

# The 1987–88 foreign licensed and chartered squid jig fishery around New Zealand

A. M. Atkins  
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E. R. Stewart

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START A NEW SHEET EACH DAY

DATE:  Day  Month  Year  
A B

- 00 : 00 : 00

NOT FISHING

無釣獲

RADIO CALL SIGN:   
Z-N-1-2

FISHING OPERATION:

LATITUDE N/S	LONGITUDE E/W	DEPTH Bottom Lure E/W m	SEA SURFACE TEMPERATURE °C	WIND SPEED m/s	WIND DIRECTION °T	TIME FISHING Day Hours	TIME FISHING Night Hours
N	E	Bottom Lure E/W m					
S	O	E/W m					

CATCH:

	TOTAL CATCH (KG) 總重量 (kg)
Arrow Squid 箭魚	
Other Squid 其他	
Other (Specify) 其他 (請註明)	

TRAY TALLY:

Number of trays c/s 入盤數	WHOLE A	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
Y-X <input type="checkbox"/>	WITHOUT LEGS 無足													

Figure 1: Squid logbook return form.

## 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 1987–88 it was the fourth most valuable New Zealand fishery, with export earnings for the year ended December 1988 of \$53 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 80–185 vessels in both foreign licensed and chartered 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 1987–88 season, 80 jig vessels from Japan, Korea, and the Soviet Union caught 39 275 t.

This report presents data from the jig fishery only; data from the trawl fishery may be published in a similar report in the future. The 1987–88 report is the ninth in a series of annual reports on the squid jig fishery. The data 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 the 1978–79 season 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 one vessel-day is a 24 hour 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.

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 chartered vessels have been used because only these vessels consistently use standard 8.0–8.5 kg trays. (Of the total fleet of 80 vessels, 67 were Japanese or Japanese chartered vessels.)

Figures 6 and 7 show average catch rates by bottom depth and sea surface temperature, respectively, in areas fished.

Five vessel-days fished by five vessels for which positions were not recorded resulted in a catch of 19 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		with position not given	Total catch	Catch per vessel-day
		East coast	West coast			
1978-79		19 134 79%*	4 954 21%	0	24 088	1.5
		I	II	III	IV	V
1979-80	2 641 6.5%	0	14 840 36.7%	11 <1%	2 <1%	4 127 10.2%
1980-81	983 2.6%	0	20 110 53.2%	89 <1%	0 41.8%	18 776 46.4%
1981-82	5 608 12.6%	0	16 498 37.0%	16 <1%	0 47.5%	780 2.1%
1982-83	9 962 19.4%	0	28 750 56.0%	10 <1%	0 16.0%	21 227 8.5%
1983-84	1 637 2.3%	0	4 427 6.4%	2 <1%	4 <1%	8 212 16.0%
1984-85	591 1.5%	0	5 099 13.3%	<1 <1%	0 23.5%	4 335 67.7%
1985-86	122 <1%	0	7 514 27%	0 <1%	14 412 15%	4 271 57%
1986-87	3 188 10.5%	0	6 103 20.1%	2 <1%	0 5.2%	1 571 19.406
1987-88	10 075 25.7%	C	25 018 63.7%	87 <1%	6 <1%	2 371 6.0%
						0 4.3%
		VI	VII	VIII		
					40 457†	2.5
					37 803	3.5
					44 649	3.3
					51 315	2.8
					69 508	3.3
					27 754	4.7
					38 237‡	2.5
					30 365	3.8
					39 275	5.9

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

† Total includes 2.4 t for which incorrect positions were given.

‡ 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, 1987–88

No. of vessels	Total vessel-days squid caught (total A)	No. of hours fishing given*	No. of vessel-days squid caught, but no hours given*			(total B)	No. of vessel-days fishing with nil catch			Total catch (t)	Catch (t) per vessel-day fishing
			No. of vessel-days	Total vessel-days with nil catch	No. of hours fishing with nil catch		No. of vessel-days with nil catch	Total catch (t)			
Japan	25	2 326	35 972	12 21	36 157		1 18	857.3	8.0	521.3	
Korea	3	217	2 288	2 21	0 2		2 938.3	4.3	4.3	743.8	
Foreign chartered	52	4 085	56 997	291 31	211 211		1 19 479.7	4.7	4.7	548.0	
Total	80	6 628	95 257	324 69	368 368		4 39 275.3	5.9	5.9	317.5	
										318.0	
										153.5	

\* Included in total A.

† Included in total B.

Table 3: Squid jigging catch and effort data from Japanese vessels, 1987–88

Month	Total vessel-days squid caught (total A)	No. of hours fishing given*	No. of vessel-days squid caught, but no hours given*			(total B)	No. of vessel-days fishing with nil catch			Total catch (t)	Catch (t) per vessel-day fishing
			No. of vessel-days	Total vessel-days with nil catch	No. of hours fishing with nil catch		No. of vessel-days with nil catch	Total catch (t)			
Dec	390	5 661	1	5	5	21	0	4 526.2	11.5	797.5	
Jan	618	9 104	5	13	51	0	0	6 826.0	10.8	743.8	
Feb	432	6 208	4	13	59	1	1	3 440.6	7.7	548.0	
Mar	557	8 966	1	5	26	0	2 237.7	4.0	4.0	249.1	
Apr	300	5 440	1	0	0	0	0	1 735.8	5.8	318.0	
May	29	5 93	0	0	0	0	0	0	3.1	153.5	

\* Included in total A.

† Included in total B.

Table 4: Squid jigging catch and effort data from Korean vessels, 1987–88

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 (kg) per hour fishing
				No. of vessel-days but no hours given*	Total vessel-days with nil catch (total B)				
Jan	38	412	2	0	0	0	0	309.8	8.2
Feb	67	696	9	1	1	1	1	210.1	3.1
Mar	62	506	10	1	1	1	1	178.2	2.8
Apr	46	622	0	0	0	0	0	228.5	5.0
May	4	52	0	0	0	0	0	11.8	2.9

\* Included in total A.

† Included in total B.

Table 5: Squid jigging catch and effort data from foreign chartered vessels, 1987–88

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 (kg) per hour fishing
				No. of vessel-days but no hours given*	Total vessel-days with nil catch (total B)				
Dec	19	326	0	0	0	0	0	227.8	12.0
Jan	808	10664	39	4	26	0	6	350.0	7.8
Feb	934	12126	57	12	65	0	4	755.5	5.0
Mar	1227	16403	90	8	80	0	3	932.4	3.2
Apr	950	15385	76	6	40	0	3	890.2	4.1
May	147	2093	29	1	1	1	1	323.8	2.2

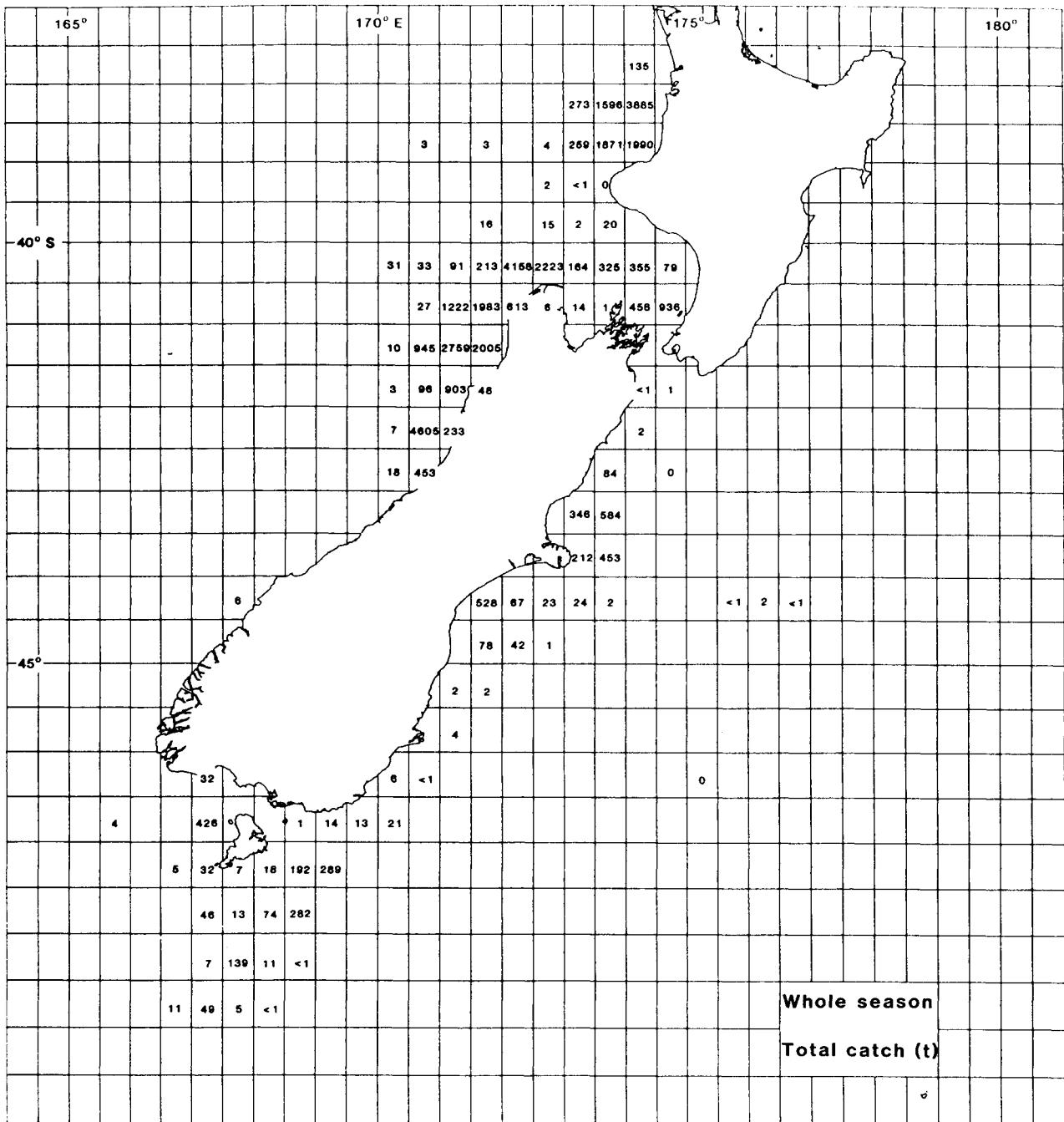
\* Included in total A.

† Included in total B.

