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The 1986–87 foreign and joint venture squid jig fishery around New Zealand

E.R. Stewart
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A.M. Atkins

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MAF Fish

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START A NEW SHEET EACH DAY

DATE: / /
 Day Month Year
 日 月 年

NOT FISHING
 無操業

RADIO CALL SIGN:
 コールサイン

FISHING OPERATION:

LATITUDE 緯度	LONGITUDE 経度		DEPTH 深さ		SEA SURFACE TEMPERATURE 海面水温 °C	WIND SPEED 風力 m/s	WIND DIRECTION 風向 °T	TIME FISHING 操業時間	
	度	分	Lowest Lure 最深漁具 m	Bottom 水深 m				Day Hours 日中	Night Hours 夜間
0	0	'	E/W						

CATCH:

総入量

	TOTAL CATCH (KG) 総捕獲量 (キログラム)
Arrow Squid イカ	
Other Squid イカ他	
Other (Specify) イカ他 (明記してください)	

捕獲尾数

	NUMBER CAUGHT 捕獲尾数
Octopus イカ	
Shark サメ	
Other (Specify) イカ他 (明記してください)	

TRAY TALLY:

イカ 2 枚

Number of squid per tray 入尾数	1-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100	101-150	151+	TOTAL 合計
Number of trays c/s イカ 2 枚													
WHOLE 丸													
WITHOUT LEGS イカ 2 枚													

Introduction

New Zealand's arrow squid, *Nototodarus* spp., are among the most abundant commercial species in the 200 n. mile Exclusive Economic Zone (EEZ) and are the basis of a substantial jig and trawl fishery. The fishery is on two closely related species of arrow squid, but because of their similarity no differentiation is made in fishing or marketing operations. In 1986-87 it was the third most valuable New Zealand fishery, with export earnings for the year ended December 1987 of \$97 million f.o.b.

The trawl fishery is centred mainly around the Auckland Islands and accounts for about 50% of the total annual squid catch of 70 000-105 000 t. The jig fishery is over a much larger area, from the North Taranaki Bight to Greymouth on the west coast, from Cook Strait down the east coast to the Snares Islands, and as far south as the Auckland Islands.

The jig fishery started with experimental fishing by a few Japanese vessels in 1971 and has expanded to a current annual influx of 95-180 vessels in both foreign licensed and joint venture capacities. In addition, there is increasing effort by New Zealand vessels. The fishing season is from December to June, and the annual catch varies between 25 000 and 70 000 t. During the 1986-87 season, 147 jig vessels from Japan, Korea, Taiwan, and the Soviet Union caught 30 365 t.

This report presents data from the jig fishery only; data from the trawl fishery may be presented in a similar report in the future. The 1986-87 report is the seventh in a series of annual reports on the squid jig fishery. Data presented here are from squid jigging logbook returns (Figure 1).

For the purposes of these reports, the New Zealand region has been divided into eight areas based on distribution of fishing effort.

Table 1 gives catch in each area, percentage of total catch, and catch per vessel-day for this and previous seasons. Data from seasons before 1980-81 have been divided into east and west coast values only.

Figure 2 shows the total catch (to the nearest tonne) for the whole season by $\frac{1}{2}^{\circ}$ squares.

Fishing effort has been measured as catch per vessel-day, where 1 vessel-day is a 24 h period during which at least some fishing took place. Catch and effort data have been summarised in Tables 2-5 and Figures 3 and 4.

Table 6 shows the lighting capacity and the numbers and types of machines used by vessels as an indication of fishing effort. Analysis of data from other seasons is not yet possible because of incomplete records.

Squid are sorted aboard jig vessels according to size and then packed into trays and frozen. For the size analysis (Figure 5), only data from Japanese licensed and joint venture vessels have been used because only these vessels consistently use standard 8.0-8.5 kg trays. (Of the total fleet of 147 vessels, 114 were Japanese or Japanese joint venture vessels.) Figures 6 and 7 show average catch rates by bottom depth and sea surface temperature, respectively, in areas fished.

Seventeen vessel-days fished by 10 vessels for which positions were not recorded resulted in a catch of 95 t. These data are not included in the above figures.

Table 1: Catch (t) by area and season and catch per vessel-day

Season	Catch								Total catch	Catch per vessel-day	
	East coast	West coast	Area								Catch with position not given
	I	II	III	IV	V	VI	VII	VIII			
1978-79		19 134 79%*		4 954 21%					0	24 088	1.5
1979-80†		22 928 57%		17 518 43%					53 <1%	40 499	2.5
1980-81	983 2.6%	0	20 110 53.2%	89 <1%	0	15 789 41.8%	780 2.1%		52 <1%	37 803	3.5
1981-82	5 608 12.6%	0	16 498 37.0%	16 <1%	0	21 227 47.5%	1 261 2.8%		39 <1%	44 649	3.3
1982-83	9 962 19.4%	0	28 750 56.0%	10 <1%	0	8 212 16.0%	4 376 8.5%		5 <1%	51 315	2.8
1983-84	1 637 2.3%	0	4 427 6.4%	2 <1%	4	16 335 23.5%	47 045 67.7%	1 <1%	57 <1%	69 508	3.3
1984-85	591 1.5%	0	5 099 13.3%	<1 <1%	0	14 412 37.7%	18 127 47.4%	0	8 <1%	38 237‡	2.5
1985-86	122 <1%	0	7 514 27%	0	7	4 271 15%	15 839 57%	0	0	27 754	4.7
1986-87	3 188 10.5%	0	6 103 20.1%	2 <1%	0	1 571 5.2%	19 406 63.9%	0	95 <1%	30 365	3.8

* Percentages refer to the proportion of a season's catch for each area.

† Provisional.

‡ Total does not include 281.5 t from one vessel for which logbooks are not held.

Table 2: Squid jigging catch and effort data by nation, 1986-87

	Total vessel-days squid caught (total A)		No. of hours fishing	No. of vessel-days squid caught, but no hours given*	Total vessel-days with nil catch (total B)	No. of hours fishing with nil catch	No. of vessel-days with nil catch, but no hours given†	Total catch (t)	Catch (t) per vessel-day	Catch (kg) per hour fishing
	No. of vessels	Total squid caught								
Japan	79	3 069	43 940	10	74	475	2	12 850.3	4.1	289.3
Korea	6	277	3 461	1	9	29	0	1 086.7	3.8	311.4
Joint venture	62	4 491	53 472	530	28	141	7	16 428.4	3.6	306.4
Total	147	7 837	100 873	541	111	645	9	30 365.4	3.8	299.1

* Included in total A.

† Included in total B.

Table 3: Squid jigging catch and effort data from Japanese vessels, 1986-87

Month	Total vessel-days squid caught (total A)		No. of hours fishing	No. of vessel-days squid caught, but no hours given*	Total vessel-days with nil catch (total B)	No. of hours fishing with nil catch	No. of vessel-days with nil catch, but no hours given†	Total catch (t)	Catch (t) per vessel-day	Catch (kg) per hour fishing
	No. of vessels	Total squid caught								
Dec	921	12 776	12 776	3	31	184	2	2 449.4	2.6	189.0
Jan	1 159	16 119	16 119	1	29	214	0	3 713.0	3.1	227.3
Feb	338	4 706	4 706	2	2	5	0	3 258.5	9.6	691.7
Mar	368	5 354	5 354	3	7	40	0	2 429.4	6.5	450.4
Apr	239	4 157	4 157	1	4	21	0	889.2	3.7	212.8
May	44	828	828	0	1	11	0	110.9	2.5	132.2

* Included in total A.

† Included in total B.

Table 4: Squid jigging catch and effort data from Korean vessels, 1986-87

Month	Total vessel-days squid caught (total A)	No. of hours fishing	No. of vessel-days squid caught, but no hours given*	Total vessel-days with nil catch (total B)	No. of hours fishing with nil catch	No. of vessel-days with nil catch, but no hours given†	Total catch (t)	Catch (t) per vessel-day	Catch (kg) per hour fished
Dec	28	248	1	0	0	0	41.6	1.5	167.9
Jan	26	287	0	2	5	0	69.9	2.5	239.4
Feb	39	430	0	0	0	0	332.0	8.5	772.0
Mar	69	859	0	5	19	0	403.1	5.4	459.1
Apr	86	1 264	0	2	5	0	190.8	2.2	150.4
May	29	373	0	0	0	0	49.3	1.7	132.2

* Included in total A.

† Included in total B.

Table 5: Squid jigging catch and effort data from joint venture vessels, 1986-87

Month	Total vessel-days squid caught (total A)	No. of hours fishing	No. of vessel-days squid caught, but no hours given*	Total vessel-days with nil catch (total B)	No. of hours fishing with nil catch	No. of vessel-days with nil catch, but no hours given†	Total catch (t)	Catch (t) per vessel-day	Catch (kg) per hour fishing
Dec	272	3 469	31	8	20	5	618.1	2.2	177.2
Jan	996	12 954	93	2	0	2	2 996.0	3.0	231.3
Feb	916	8 535	110	1	10	0	5 145.8	5.6	602.2
Mar	1 022	10 380	132	6	20	0	4 928.0	4.8	473.8
Apr	1 031	14 762	103	9	54	0	2 423.2	2.3	163.6
May	254	3 372	61	2	37	0	317.2	1.2	93.0

* Included in total A.

† Included in total B.

Table 6: Number of vessels* and their jig machine and lighting capacity, by vessel size, 1986-87

Vessel size (t)	No. of vessels	No. of vessels with hand machines	No. of mechanical machines per vessel	Light power (kW)						
				n/a	≤ 100	101-150	151-250	251-250	>250	
<250	13	7	≤ 35	2	3	8				
			36-40							
			41-45							
			46-50							
			>50							
250-350	27	15	≤ 35				2			
			36-40	1			3	1		
			41-45				3	4		
			46-50				2	2		1
			>50				1	2	5	
350-450	46	28	≤ 35				1			
			36-40				1	2		
			41-45				2	5		
			46-50		1		4	5	2	
			>50				2	15	5	1
>450	9	5	≤ 35							1
			36-40							
			41-45					2		
			46-50						2	
			>50					1	2	

* Data for 52 vessels are not included because of incomplete records.

