following table gives the sampling coverage by state.

State	Total Number of landings	Total Landings sampled	Percent coverage
Catch and Effort:			
California	2,542	253	10%
Hawaii	73	51	70%
Oregon	301	107	36%
Washington	71	41	58%
Total	2,987	452	15%
Length Frequency:			
California	2,542	248	10%
Hawaii	73	72	99%
Oregon	301	43	14%
Washington	71	32	45%
Total	2,987	395	13%

The lower sampling coverage in California was probably caused by the closure of albacore buying stations in Oregon and Washington. Vessels that normally landed their catches in Oregon and Washington landed in California. This shift in landing patterns resulted in a lower than expected sampling coverage in California since sampling effort was distributed according to normal historical landing patterns. Additionally, some albacore were sold frozen-fresh, directly to the public, and did not enter the normal sampling areas.

CATCH

In 1982, the total U. S. North Pacific albacore catch decreased 58% from 15,838 metric tons (mt) in 1981 to 6,648 mt (Table 1, Figure 1). Catch data for foreign fisheries in 1982 were not available at this time. However, catch distributions (latest available data) from the four major North Pacific albacore fisheries were included (Figure 2) to show the areas fished.

Since 1980, the U. S. North Pacific fishery for albacore operated progressively farther from the coast. To illustrate this, we have arbitrarily divided the fishery into two areas (1) the inshore area from the U. S. coastline to 145 degrees west longitude, and (2) the offshore area west of 145 degrees west longitude. The 1982 fishing season began in April, while the 1981 fishing season began in May. Both seasons lasted until October. In both

years, the fishery operated in the offshore area but for a much longer time in 1982 than in 1981 (Figure 3). In both years, catch distributions from the inshore areas remained much the same. Besides the decrease in catch, the most significant difference between the 1981 and 1982 fishing season was the distribution of catch between the inshore and offshore areas. In 1981, the inshore catch was 91% of the total catch, and the offshore catch was 9%. In 1982, the inshore catch was 43% of the total catch, and the offshore catch was 57%. This increased catch in the offshore area for 1982 was caused by increased catches in areas north of 40 degrees north latitude where over 70% of the offshore catch was located.

CATCH-PER-UNIT-EFFORT (CPUE)

We expressed catch-per-unit-effort (CPUE) in numbers of albacore per day's fishing for a hypothetical 14-meter (45-foot) jigboat. This enabled comparisons between areas and fishing years without having to additionally consider vessel size. This adjustment was required because some vessel size classes such as 15 to 18-meter (50 to 59-foot), inclusive, (the average size vessel in the 1982 fishery), caught more fish in an average day's fishing than did vessels in the 12 to 15-meter (40 to 49-foot) size class. A single day's fishing for a large vessel was equivalent to a full fishing day plus a fraction of a fishing day for a 14-meter (45-foot) vessel.

Annual estimated standardized CPUE, in numbers of fish per day's fishing for a standard 14-meter (45-foot) jigboat, decreased from 80 fish per day in 1981 to 62 fish per day in 1982 (Figure 4). Estimates of CPUE for 1982, as in 1981, were highest during the month of August (Figure 5). In 1982, fewer 1-degree squares had CPUEs greater than 200 fish per day than in 1981. Also, unlike 1981, in 1982, only two 1-degree square inshore areas had CPUEs greater than 200 fish per day. The offshore areas of high CPUE in 1982 were predominately located north of 40 degrees north latitude.

LENGTH FREQUENCY

Length-frequency samples of the 1982 North Pacific albacore catch were taken mostly from jigboats and were very similar to those collected in 1981 (Figure 6). The majority of fish caught in the inshore area were between 60 and 66 centimeters (cm) in fork length (tip of nose to fork of tail). The majority of the fish caught in the offshore area were between 74 and 80 cm. The number of fish sampled in some areas may not be adequate, and some minor deviations from the actual fish sizes in the catch may exist.

SEA-SURFACE TEMPERATURE

Sea-surface temperatures (SST) compiled and analyzed into monthly or seasonal charts provided useful data for locating surface ocean fronts and regions of relatively cold or warm water. In general, these fronts could be used in locating fishing areas for albacore. In inshore areas, mean monthly patterns of SST data over the eastern north Pacific from April to October 1982

showed no large scale and persistent regions of positive or negative departures from normal (Figure 7). In contrast, from July to September 1981, there were large areas with SSTs 2.2 to 3.3 degrees C (4 to 6 degrees F) below normal in the offshore area and centered along 40 degrees north latitude. In the inshore area and south of 40 degrees north, SSTs were warmer than normal over large areas from April to June, and again from September to October 1981. Thus, in 1981, there were frequent periods of stronger ocean fronts than for corresponding periods in 1982, in most fishing areas. This was due, in part, to the more abnormal SST conditions which existed during 1981 in the eastern north Pacific. In areas closer to the U. S. west coast (areas east of 125 degrees west), there were no marked differences in SST patterns between 1981 and 1982 for the April to October periods.

DISCUSSION

Both the 1982 and 1981 U. S. North Pacific albacore fisheries started when jigboats leaving for areas off Midway Island reported catches in areas west of Erben Bank. The 1982 season started in April, and the 1981 season a month later in May. The sizes of fish caught in both years were essentially the same. The major observed differences between the 1982 fishing season and the 1981 fishing season were 1) the fleet spent more time and experienced higher catches and CPUEs in the offshore areas, especially in areas north of 40 degrees north latitude, 2) the total catch decreased 58%, and 3) SSTs were closer to normal in all areas. The instability in marketing conditions and the inability of smaller boats to fish offshore may have contributed to the lower total catch in 1982.

Table 1. Catches for North Pacific albacore in metric tons, 1952-1982.

Year	Japan					Taiwan & Korea	United States				Canada	
	Pole-and-line	Long-line	Gill-net	Other gear	Total	Longline	Baitboat	Jigboat	Sport	Total	Jigboat	Grand Total
1952	41,386	26,687		237	68,710			23,843	1,373	25,216	71	93,997
1953	32,921	27,777		132	60,830			15,740	171	15,911	5	76,746
1954	28,069	20,958		38	49,065			12,246	147	12,393		61,458
1955	24,236	16,277		136	40,649			13,264	577	13,841		54,490
1956	42,810	14,341		57	57,208			18,751	482	19,233	17	76,458
1957	49,500	21,053		151	70,704			21,165	304	21,469	8	92,181
1958	22,175	18,452		124	40,731			14,855	48	14,903	74	55,708
1959	14,252	15,502		67	30,121			20,990		20,990	212	51,323
1960	23,156	17,369		76	42,601			20,100	557	20,657	5	63,263
1961	18,636	17,437		268	36,341		2,837	12,054	1,355	16,246	4	52,591
1962	8,729	15,764		191	24,684		1,085	19,753	1,681	22,519	1	47,204
1963	26,420	13,464		218	40,102		2,432	25,142	1,161	28,735	5	68,812
1964	23,858	15,458		319	39,635	26	3,411	18,389	824	22,624	3	62,283
1965	41,491	13,701		121	55,313	16	417	16,461	731	17,609	15	72,953
1966	22,830	25,050		585	48,465	16	1,600	15,169	588	17,357	44	65,882
1967	30,481	28,869		520	59,870	17	4,113	17,814	707	22,634	161	82,682
1968	16,597	23,961		1,109	41,667	15	4,906	20,441	951	26,298	1,028	69,008
1969	32,107	18,006		1,480	51,593	21	2,996	18,826	358	22,180	1,365	75,157
1970	24,376	15,372		956	40,704	23	4,416	21,039	822	26,277	354	67,358
1971	53,198	11,035		1,262	65,495	24	2,071	22,496	1,175	25,442	1,587	92,548
1972	60,762	12,649	1	921	74,333	25	3,750	23,600	637	27,987	3,558	105,903
1973	69,811	16,059	39	1,883	87,792	35	2,236	15,652	88	17,976	1,270	107,073
1974	73,576	13,053	224	1,065	87,918	40	4,777	20,177	739	25,693	1,207	114,858
1975	52,157	10,060	166	402	62,785	28	3,243	18,926	1,243	23,412	101	86,326
1976	85,336	15,896	1,070	1,394	103,696	37	2,700	16,314	766	19,780	252	123,765
1977	31,934	15,737	688	1,039	49,398	561	1,497	10,012	619	12,128	53	62,140
1978	59,877	13,061	4,029	3,209	80,176	53	950	15,700	871	17,512	23	97,773
1979	44,662	14,249	2,856	1,280	63,047	81	303	6,253	75	6,631	289	70,050
1980	46,743	14,660	2,986	1,516	65,905		382	7,599	174	8,155	212	74,272
1981	26,000		20,000							15,838	200	
1982										6,648	103	

Remarks:

1. Figures for 1980-82 are preliminary.
2. Japanese longline catches for 1952-60 exclude minor amounts taken by vessels under 20 gross tons. Longline catches in weight are estimated by multiplying annual number of fish caught by average weight statistics.
3. Japanese pole-and-line catches include catches by research vessels.
4. United States jigboat catches include minor amounts taken by baitboats not submitting logbooks.
5. Jigboat catches for years 1952-60 include baitboat catches.
6. United States sport catch is a minimum estimate based on partial coverage.
7. Grand totals omit unknown but minor catches by longline and pole-and-line vessels of the Republic of Korea.

TOTAL CATCH BY FISHERY

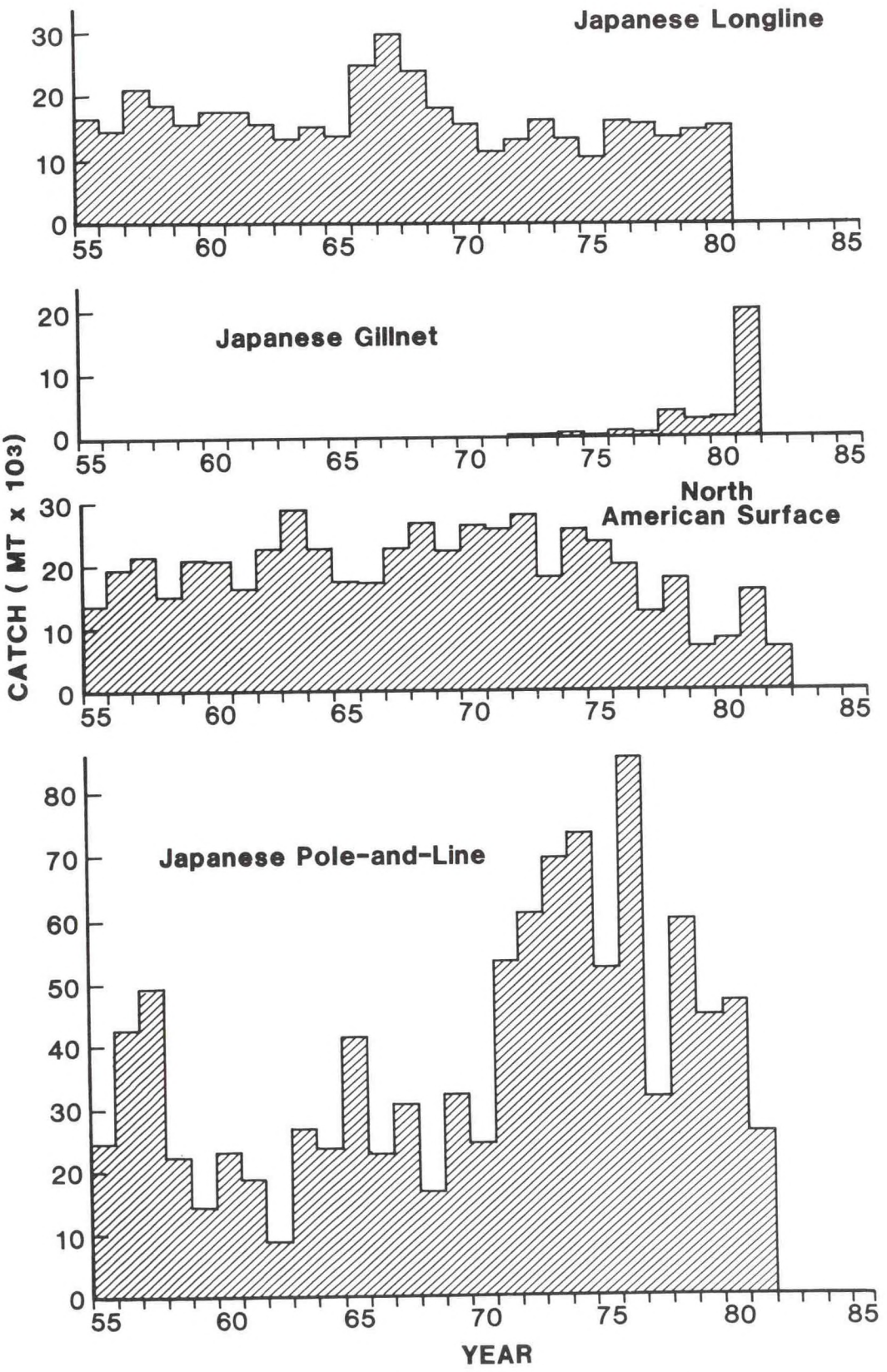

Figure 1. Total catch (metric tons) by fishery and year

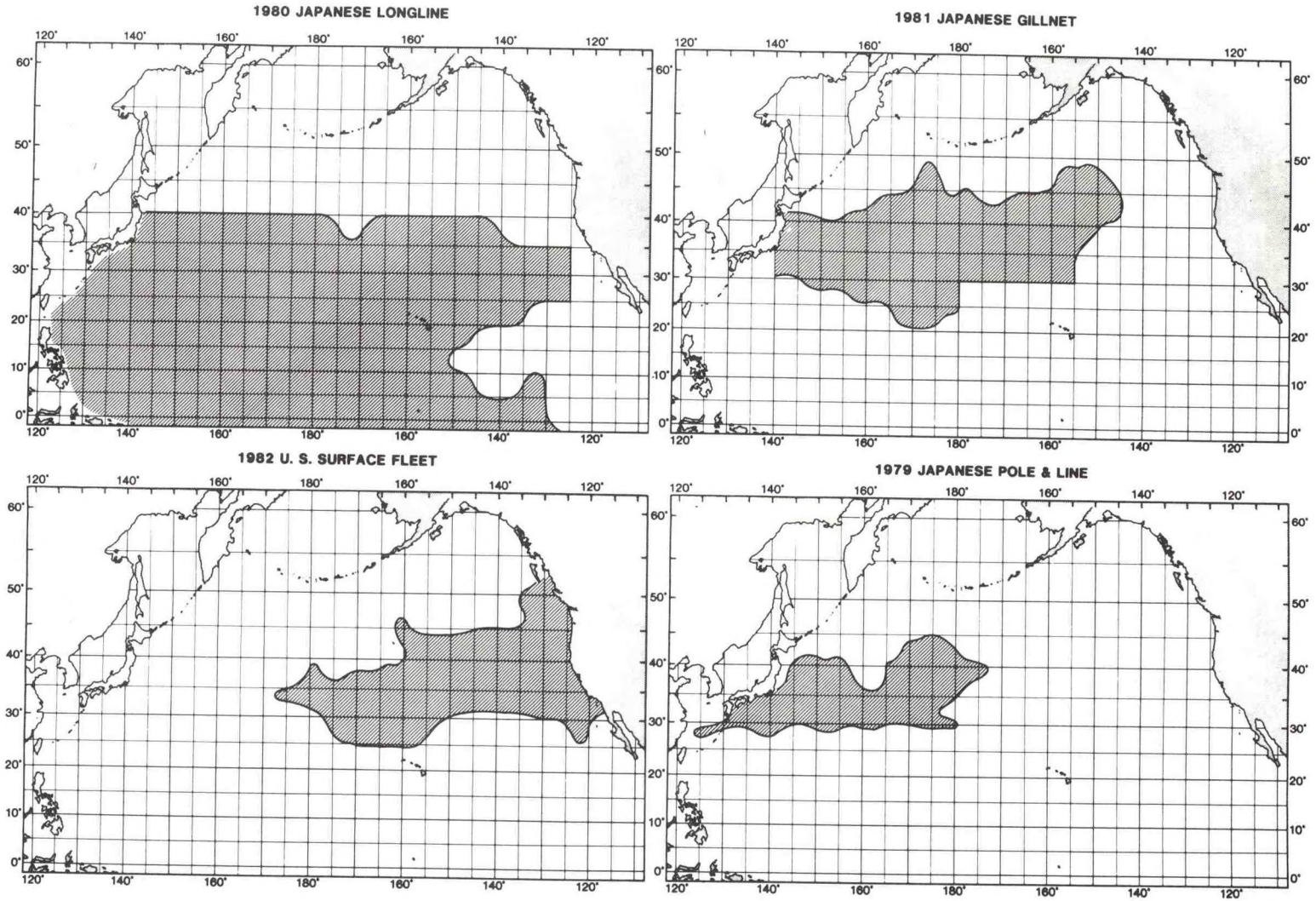

Figure 2. Catch distributions of the four major fisheries for the North Pacific albacore.