Table 6: Number of vessels\* and their jig machine and lighting capacity, by vessel size, 1987-88

Vessel size (t)	No. of vessels	No. of vessels with hand machines	No. of mechanical machines per vessel	Light power (kW)				
				≤100	101-150	151-250	201-250	>250
<250	23	12	≤35	5	13		5	
				36-40				
				41-45				
				46-50				
				>50				
250-350	4	2	≤35					
				36-40	1			
				41-45		1		
				46-50			2	
				>50				
350-450	46	28	≤35					
				36-40				
				41-45				
				46-50	1		4	
				>50		5	2	4
>450	9	5	≤35					
				36-40				
				41-45				
				46-50	1			
				>50			1	1

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



**Figure 2:** Total catch (t) for the whole season by  $1/2^{\circ}$  squares.

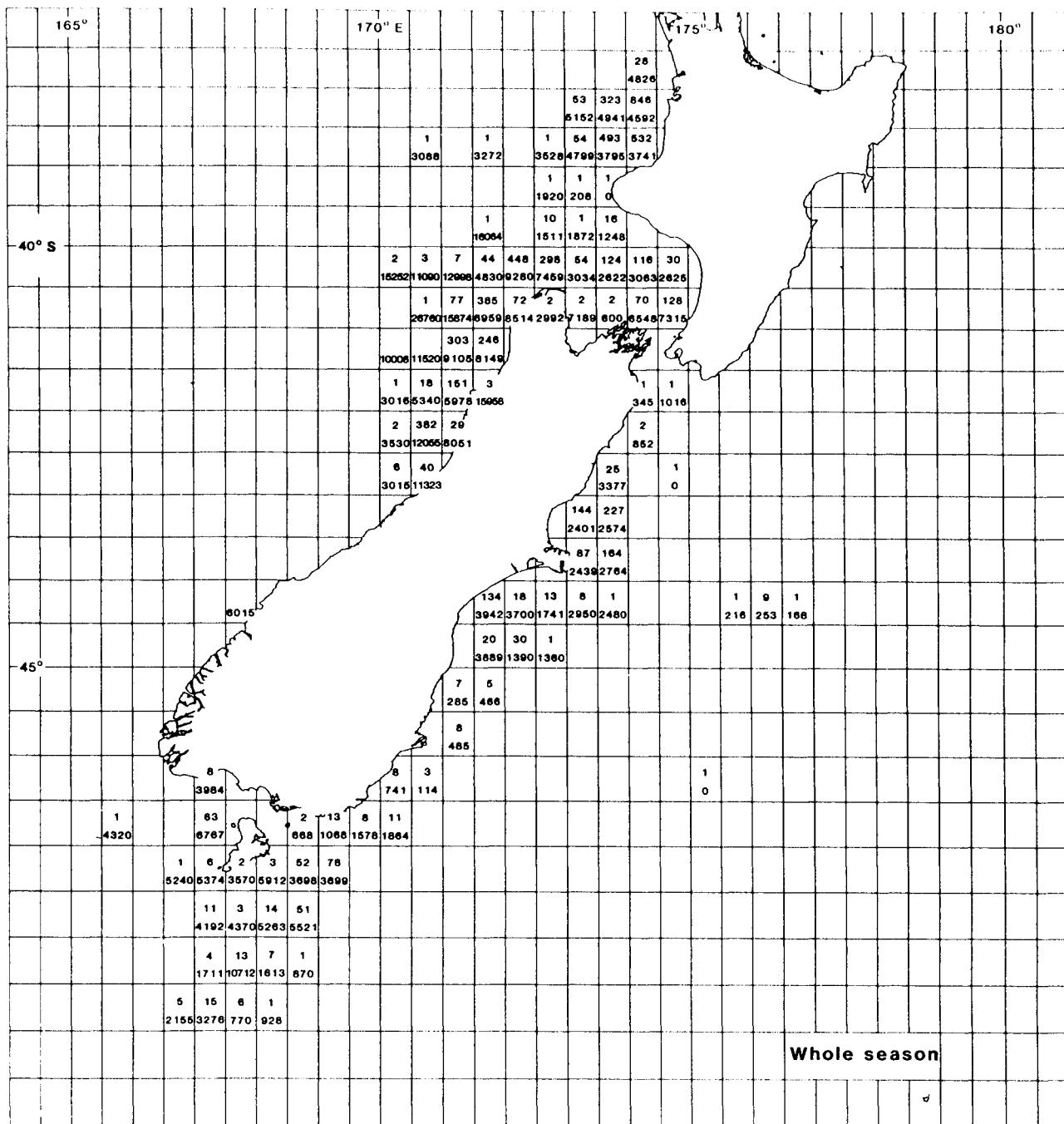


Figure 3: Seasonal summary of vessel-days fished (above) and catch (kg) per vessel day (below) by  $1/2^\circ$  squares.

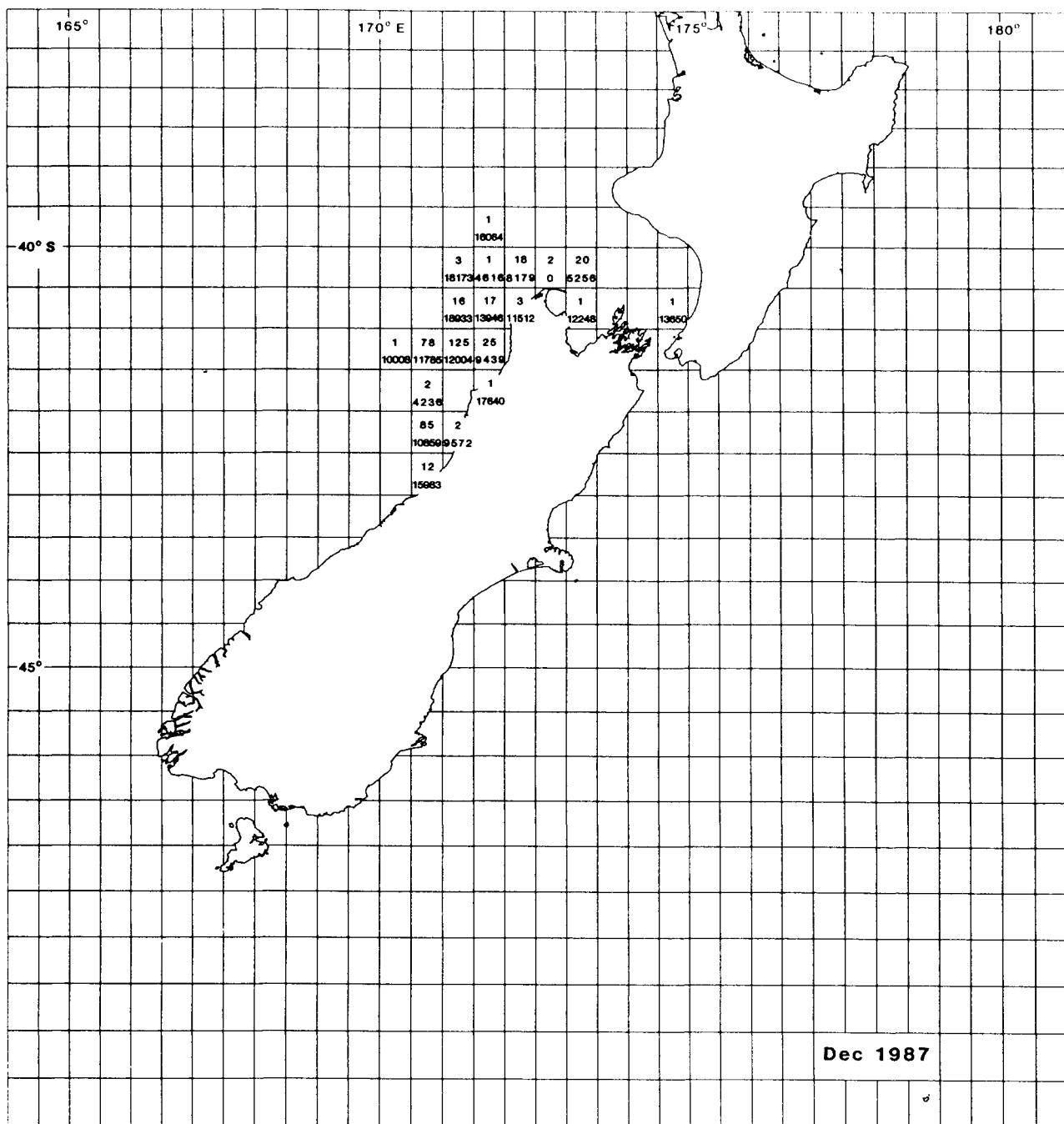
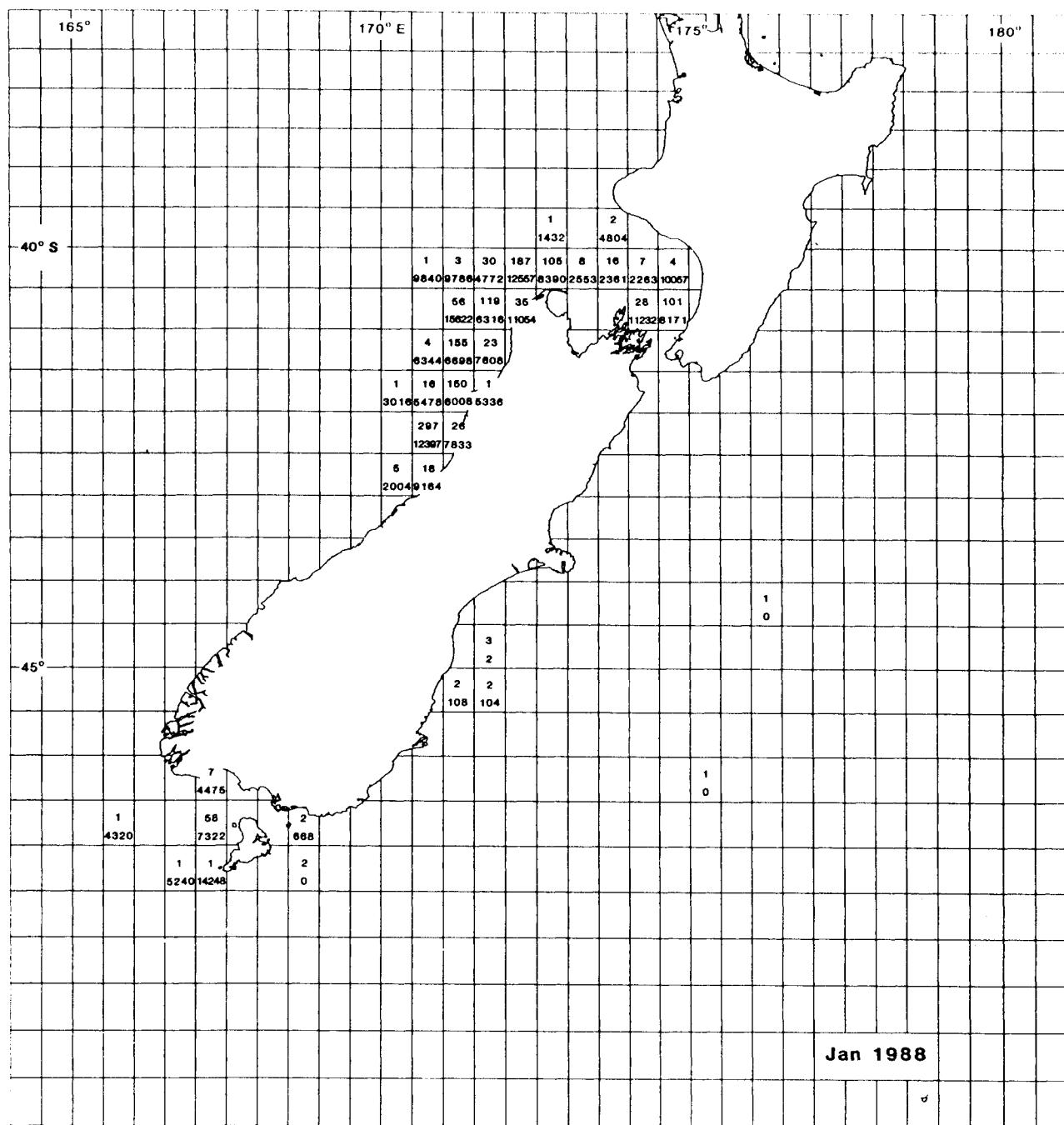


Figure 4: Monthly summary of vessel-days fished (above) and catch (kg) per vessel-day (below) by  $1/2^{\circ}$  squares.