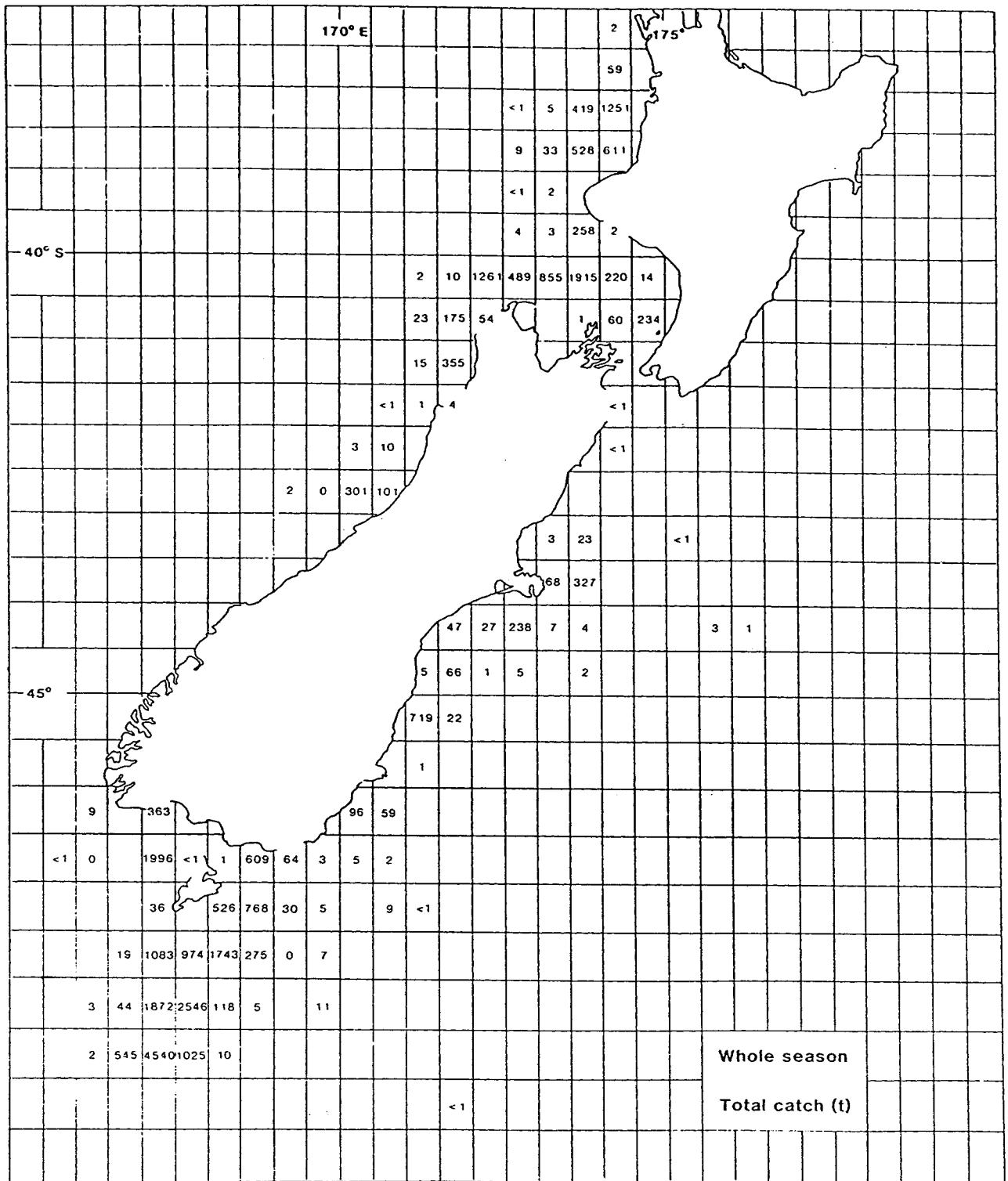


Figure 2: Total catch (t) for the whole season by 1/2° squares.

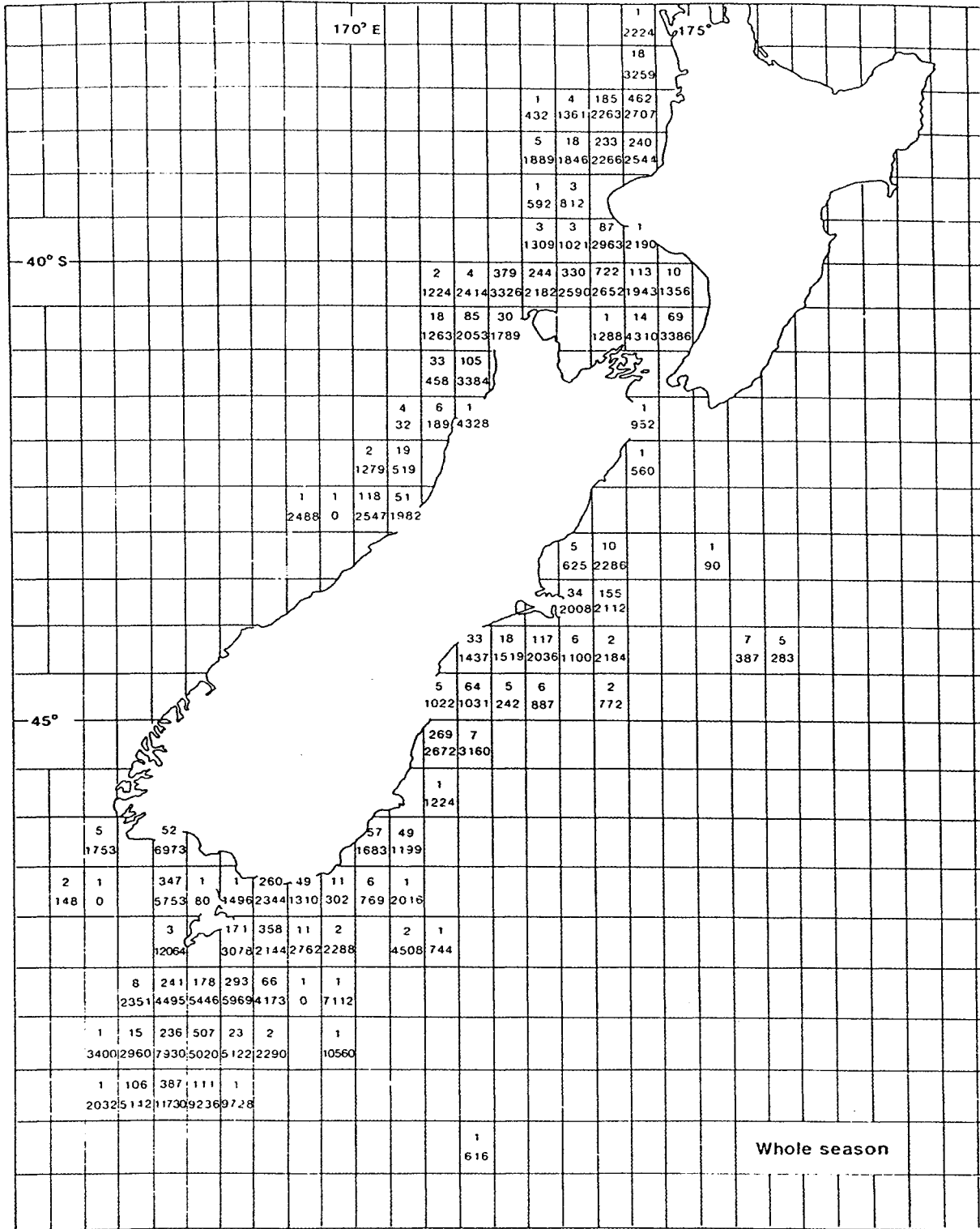


Figure 3: Seasonal summary of vessel-days fished (above) and catch (kg) per vessel-day (below) by 1/2° squares.

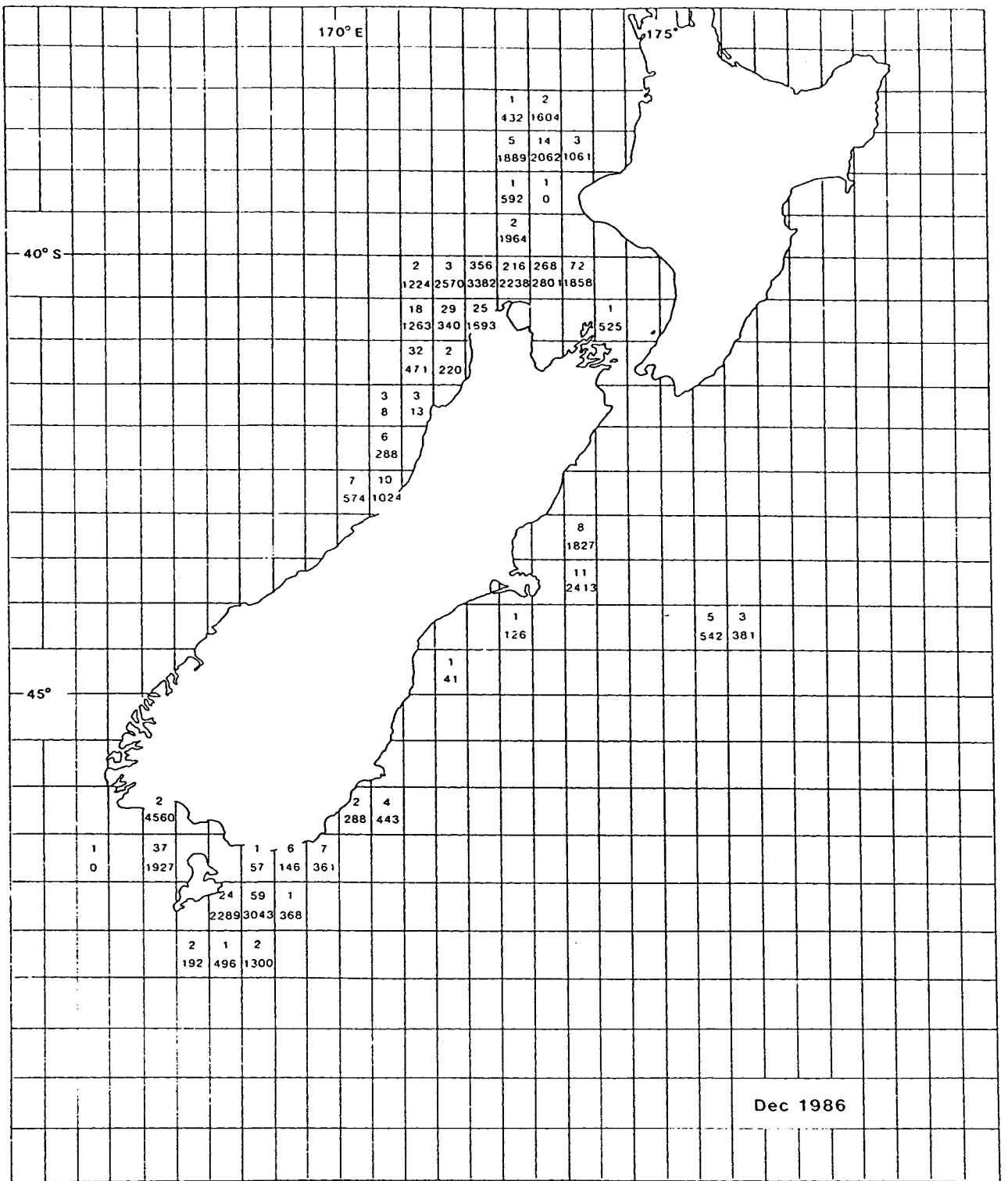


Figure 4: Monthly summary of vessel-days fished (above) and catch (kg) per vessel-day (below) by 1/2 squares.