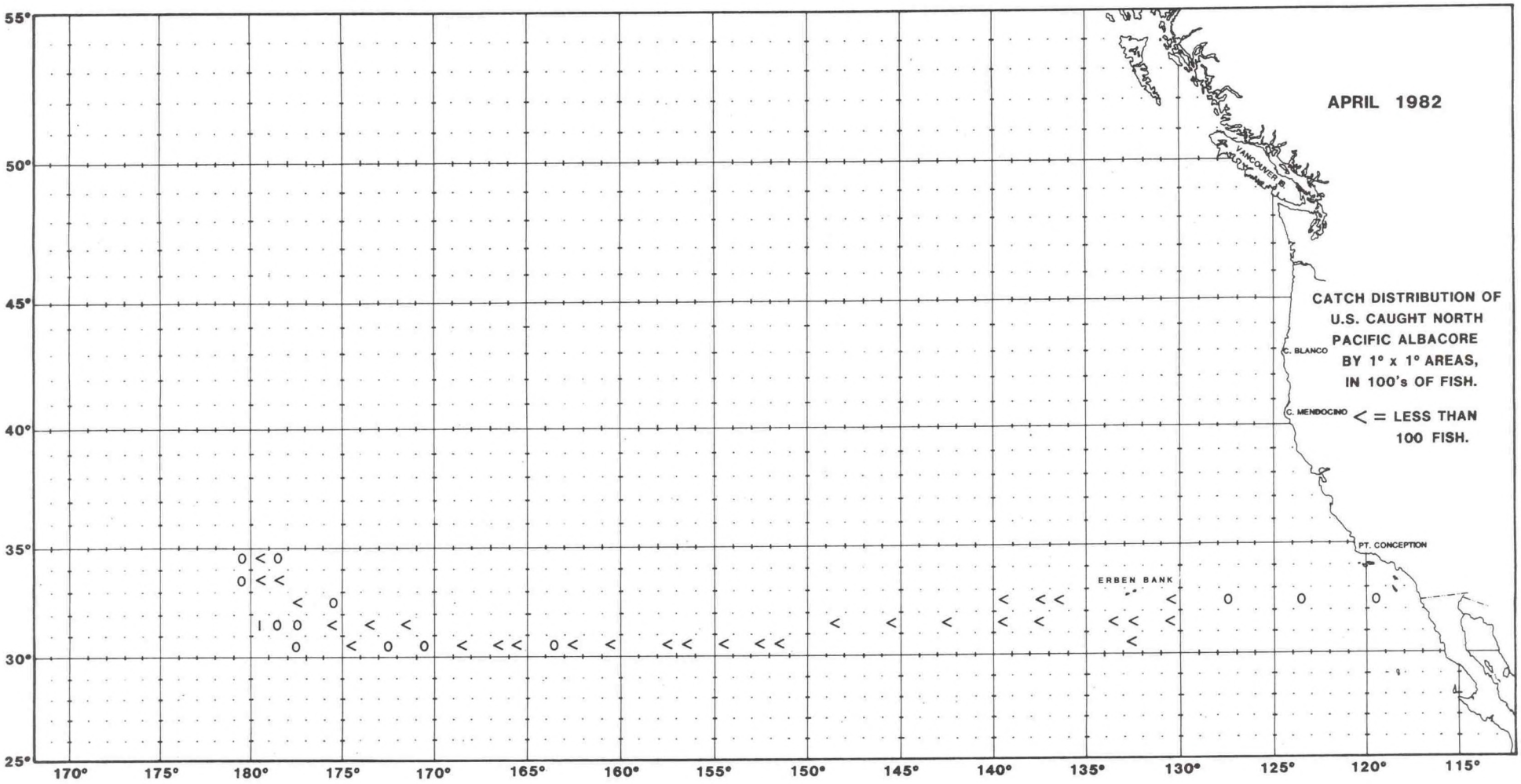

Figure 3a. Combined jigboat and baitboat fishery catches (in numbers of fish) by 1-degree square area, April 1982.

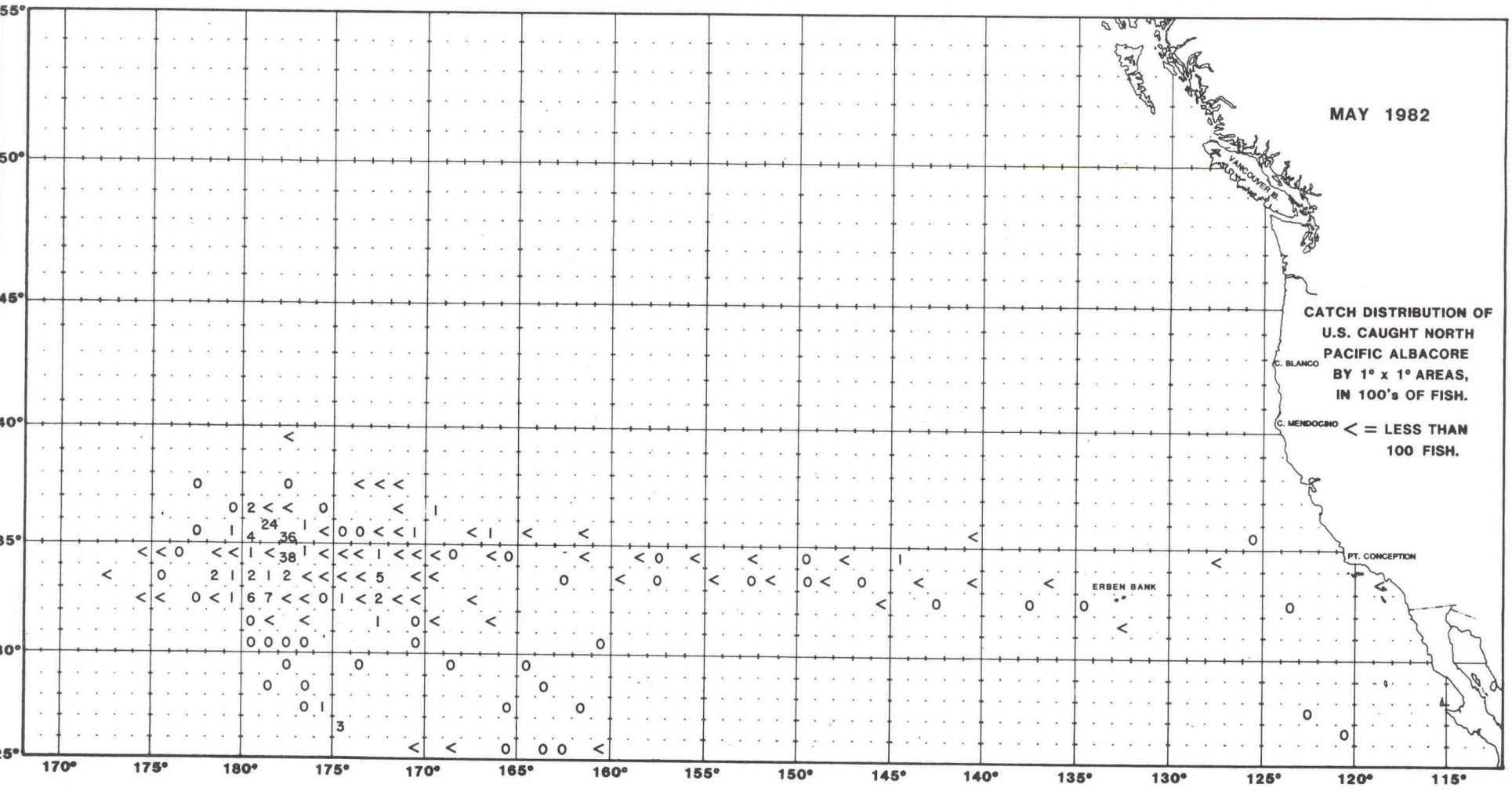

Figure 3b. Combined jigboat and baitboat fishery catches (in numbers of fish) by 1-degree square area, May 1982.

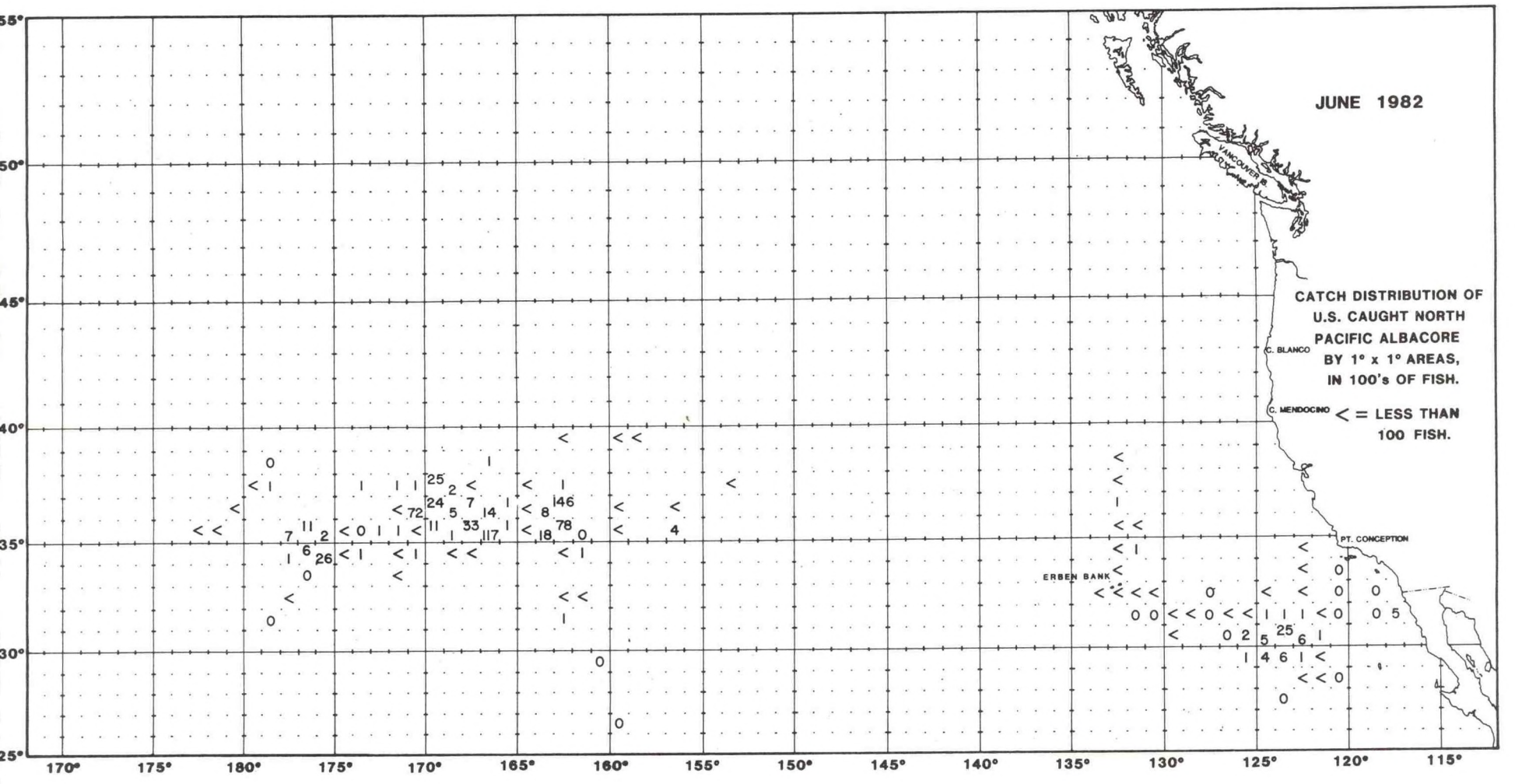

Figure 3c. Combined jigboat and baitboat fishery catches (in numbers of fish) by 1-degree square area, June 1982.

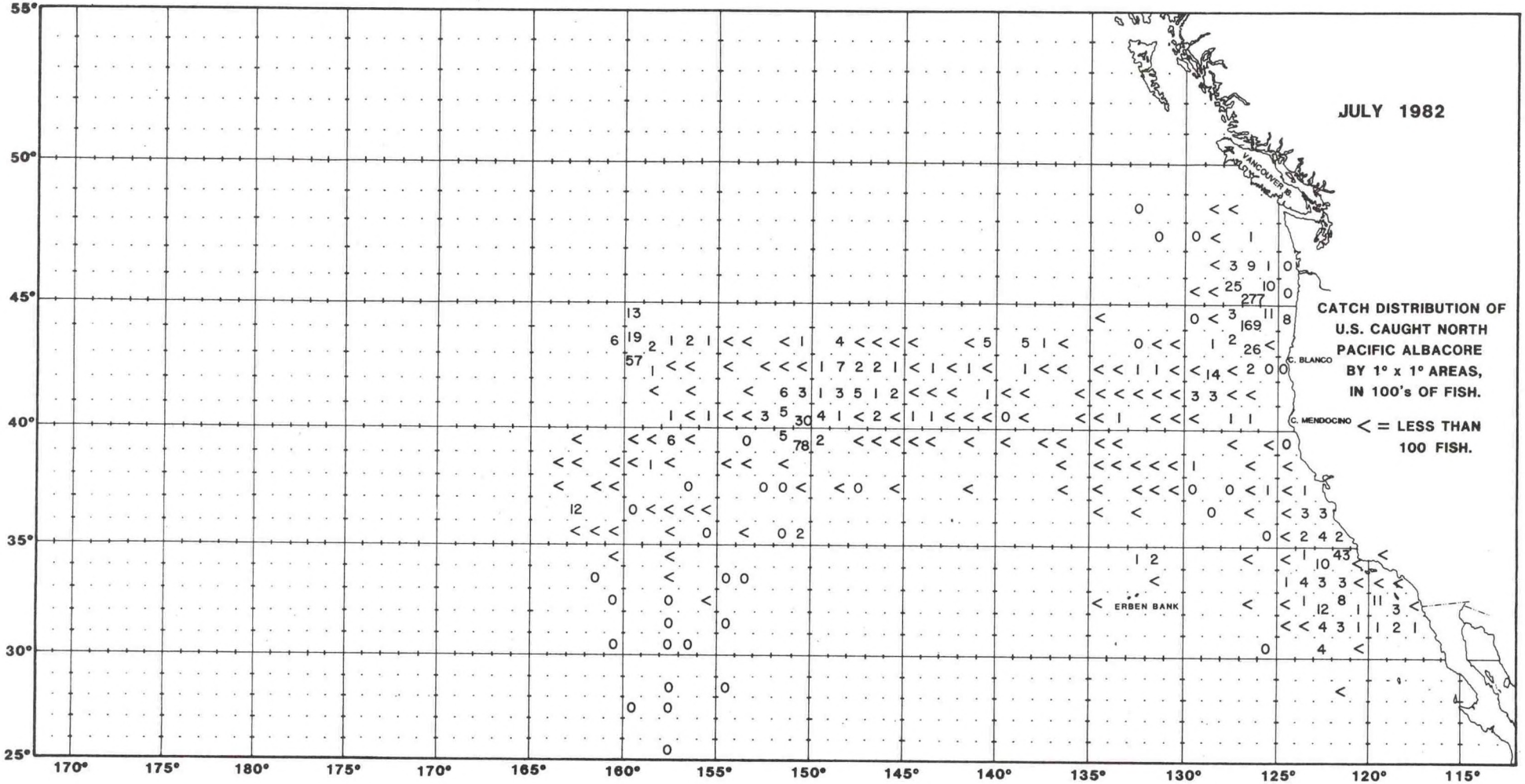

Figure 3d. Combined jigboat and baitboat fishery catches (in numbers of fish) by 1-degree square area, July 1982.

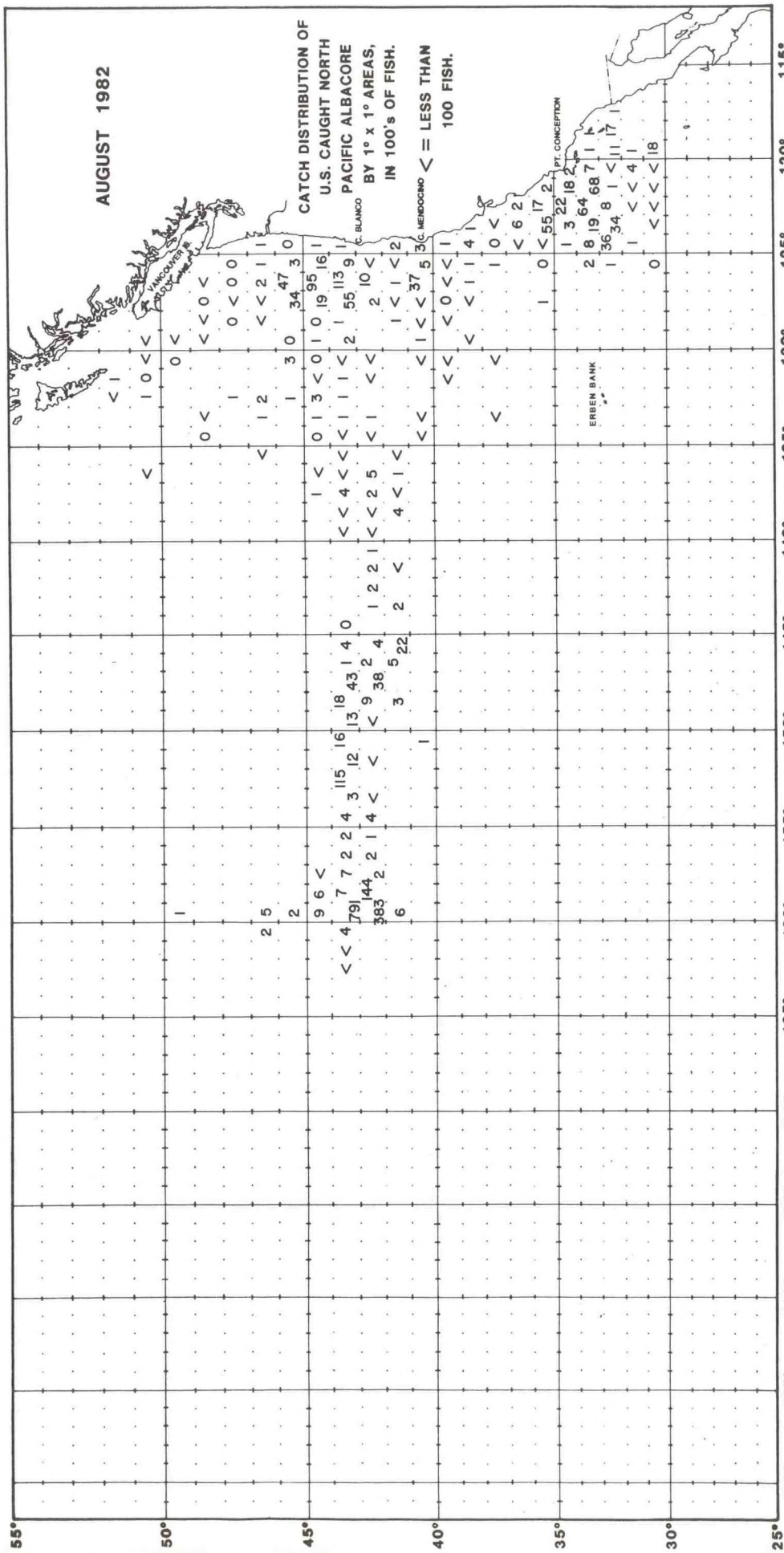

Figure 3e. Combined jigboat and baitboat fishery catches (in numbers of fish) by 1-degree square area, August 1982.