**Figure 4: (continued).**

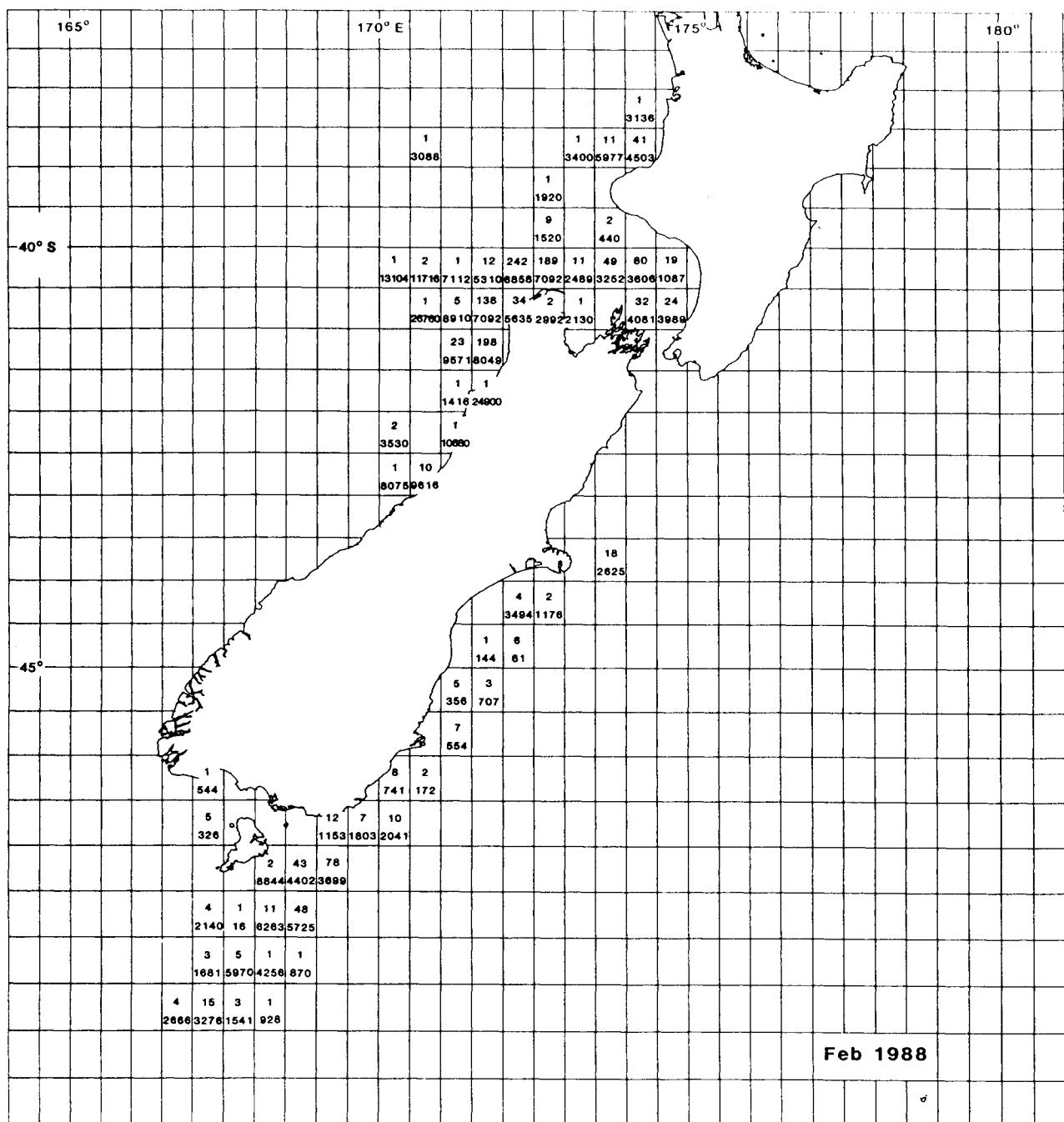


Figure 4: (continued).

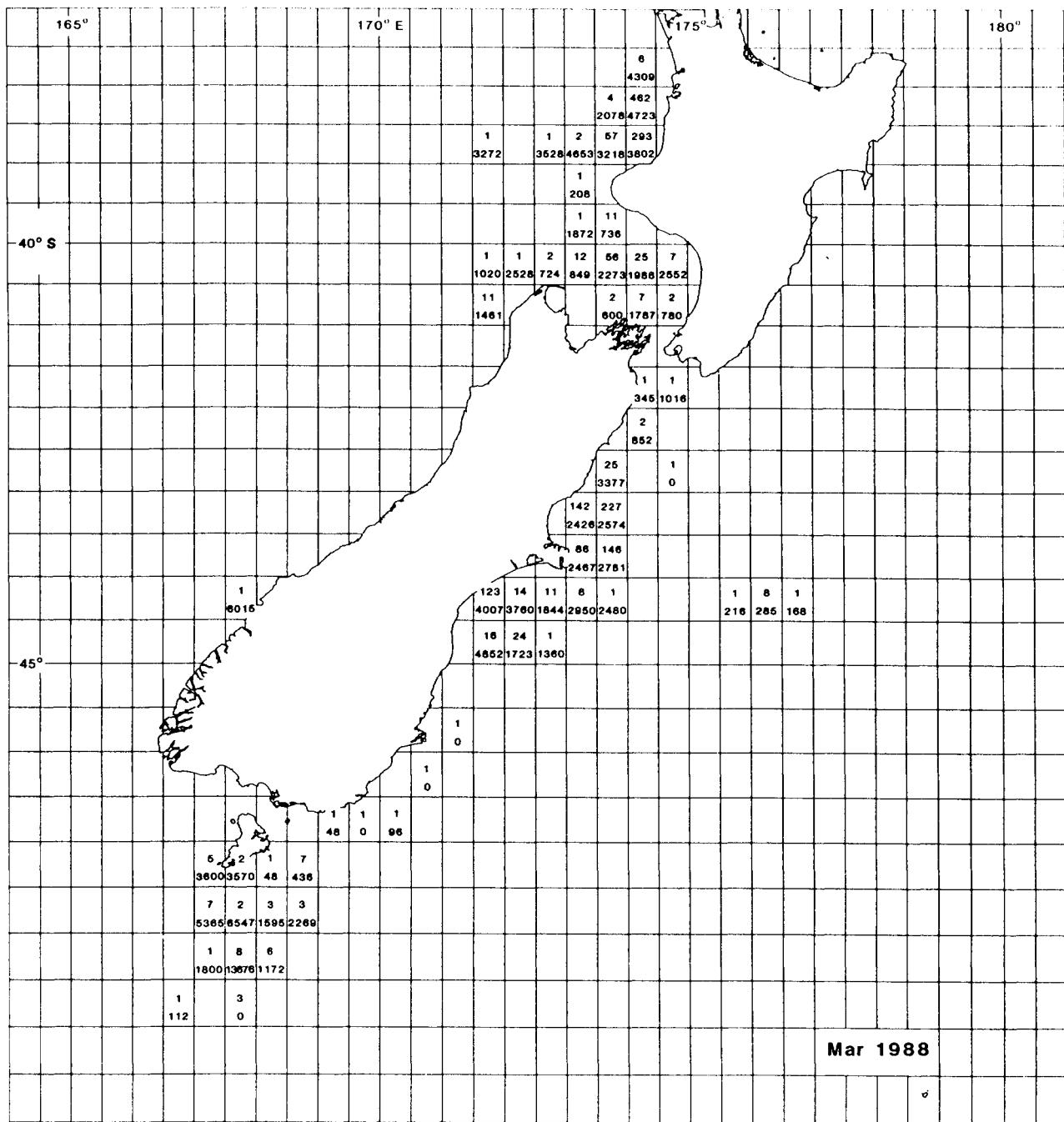
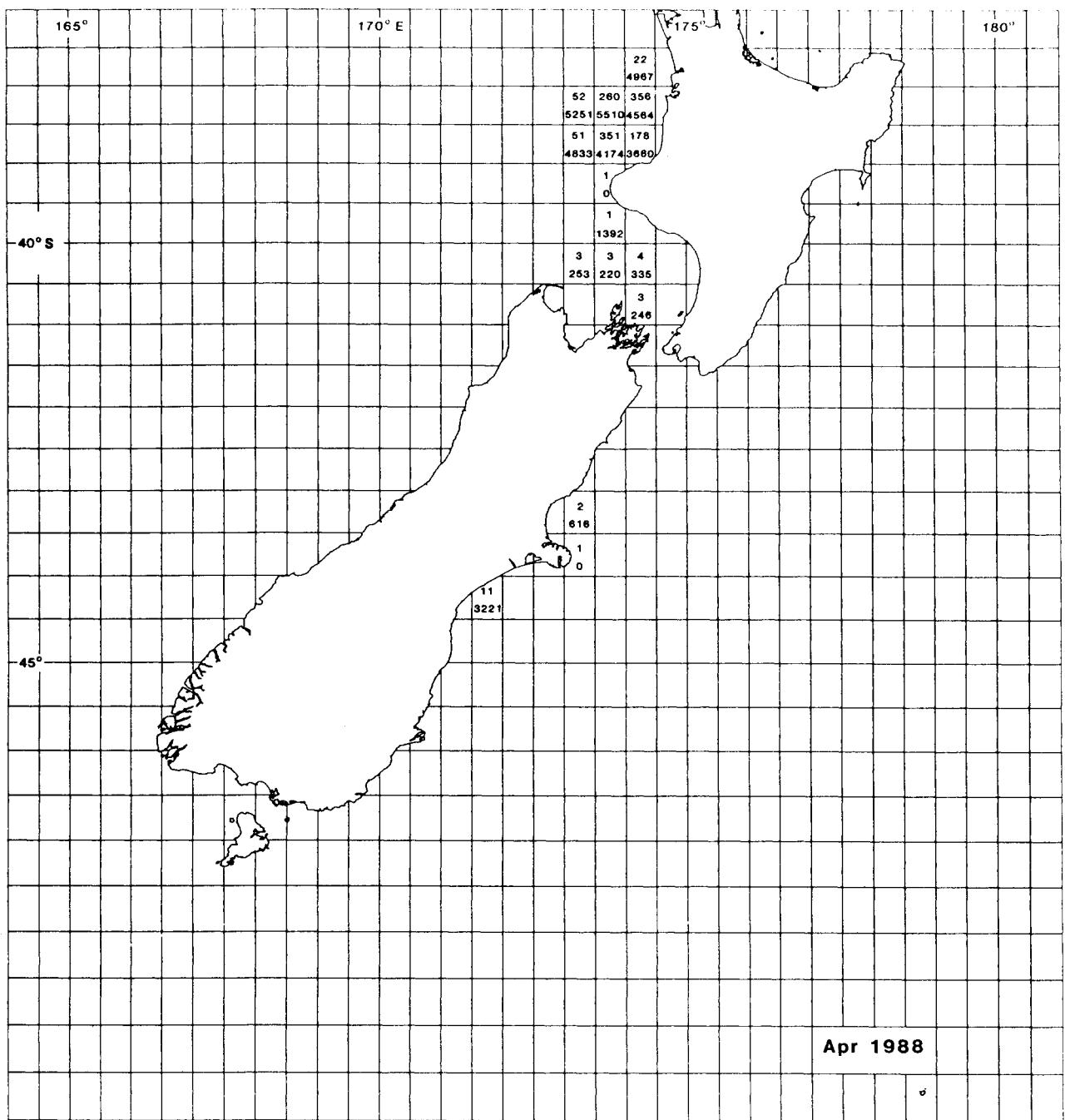
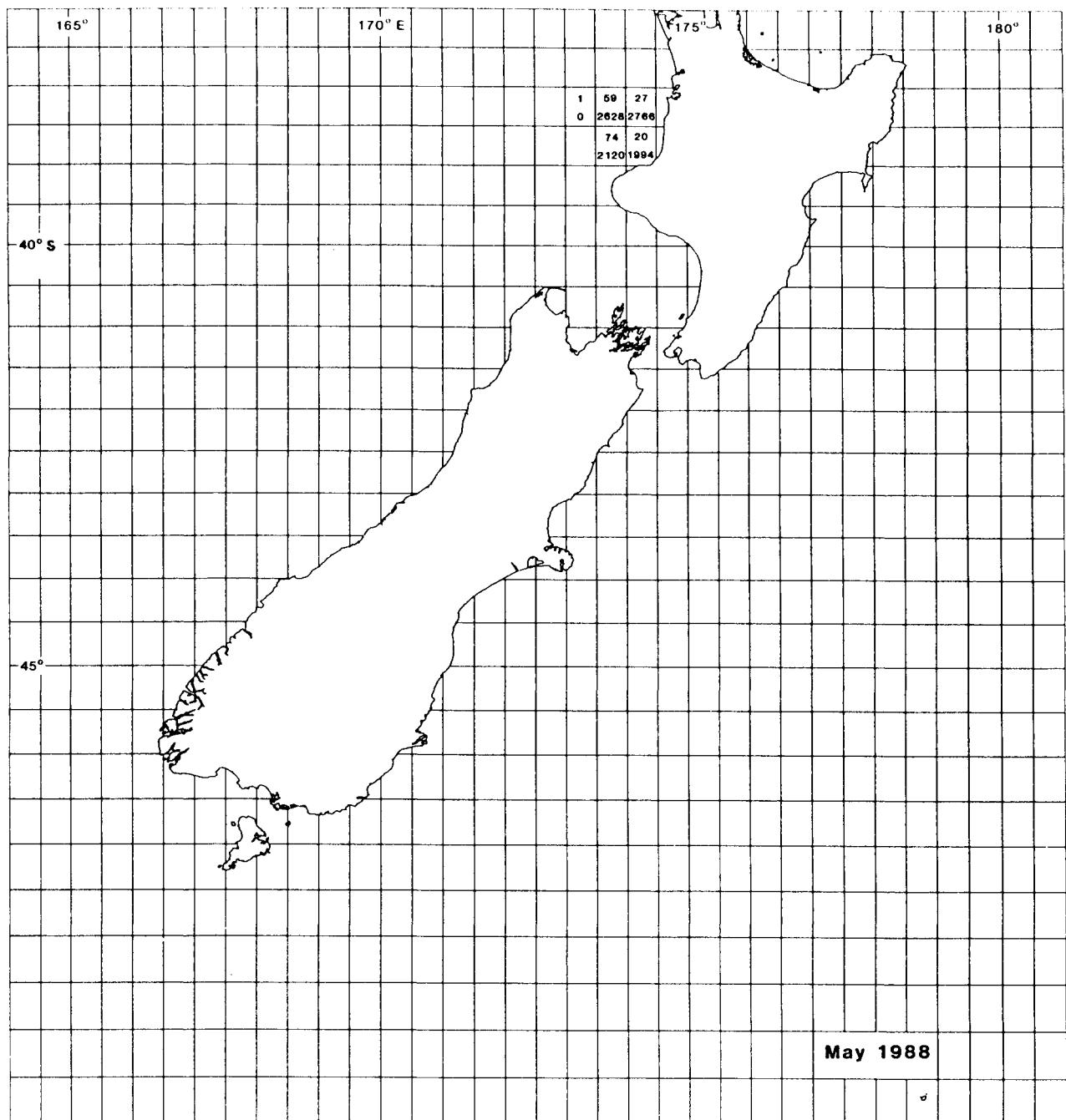