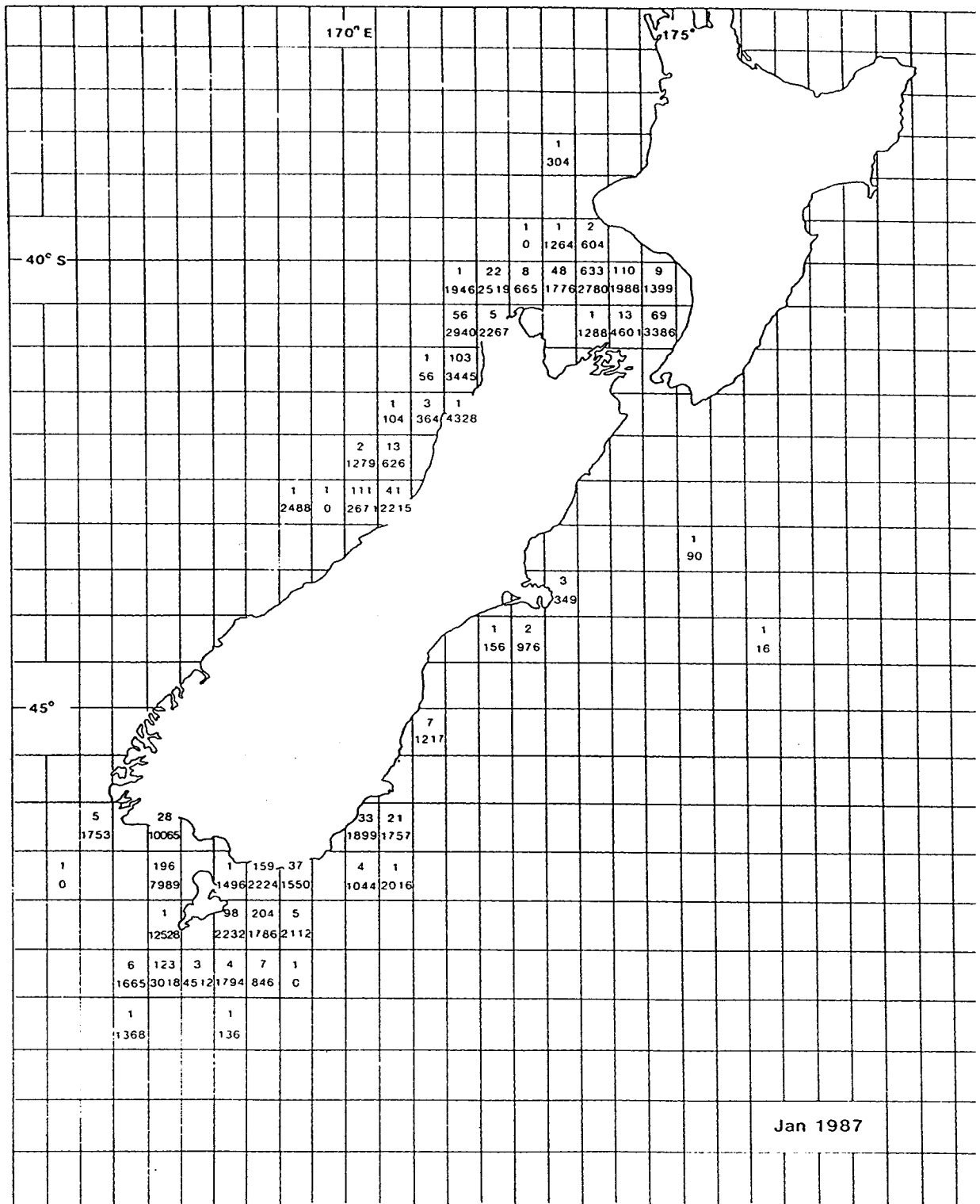


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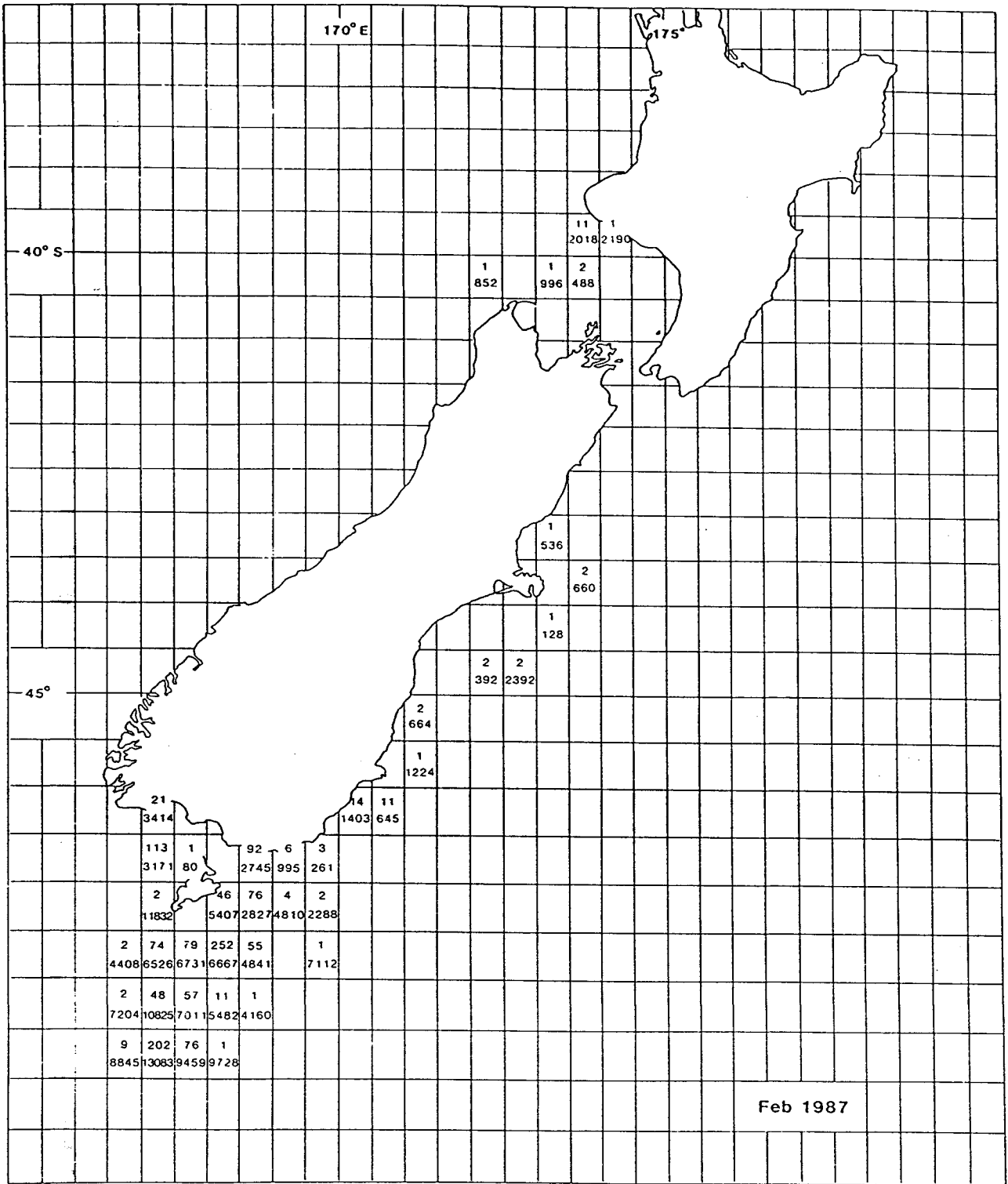


Figure 4: (continued).

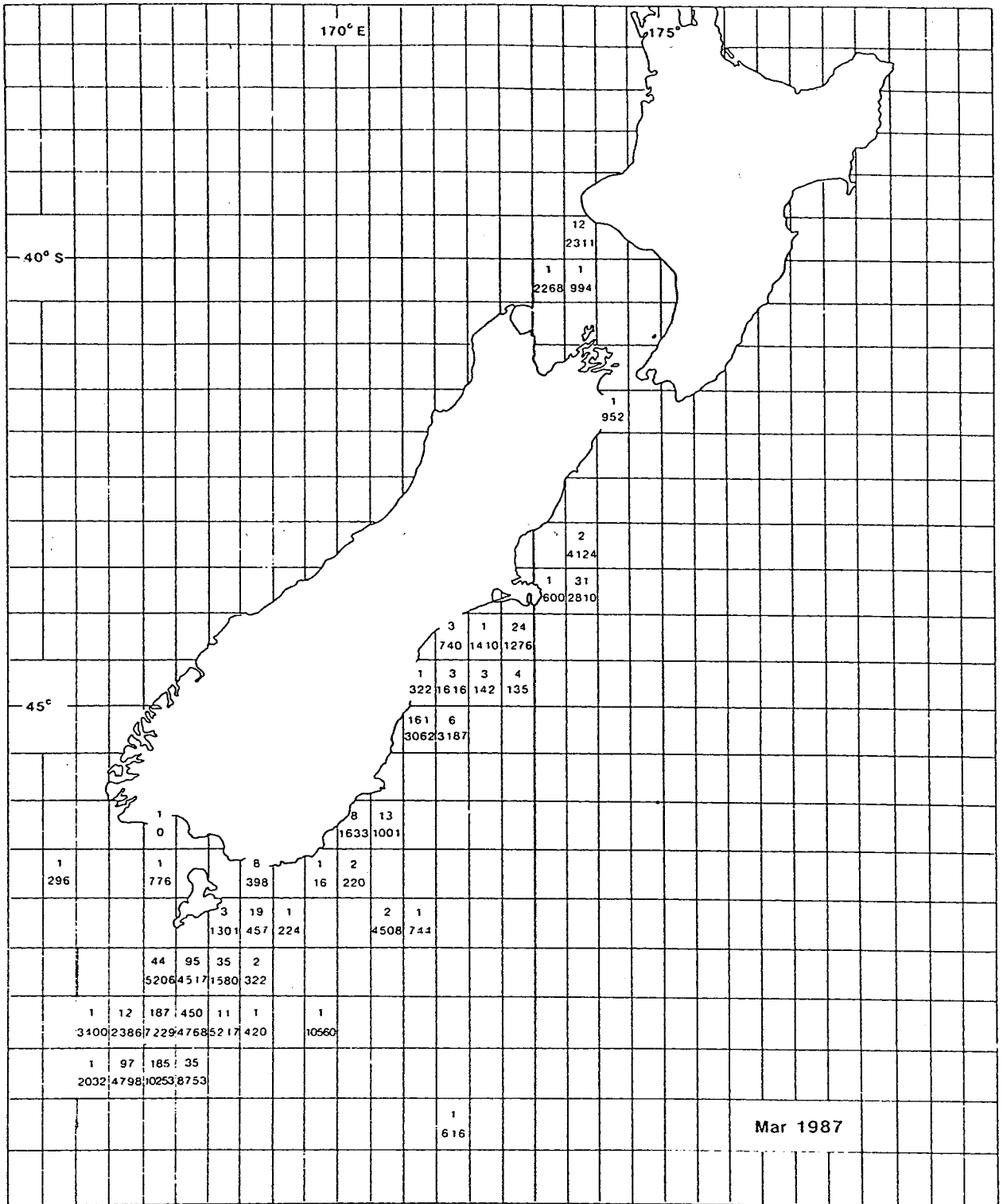


Figure 4: (continued).

