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The 1985–86 foreign and joint venture squid jig fishery around New Zealand

by
A. M. Atkins

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START A NEW SHEET EACH DAY
一日に一枚使用のこと

DATE: Day 日 | Month 月 | Year 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 表面水温	WIND SPEED 風力	WIND DIRECTION 風向	TIME FISHING 操業時間	
度	分		度	分		Lowest Lure 最深漁具	Bottom 水深				Day Hours 日中	Night Hours 夜間
o	'		o	'	E/W	m	m	°C	m/s	°T		
		S										

CATCH: 漁獲

	TOTAL CATCH (KG) 総捕獲量(キロ)
Arrow Squid スルメイカ	
Other Squid その他のイカ	
Other (Specify) その他(明記のこと)	

	NUMBER CAUGHT 捕獲尾数
Octopus タコ	
Shark サメ	
Other (Specify) その他(明記のこと)	

TRAY TALLY: ケース数

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 ケース数	WHOLE 丸													
	WITHOUT LEGS ツボ抜き													

Fig. 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 1985-86 it was the second most valuable New Zealand fishery, with export earnings for the year ended December 1986 of $64 million f.o.b.

The trawl fishery is centred mainly around the Auckland Islands and accounts for about 45% 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 from three nations, 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 1985-86 season, 97 vessels from Japan, Korea, and Taiwan caught 27 754 t.

Data presented here are from squid jigging logbook returns (Fig. 1). The 1985-86 report is the sixth in a series of annual reports on the squid jig fishery.

One vessel fished experimentally in the pre-season period from 7 November to 5 December 1985 and caught 1 t. Summaries of these data have not been included here.

For the purposes of these reports, the New Zealand region has been divided into eight areas based on distribution of fishing effort, not on existing EEZ management zones, which are less applicable to the squid jig fishery.

Table 1 shows 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, pending further analysis.

Figure 2 shows the total catch (to the nearest tonne) for the whole season by ½° 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 Figs. 3 and 4.

Tables 6 and 7 show the lighting capacity and the numbers and types of machines used by vessels. Data from seasons before 1985-86 will be summarised in the 1986-87 annual report.

Squid are sorted aboard jig vessels according to size and then packed into trays and frozen. For the size analysis (Fig. 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 97 vessels, 84 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.

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

Season	Catch: East coast	Catch: West coast	Catch with position not given	Total catch	Catch per vessel-day
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

	Area I	II	III	IV	V	VI	VII	VIII	Catch with position not given	Total catch	Catch per vessel-day
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 <1%	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 <1%	4 271 15%	15 839 57%	0	0	27 754	4.7

* 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, 1985-86

	No. of vessels	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
Japan	79	4 388	61 376	17	50	240	2	23 168.9	5.2	375.0
Korea	4	226	2 672	0	0	0	0	1 081.2	4.8	404.6
Joint venture	14	1 226	14 810	147	26	203	2	3 503.4	2.8	233.4
Total	97	5 840	78 838	164	76	443	4	27 753.5	4.7	350.0

* Included in total A.
† Included in total B.

TABLE 3: Squid jigging catch and effort data from Japanese vessels, 1985-86

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	1 032	14 638	6	5	14	1	6 126.6	5.9	418.1
Jan	1 551	21 552	8	11	56	0	12 448.3	8.0	576.1
Feb	684	8 853	2	14	88	0	2 326.1	3.3	260.2
Mar	701	9 320	1	11	47	1	1 353.7	1.9	144.5
Apr	316	5 131	0	5	16	0	660.5	2.1	128.3
May	104	1 882	0	4	19	0	253.7	2.3	133.5

* Included in total A.
† Included in total B.

TABLE 4: Squid jigging catch and effort data from Korean vessels, 1985-86

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	48	412	0	0	0	0	191.2	4.0	464.1
Jan	77	740	0	0	0	0	614.4	8.0	830.3
Feb	27	248	0	0	0	0	101.4	3.8	408.9
Mar	26	305	0	0	0	0	46.7	1.8	153.1
Apr	30	575	0	0	0	0	75.0	2.5	130.4
May	18	392	0	0	0	0	52.5	2.9	133.9

* Included in total A.
† Included in total B.

TABLE 5: Squid jigging catch and effort data from joint venture vessels, 1985-86

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	96	1 048	13	1	2	0	399.2	4.1	380.2
Jan	307	3 211	56	0	0	0	1 452.9	4.7	452.5
Feb	265	2 933	32	6	26	1	670.6	2.5	226.6
Mar	299	3 615	33	13	106	1	530.7	1.7	142.6
Apr	201	3 018	13	4	49	0	342.9	1.7	111.8
May	58	985	0	2	20	0	107.2	1.8	106.7

* Included in total A.
† Included in total B.

TABLE 6: Number of vessels* and their lighting capacity, by vessel size, 1985-86

	No. of lights					
Vessel size (t)	≤40	41-60	61-80	81-100	101-120	>120
250-350						
Light power (W)						
1000	3	1	1	5	4	1
2000	6	6	6	1	1	0
2001-2500	0	0	0	1	0	0
3000	1	0	1	0	0	0
Total	10	7	8	7	5	1
350-450						
Light power (W)						
1000	1	3	2	4	8	9
2000	6	5	11	4	1	0
2001-2500	1	0	0	0	1	0
3000	0	0	0	0	0	0
Total	8	8	13	8	10	9
450-550						
Light power (W)						
1000	0	0	1	0	1	1
2000	2	0	4	2	1	0
2001-2500	0	0	0	0	0	0
3000	1	0	0	0	0	0
4000	1	0	0	0	0	0
Total	4	0	5	2	2	1

* Several vessels carry more than one wattage of light. Data for 15 vessels are not included, because of incomplete records.

TABLE 7: Number of vessels* and their jig machine capacity, by vessel size, 1985-86

Vessel size (t)	No. of vessels	No. of vessels with hand machines	Mechanical machines						
			No. of lures per line	No. per vessel					
				≤30	31-35	36-40	41-45	46-50	>50
250-350	27	14	≤20	2	0	0	1	0	1
			21-30	0	1	4	5	2	3
			31-40	1	1	2	0	0	1
			41-50	1	0	1	0	0	0
			>50	0	0	1	0	0	0
			Total	4	2	8	6	2	5
350-450	45	35	≤20	0	1	1	0	0	2
			21-30	0	0	5	7	8	10
			31-40	0	0	3	1	4	1
			41-50	0	0	1	1	0	0
			>50	0	0	0	0	0	0
			Total	0	1	10	9	12	13
450-550	10	6	≤20	0	0	0	0	0	0
			21-30	0	0	0	1	0	6
			31-40	0	0	1	0	0	2
			41-50	0	0	0	0	0	0
			>50	0	0	0	0	0	0
			Total	0	0	1	1	0	8

* Data for 15 vessels are not included, because of incomplete records.

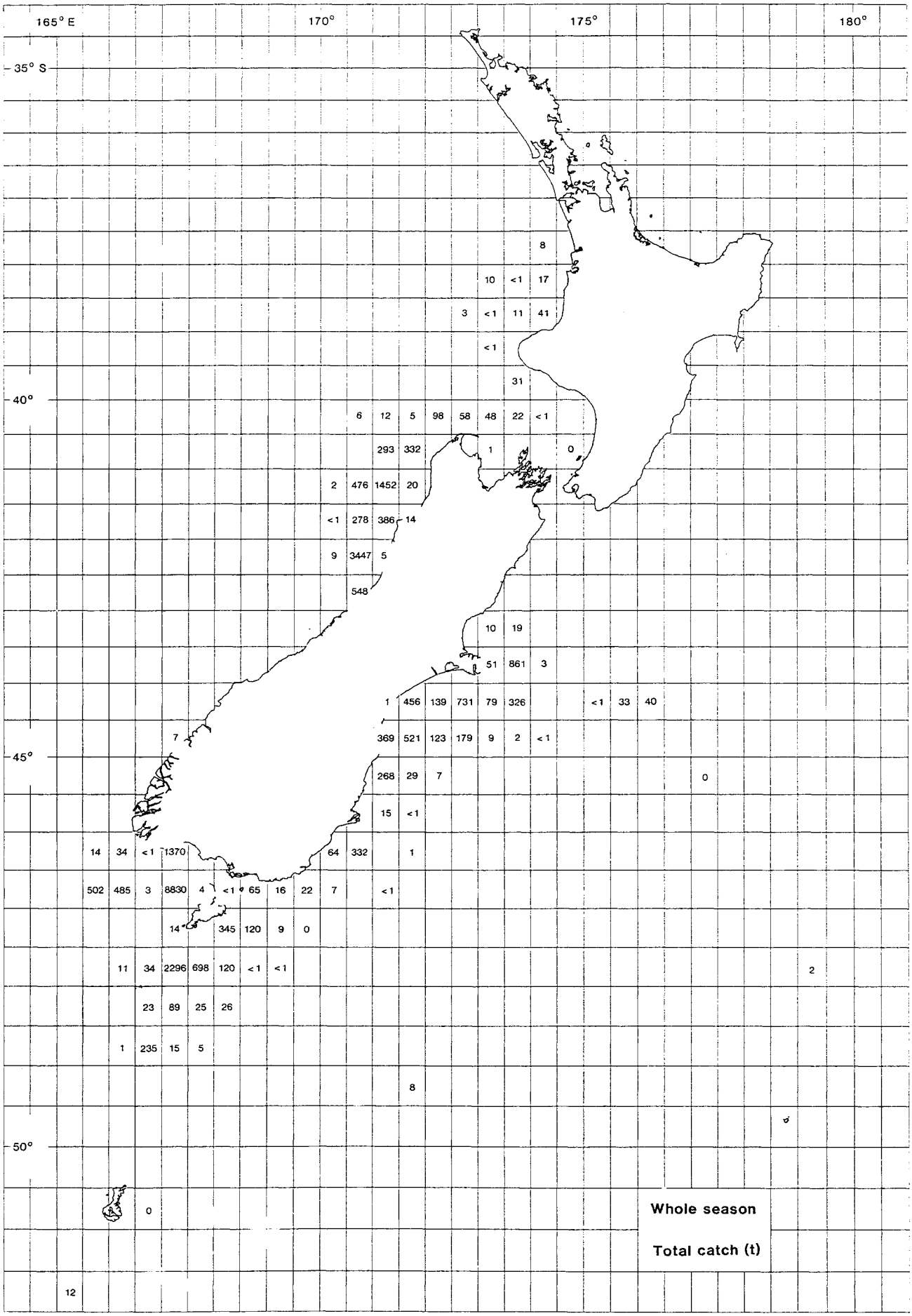


Fig. 2: Total catch (t) for the whole season by ½° squares.