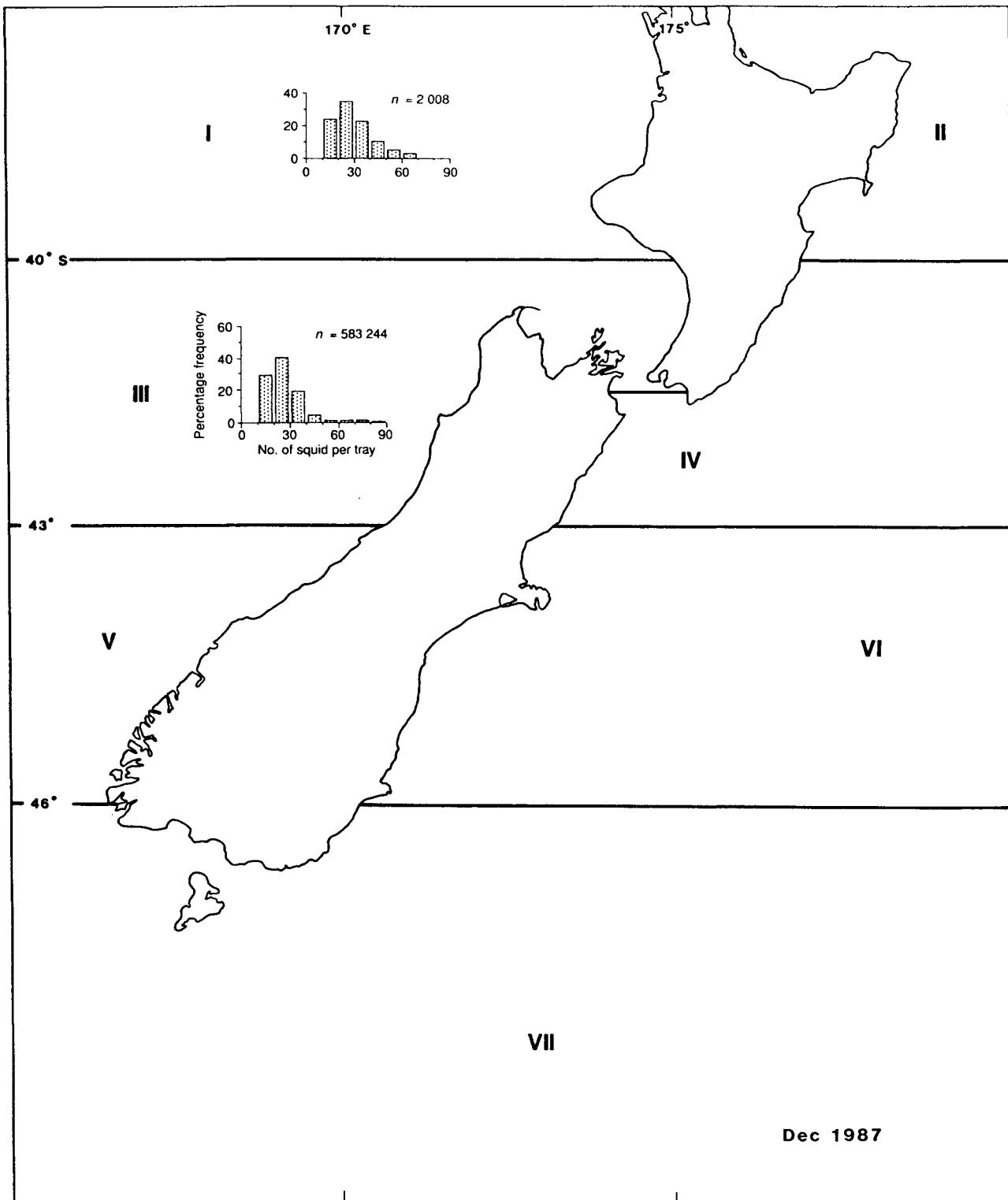
Figure 4: (continued).