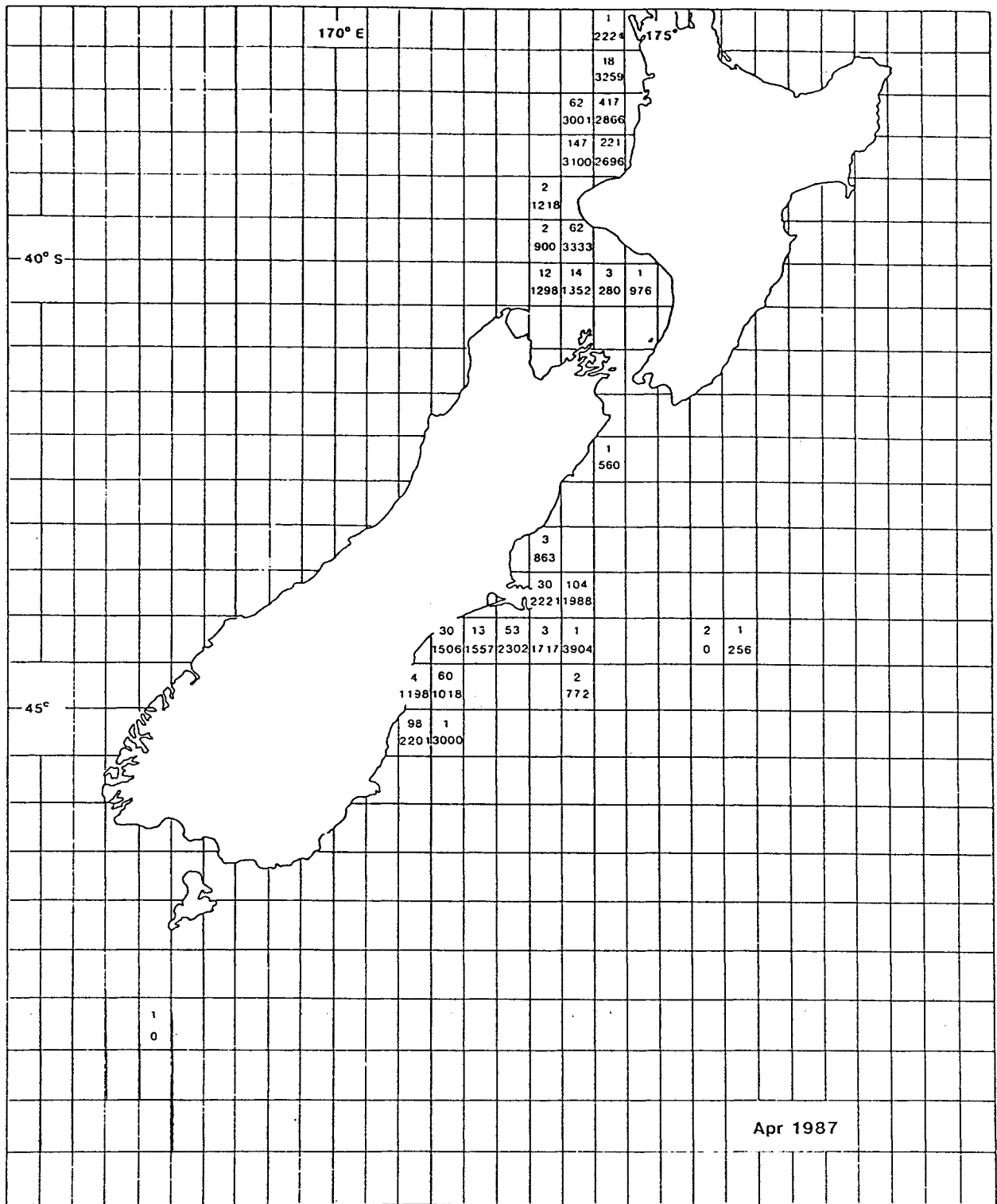


Figure 4: (continued)..

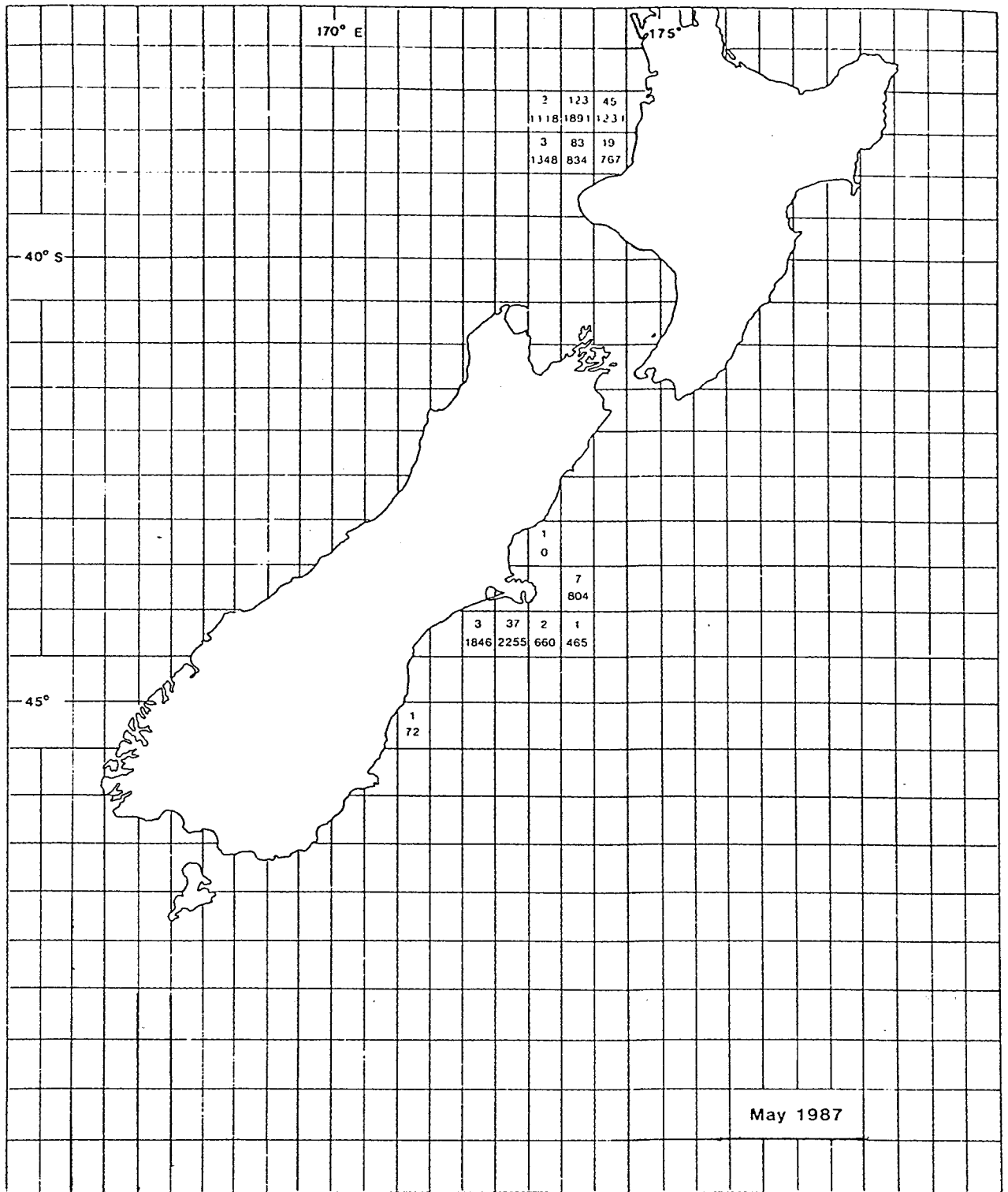


Figure 4: (continued).

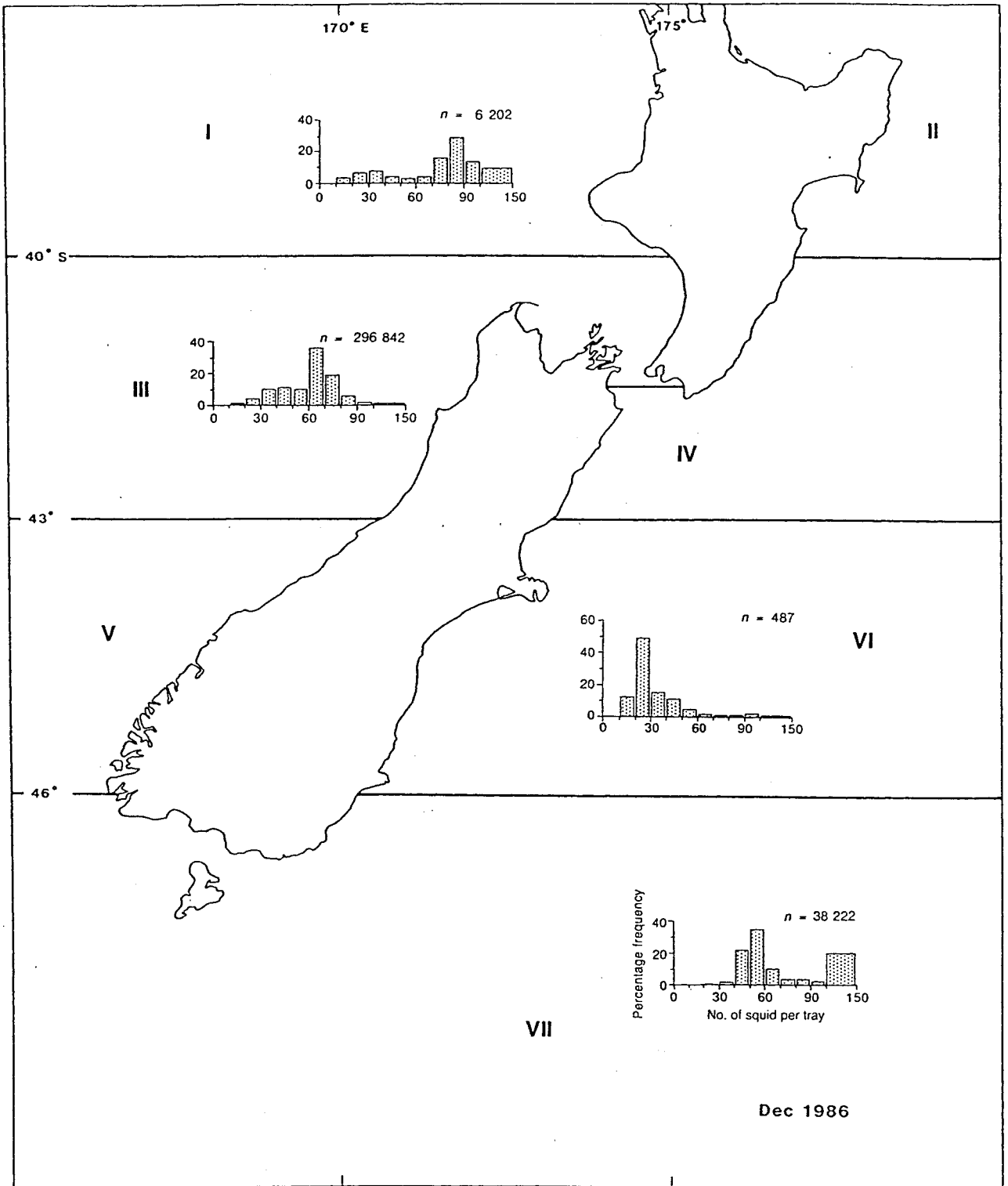


Figure 5: Percentage frequency of the number of squid per tray by month for areas I-VII. (The 100 to 150 squid-per-tray classes have been pooled; n = total number of trays.)