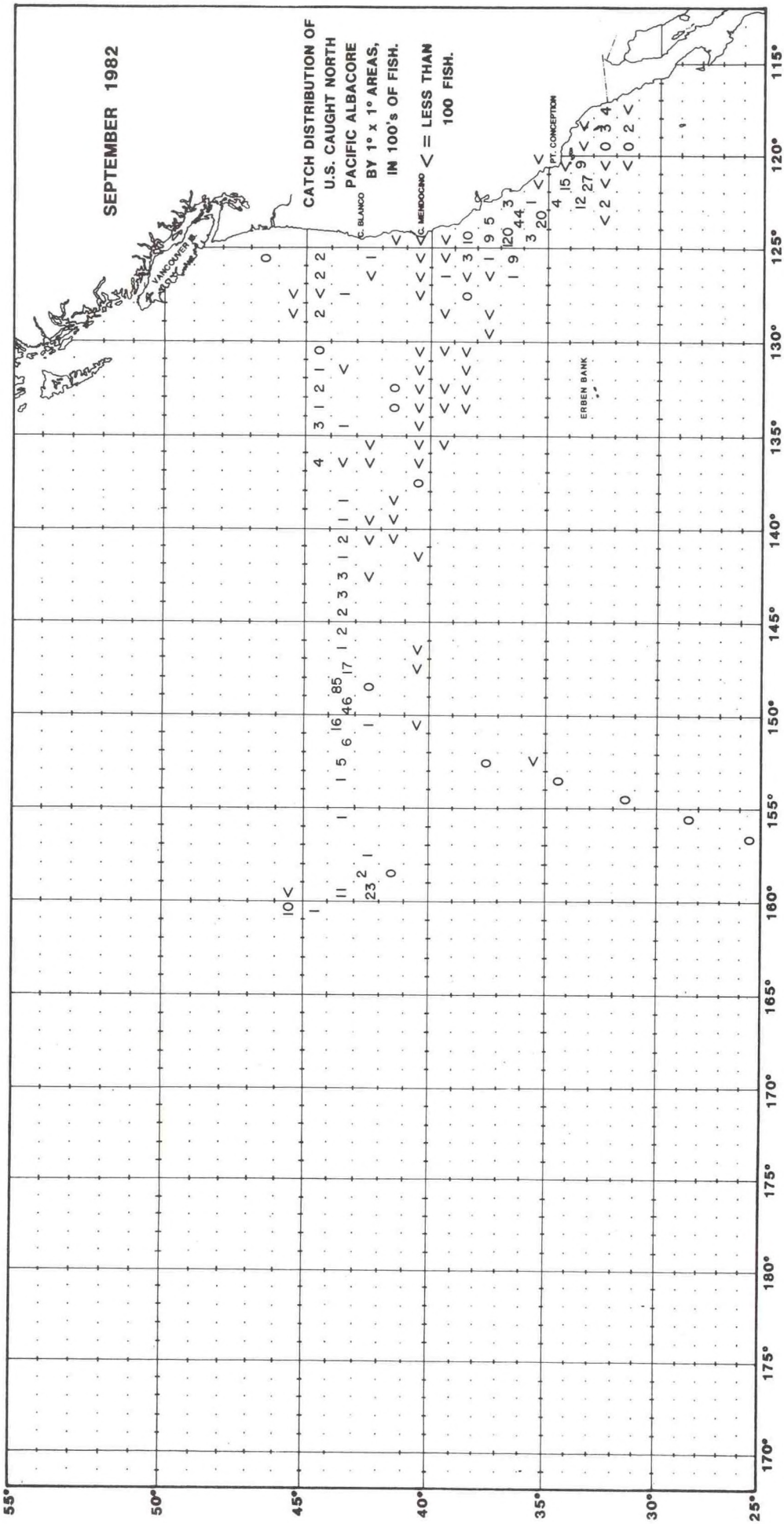

Figure 3f. Combined jigboat and baitboat fishery catches (in numbers of fish) by 1-degree square area, September 1982.

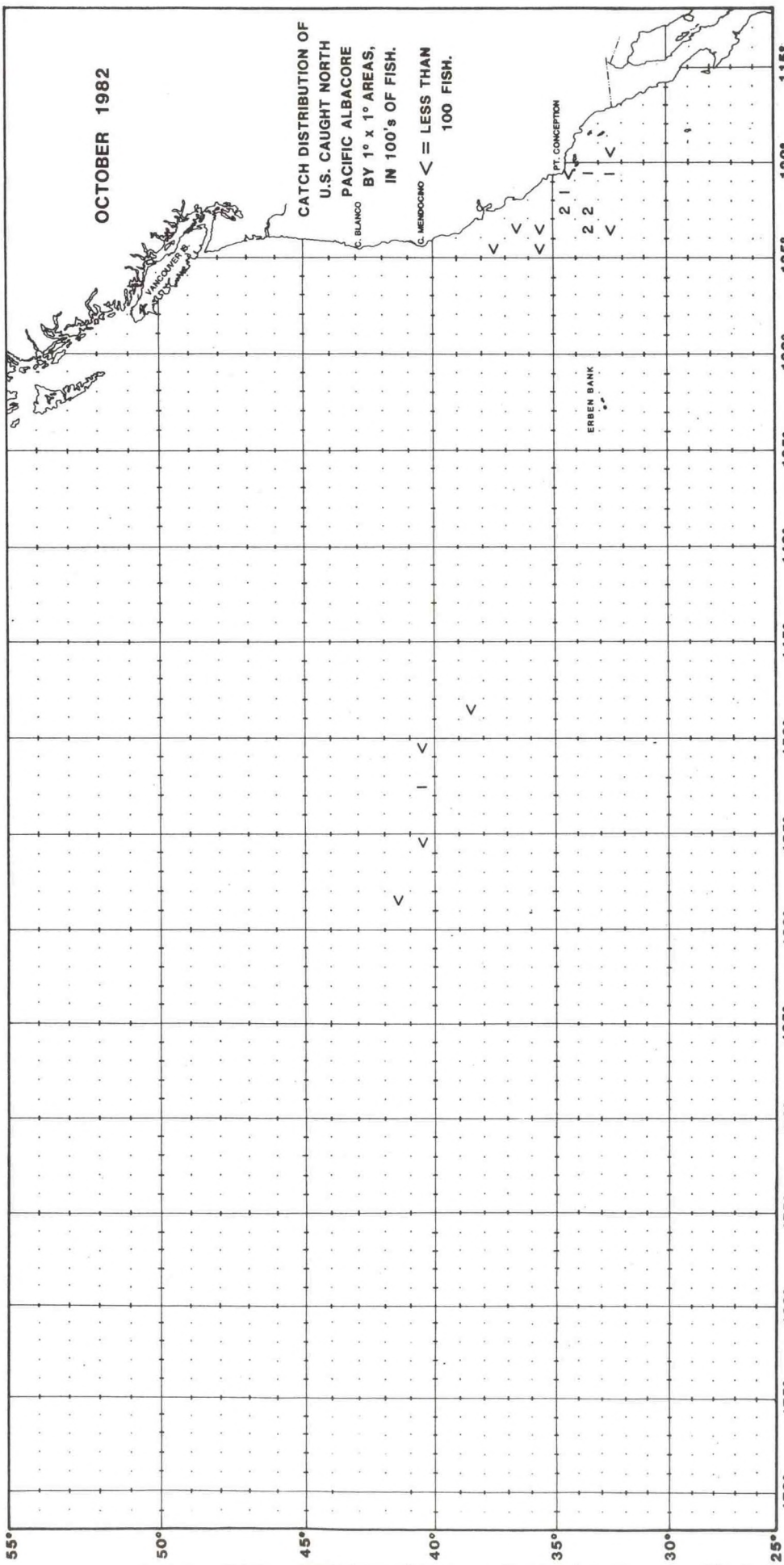

Figure 3g. Combined jigboat and baitboat fishery catches (in numbers of fish) by 1-degree square area, October 1982.

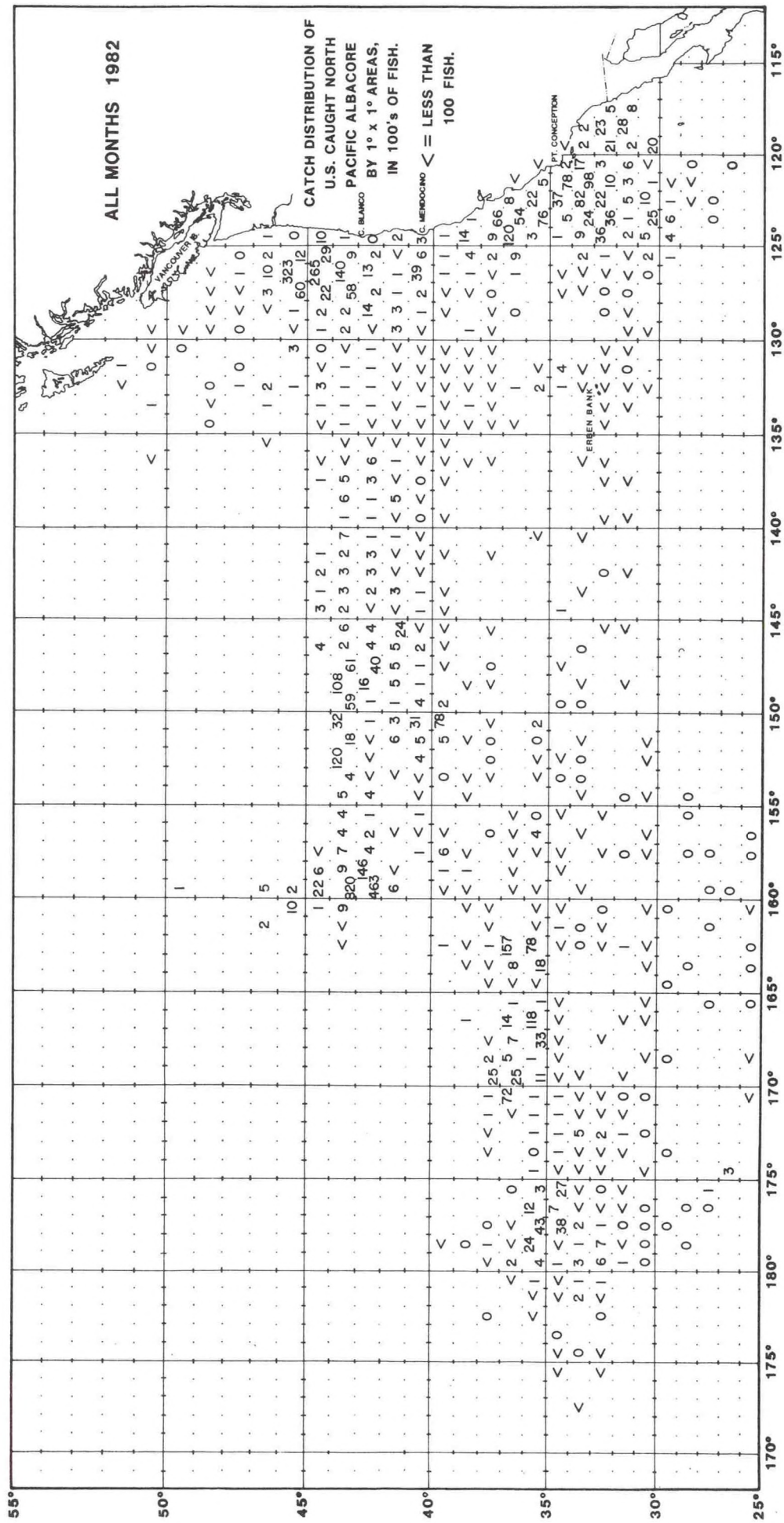

Figure 3h. Combined jigboat and baitboat fishery catches (in numbers of fish) by 1-degree square area, all months 1982.

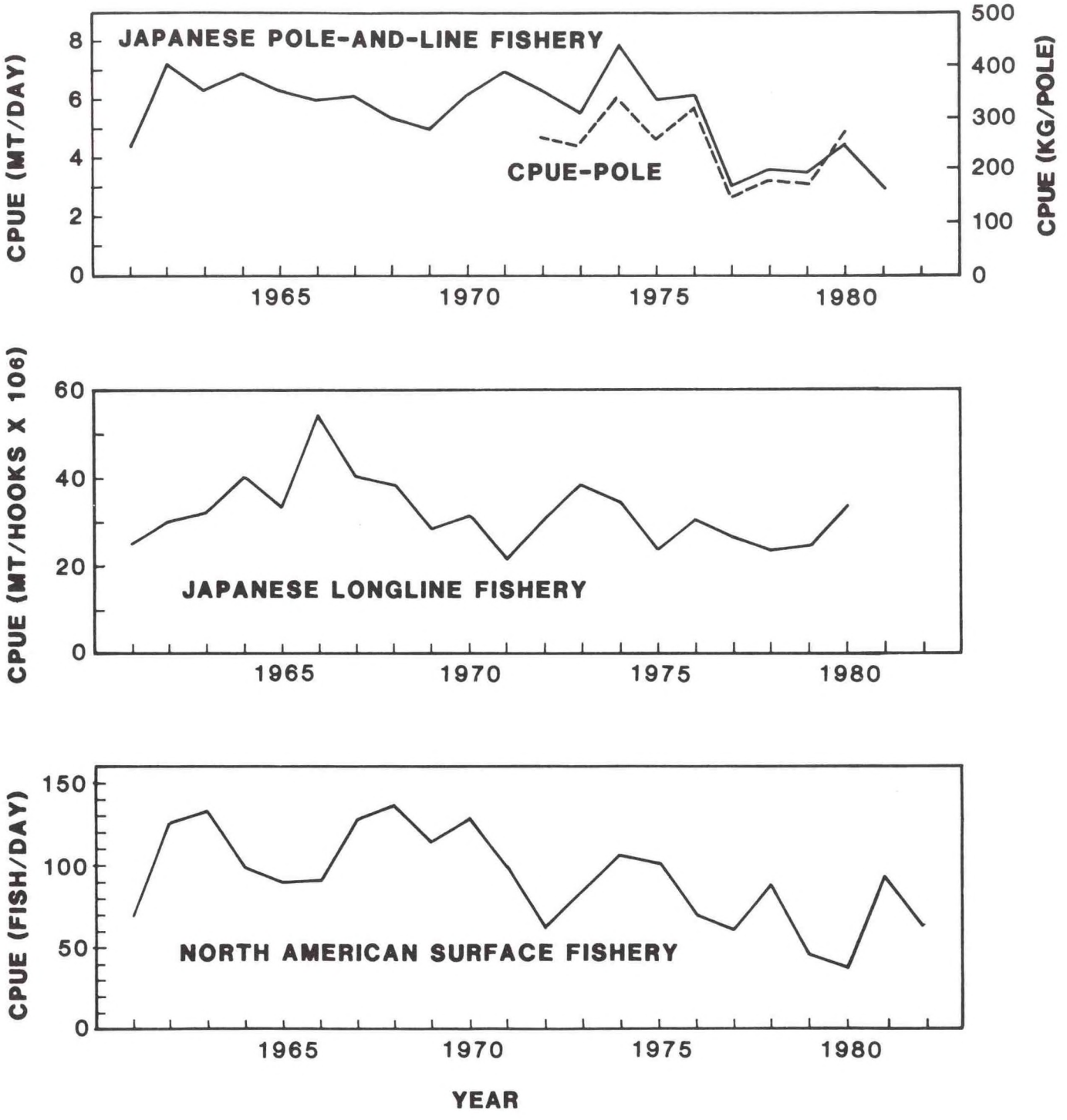

Figure 4. North Pacific albacore catch-per-unit effort (CPUE) by fishery and gear.

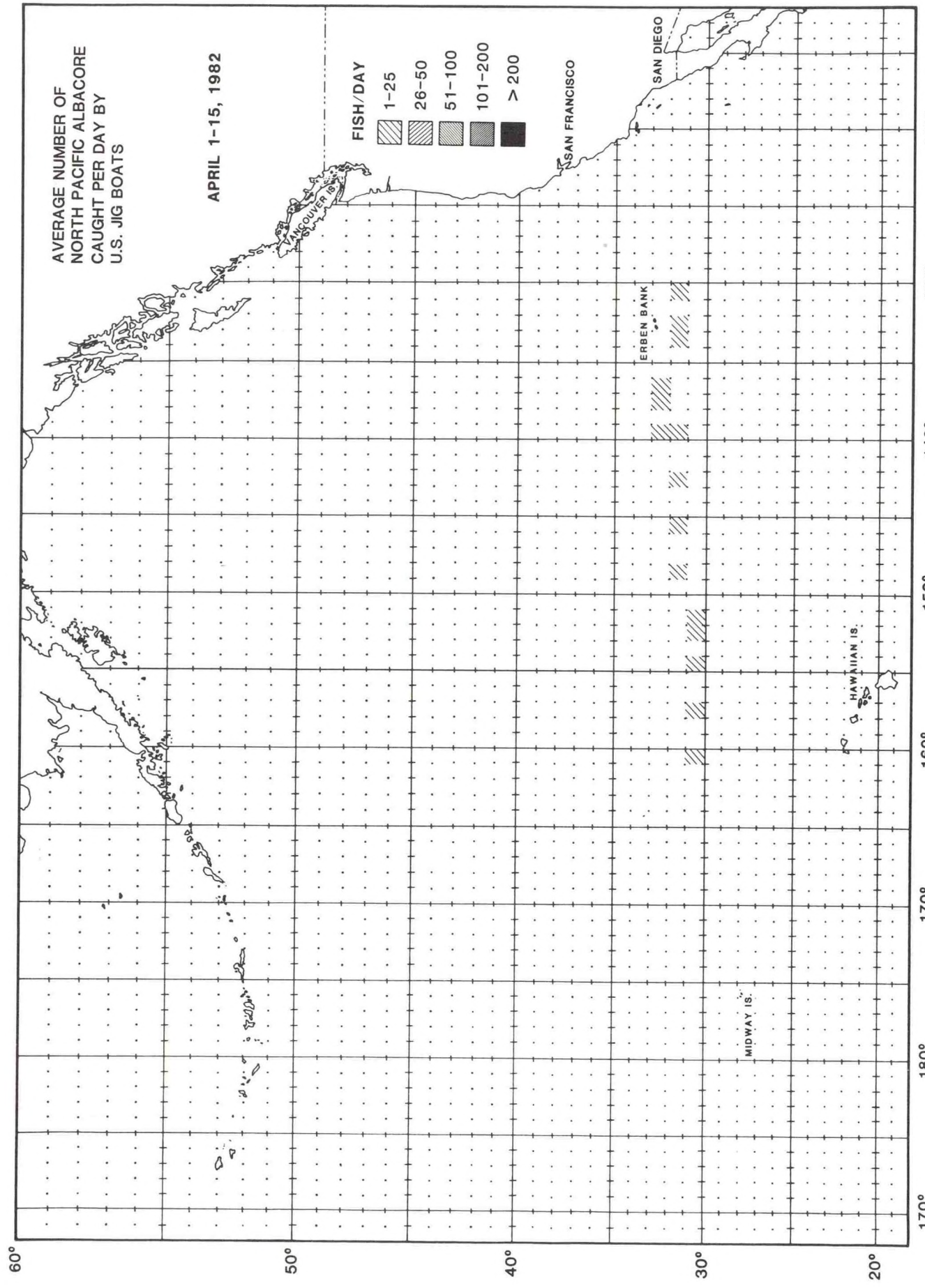

Figure 5a. Jigboat catch-per-standard-day fishing by 1-degree square area and half-months, April 1-15, 1982.