**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.)**

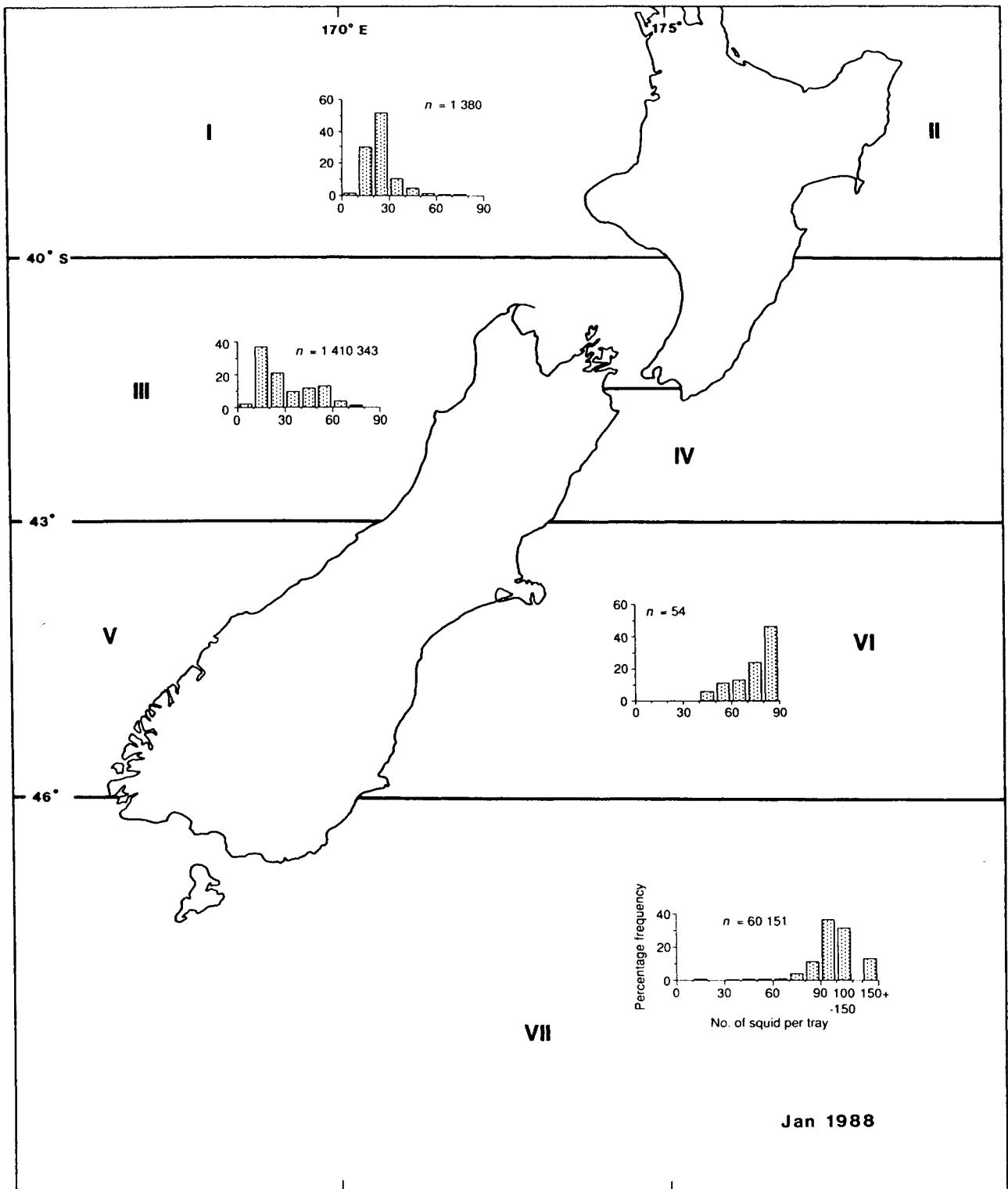


Figure 5: (continued).

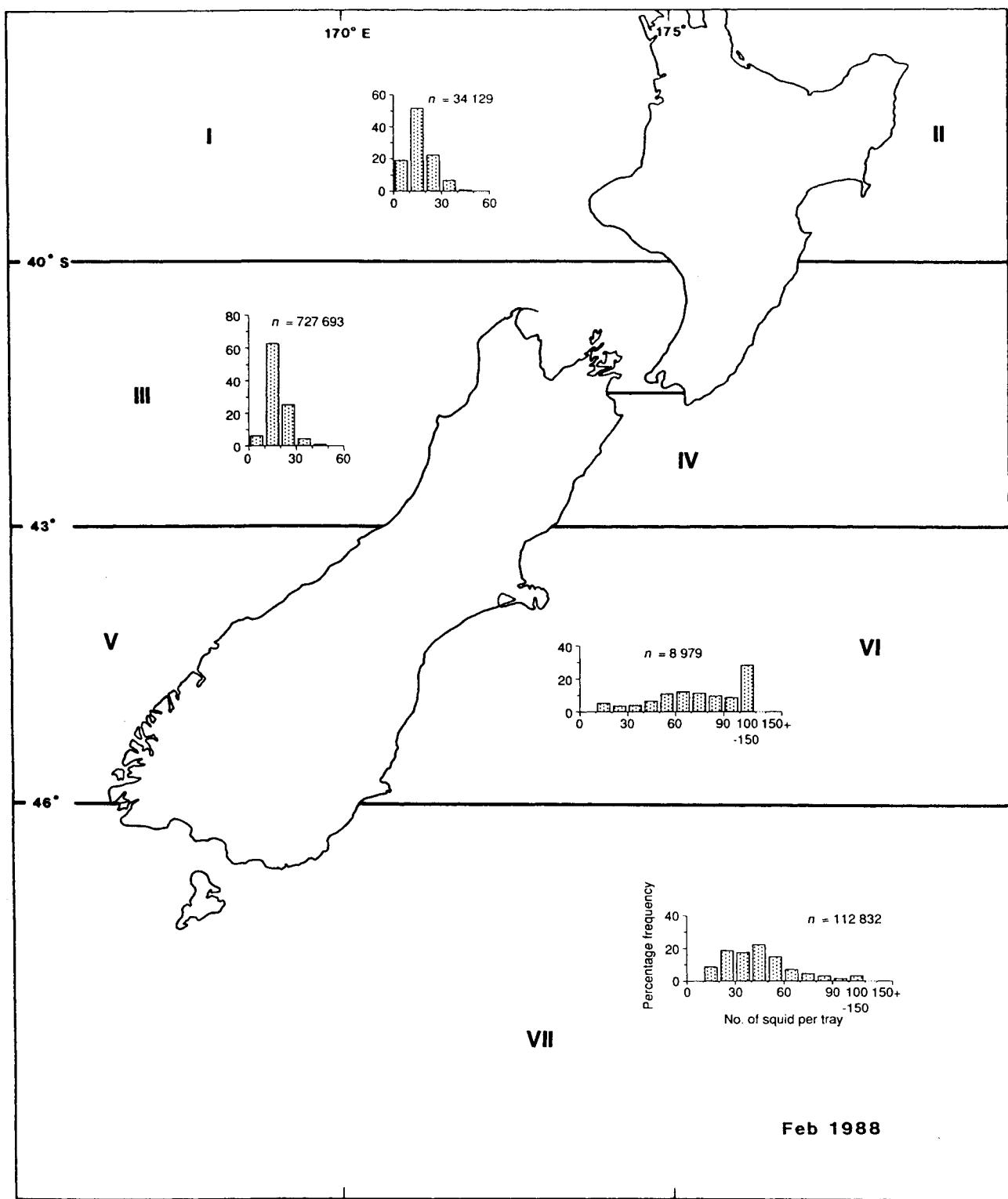


Figure 5: (continued).

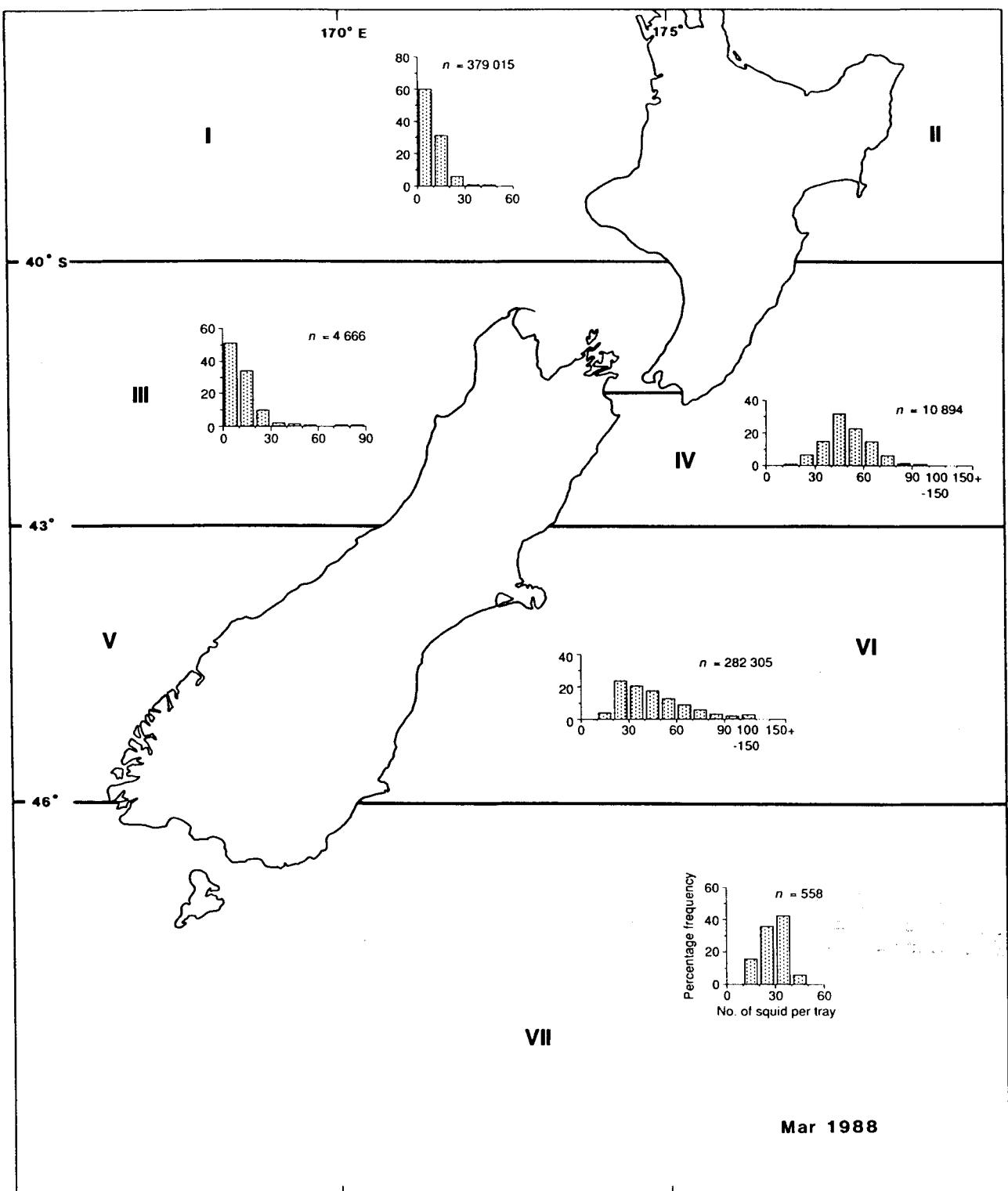


Figure 5: (continued).