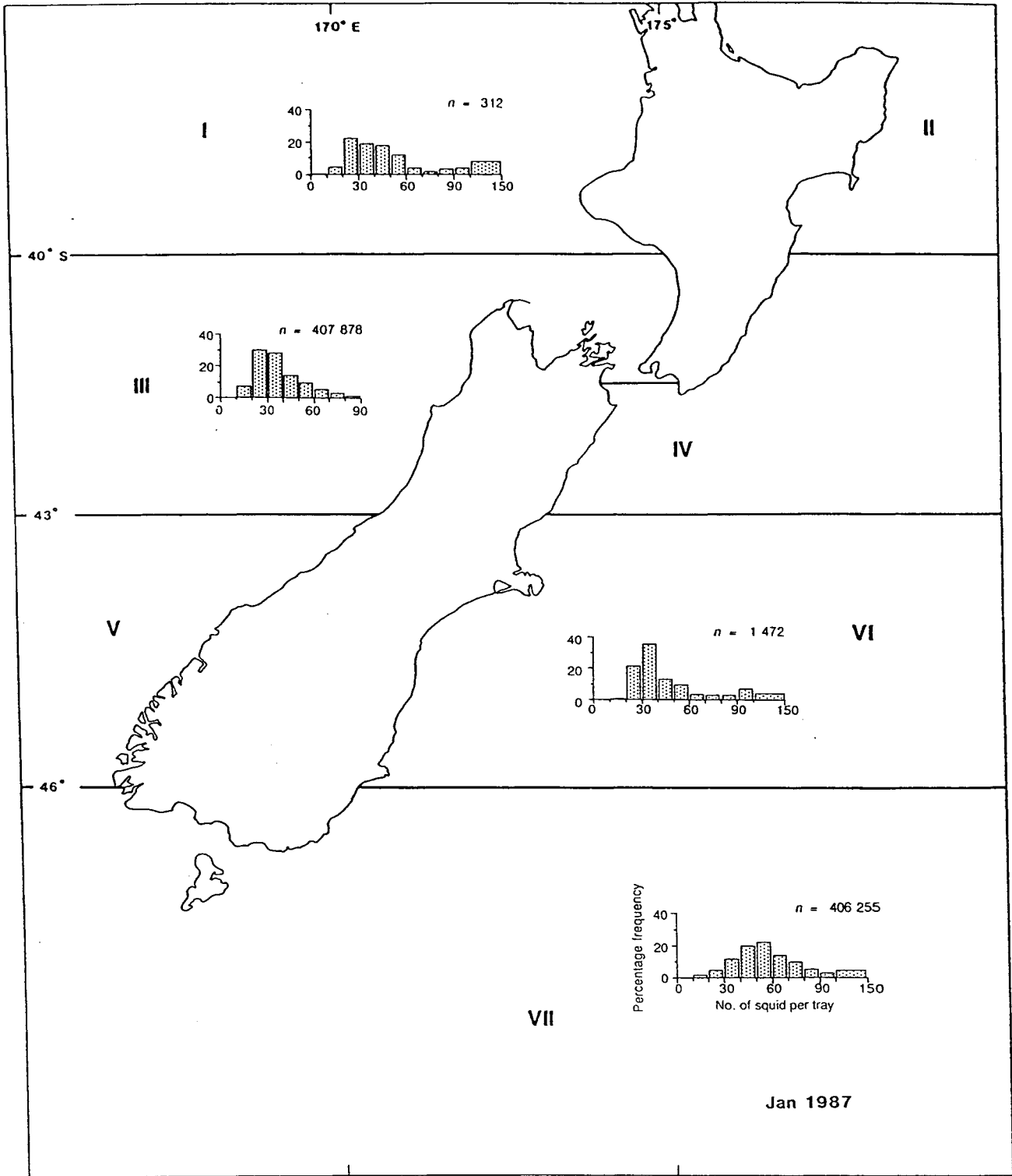


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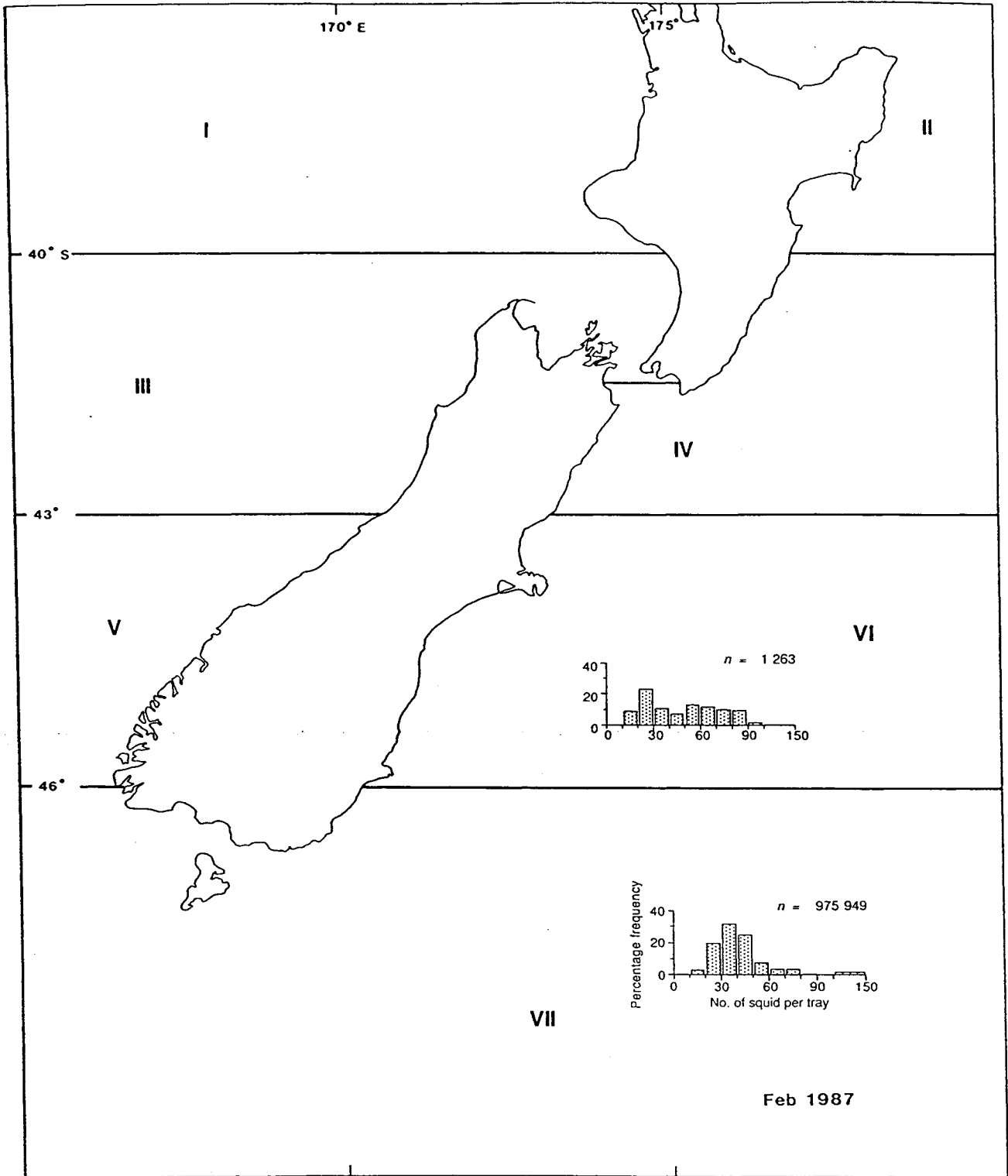


Figure 5: (continued).