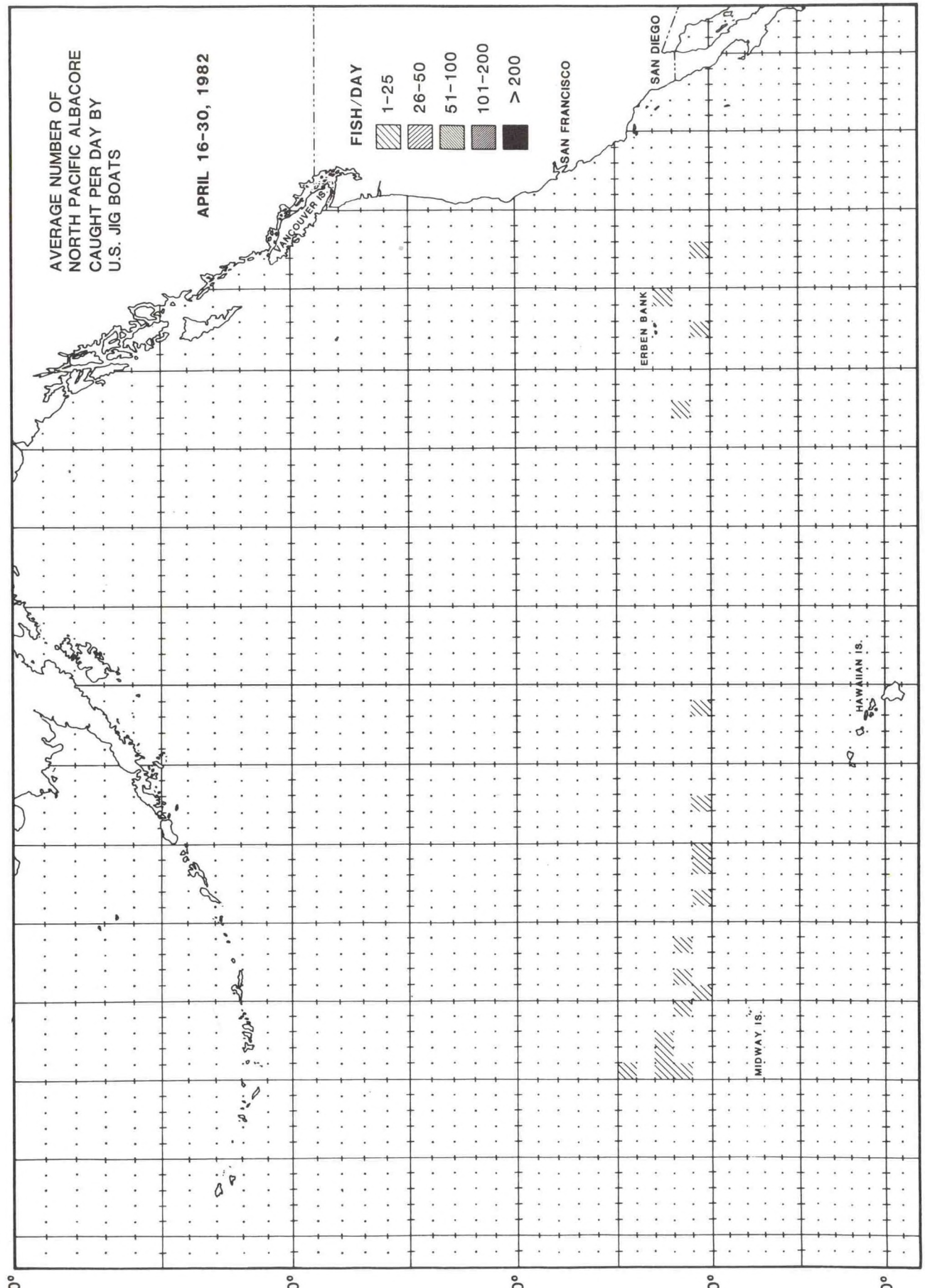

Figure 5b. Jigboat catch-per-standard-day fishing by 1-degree square area and half-months, April 16-30, 1982.

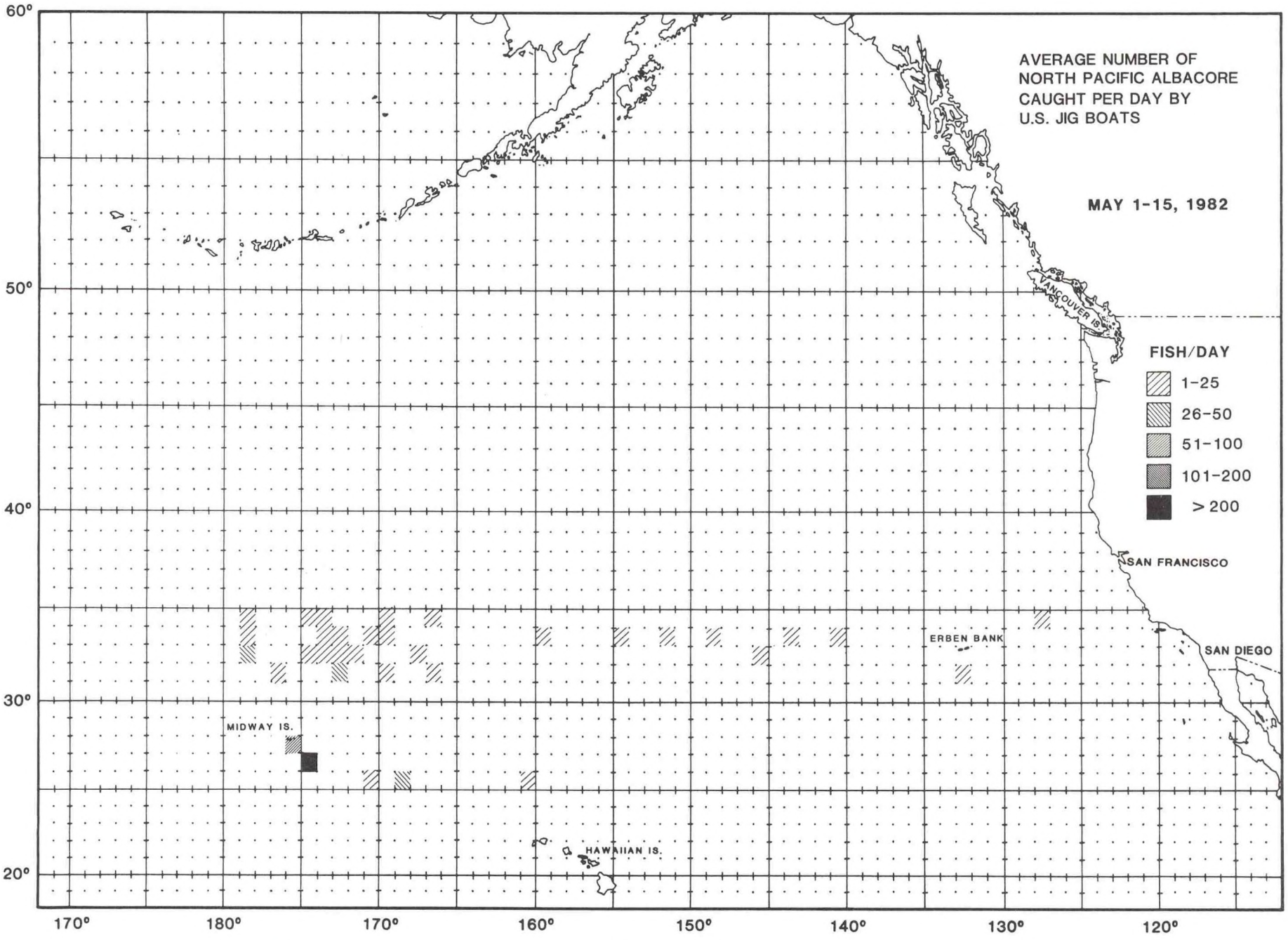

Figure 5c. Jigboat catch-per-standard-day fishing by 1-degree square area and half-months, May 1-15, 1982.

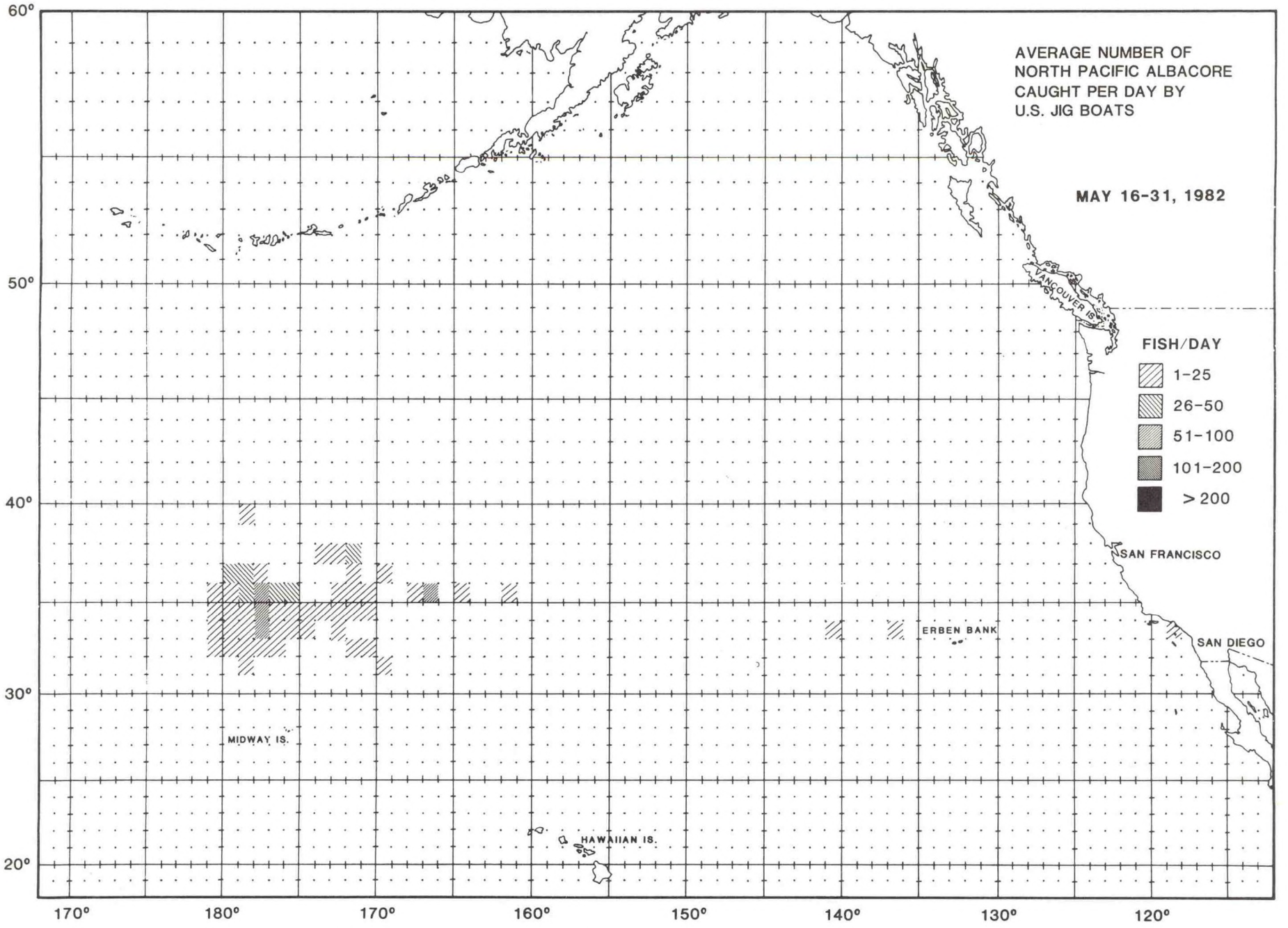

Figure 5d. Jigboat catch-per-standard-day fishing by 1-degree square area and half-months, May 16-31, 1982.

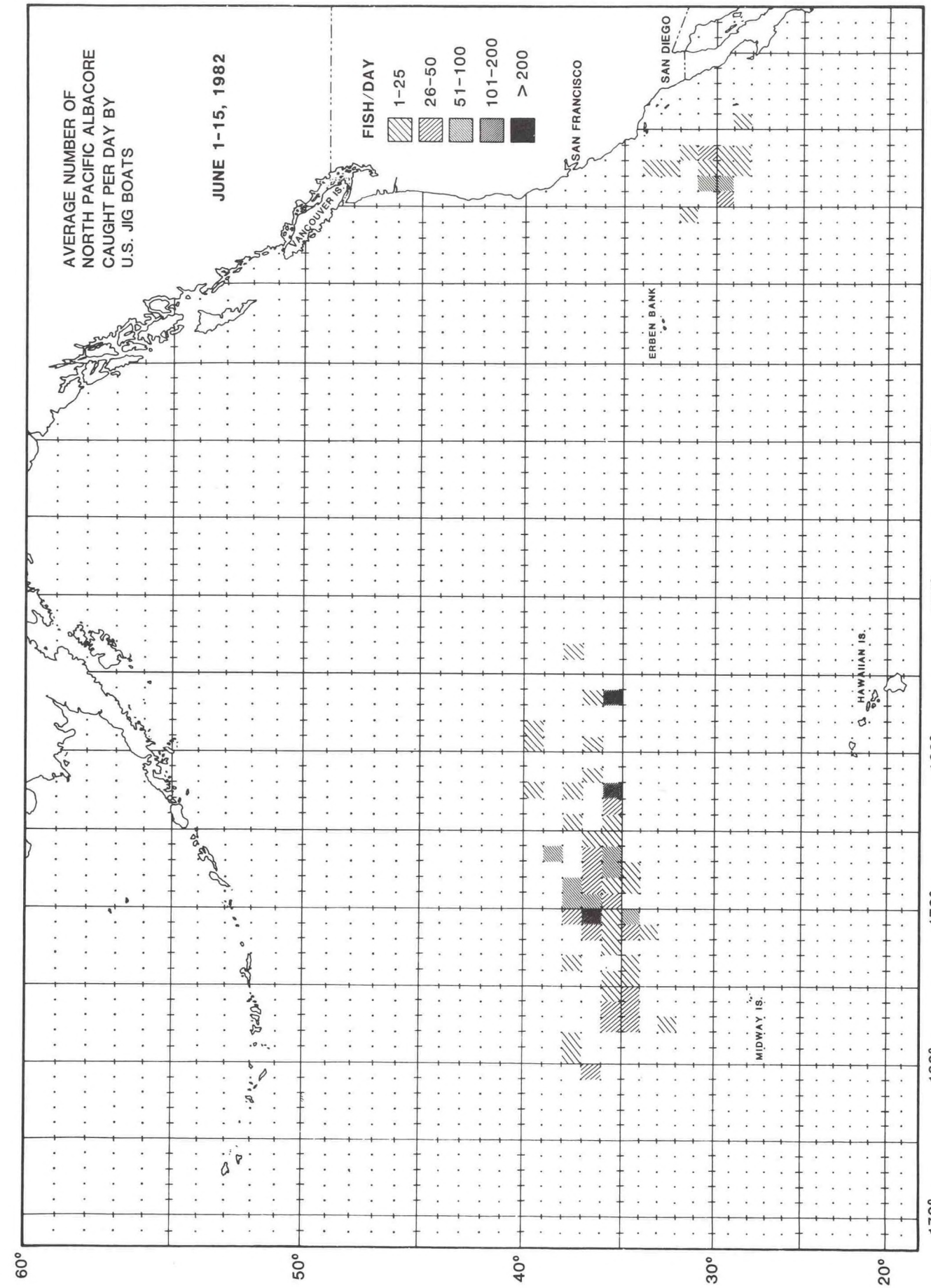

Figure 5e. Jigboat catch-per-standard-day fishing by 1-degree square area and half-months, June 1-15, 1982.