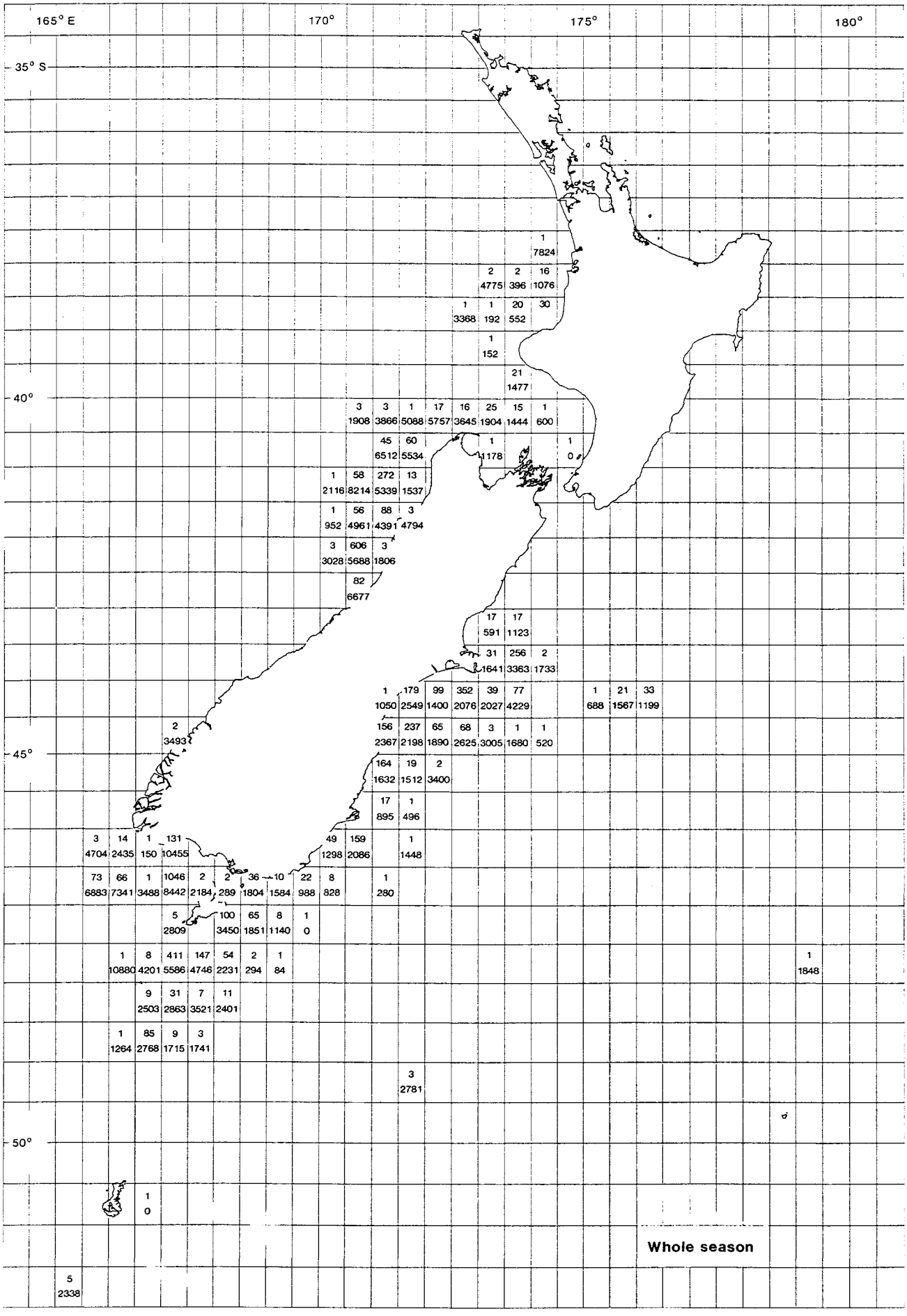


Fig. 3: Seasonal summary of vessel-days fished (above) and catch (kg) per vessel-day (below) by ½° squares.

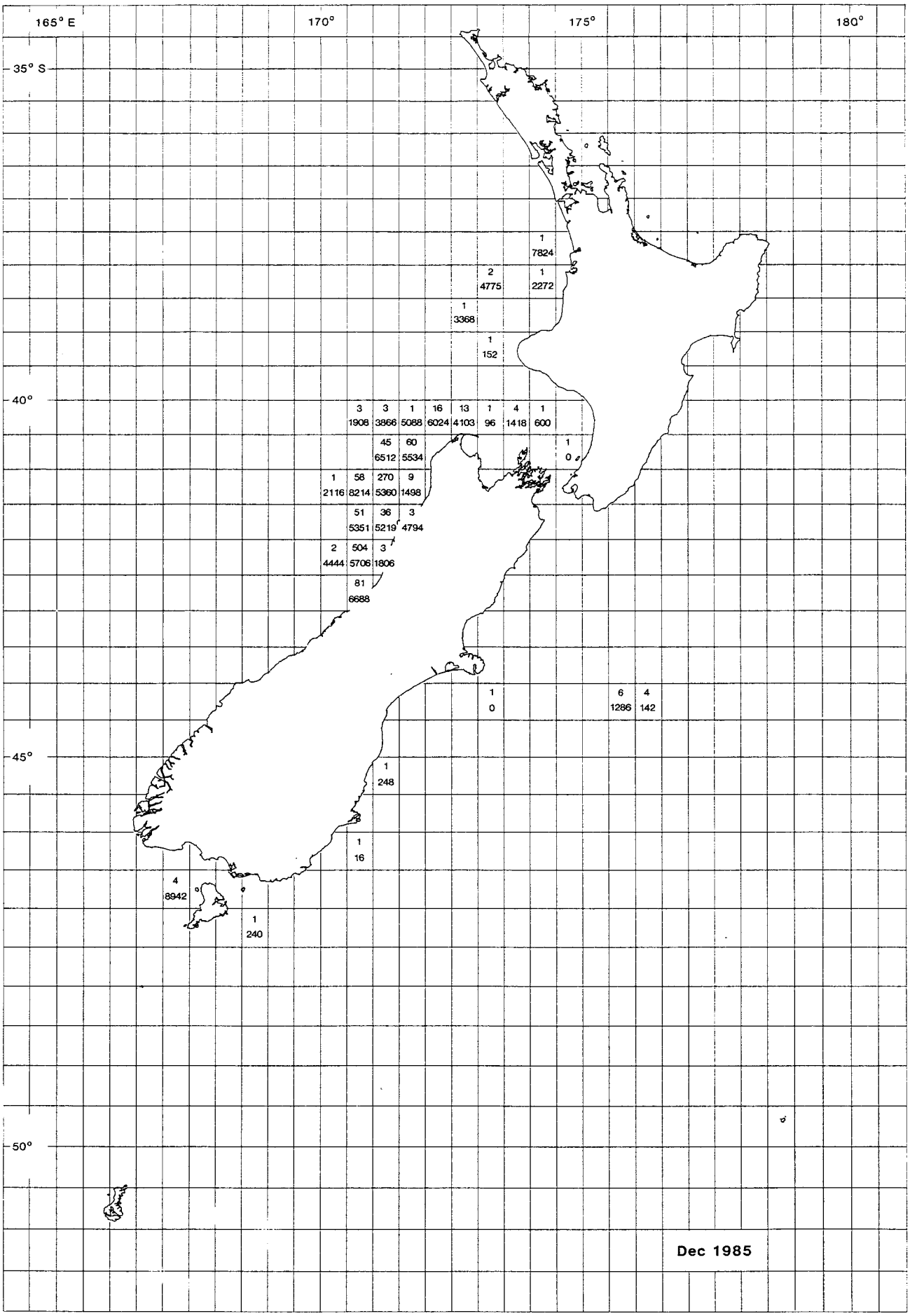
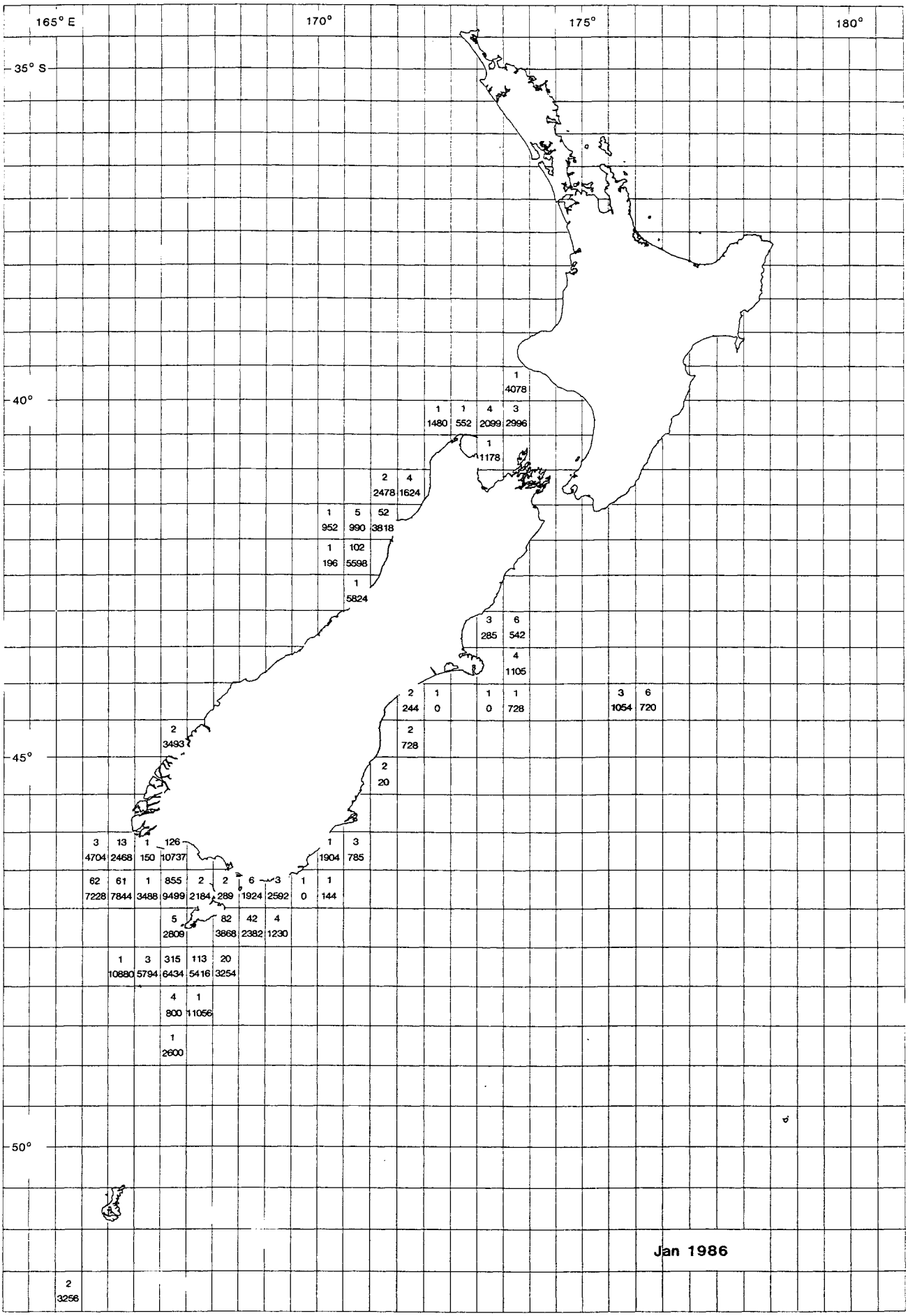


Fig. 4: Monthly summary of vessel-days fished (above) and catch (kg) per vessel-day (below) by ½° squares.