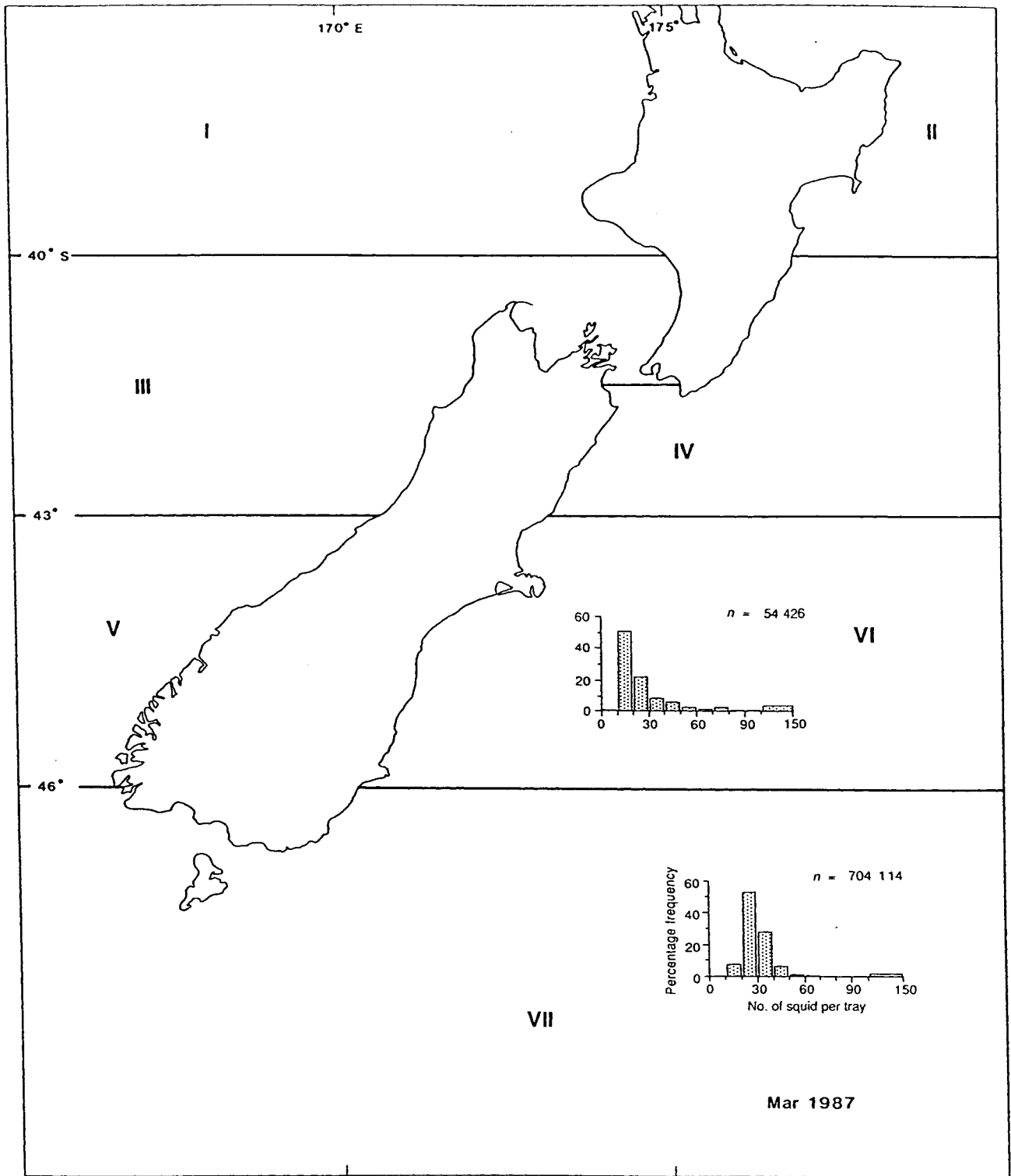


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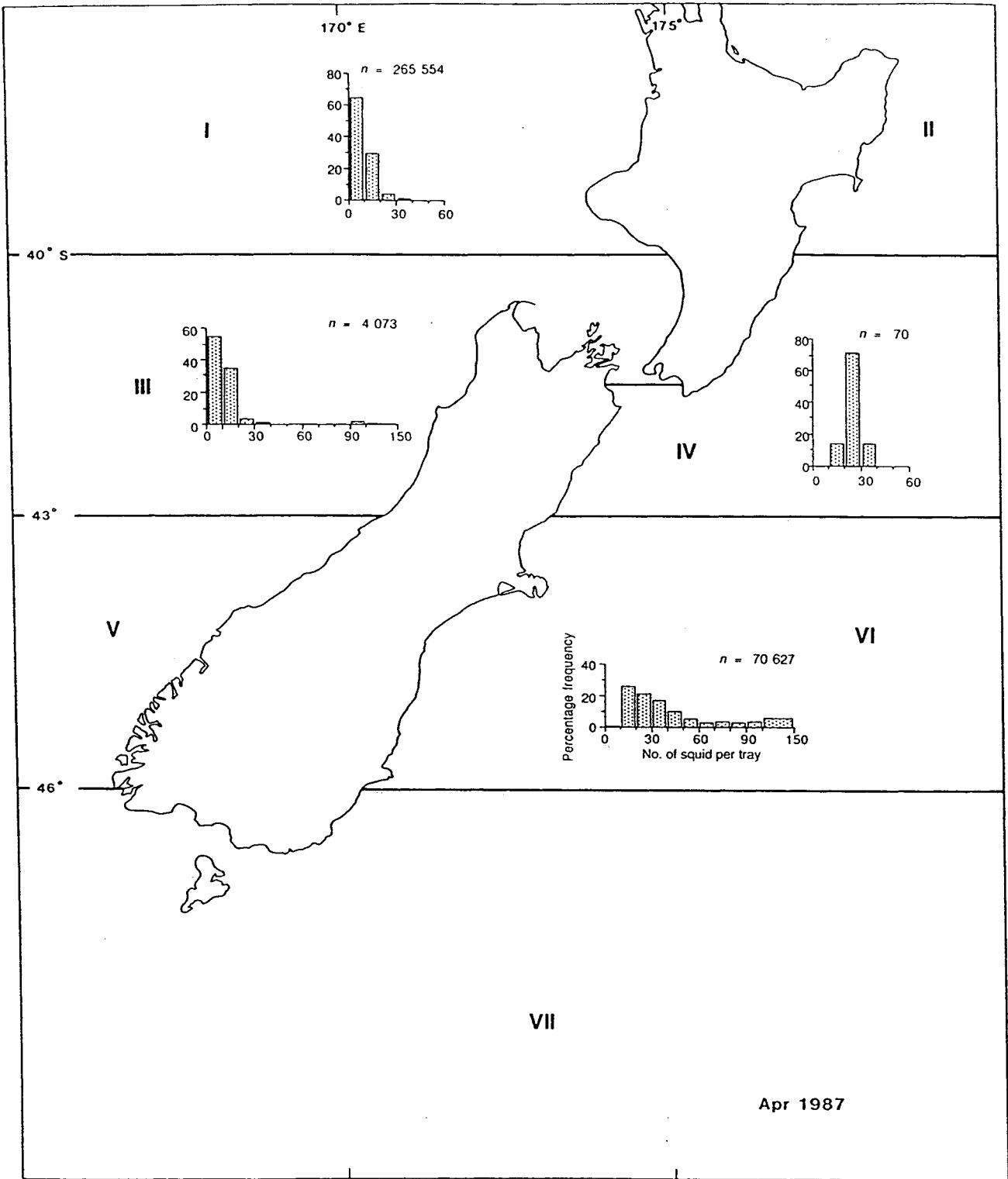


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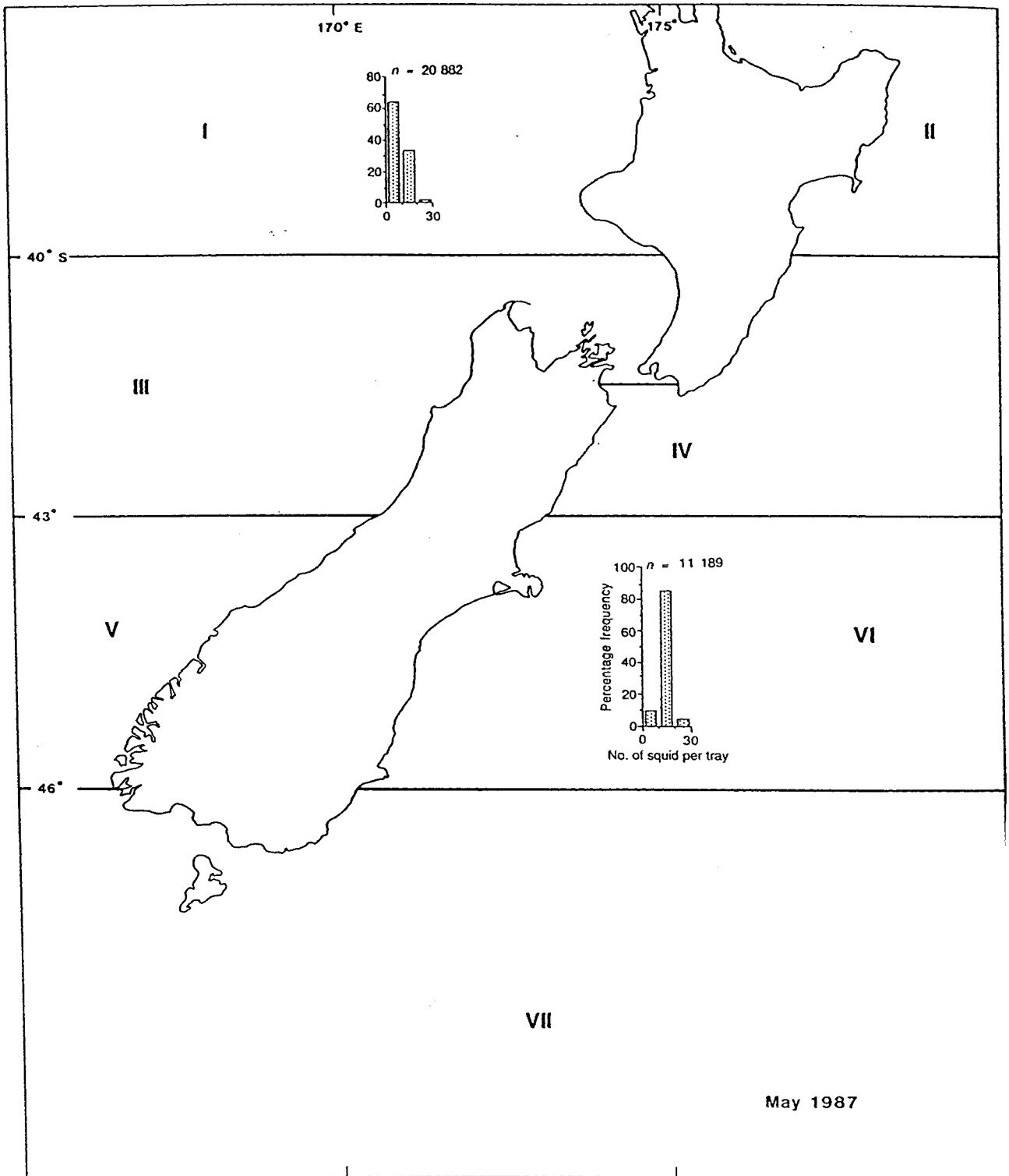


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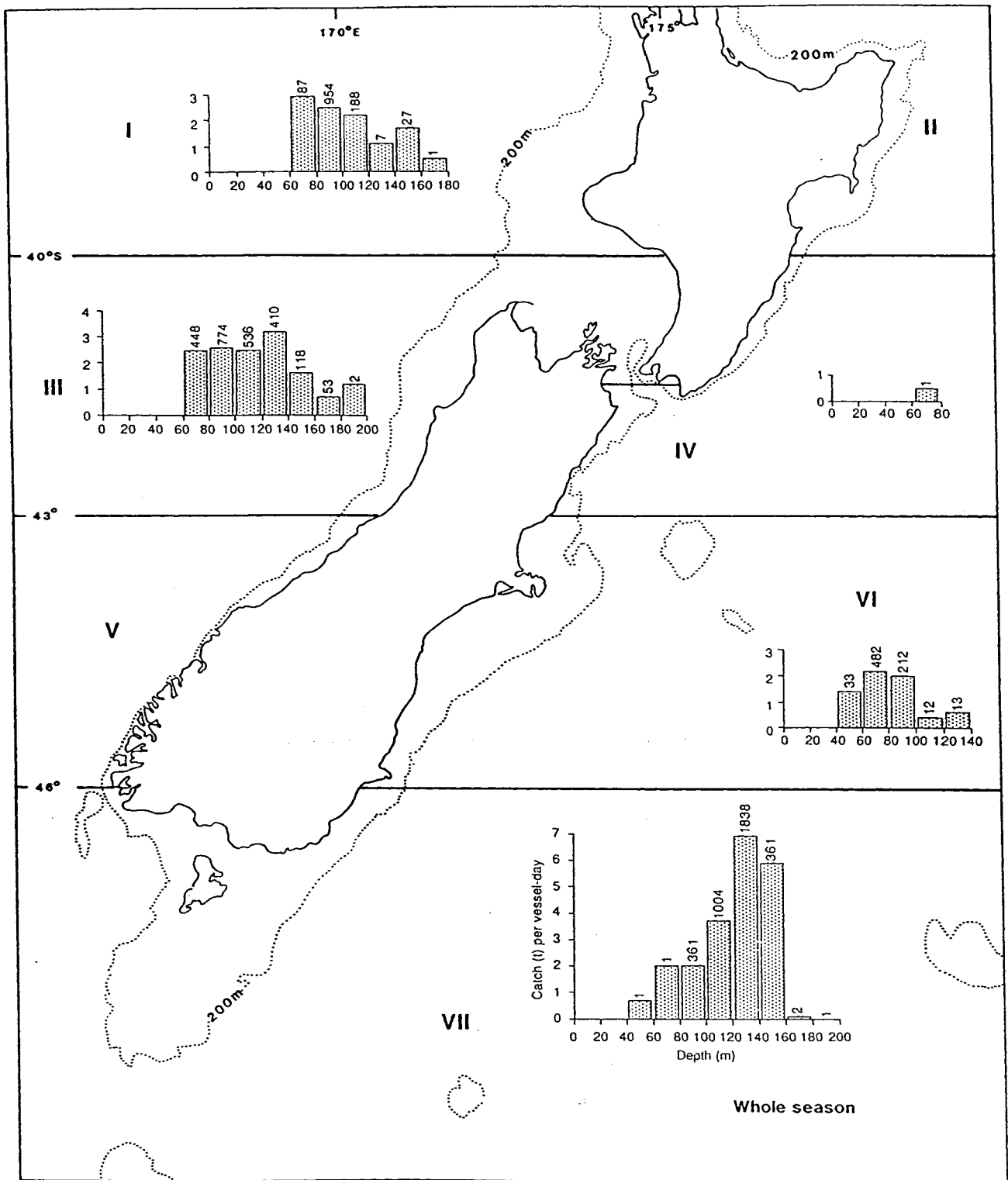


Figure 6: Seasonal summary of catch (t) per vessel-day by mean bottom depth of fishing grounds in areas I-VII. (Individual figures above the histograms are the number of vessel-days fished in each depth range; a number above a nil value means either a nil catch or a catch of less than 100 kg per vessel-day.)