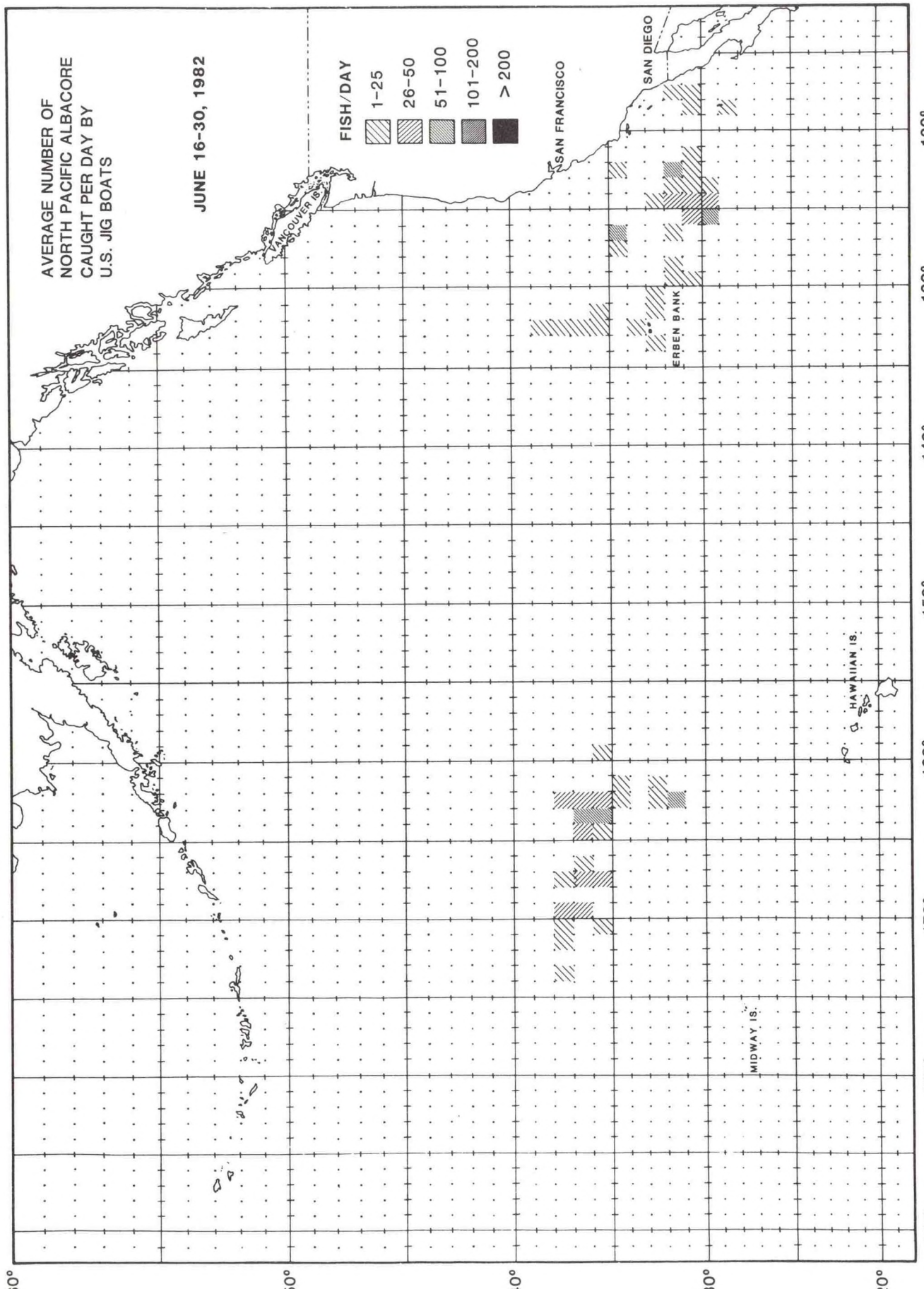

Figure 5f. Jigboat catch-per-standard-day fishing by 1-degree square area and half-months, June 16-30, 1982.

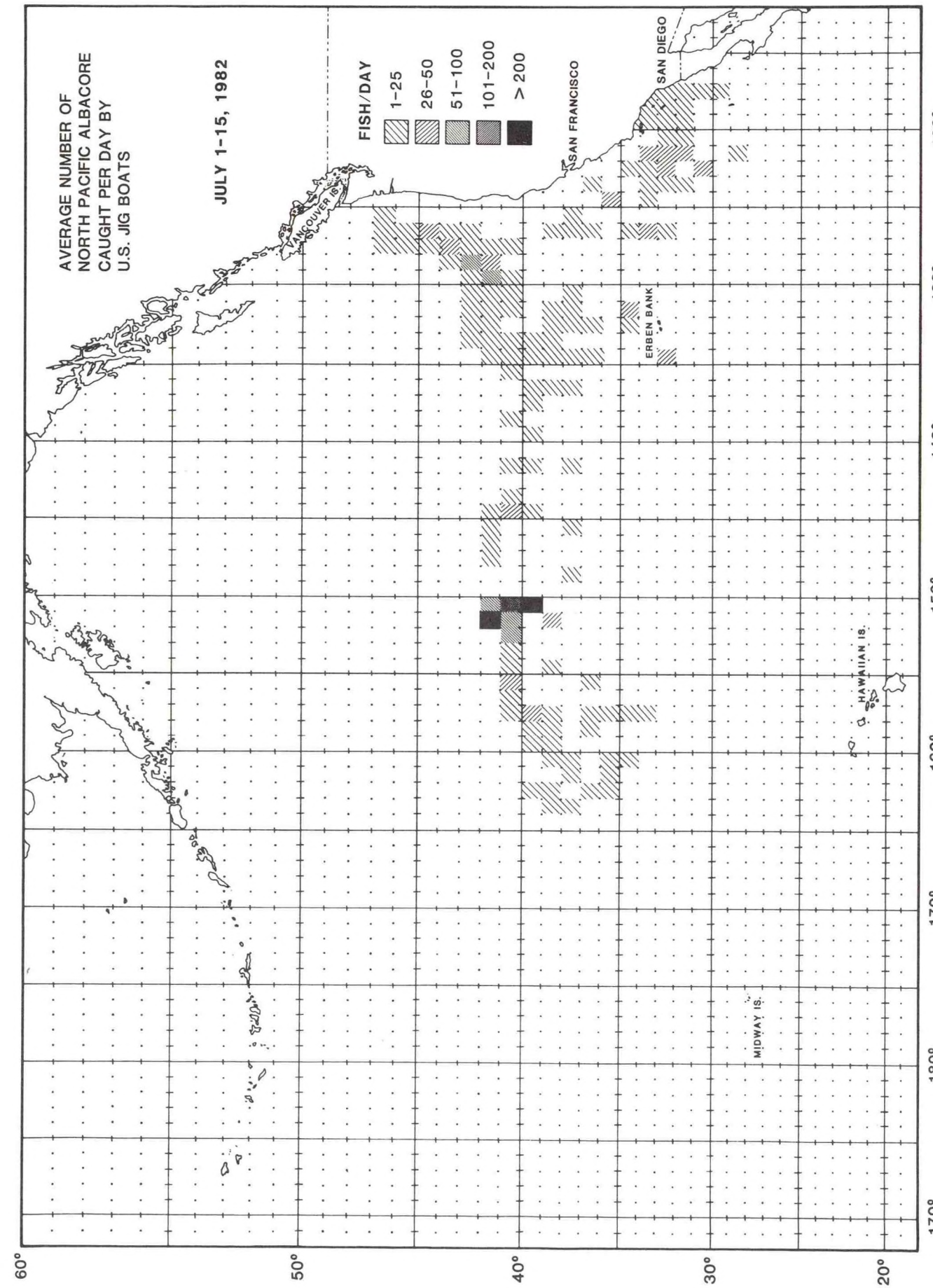

Figure 5g. Jigboat catch-per-standard-day fishing by 1-degree square area and half-months, July 1-15, 1982.

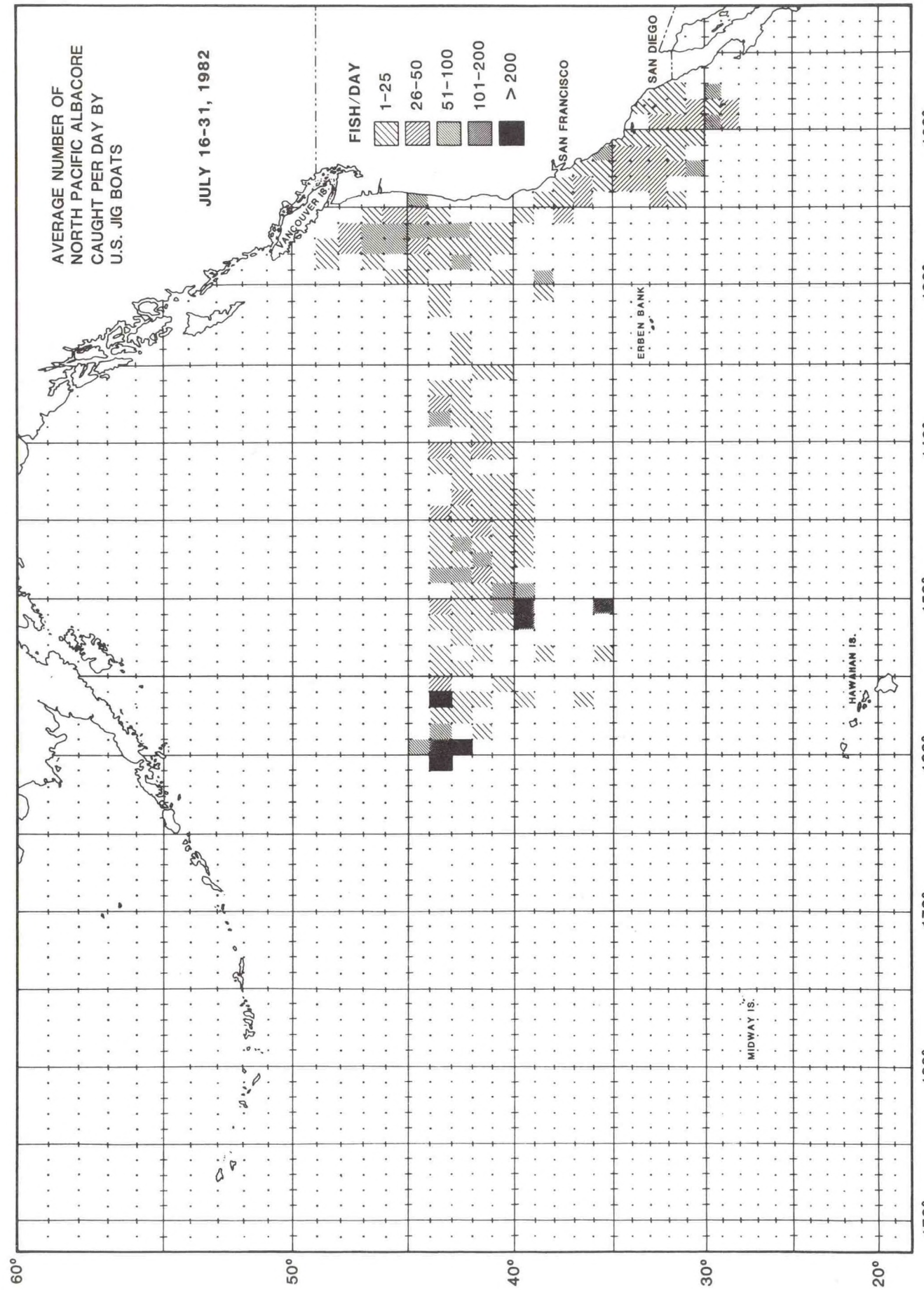

Figure 5h. Jigboat catch-per-standard-day fishing by 1-degree square area and half-months, July 16-31, 1982.

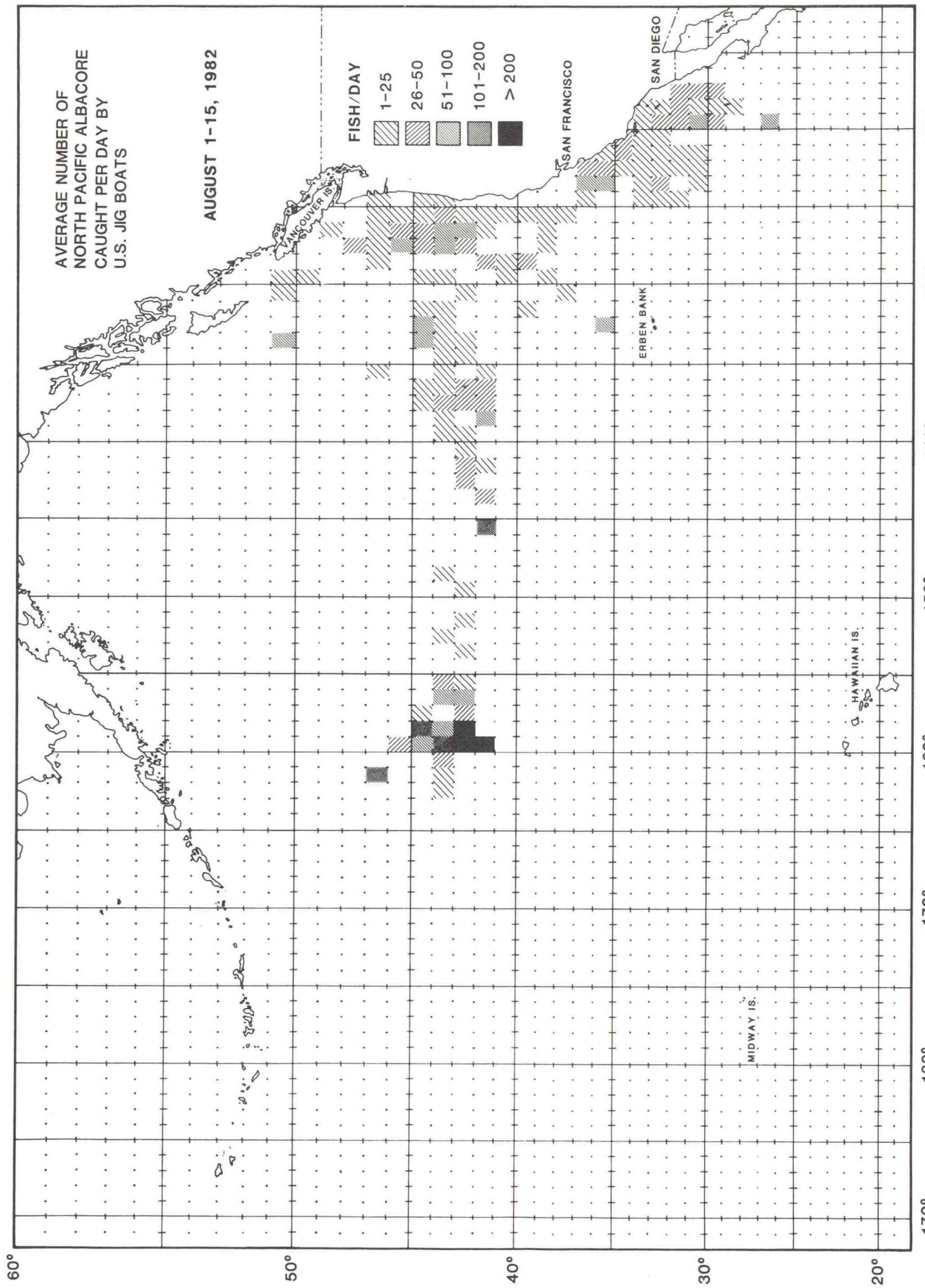

Figure 5i. Jigboat catch-per-standard-day fishing by 1-degree square area and half-months, August 1-15, 1982.

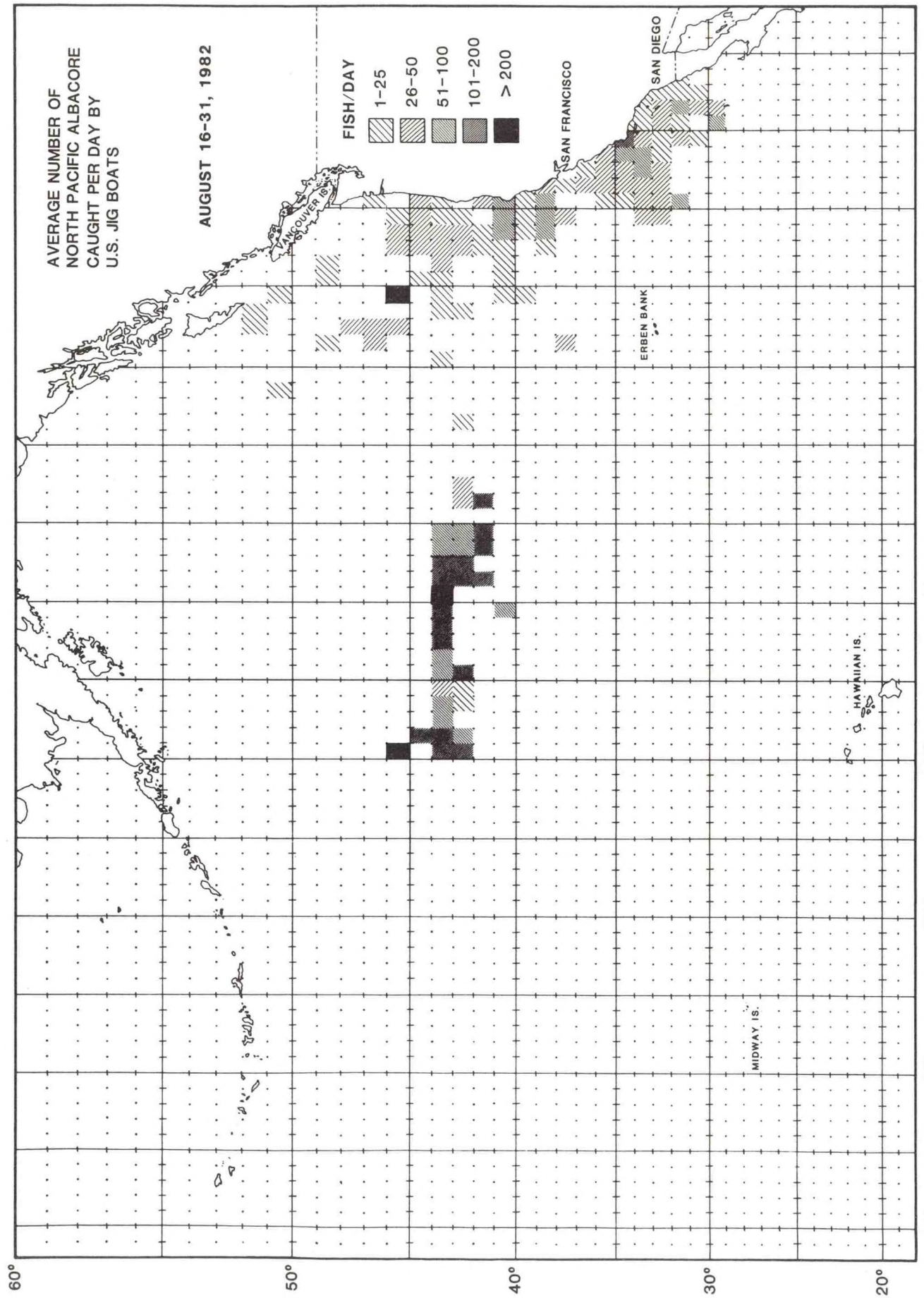

Figure 5j. Jigboat catch-per-standard-day fishing by 1-degree square area and half-months, August 16-31, 1982.