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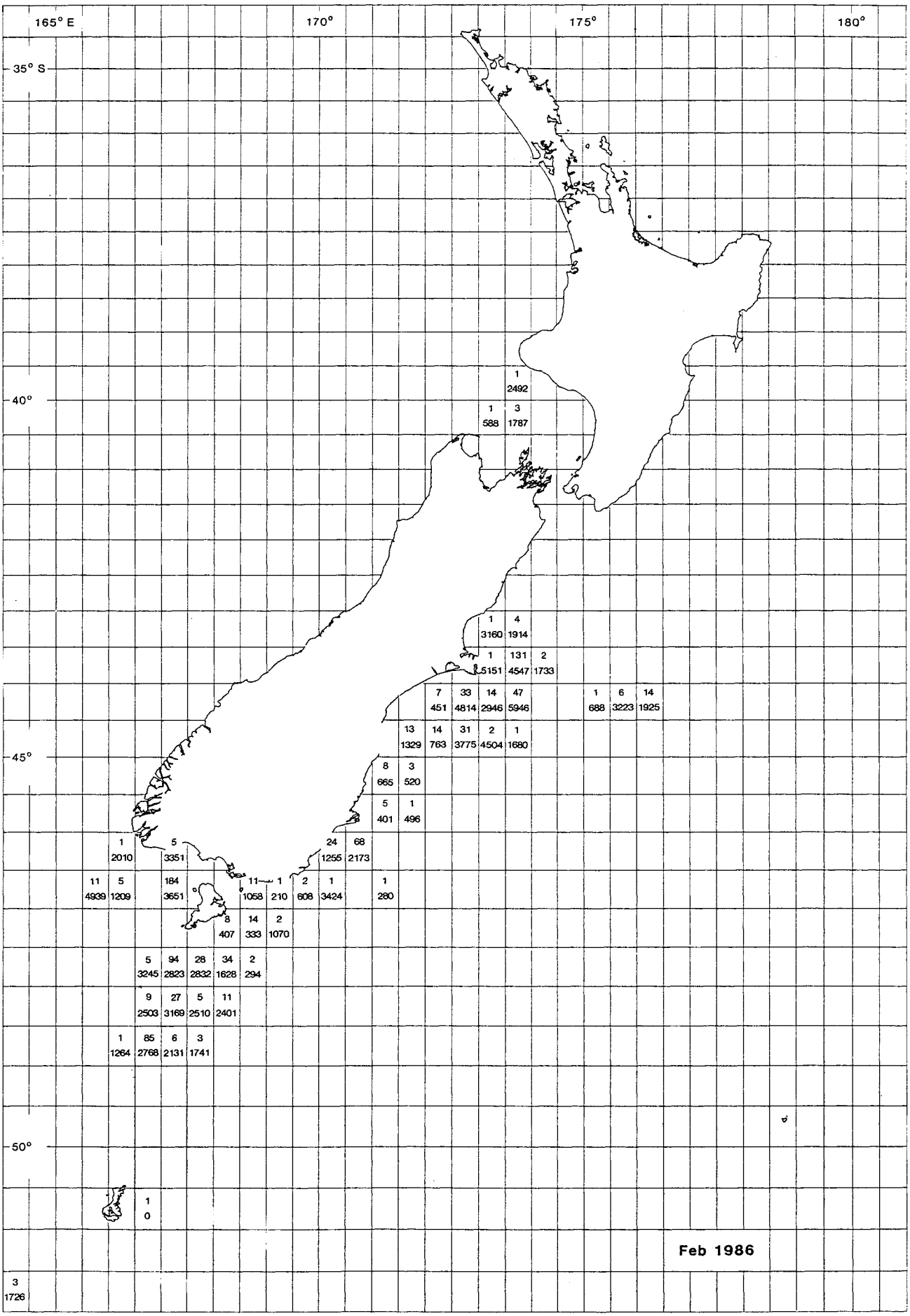

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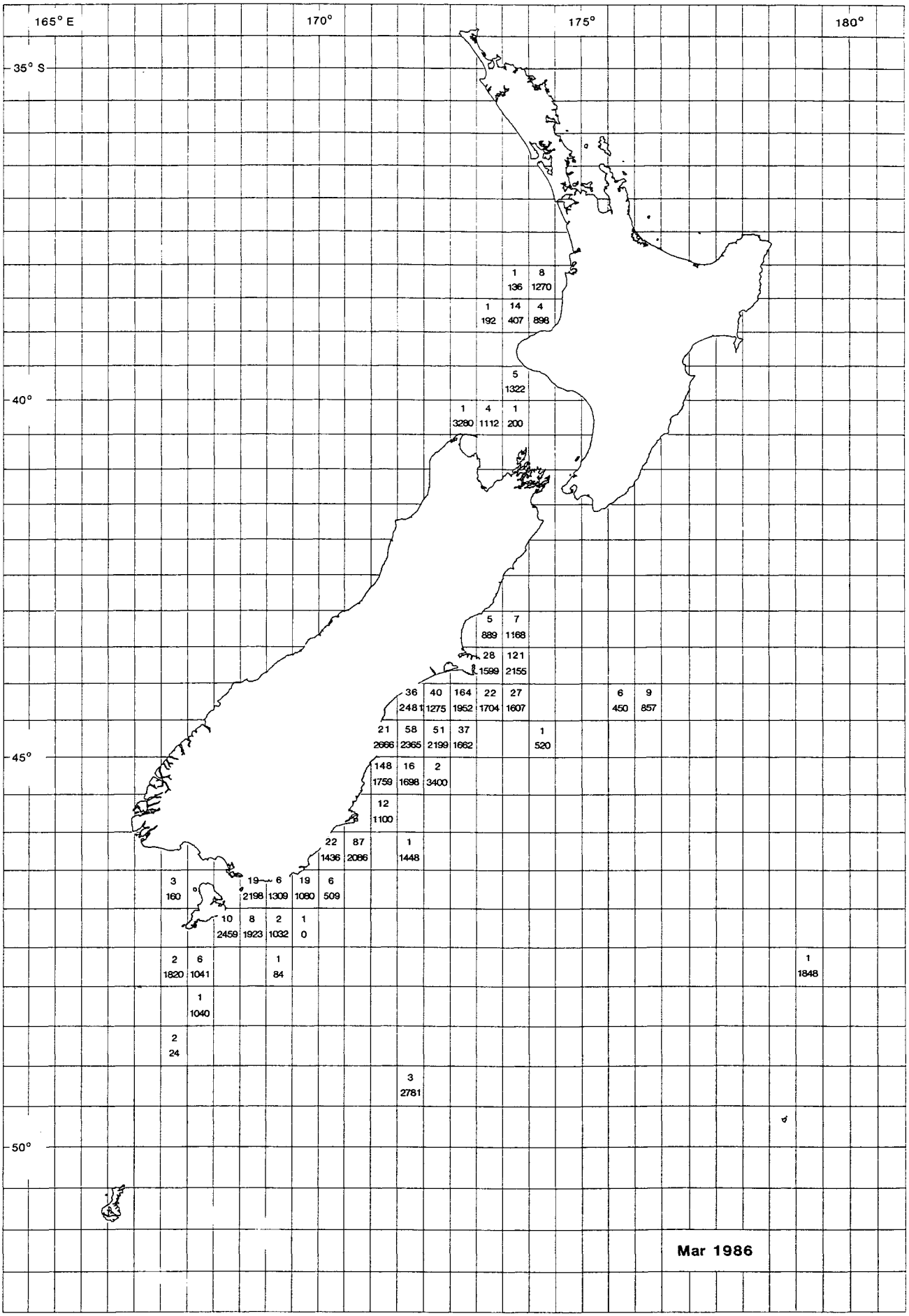

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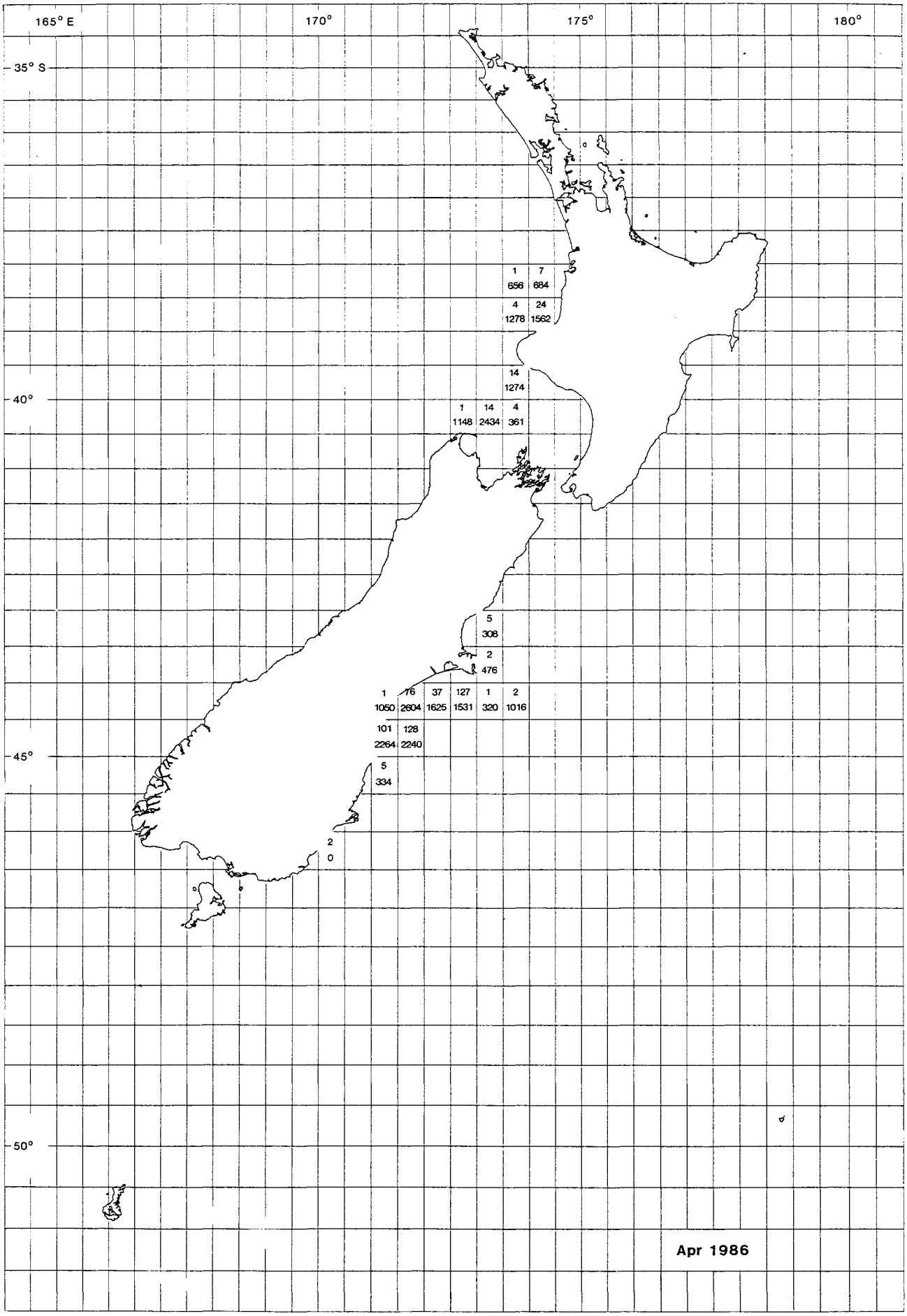