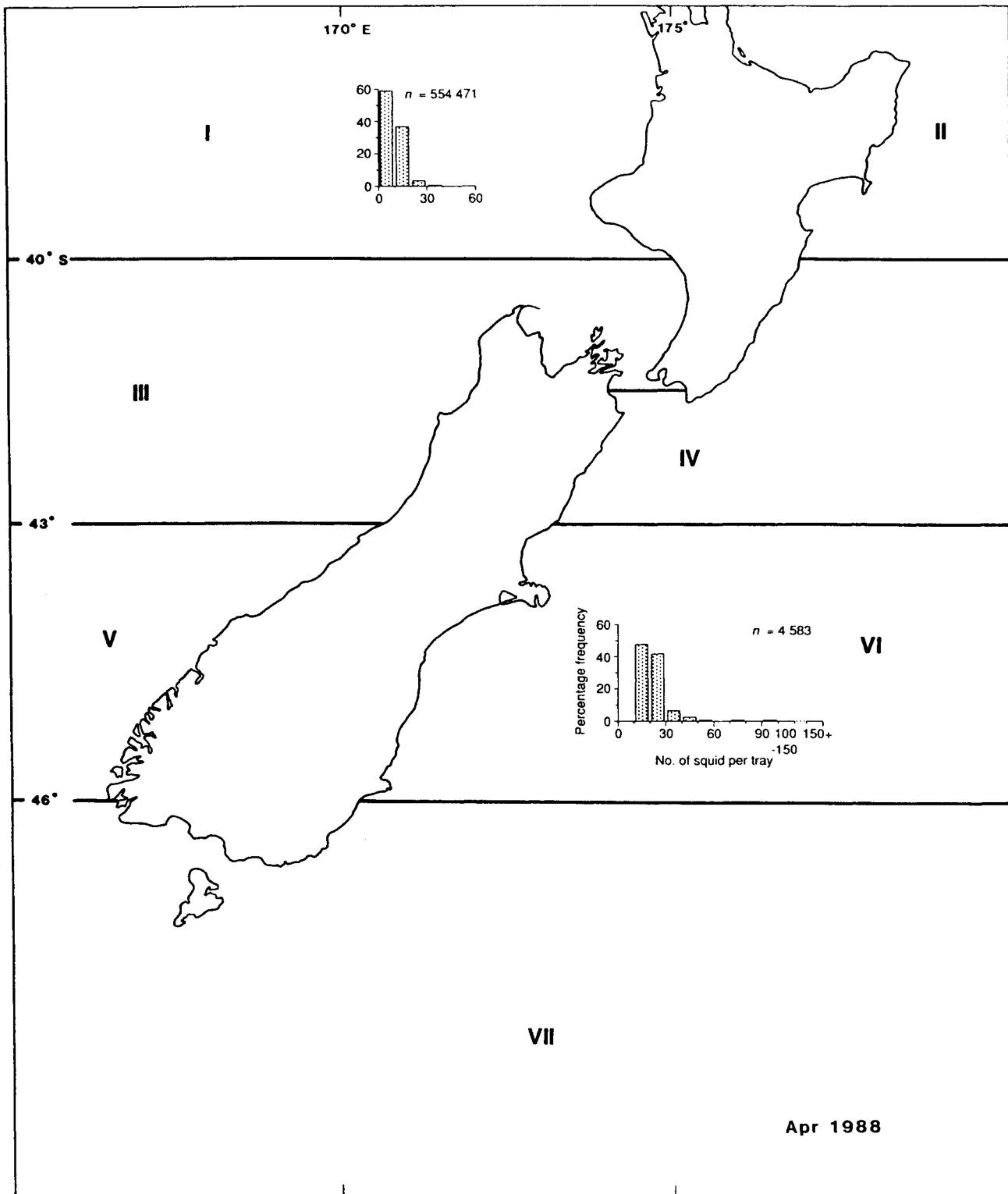


Figure 5: (continued).

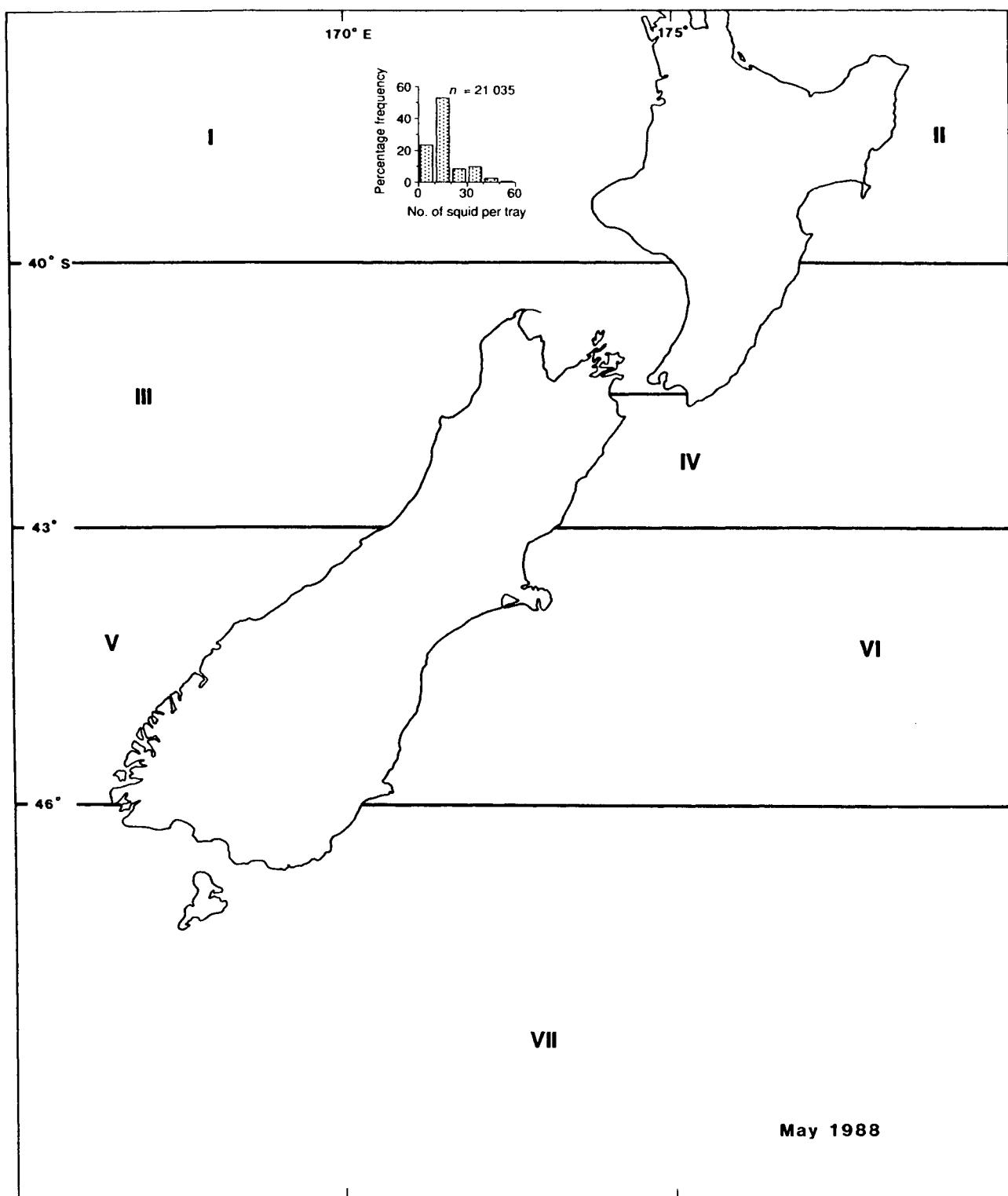
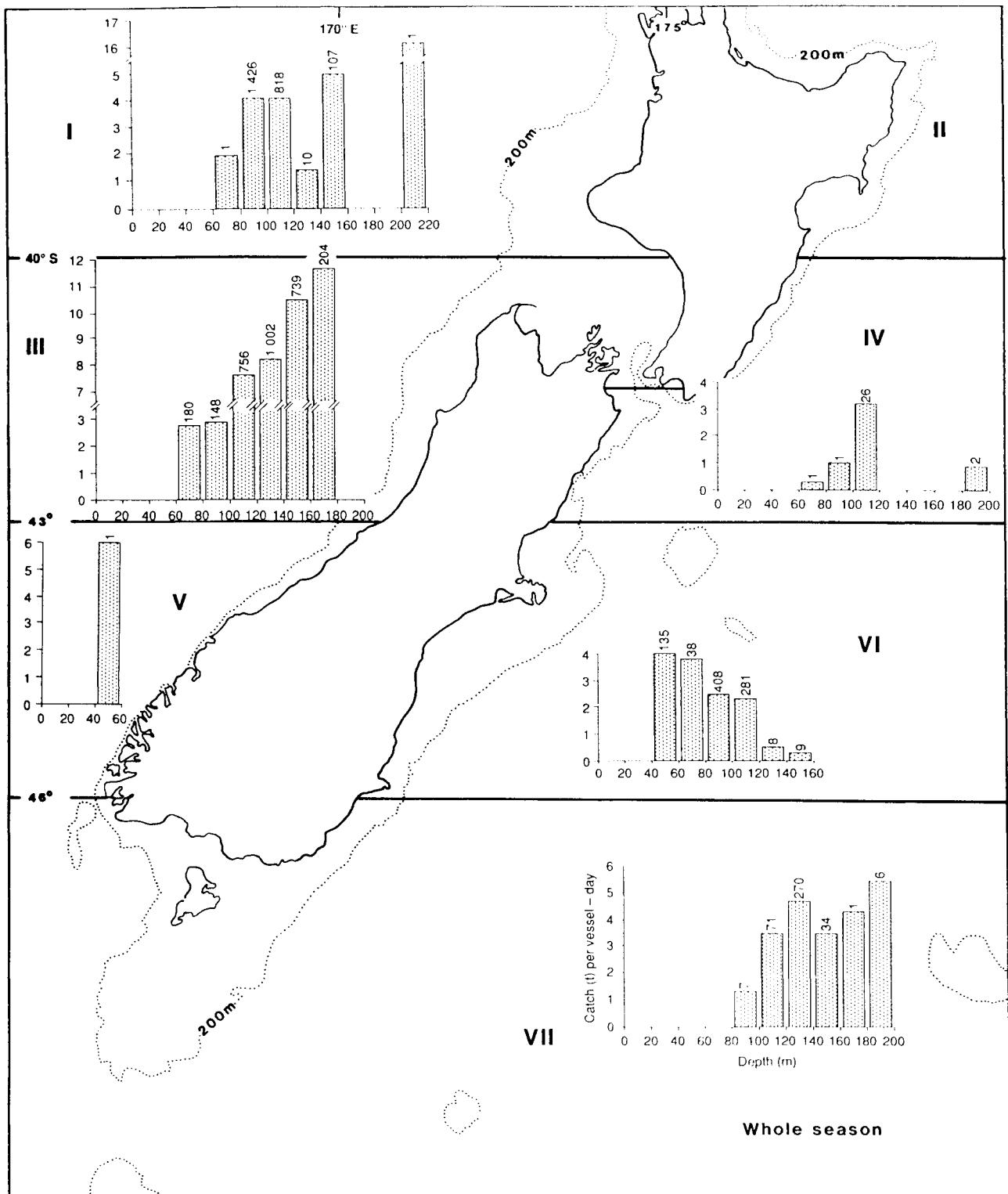
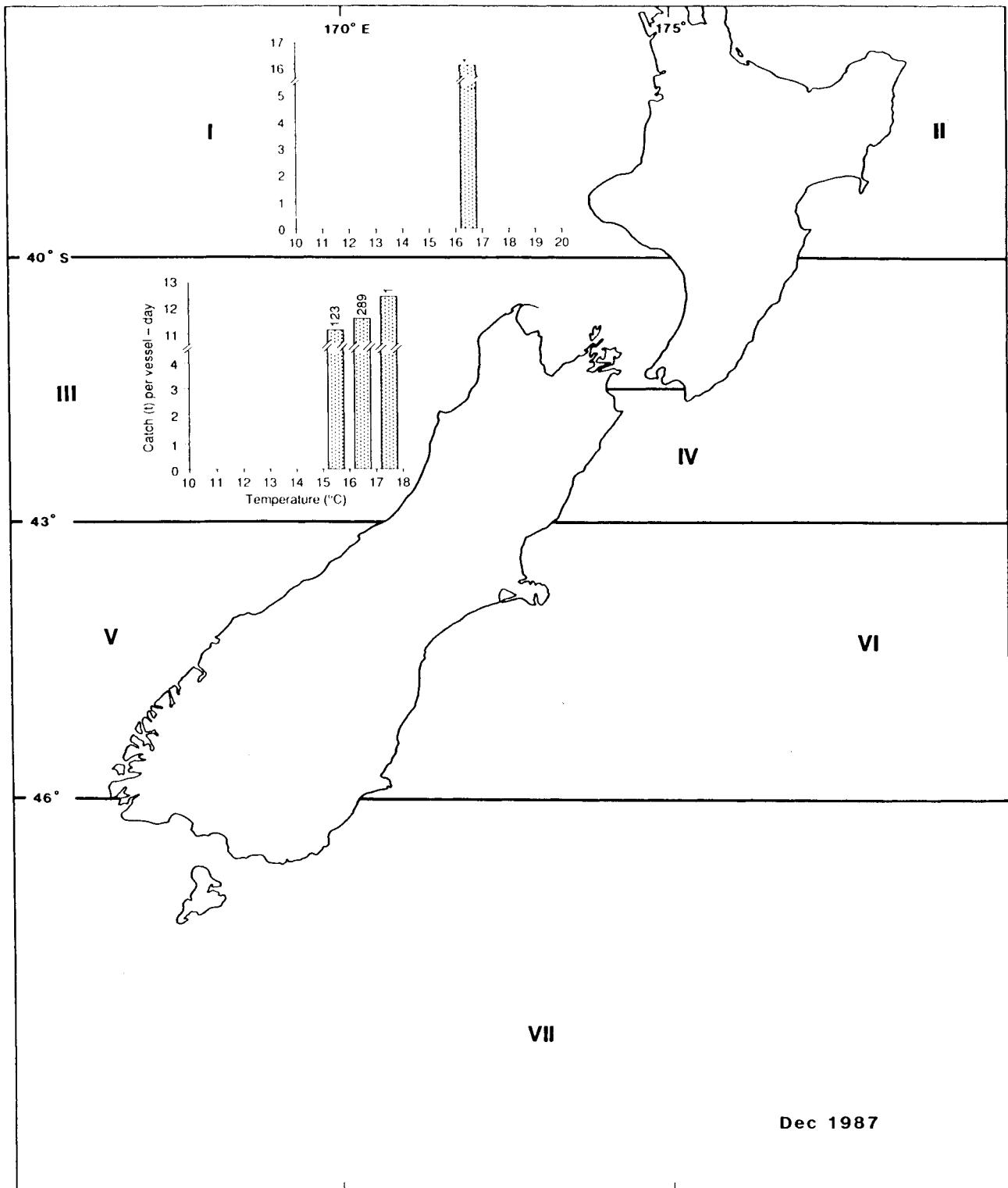