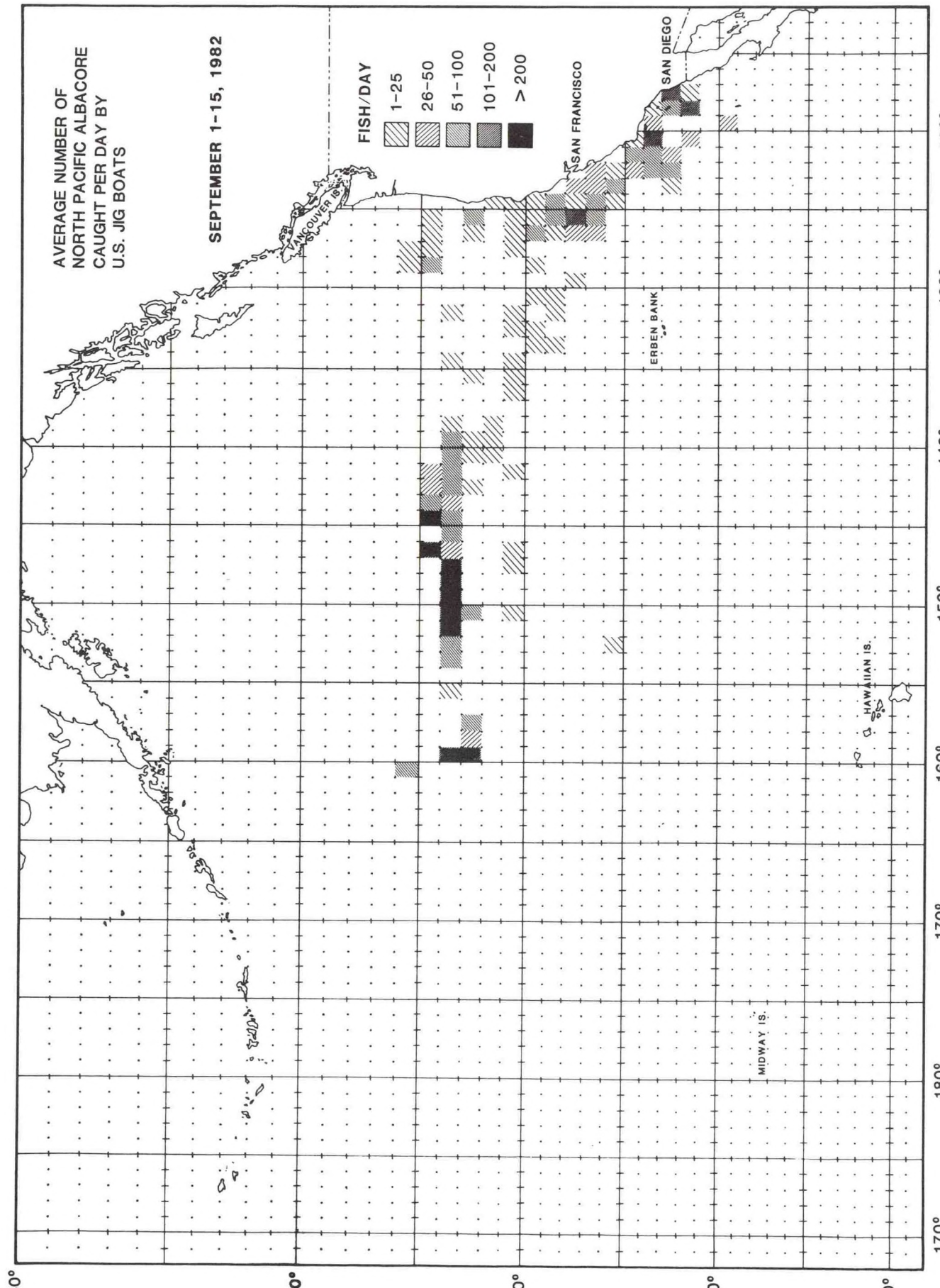

Figure 5k. Jigboat catch-per-standard-day fishing by 1-degree square area and half-months, September 1-15, 1982.

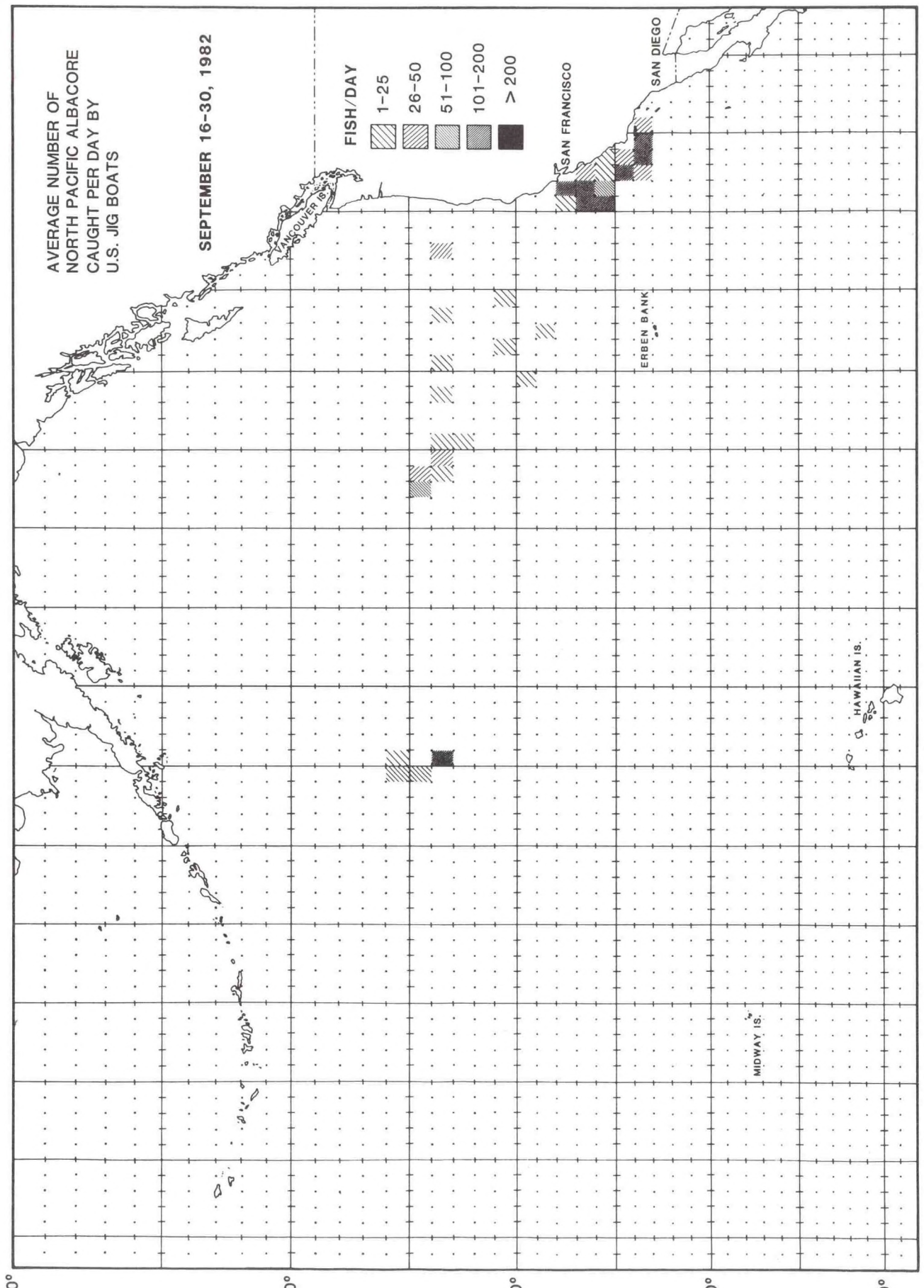

Figure 51. Jigboat catch-per-standard-day fishing by 1-degree square area and half-months, September 16-30, 1982.

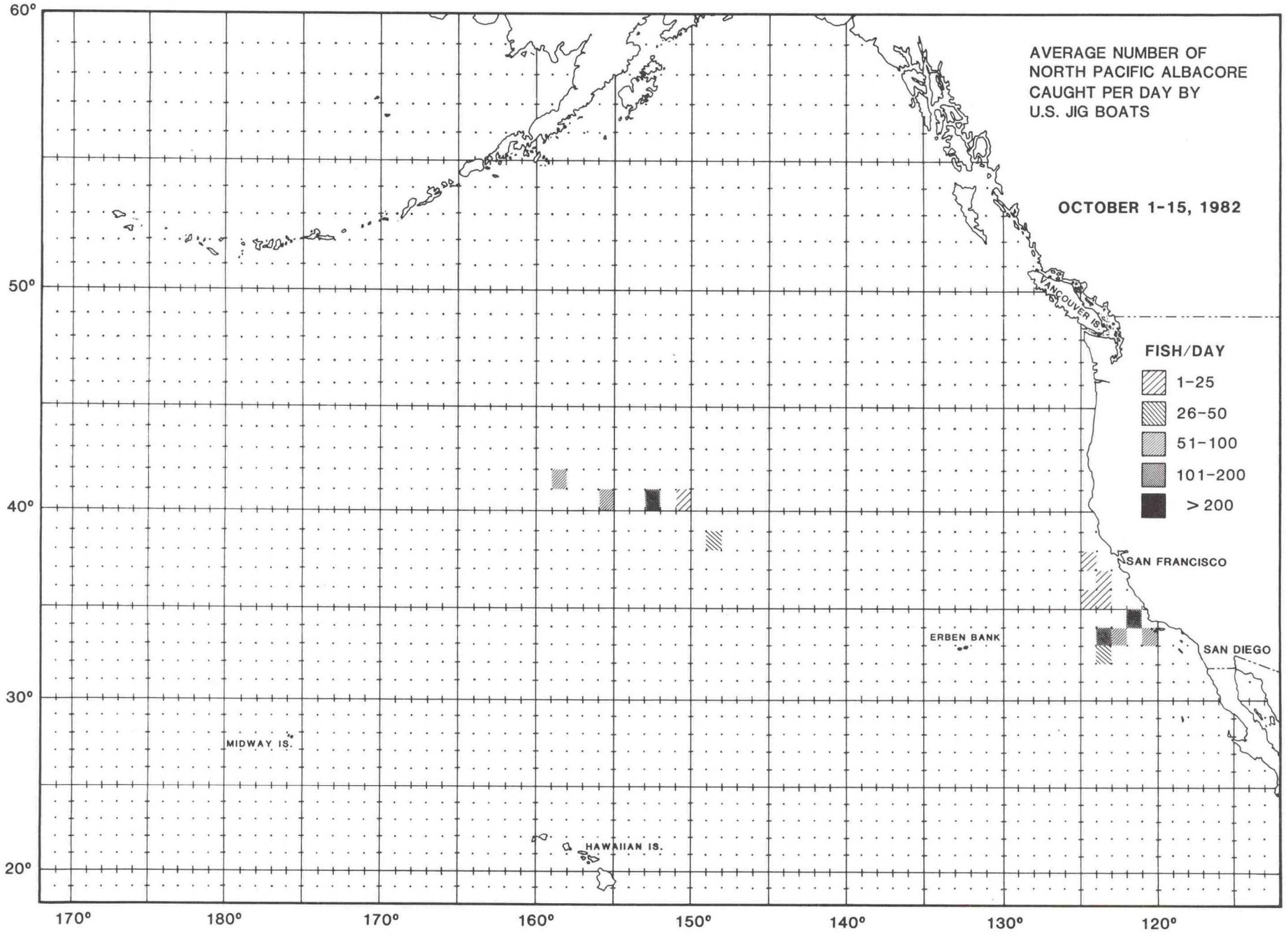

Figure 5m. Jigboat catch-per-standard-day fishing by 1-degree square area and half-months, October 1-15, 1982.

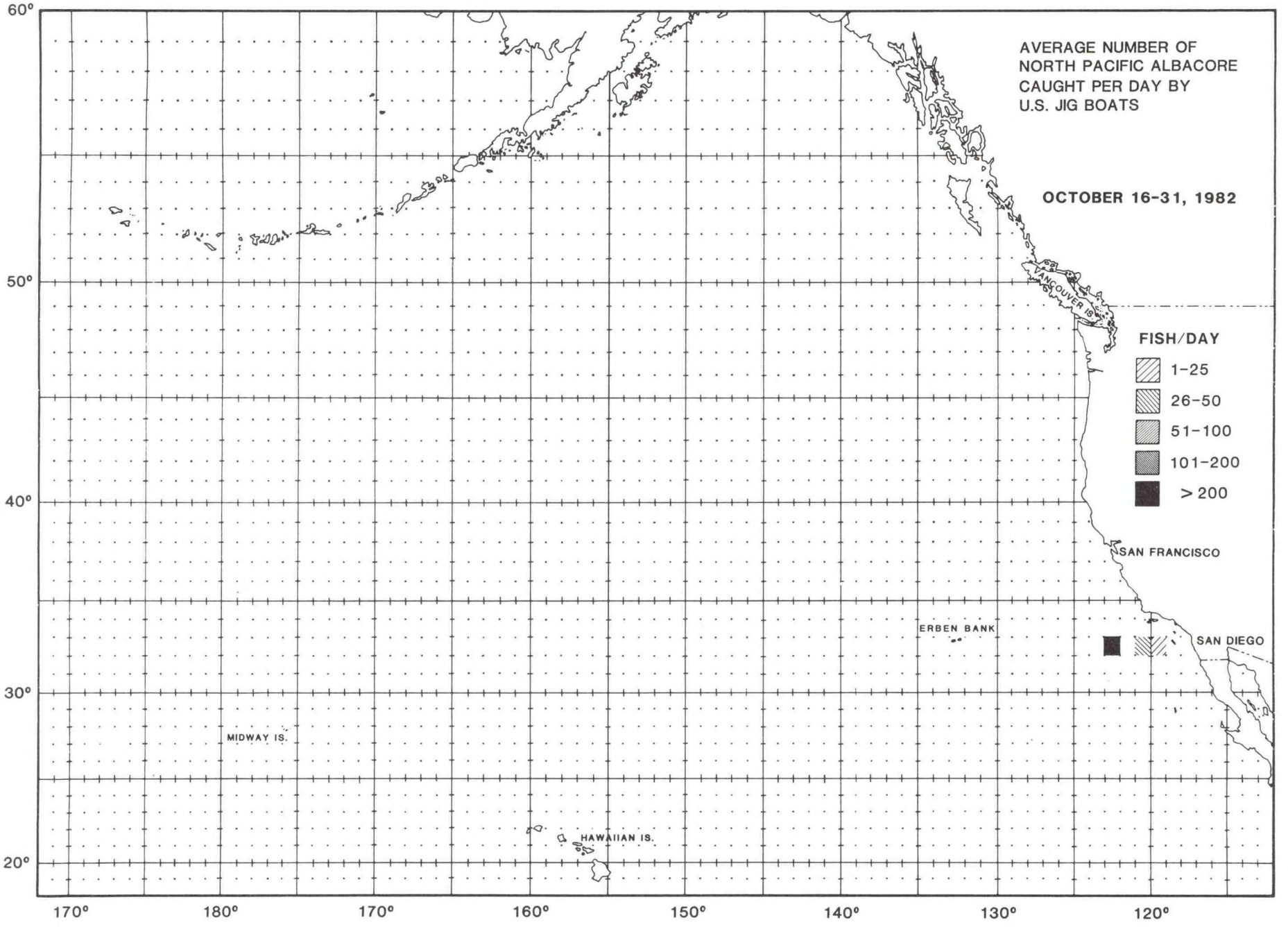

Figure 5n. Jigboat catch-per-standard-day fishing by 1-degree square area and half-months, October 16-31, 1982.

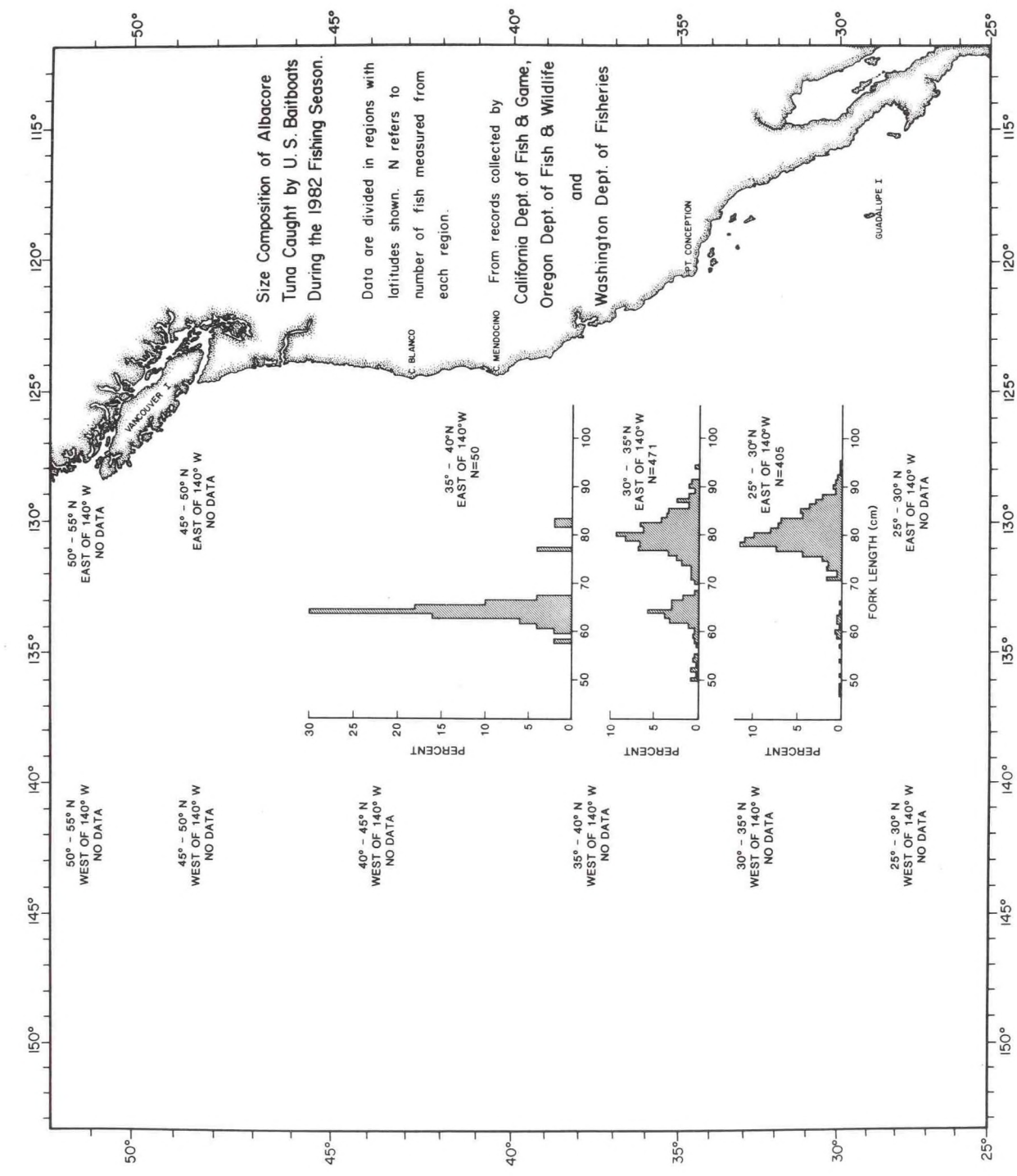

Figure 6a. Length-frequency histograms of 1982 North Pacific albacore caught by U. S. baitboat fishery.