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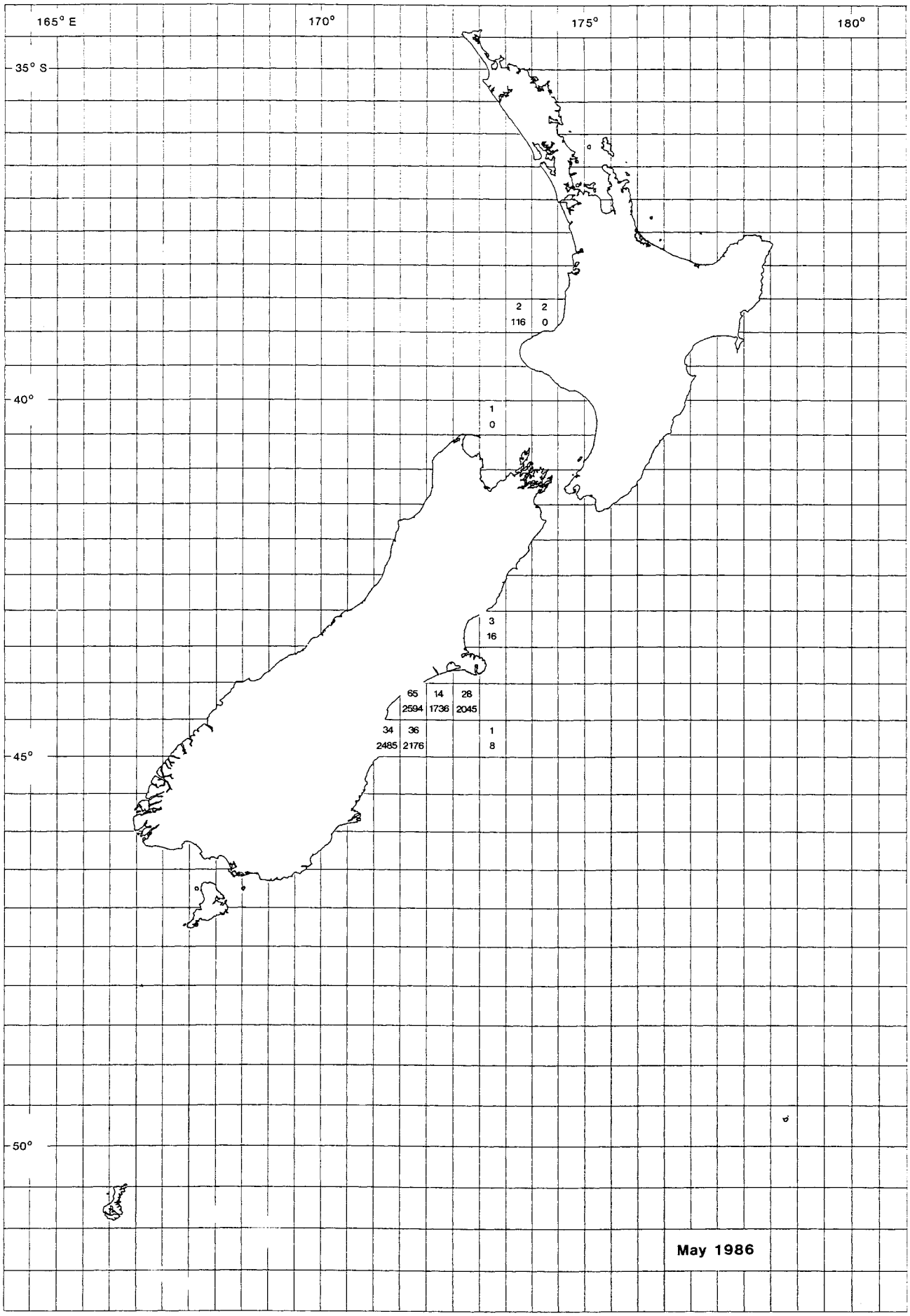

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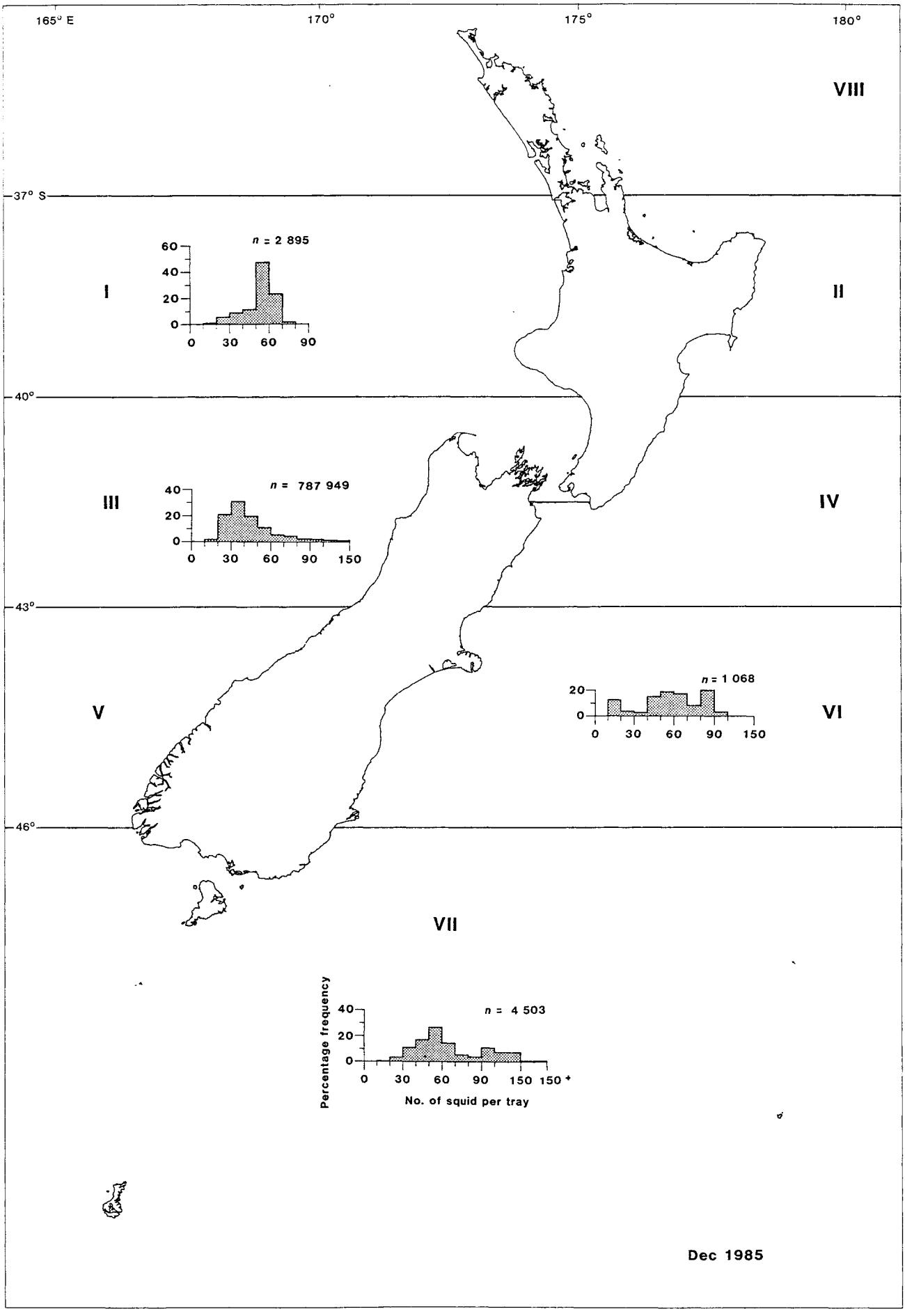
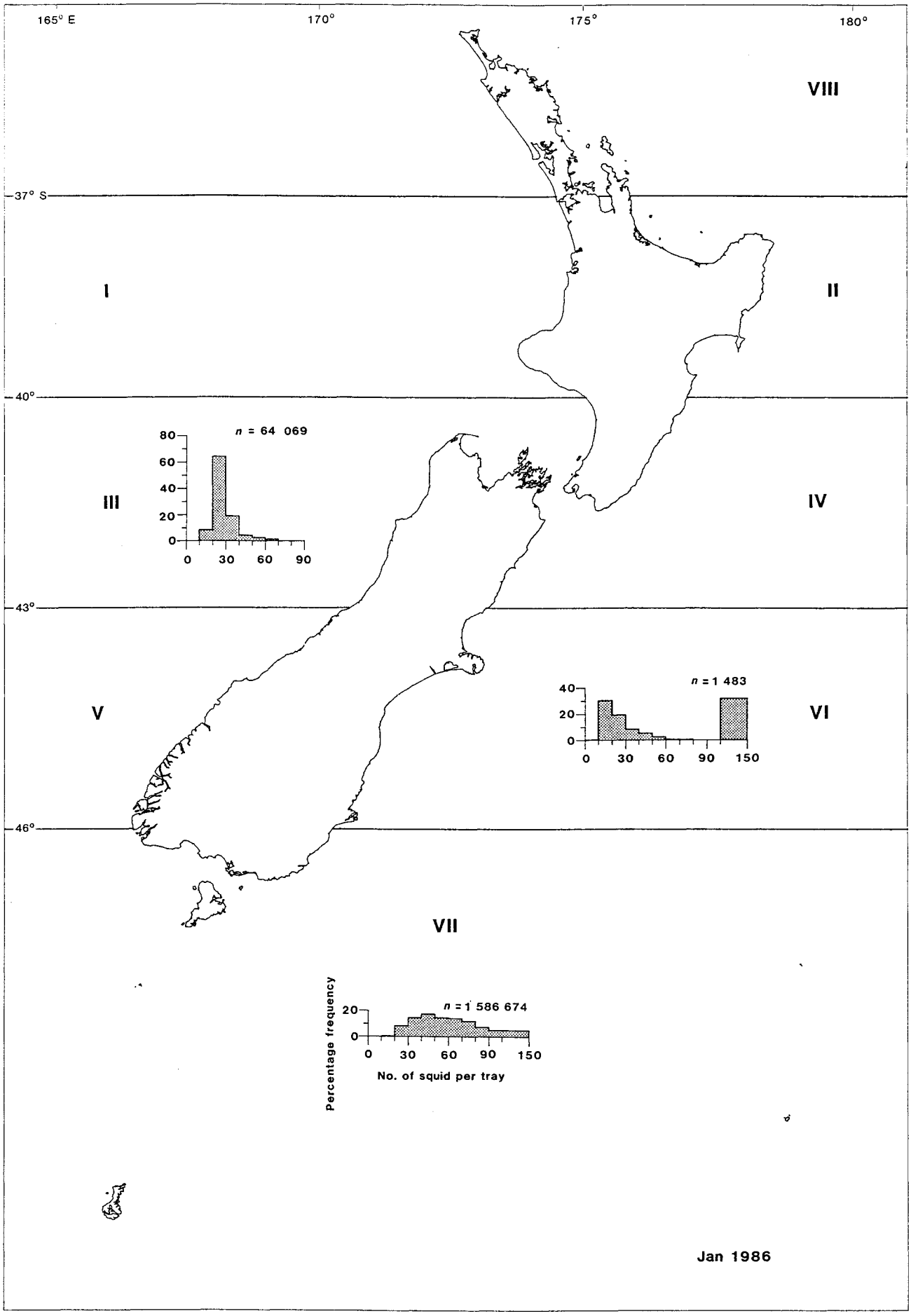


Fig. 5: Percentage frequency of the number of squid per tray by month for areas I–VIII. (The 100 to 150 squid-per-tray classes have been pooled; n = total number of trays.)