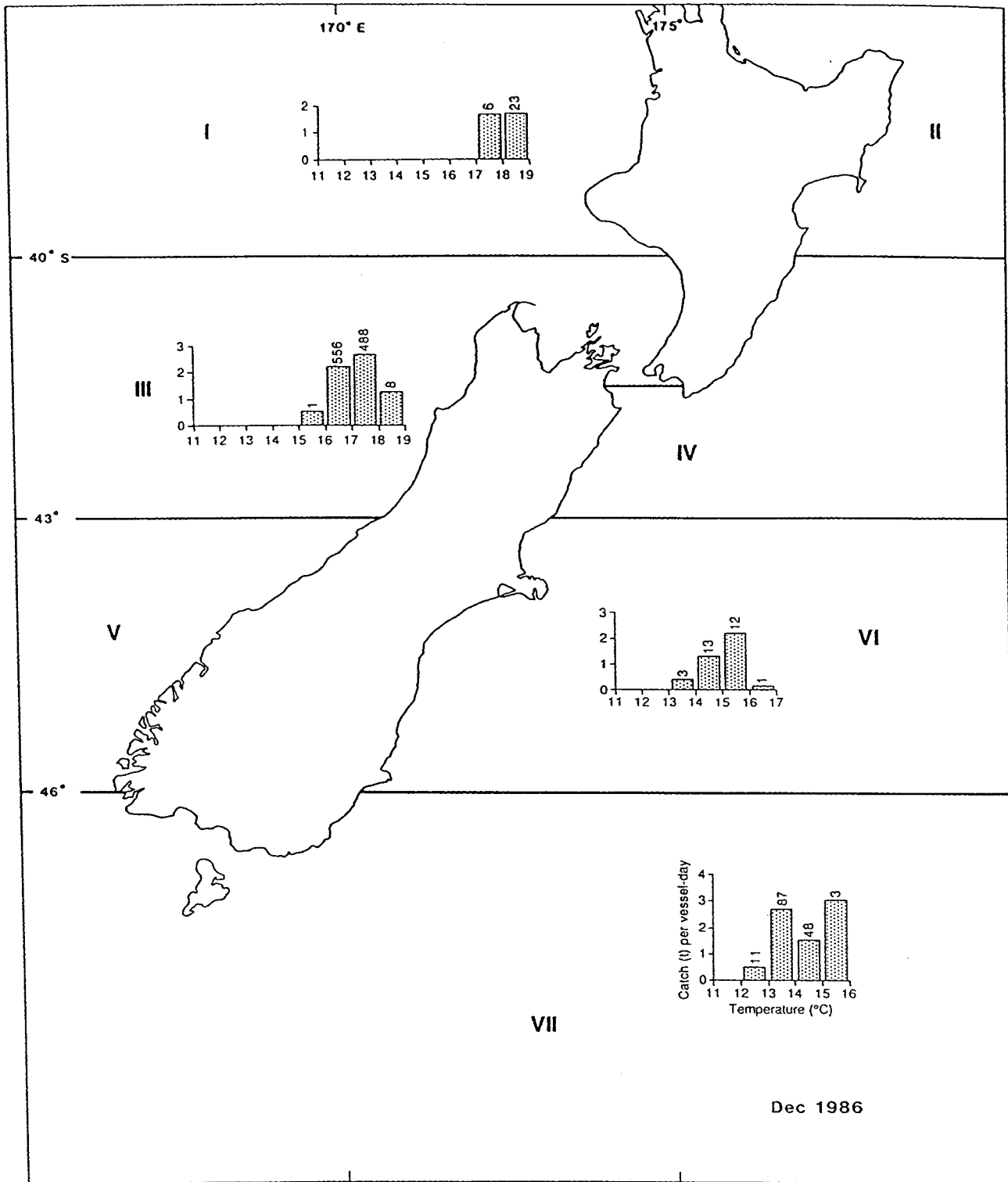


Figure 7: Monthly summary of catch (t) per vessel-day by mean sea surface temperature of fishing grounds in areas I–VII. (Individual figures above the histograms are the number of vessel-days fished in each temperature range; a number above a nil value means either a nil catch or a catch of less than 100 kg per vessel-day.)

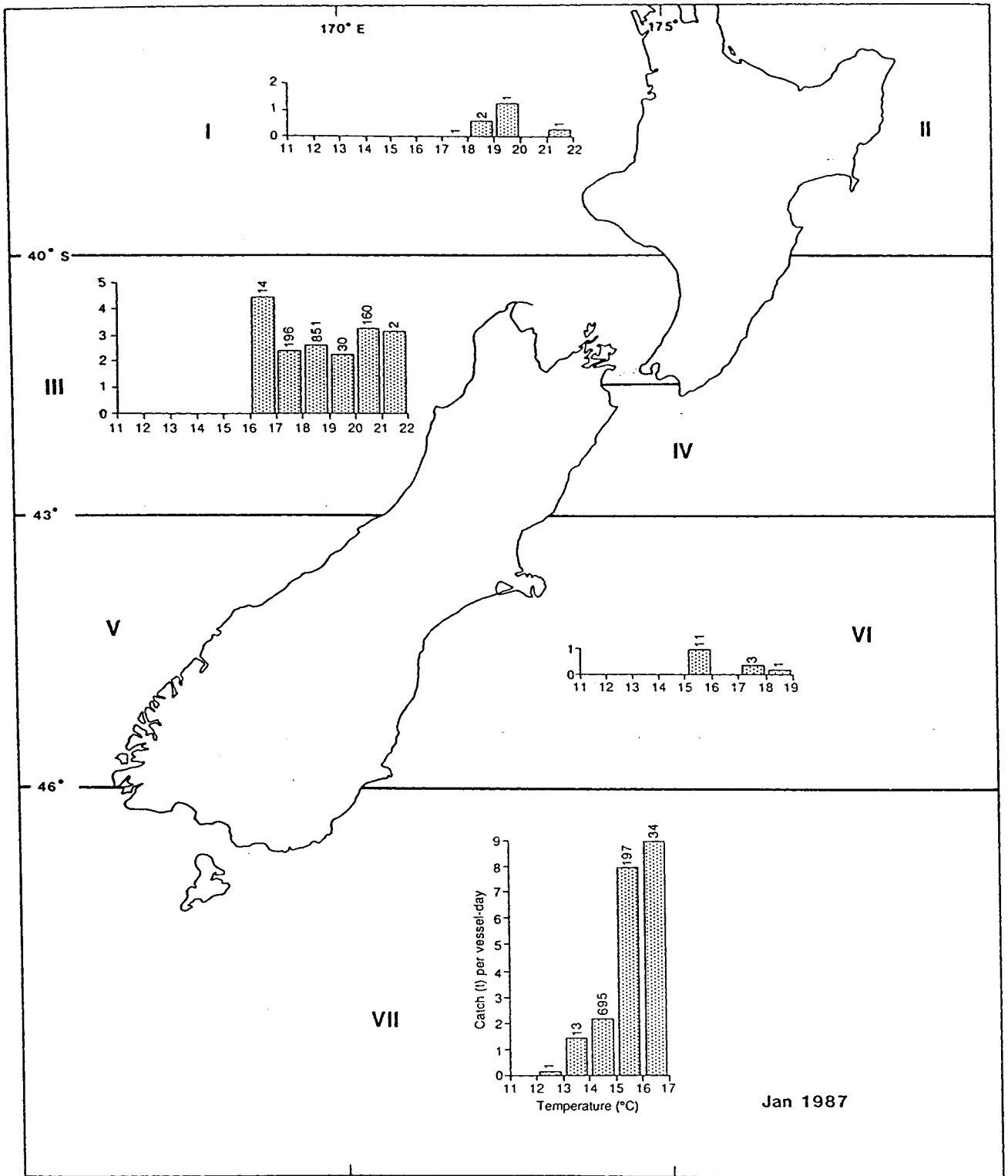


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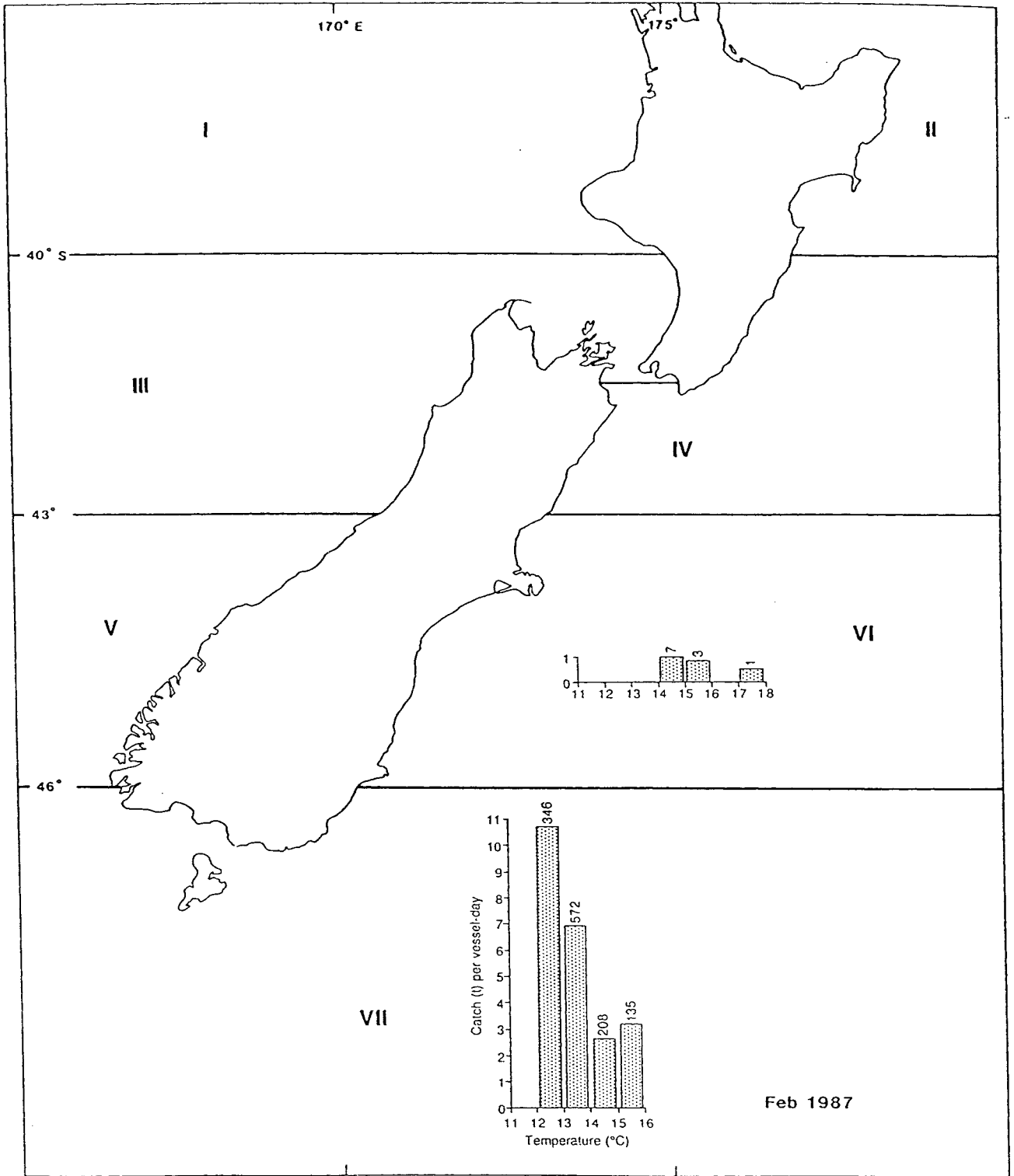