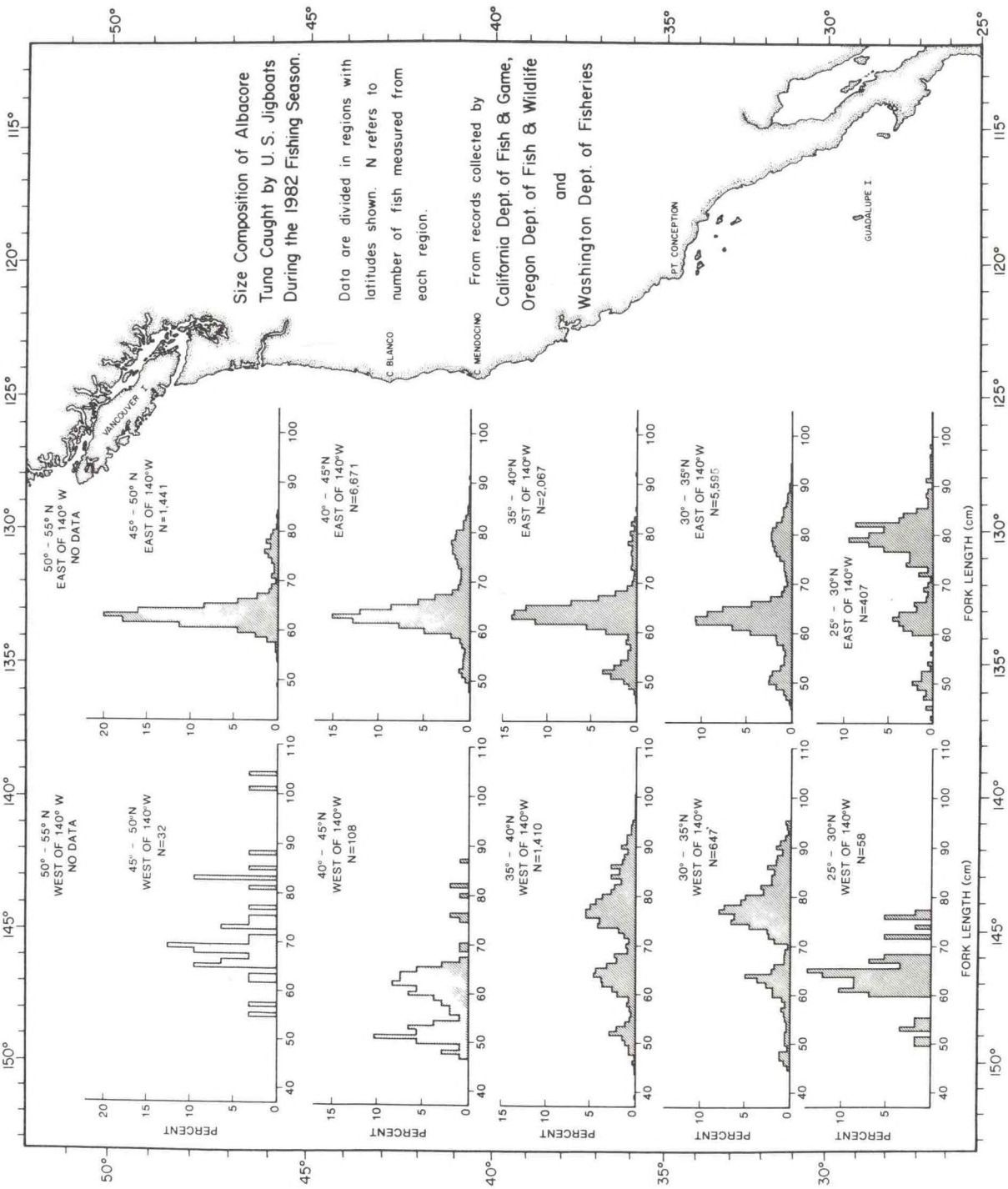

Figure 6b. Length-frequency histograms of 1982 North Pacific albacore caught by U. S. jigboat fishery.

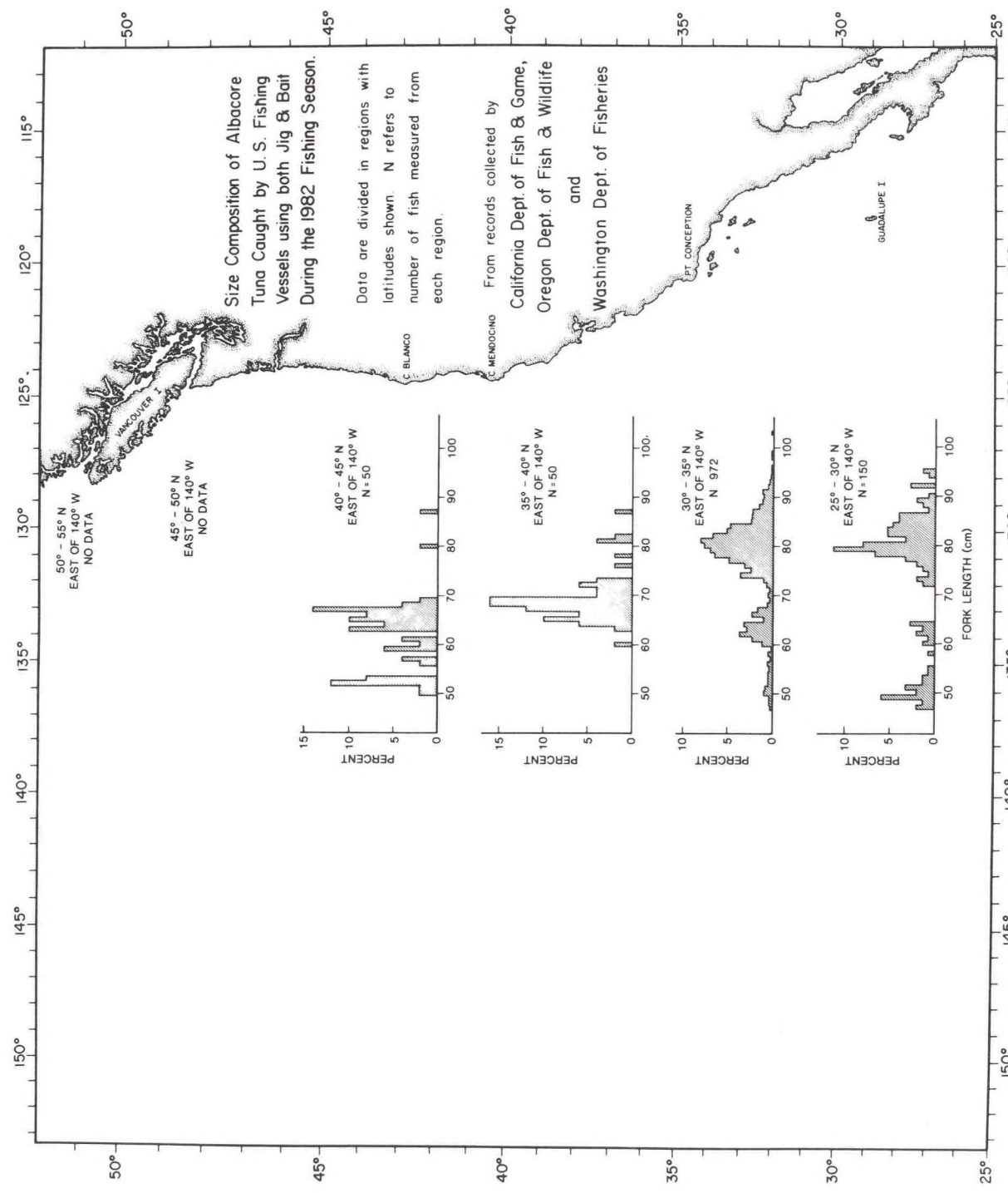

Figure 6c. Length-frequency histograms of 1982 North Pacific albacore caught by U. S. vessels using both bait and jig.

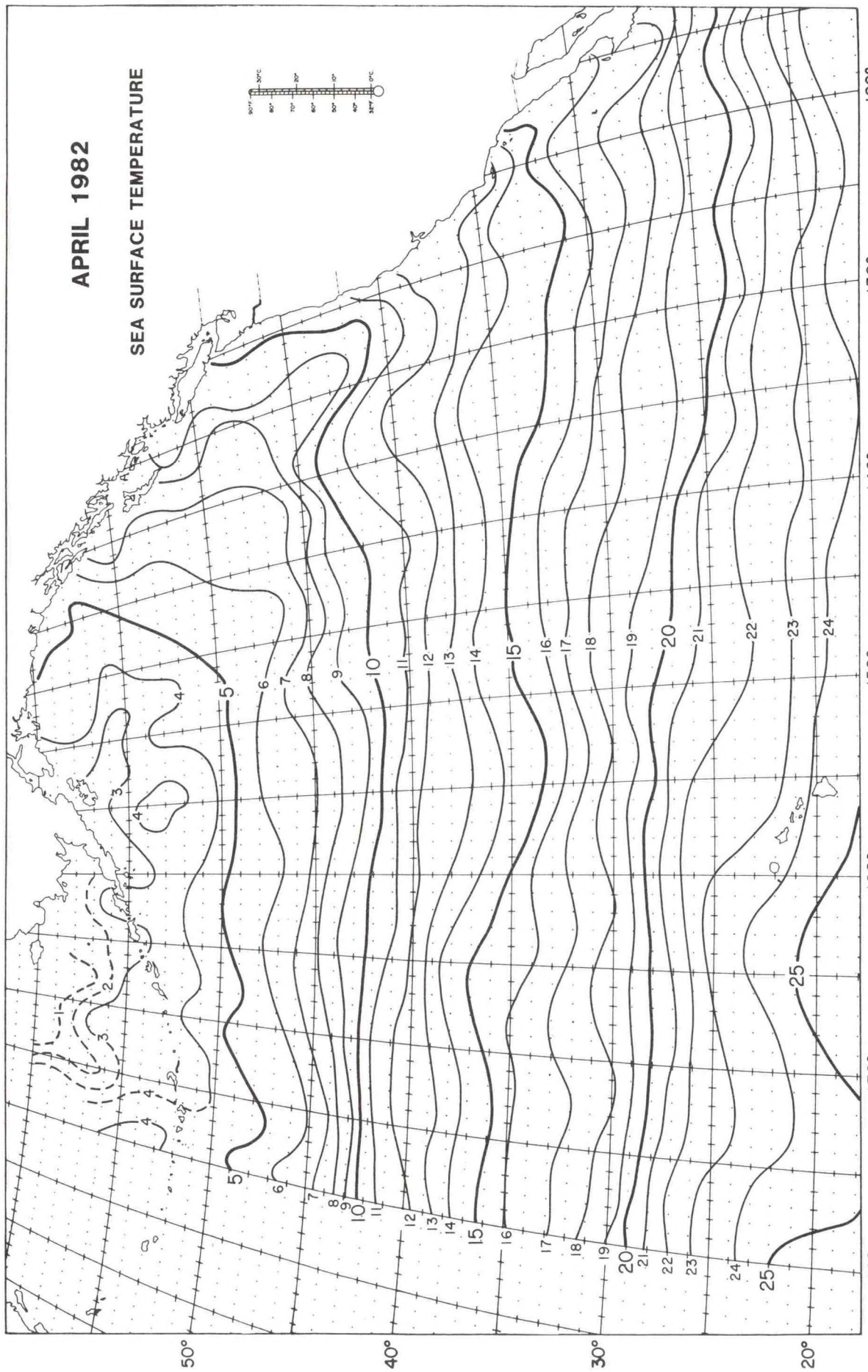

Figure 7a. Average sea surface temperature isopleths (°C) by month for the eastern Pacific Ocean, April 1982.

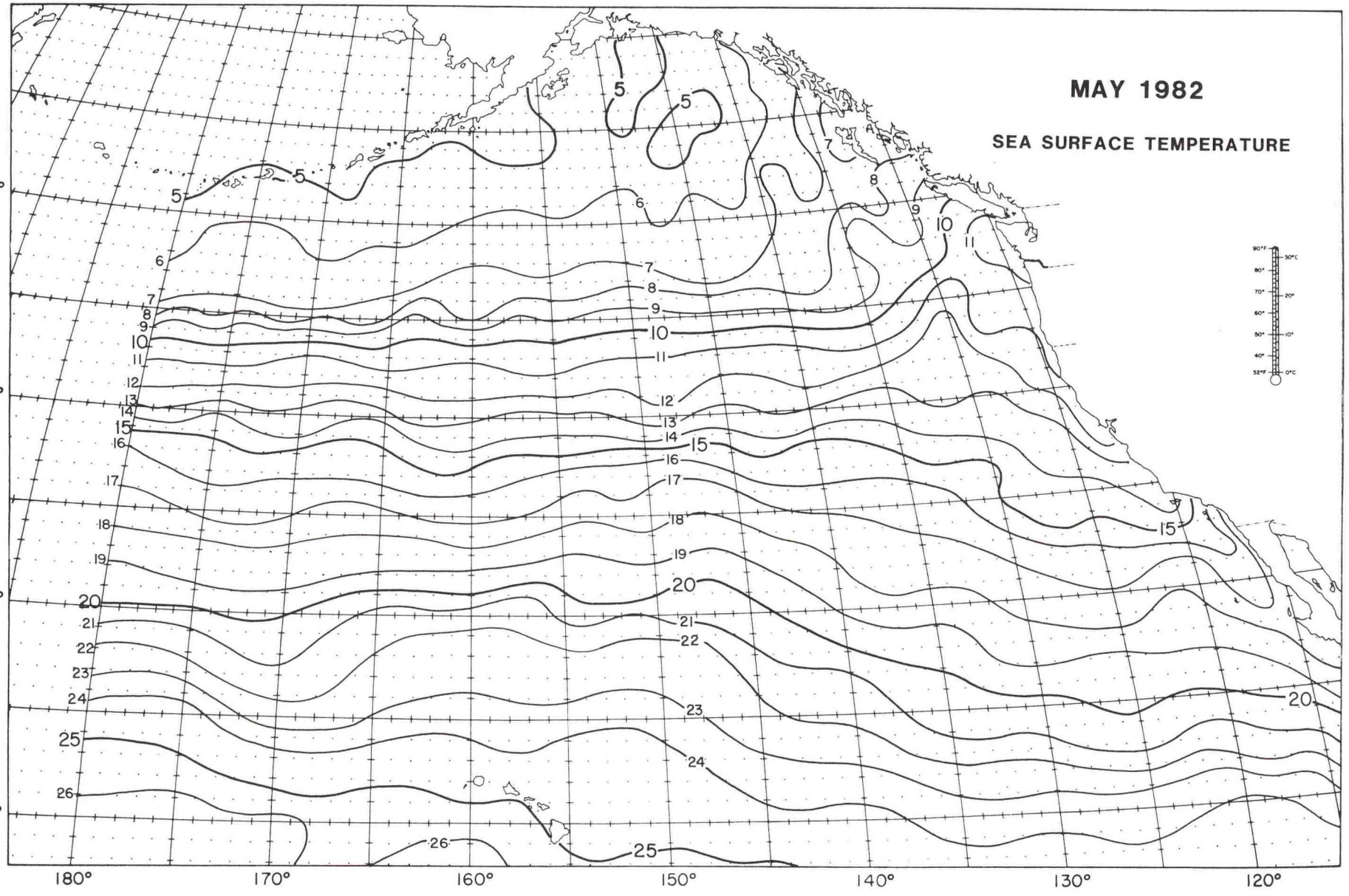

Figure 7b. Average sea surface temperature isopleths (°C) by month for the eastern Pacific Ocean, May 1982.