Figure 5: (continued).



**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.)**

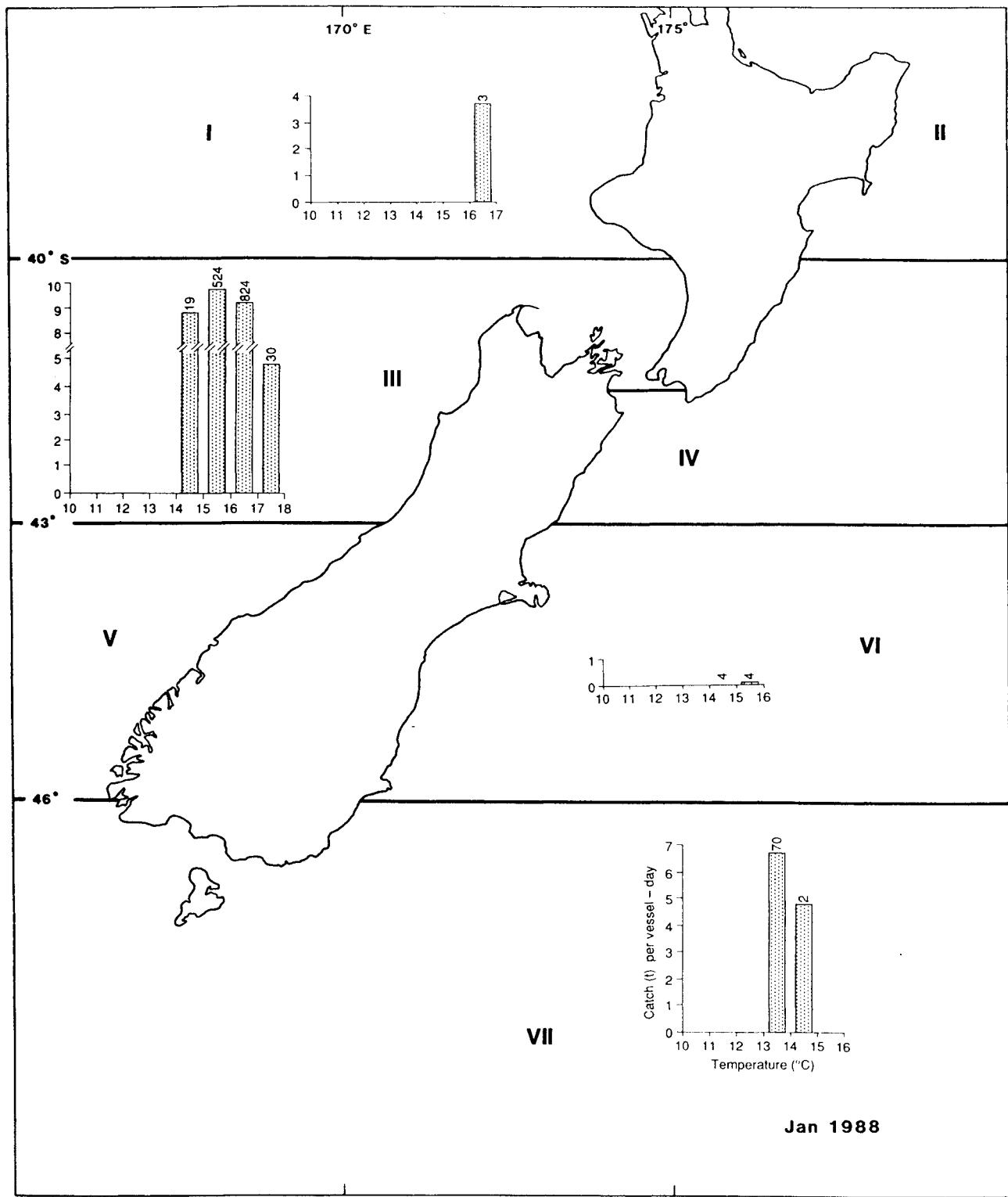


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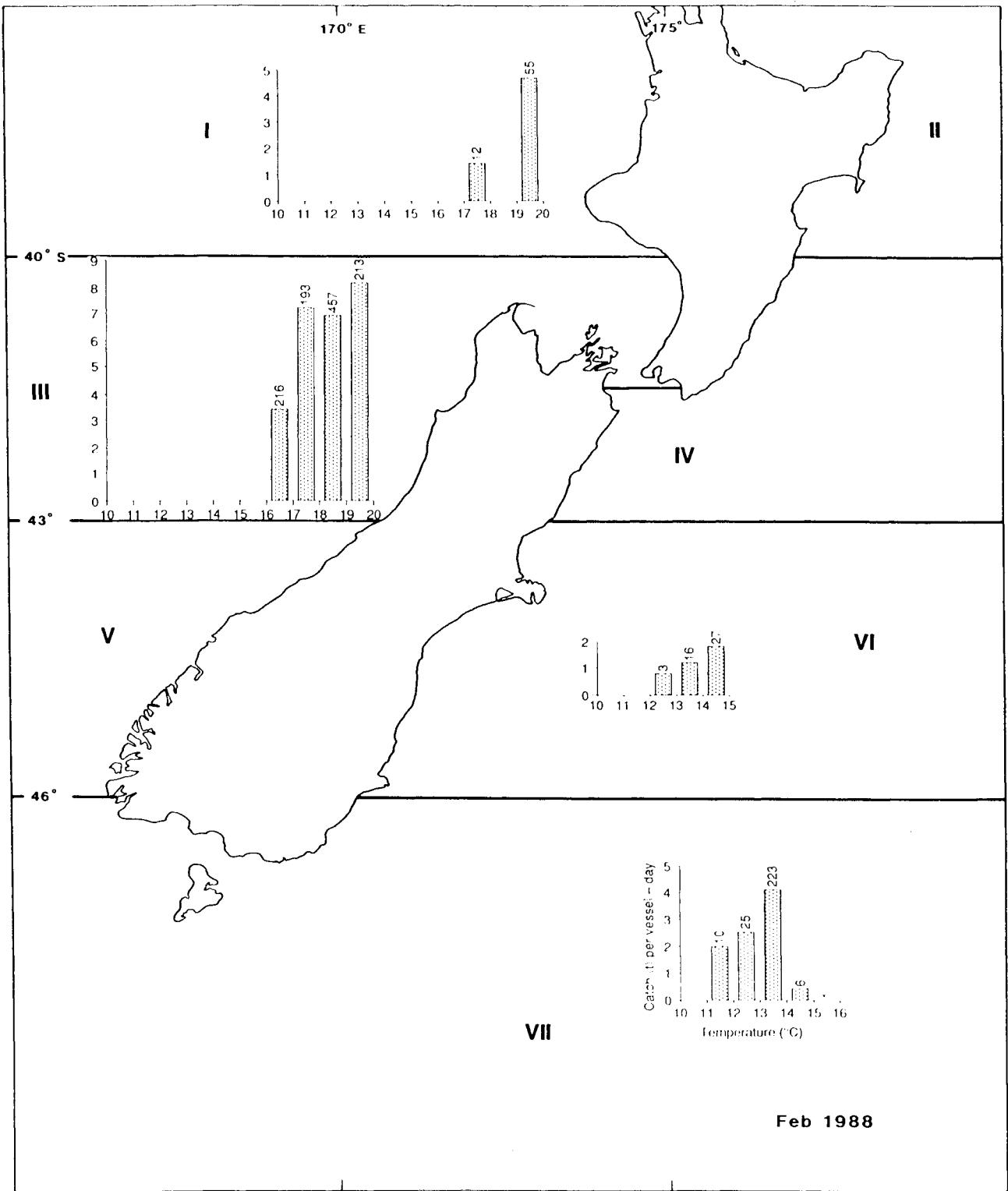


Figure 7: (continued).