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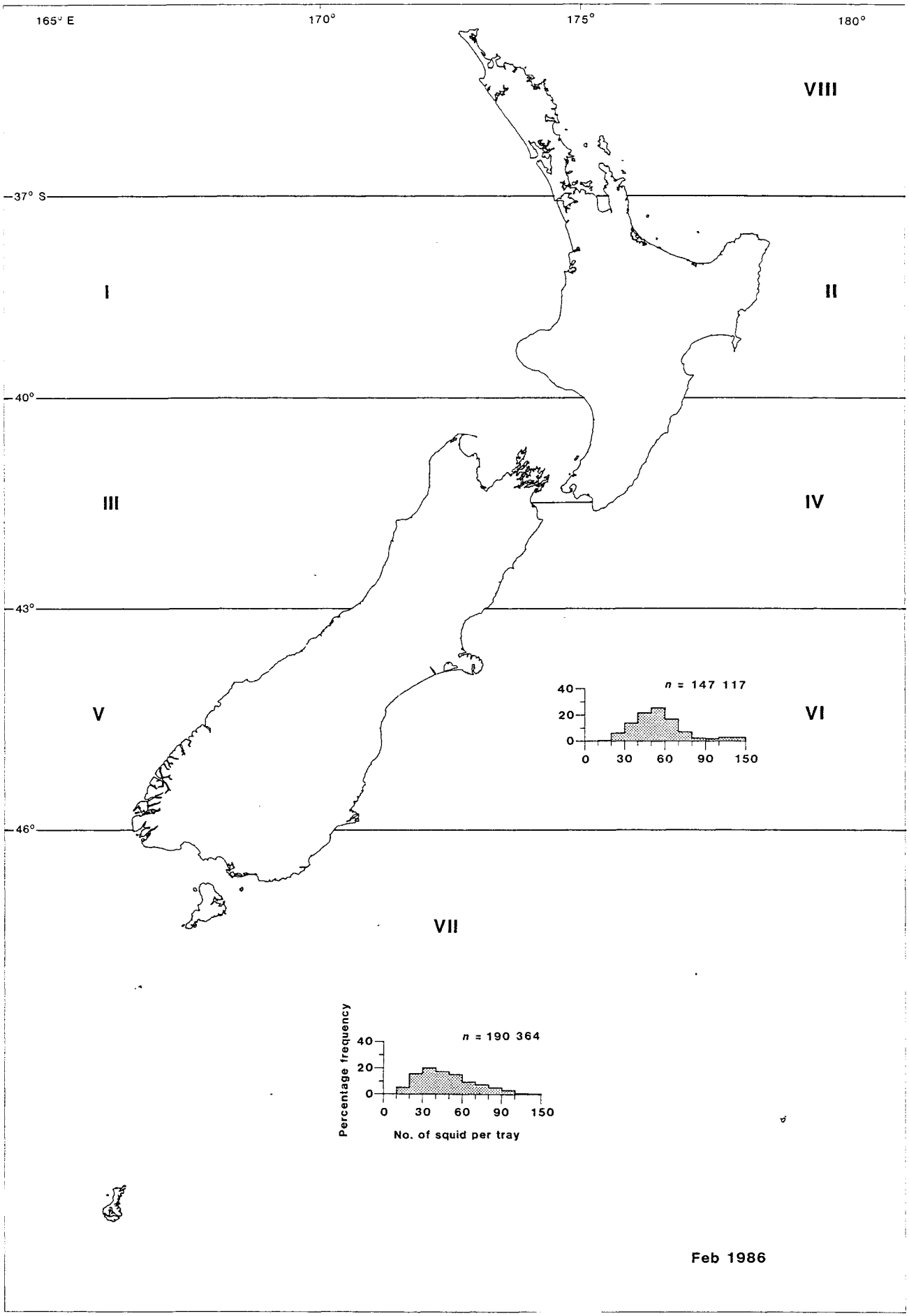

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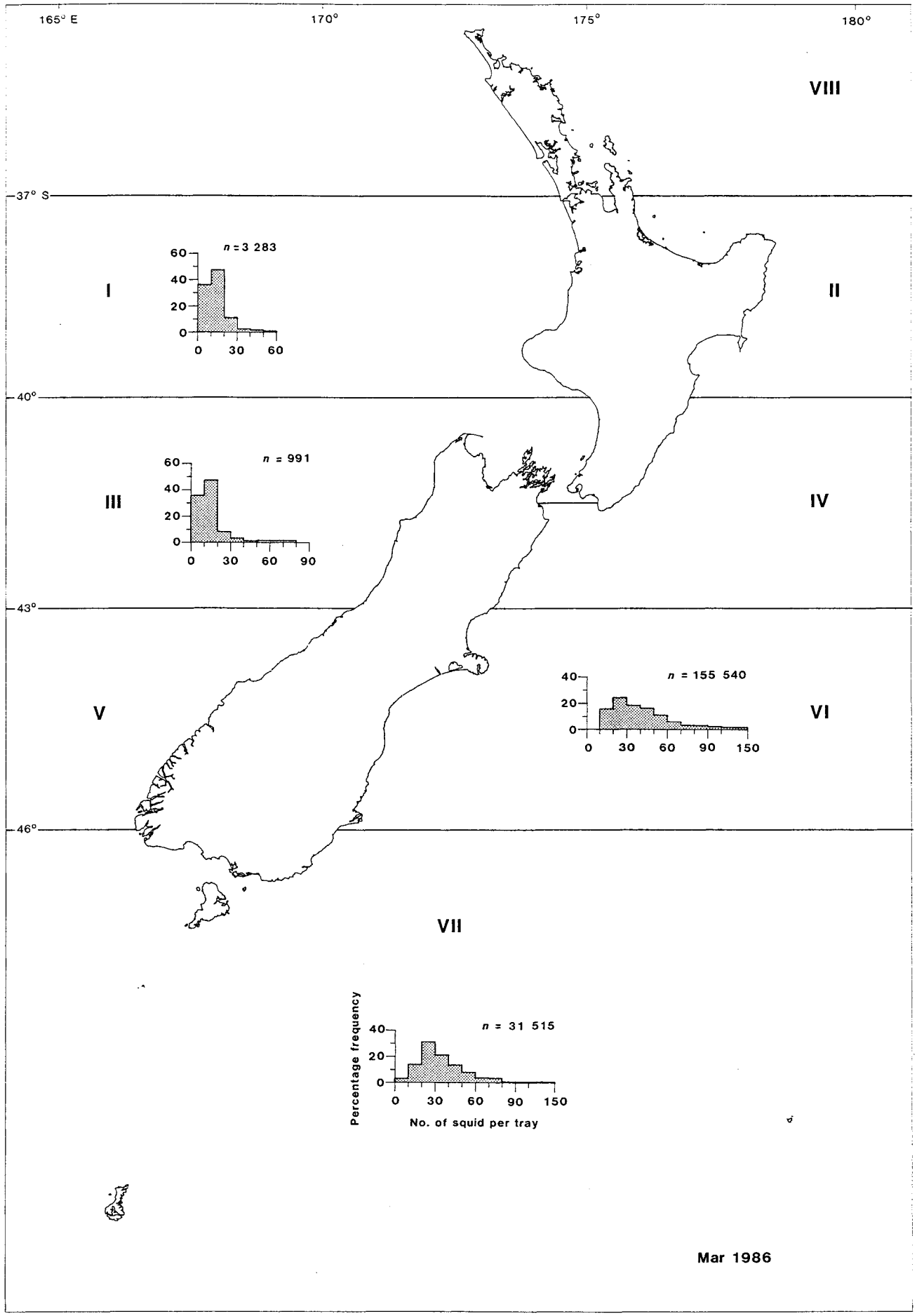