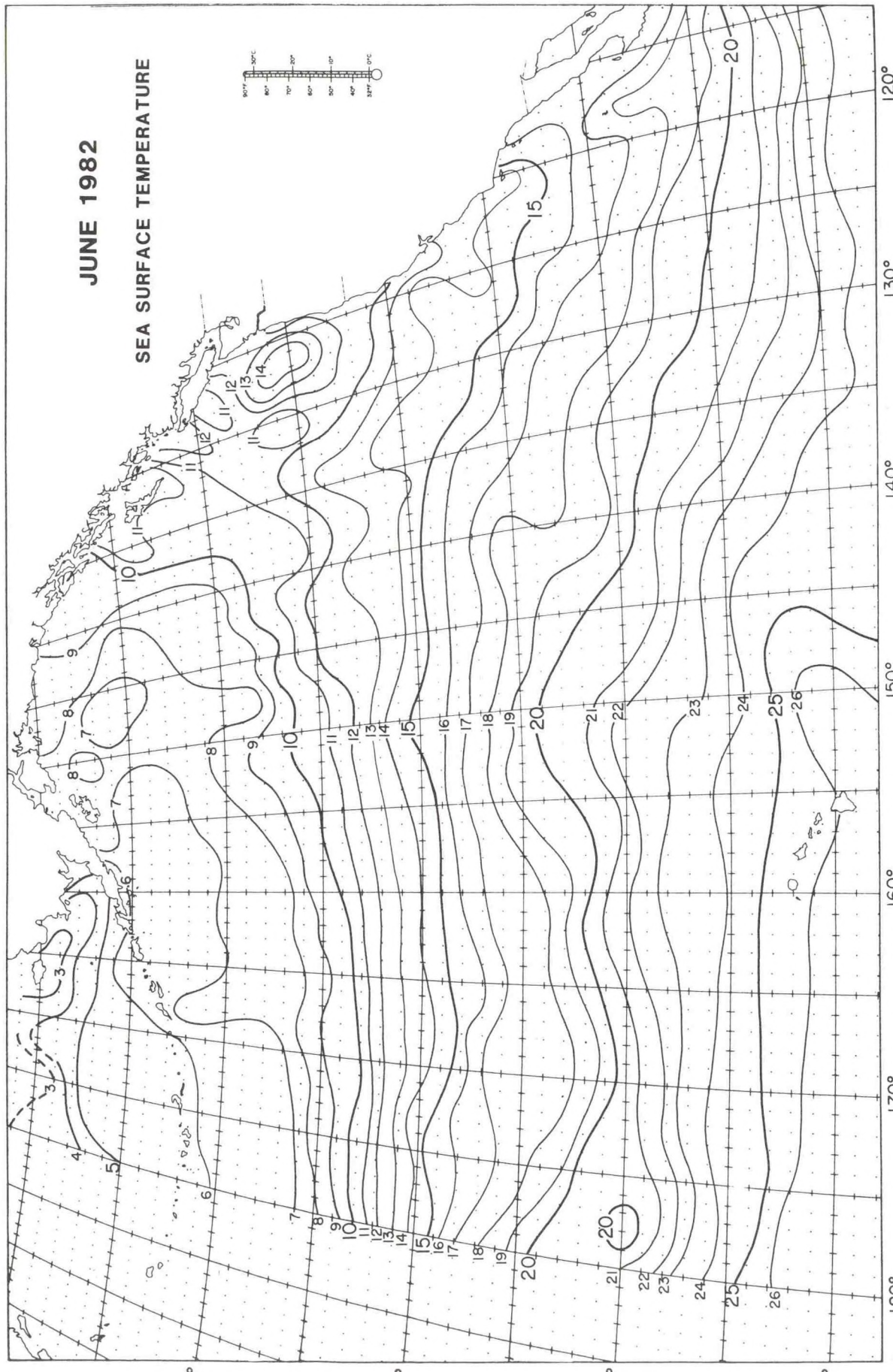

Figure 7c. Average sea surface temperature isopleths (°C) by month for the eastern Pacific Ocean, June 1982.

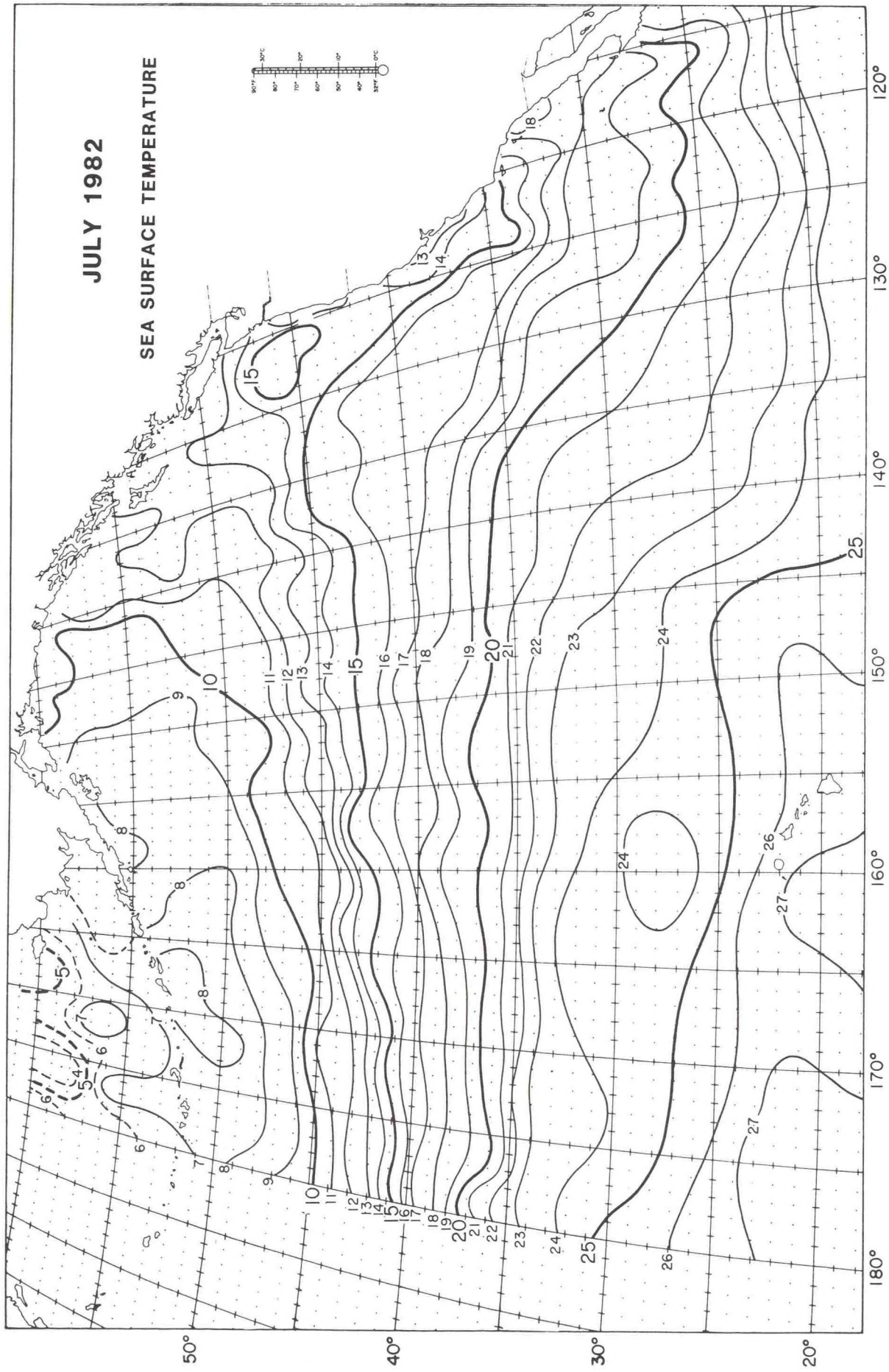

Figure 7d. Average sea surface temperature isopleths (°C) by month for the eastern Pacific Ocean, July 1982.

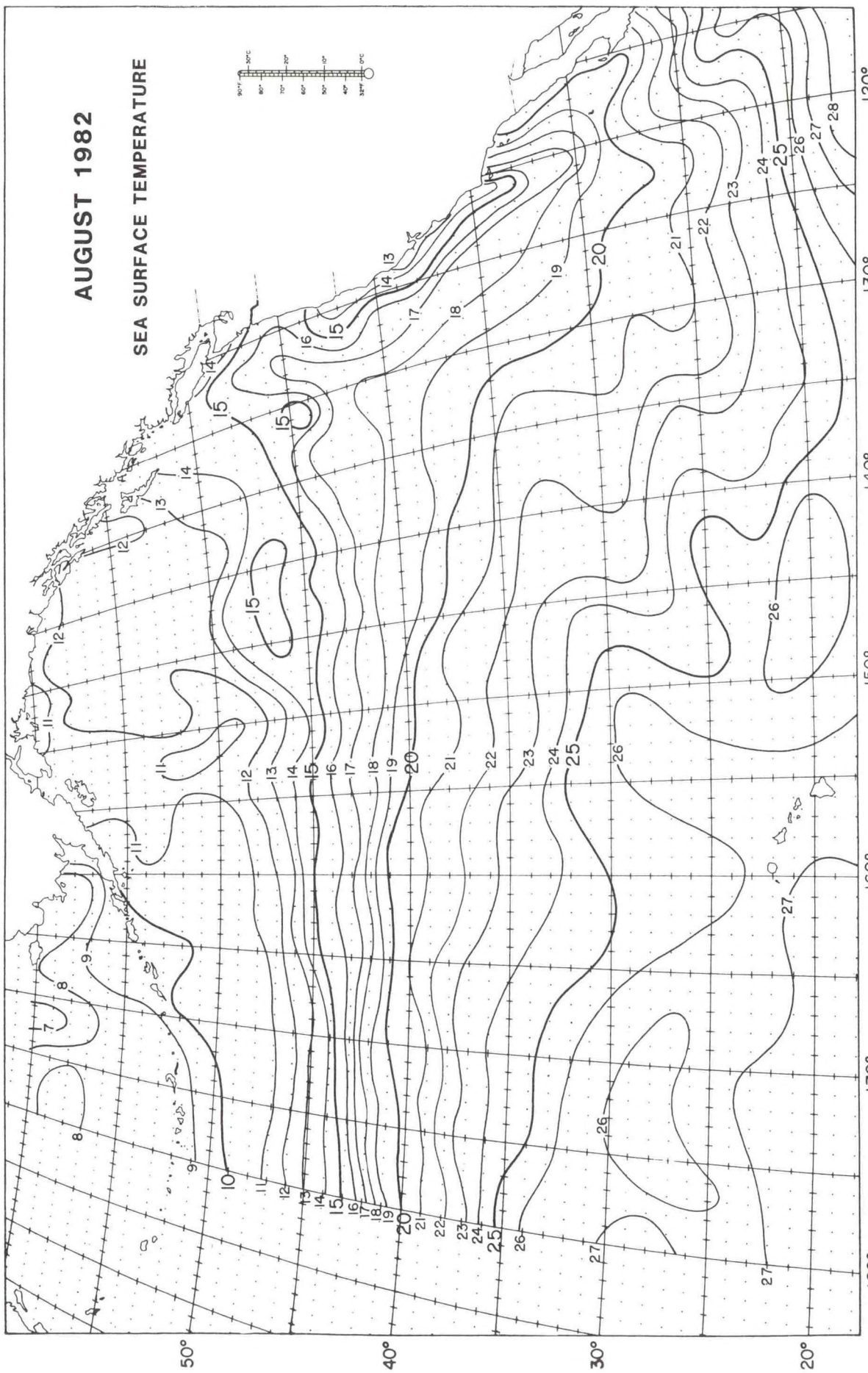

Figure 7e. Average sea surface temperature isopleths (°C) by month for the eastern Pacific Ocean, August 1982.

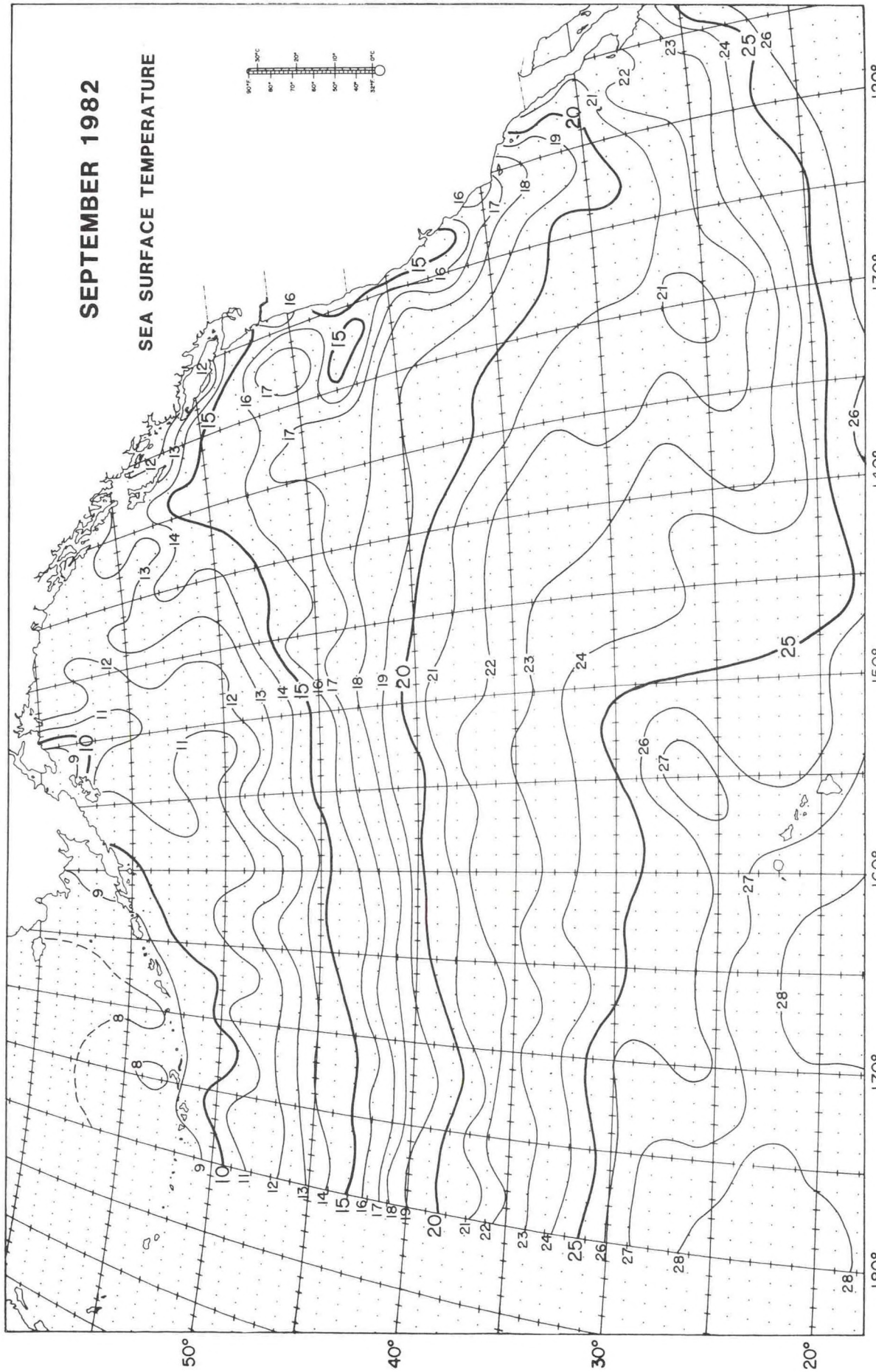

Figure 7f. Average sea surface temperature isopleths (°C) by month for the eastern Pacific Ocean, September 1982.

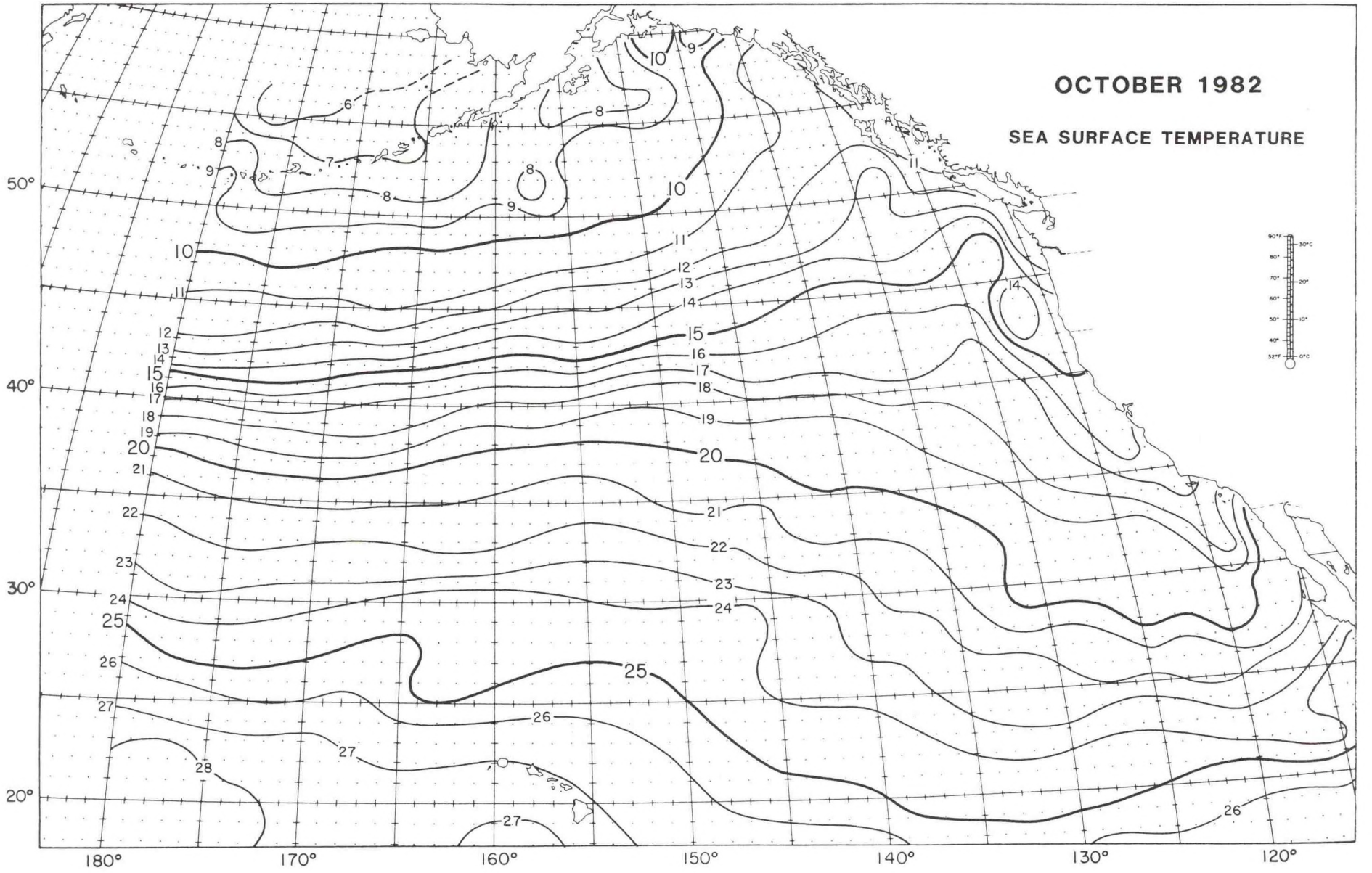

Figure 7g. Average sea surface temperature isopleths (°C) by month for the eastern Pacific Ocean, October 1982.