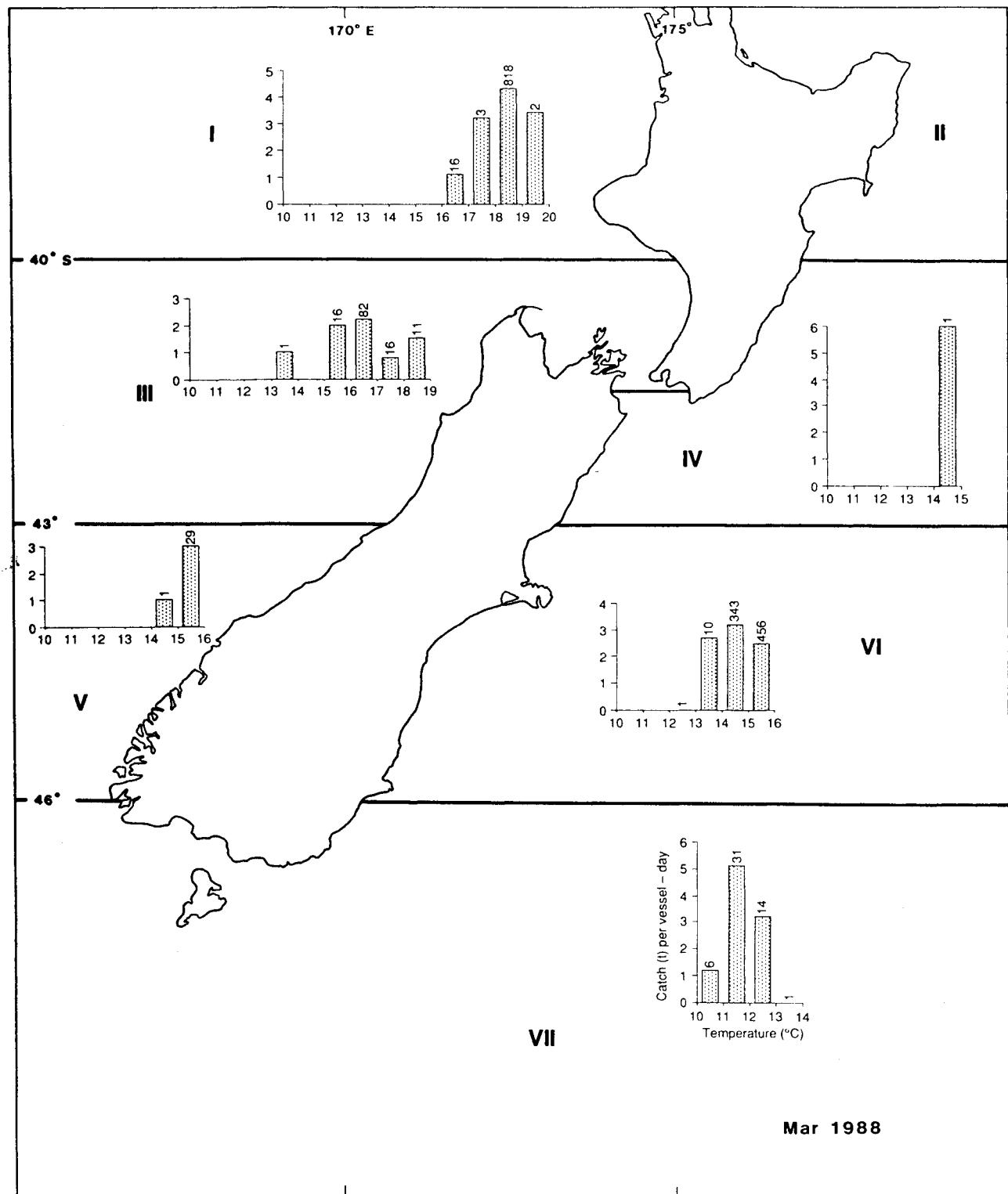


Figure 7: (continued).

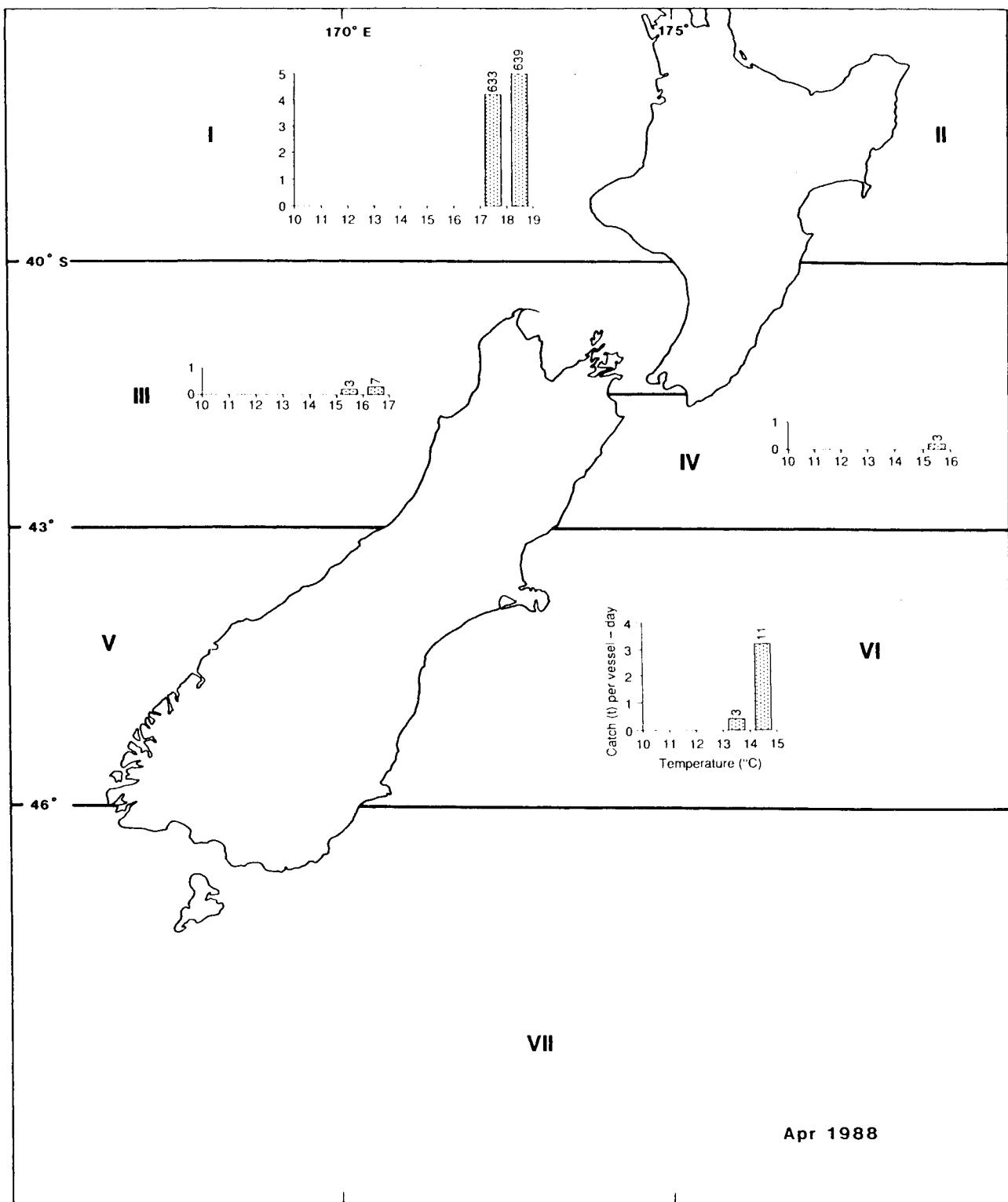


Figure 7: (continued).

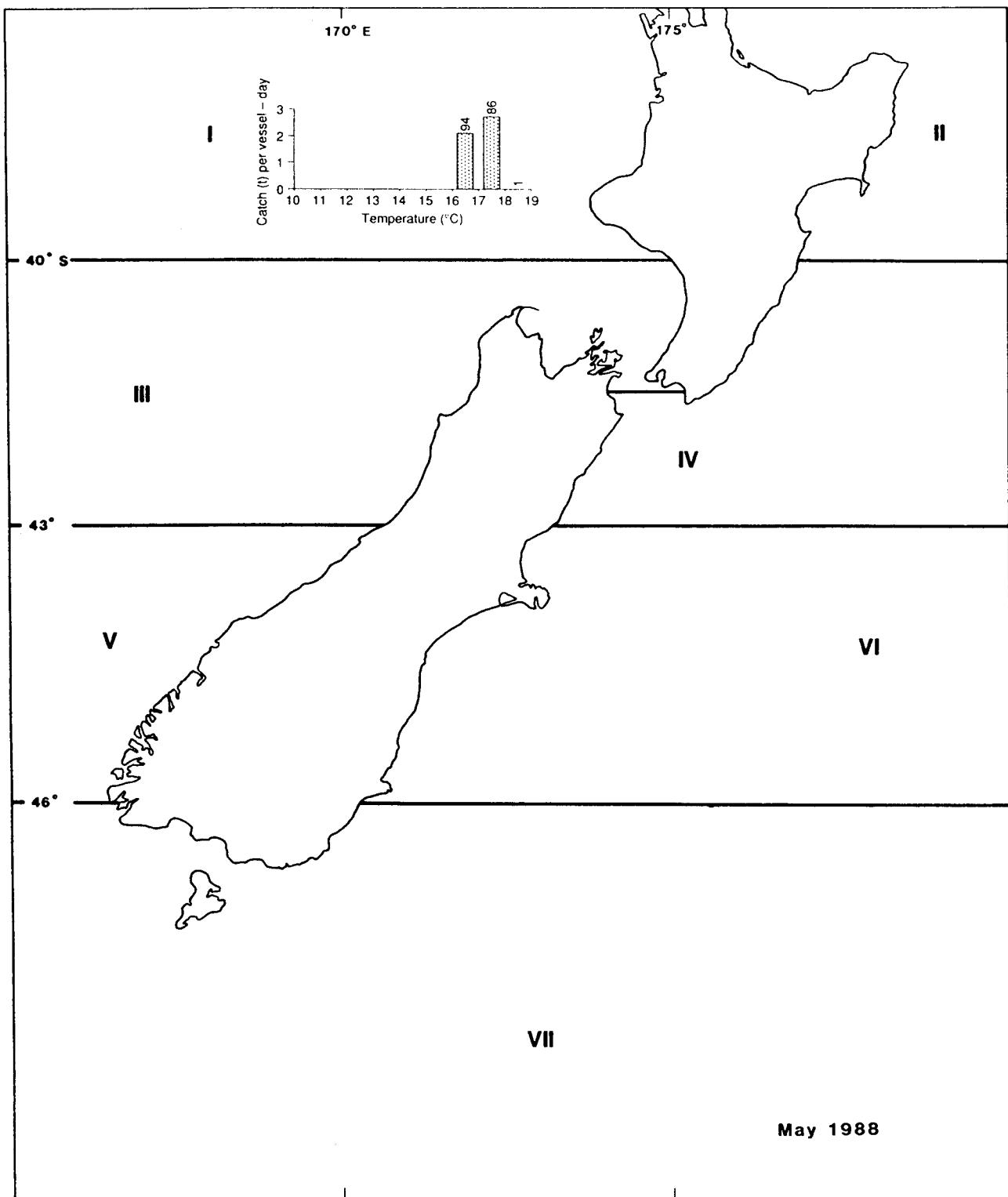


Figure 7: (continued).