Review of Japanese SBT Fisheries in 2011
日本のミナミマグロ漁業のレビュー：2011 年

Osamu SAKAI[1], Tomoyuki ITOH[1] and Yujirou AKATSUKA [2]
境　磨[1] ・伊藤智幸[1] ・赤塚祐史朗[2]
1:National Research Institute of Far Seas Fisheries　国際水産資源研究所
2:Fisheries Agency of Japan　水産庁

要約

日本の商業漁業では、ミナミマグロを延縄のみで漁獲してきた。本文書では、2011 年のミナミマグロの漁獲量、努力量、ノミナル CPUE、体長組成、隻数と操業海域分布を、それ以前の年代もカバーして歴史的に記す。2011 年漁期には 82 隻の許可を受けた商業延縄漁船により 2,585 トンが漁獲された（暦年では 83 隻により 2,519 トン）。2008 年以降、主要な CCSBT 統計海区（4、7、8、および 9 海区）では高いノミナル CPUE が観察されている。2011 年も昨年と同様に、4 海区・7 海区では 120～150cmFL の小型～中型魚の漁獲が主体であり、8 海区では 150～180cmFL の大型魚も多く漁獲された。9 海区では約 100cmFL の小型魚の漁獲も見られた。漁業者により 2011 年に 3988 尾の小型魚放流が報告された。

日本は、ミナミマグロを対象とした操業許可を持つ合計 16 隻の商業延縄船において、科学オブザーバ活動を実施した。4～9 海区におけるカバー率は、隻数で 14.8%、使用釣鈎数で 11.8%、ミナミマグロ漁獲尾数で 14.8%であった。また、豪州南西沿岸において曳縄による加入量調査を実施した。これらの科学調査活動により耳石 422 個体分を収集した。

Summary

Longline is the only method that Japanese commercial fleets used to catch southern bluefin tuna (SBT). This document summarizes catch, effort, nominal CPUE, size composition, and fleet size and distribution of the Japanese commercial fisheries in 2011, as well as for historical period. In 2011 fishing year, 82 authorized commercial longline vessels caught SBT. Their total catch was 2,583 t (total catch in 2011 calendar year was 2,514 t). The nominal CPUEs were at higher levels in the major CCSBT statistical area (Area 4, 7, 8, and 9) after 2008. Japanese longline vessels mainly caught small or middle sized fish (120-150cm FL) in CCSBT statistical area 4 and 7. In CCSBT statistical area 8, larger fish (150-180cm FL) were also caught. Smaller fish (with mode of around 100cm FL) were caught in CCSBT statistical area 9. Japanese longline vessels reported 3,988 SBT individuals of release and discard in 2011 calendar year.

Japan conducted the scientific observer program with the 16 authorized longline vessels in 2011. Observer coverage against Japanese SBT longline fishing was 14.8% in the number of vessels, 11.8% in the number of hooks used, and 14.8% in the number of SBT caught in CCSBT statistical area 4-9. Around the southwest coast of Australia, the recruitment monitoring survey was conducted by trolling. Otoliths were collected from 422 individuals by these scientific activities.

1. 緒言　Introduction

本文書では、日本によるミナミマグロ漁業の歴史と 2011 年の状況を概観する。なお、ここで提示した漁獲量の統計値は商業船による漁業情報（RTMP を含む）のみを対象としており、科学調査による漁獲については、本文書の「他の関連情報」に記述してある。

【歴史】

日本のミナミマグロの漁獲は全て延縄による。漁獲は 1952 年に本格的に始まった。当初漁獲されていたミナミマグロは、インド洋東部の低緯度水域（CCSBT 統計海区 1,2 海区（以下では単に海区と称す））でのメバチやキハダを対象とした操業で混獲された経産卵魚であり、肉質は非常に悪かった。その後良質の魚を求めて漁場は高緯度域へと拡大していき、1956 年にニュージーランド北東部海域（5 海区）、1961 年にタスマニア島周辺からオーストラリア南東岸沖（4,7 海区）、1965 年に南インド漁場（8 海区）、1967 年にケープ沖漁場（9 海区）が開発された。1960 年代にミナミマグロを対象としていた操業隻数は約 300 隻であった。その後、ニュージーランド東部からチリ沖合にかけての海域、ケープの西沖からアルゼンチン沖合にかけての海域でも操業が行われた。これらの海域では、漁獲はあったものの分布密度が低かったため、主要な漁場とはならなかった。

1970 年代には、親魚漁獲量の低下と小型魚の占める割合の増加から資源量の低下が懸念され、1971 年 10 月から、産卵場における 12－3 月の操業ならびに小型魚が多獲される漁場（シドニー沖 5-7 月、オーストラリア大湾 10-3 月、ケープ沖 10-1 月）での操業を禁止する国内規制が導入された。これらの規制ならびに漁業者がより高価な漁獲物を志向するようになったことにより、1, 2 海区での操業は激減した。また、1973-1974 年に日本のまぐろ延縄漁業では深縄を導入し始め、ミナミマグロ狙いからメバチ狙いへ転換していく船も相当数あった。