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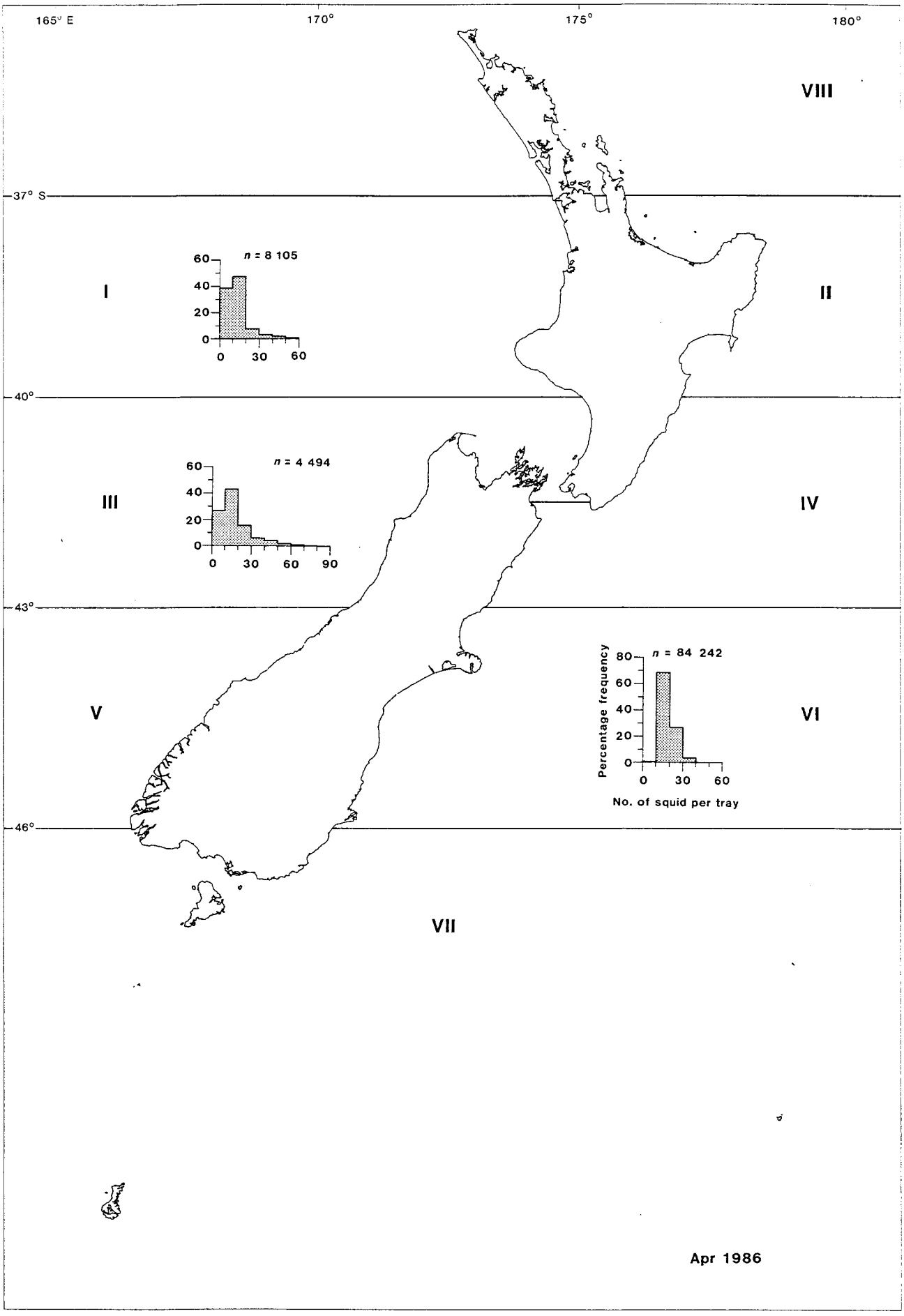

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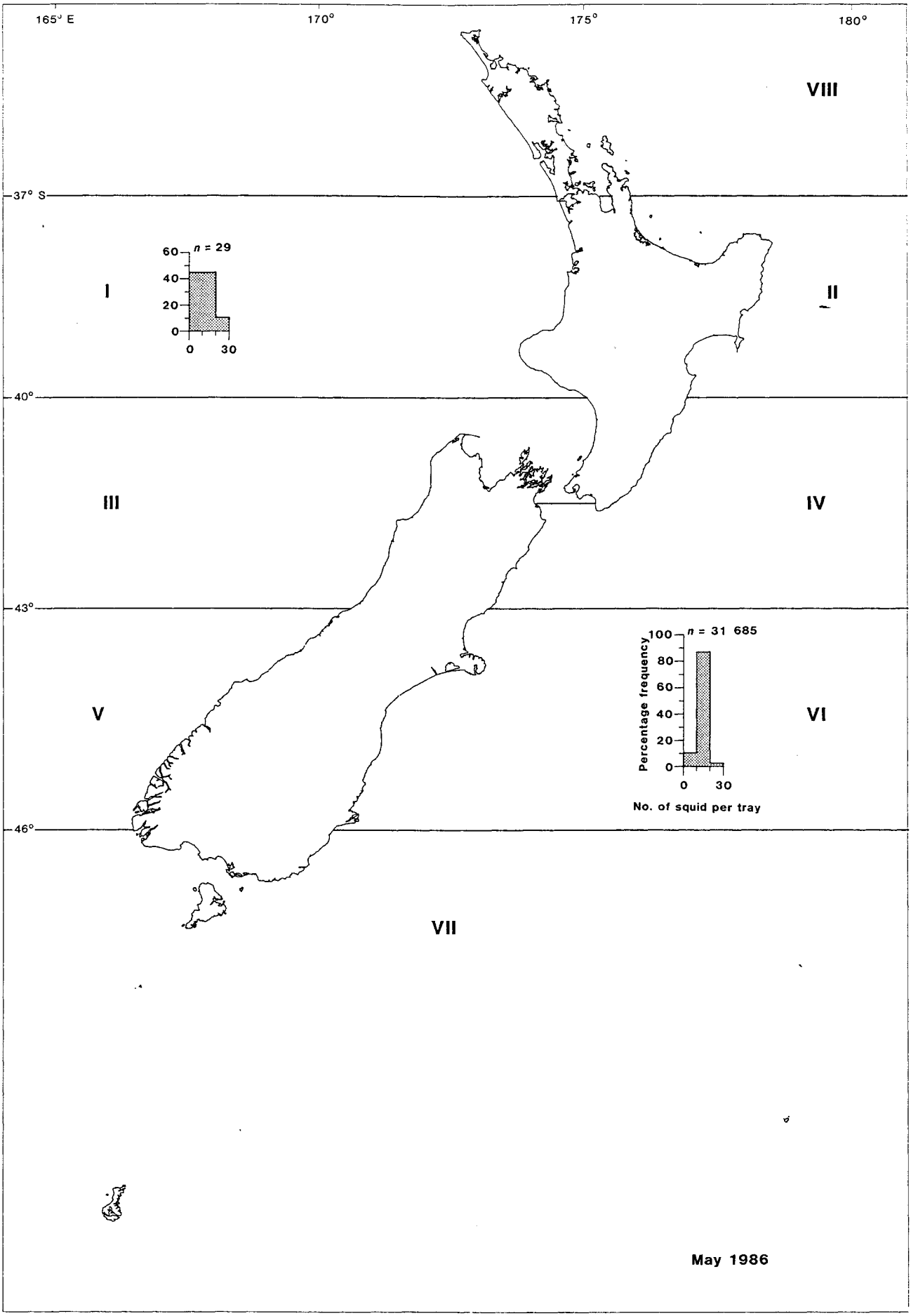

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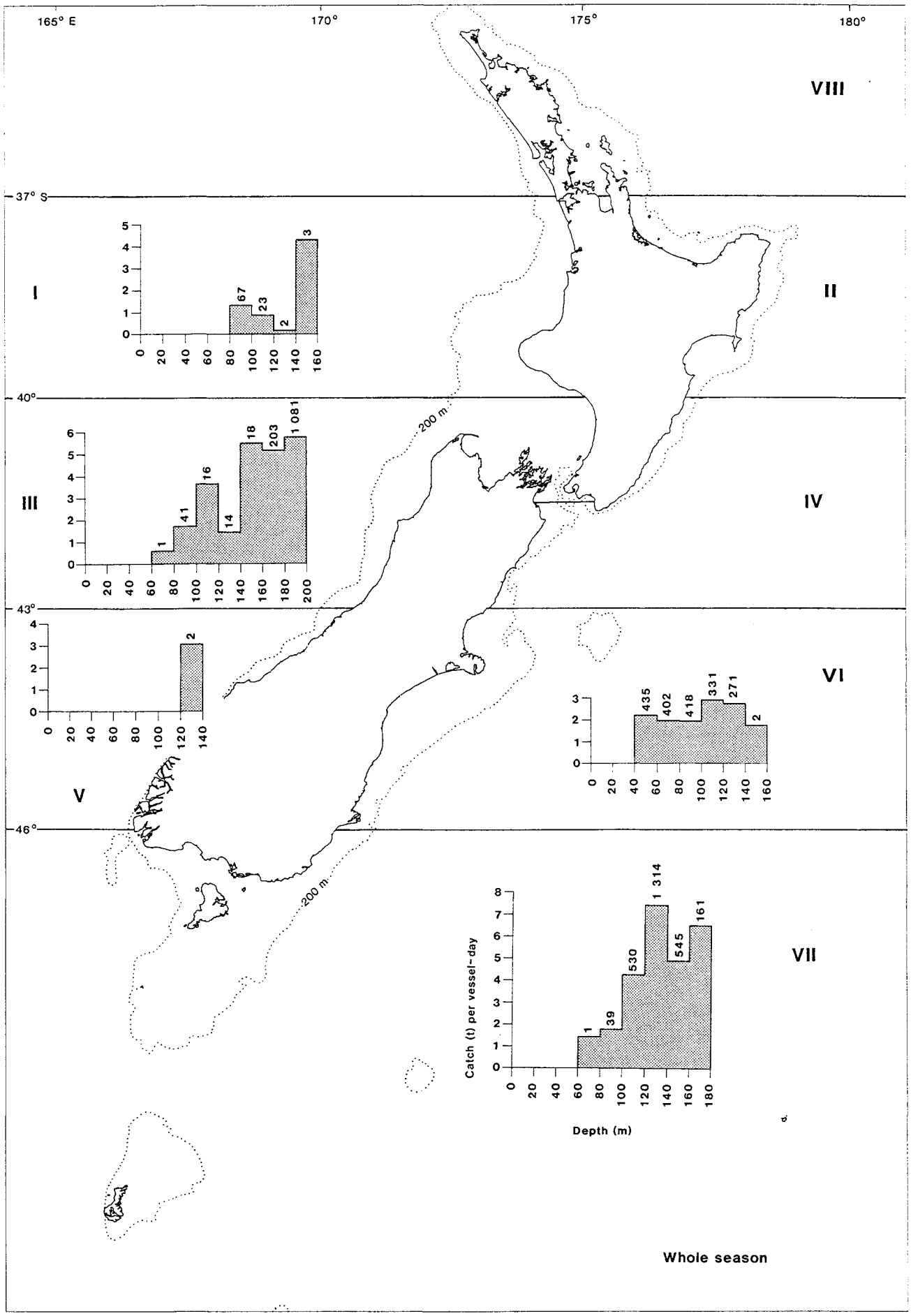


Fig. 6: Seasonal summary of catch per vessel-day by mean bottom depth of fishing grounds in areas I–VIII. (Individual figures above the histograms are the number of vessel-days fished in each depth range.)