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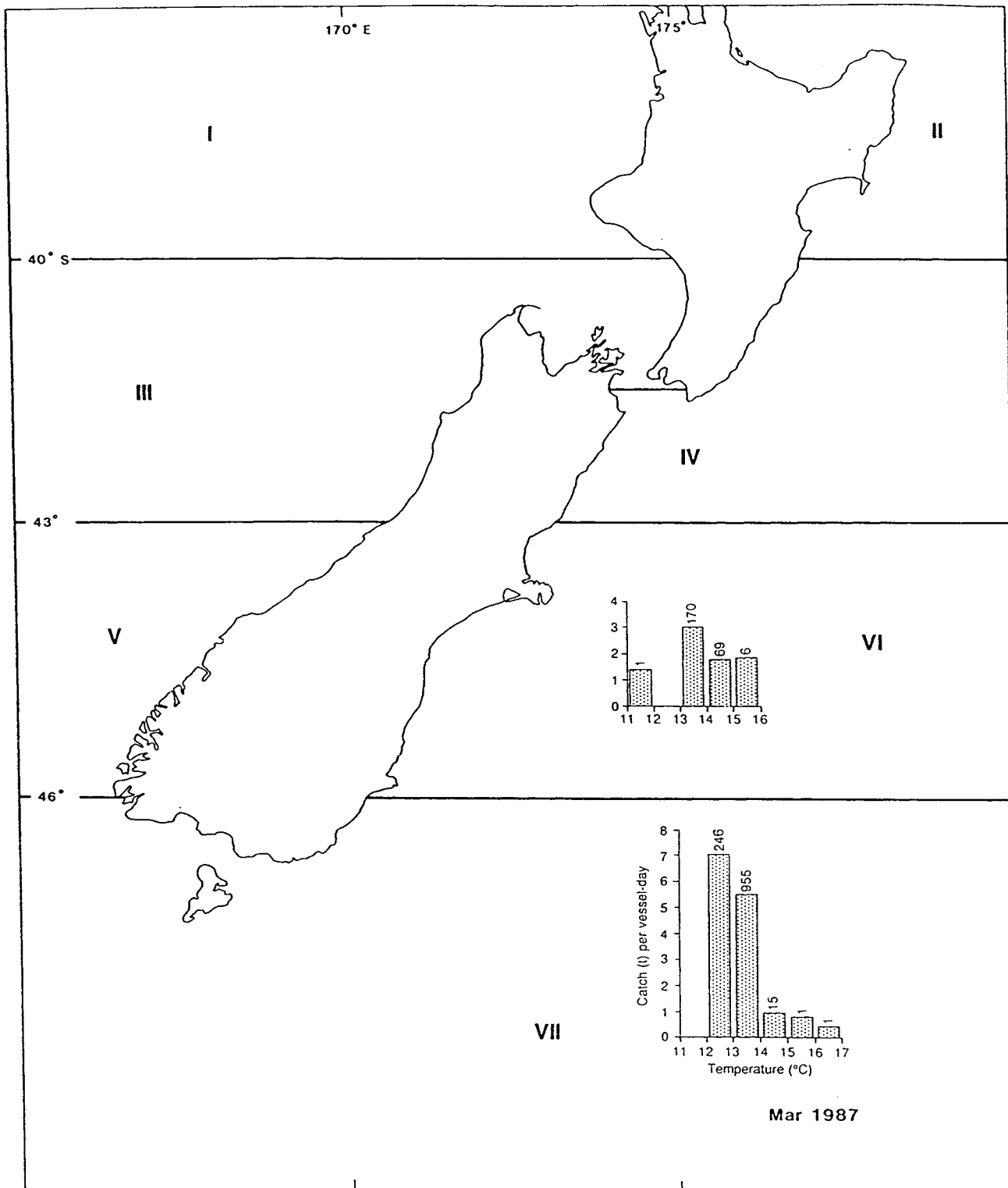


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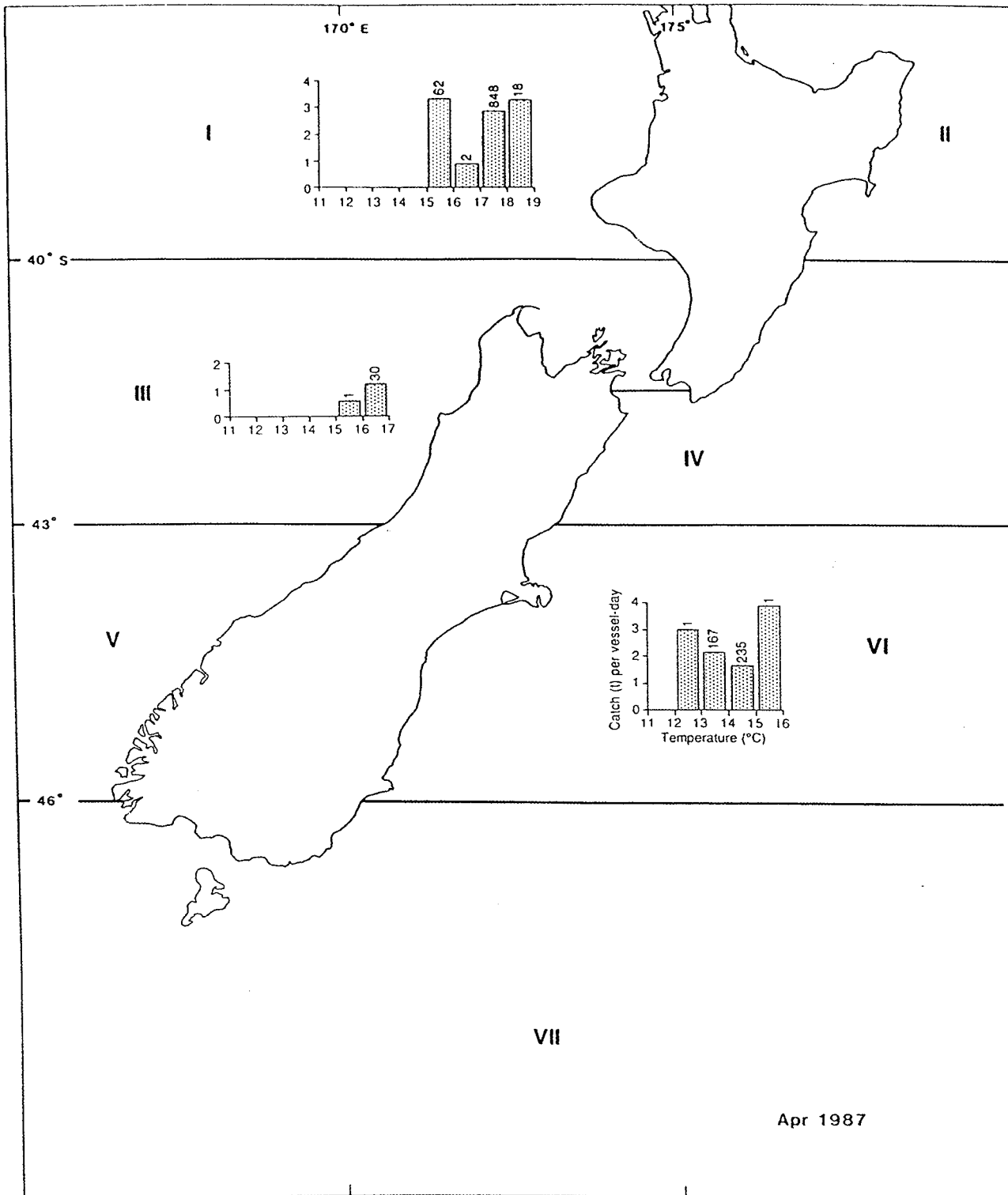


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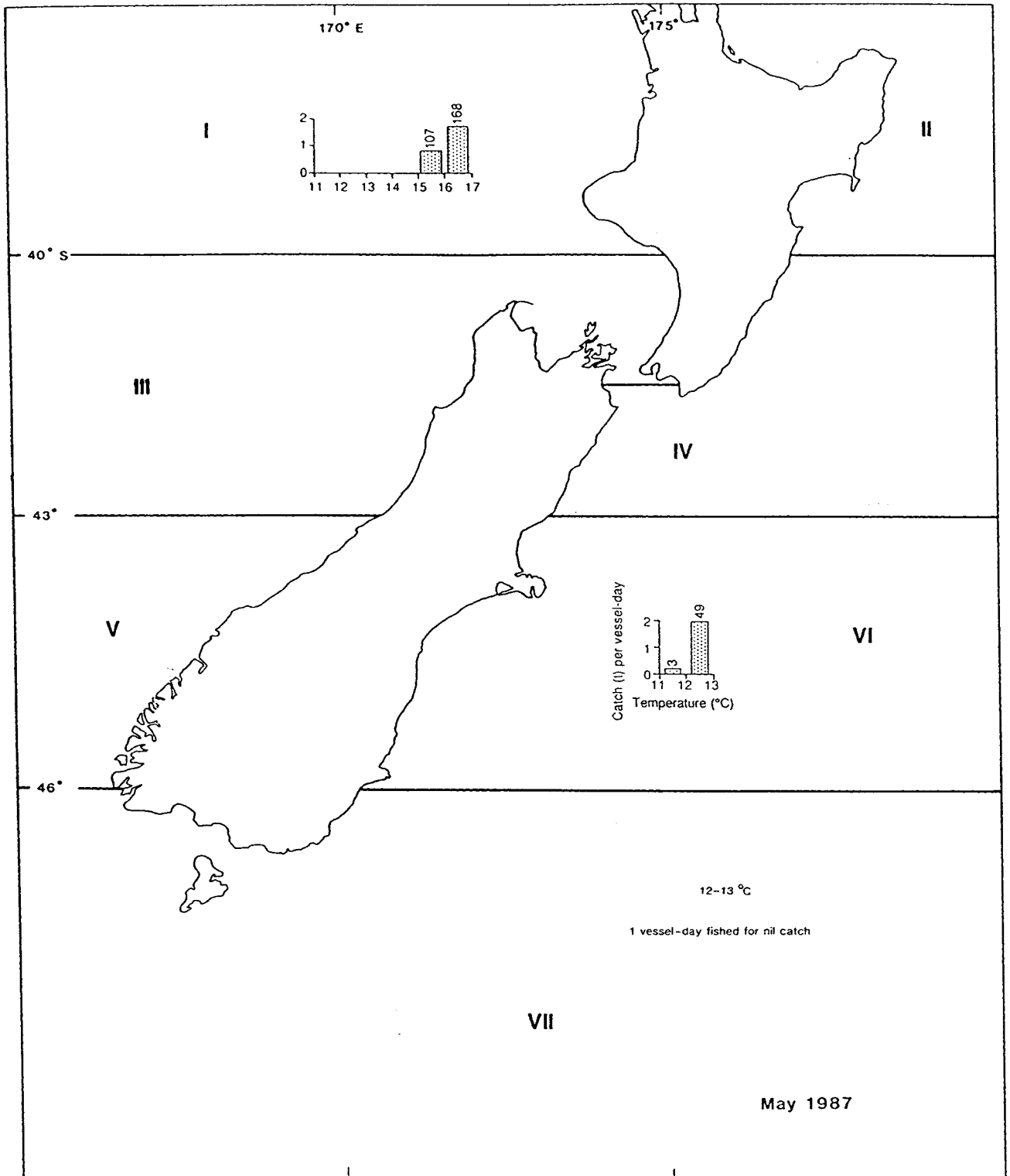


Figure 7: (continued).