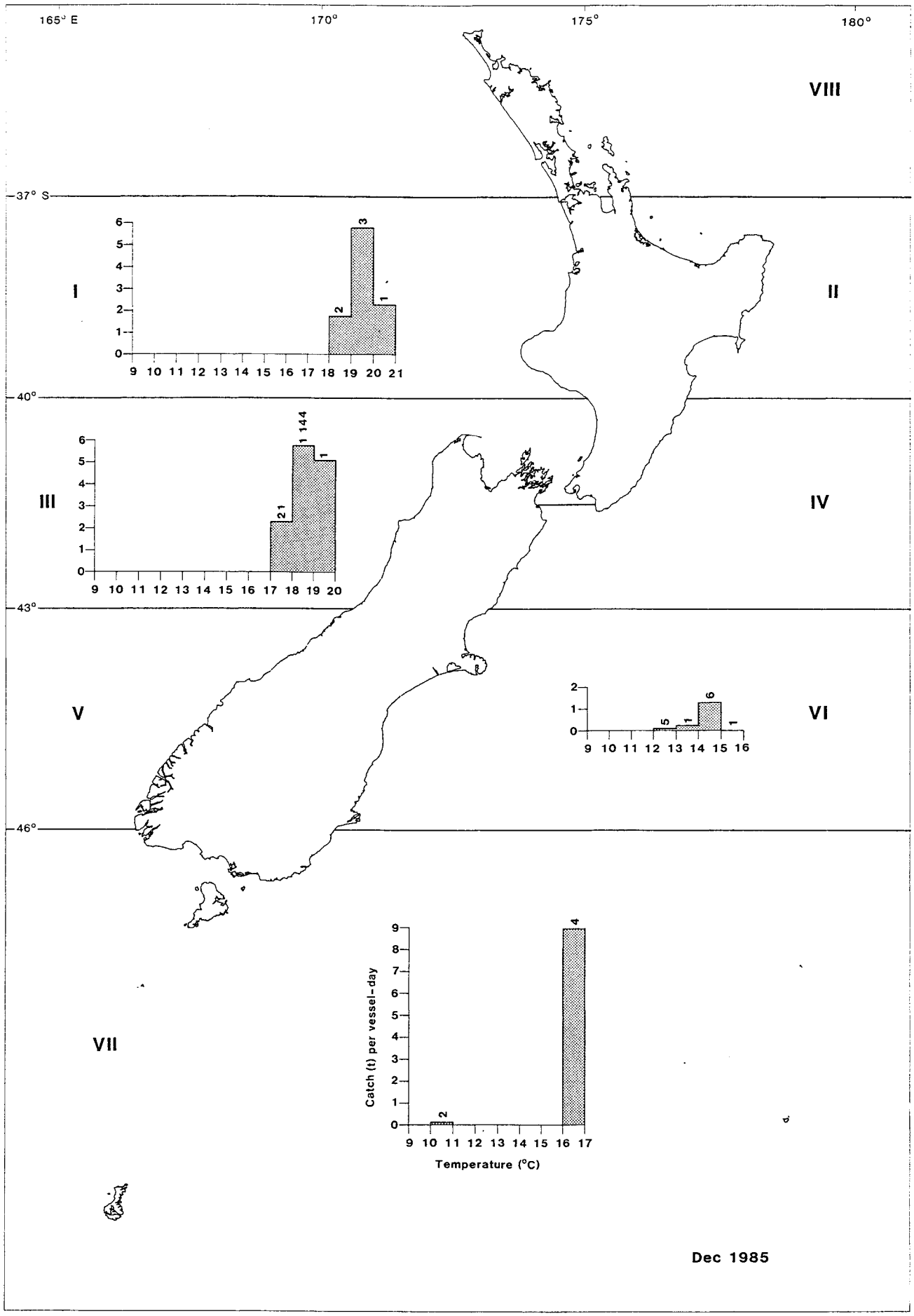
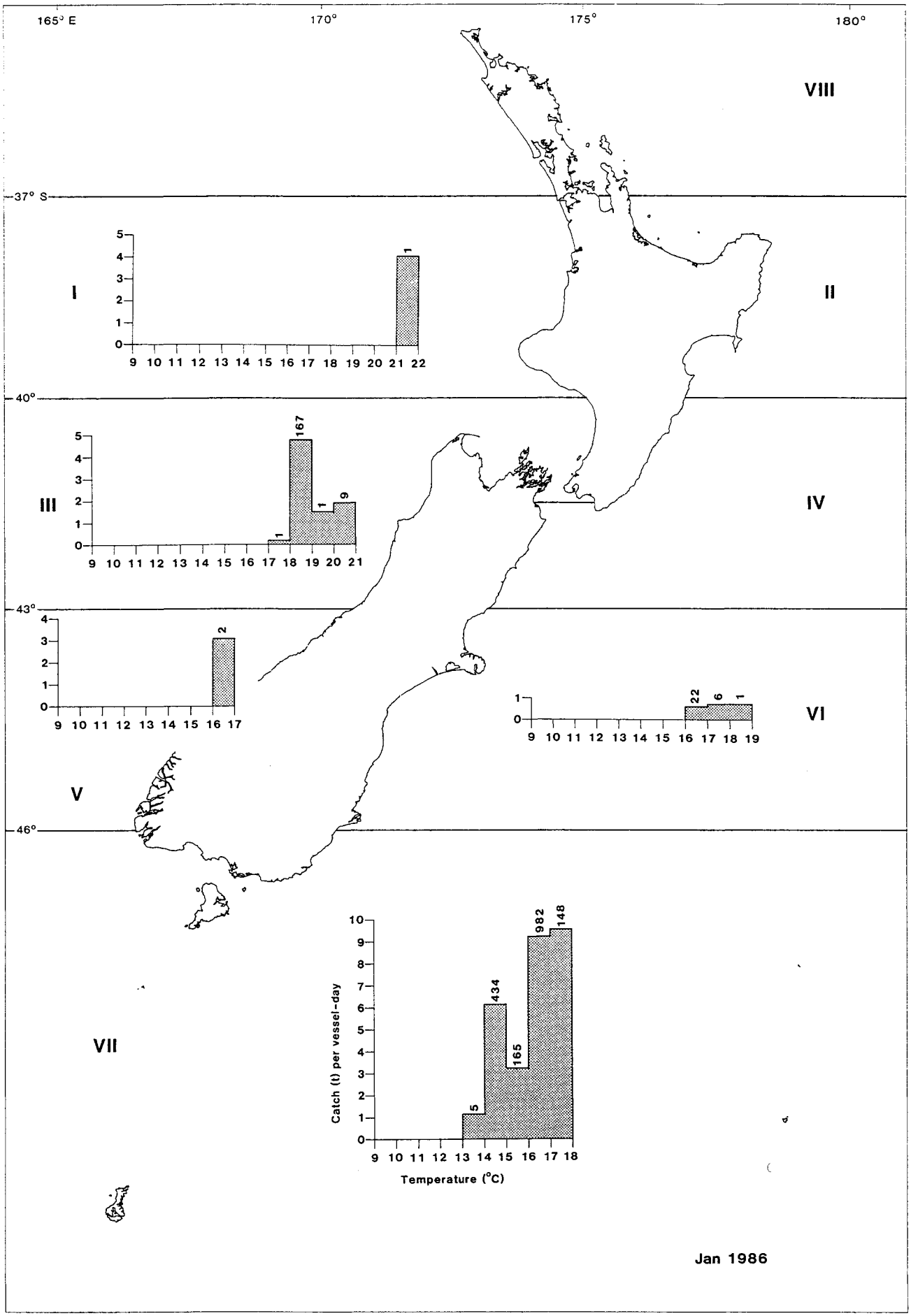


Fig. 7: Monthly summary of catch per vessel-day by mean sea surface temperature of fishing grounds in areas I–VIII. (Individual figures above the histograms are the number of vessel-days fished in each temperature range; a number above a nil value means either a nil catch or a catch of less than 100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



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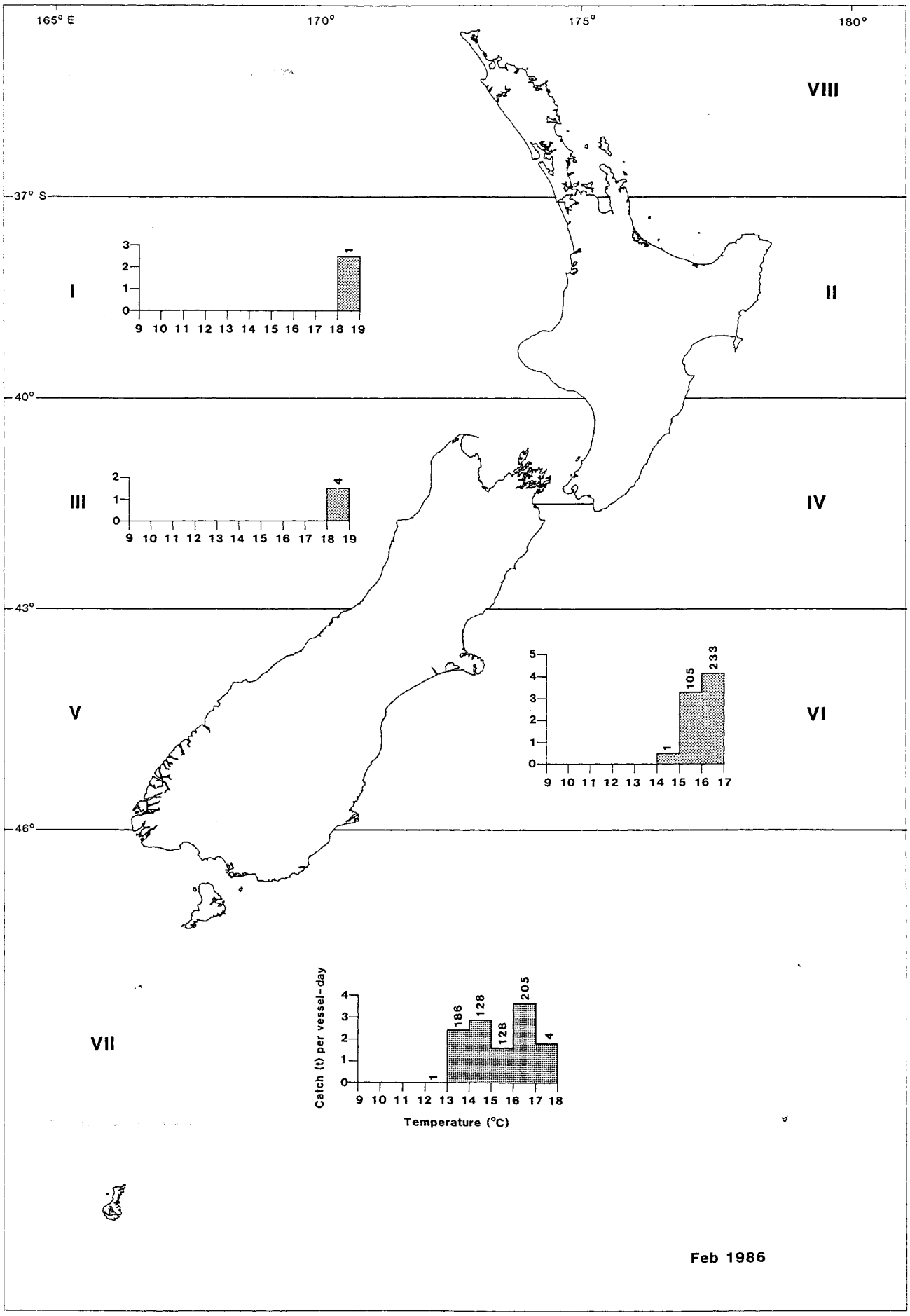

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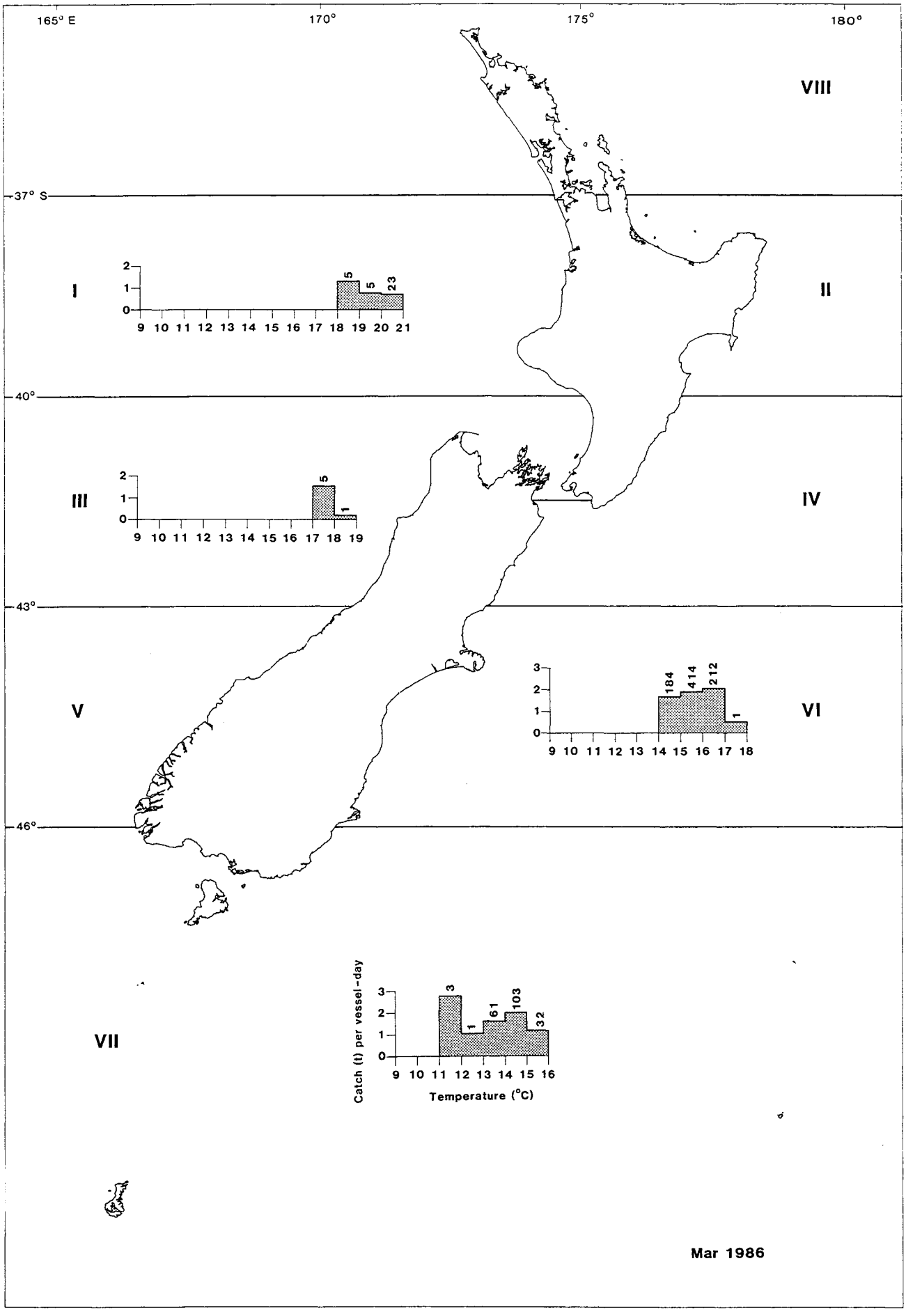

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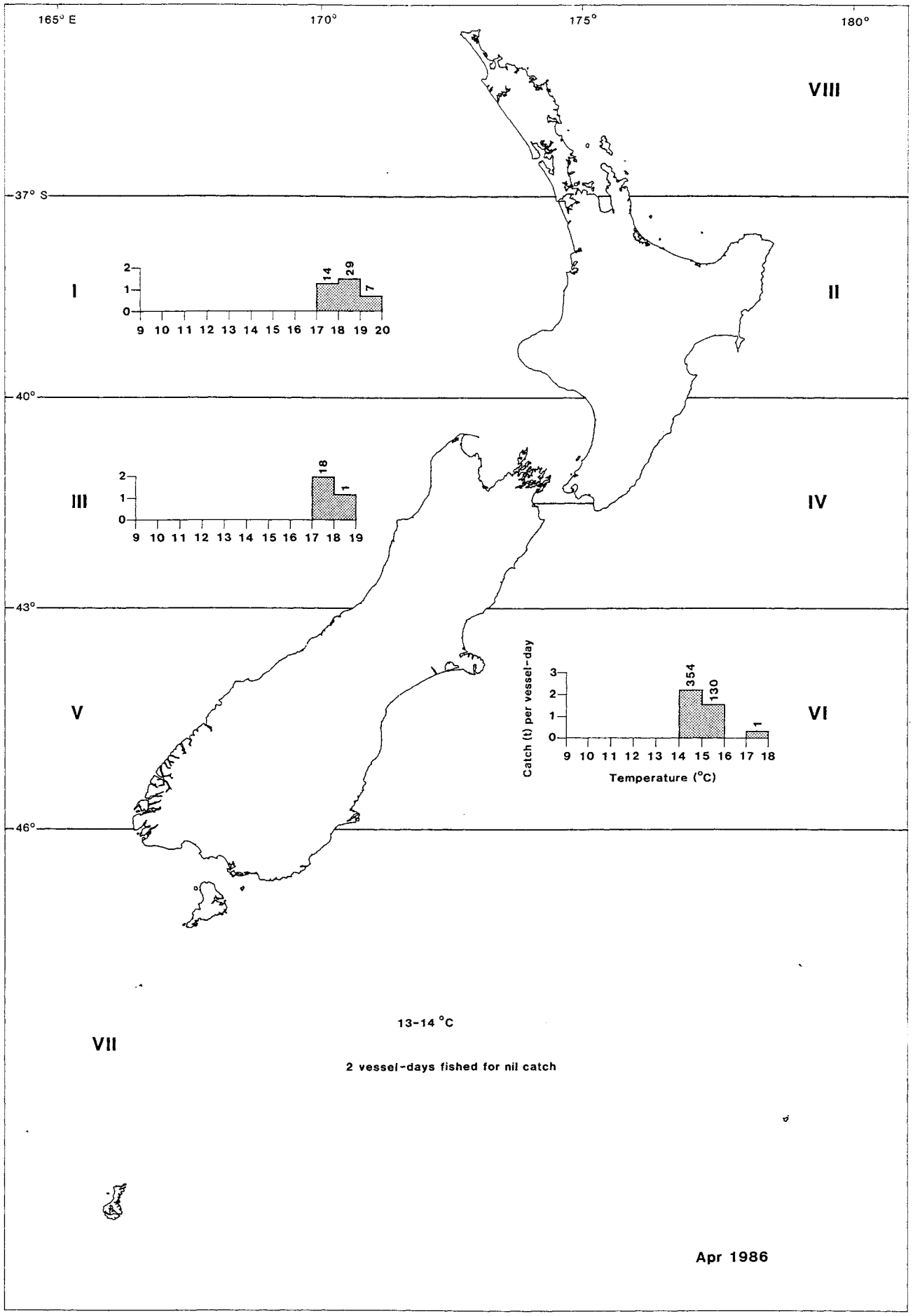

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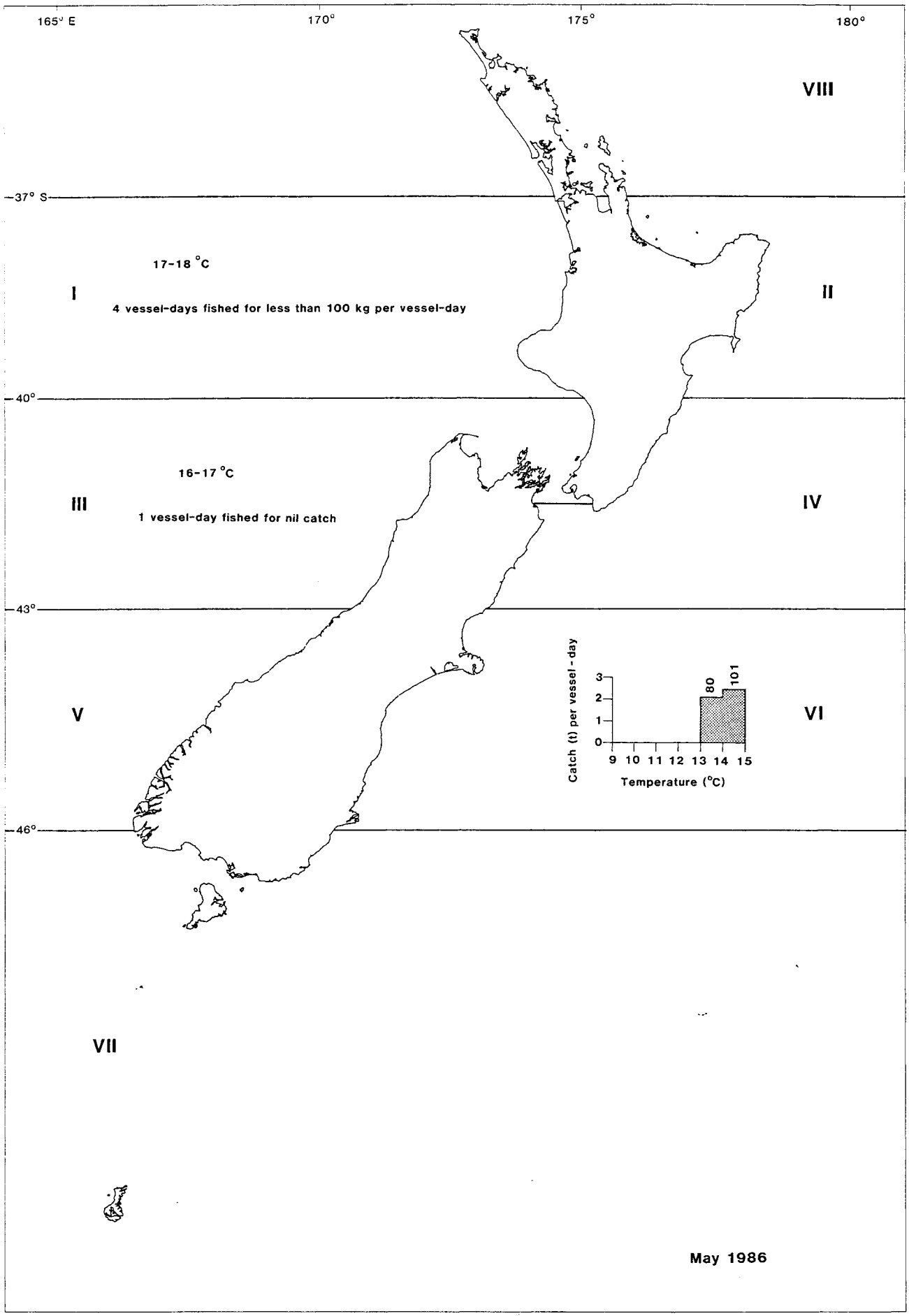

Fig. 7: (continued).