1980 年代前半にオーストラリアの表層漁業による漁獲が急増したのに対し、日本の延縄の漁獲量は低下した。1982 年には日、豪、NZによるミナミマグロ三国間会議が組織され、1985 年に 3 国の漁獲割当量が設定された。この時点での日本の割当量は 23,150 トンであり、その後 1986 年会議で 19,500 トン、1988 年会議で 8,800 トン、1989 年会議で 6,065 トンへと漸減した。1989 年以降、漁獲枠の削減の結果として、日本延縄漁船は漁獲枠の消化が漁期途中で終了するようになった（Table 1）。1994 年にはミナミマグロ保存条約（CCSBT）が発効した。日本の漁獲割当量は 1997 年まで 6,065 トンが維持され、その後、2003 年の年次会合において 6,065 トンで合意されるまで自主規制枠（6,065 トン）を設定していた。2006 年の漁獲割当量も前年同様の 6,065 トンであったが、2005 年に 1790 トンの漁獲量超過が見つかったため、同量を差し引いた 4,275 トンを漁獲量の上限として漁獲が管理された。2006 年の年次会合では、2007 年以降 5 年間の日本の漁獲割当量を 3000 トンに削減することで合意されたが、資源状態の悪化を受けて 2010・2011 年の漁獲量の上限をそれぞれ 2,200 トン・2,600 トン[1]として管理した。日本の 2012 年の漁獲割当量は 2,519 トンである。

割当量に対する日本漁船の漁獲量の管理方策としては、1990 年から 2005 年までは、主要 3 漁場に対し、入漁隻数、操業開始日、漁場別の漁獲割当量を各々設定し、漁獲状況に応じて漁場閉鎖日を設定するオリンピック方式の漁業管理制度を用いていたが、2006 年からは個々の漁船に対する漁獲枠の個別割当制度（IQ 制）へ転換した。また同年より、漁獲したミナミマグロ全個体に識別標識を装着する制度を併せて導入し、漁獲量管理を強化した。現在、ミナミマグロの高い CPUE に対し、各漁船は

[1] ニュージーランドからの年間移譲分（139 トン）が含まれる。

少ない漁獲枠しか持たないため、少ない操業回数で漁獲枠を消化しミナミマグロ漁場を離脱する場合が多い。2011 年における日本漁船の操業パターンの詳細は CCSBT-ESC/1208/34 を参照されたい。

2. 漁獲量と努力量　Catch and Effort

1952 年から最近年までのミナミマグロの漁獲尾数、重量（原魚換算）と努力量（釣鈎数）を Table 2、Fig.1 に示す。日本の製品形態は、基本的に鰓、内臓、および尾部を除去した「GG」であるため、原魚重量は製品重量に係数「1.15」を掛け合わせることで算出した。2011 年漁期の日本商業延縄漁船による総漁獲重量は 2,585 トン（暦年では 2,519 トン）、総漁獲尾数は約 6 万尾であった。なお、本レポートの 2011 年の統計値は主として RTMP 調査から得られた暫定値である。また 2010 年以前の統計値についても今後、若干の修正が行われる可能性がある。2011 年に漁船から報告された放流・投棄尾数の総計は 3988 尾である。放流・投棄の詳細は CCSBT-ESC/1208/40 を参照されたい。

漁獲尾数は 1958 年から 1959 年にかけて急増し、1961 年に 122 万尾で最高となり、その後は近年にいたるまで単調に減少した。2000 年代前半には 11 万-14 万尾レベルで推移していたが、2006 年以降、漁獲可能量の削減に伴い急減した。1970 年以降、4-9 海区での漁獲がほとんど全てを占めている。

努力量（釣鈎数）は、1950-1970 年代に増加し、1980 年には最高値 1.3 億本に達した。その後、0.6-0.7 億本前後に落ち込んだ 1990 年代前半を除けば、2000 年代前半まで概ね 1 億本前後で推移していた。しかし、2006 年以降、漁獲可能量の削減に伴い大きく減少し、近年には 2-3 千万本レベルで推移している。なお、この努力量は、CCSBT 統計海区 1-10 の全ての努力量と、その他の海区および海区外でその年に 1 尾以上のミナミマグロが漁獲された 5x5 度区画の年間努力量との合計であり、ミナミマグロを対象としていない操業での努力量も含まれている可能性に注意が必要である。

1972-1993 年には、努力量の大半が 4-9 海区内での操業によるものだが、1994 年以降、8・9 海区の北側に位置する 2・14・15 海区の努力量も多くなった。これらの海域はメバチの主漁場であり、ミナミマグロの漁獲尾数は少ない。4-9 海区の努力量は、これらの海域が開発された 1970 年代初め以降、ほぼ 0.7-1.2 億本レベルで推移していた。1990 年以降は 4 千万～6 千万本台で推移し、2006 年には 3 千万本台に、2007 年～2009 年には 2 千万本台に、そして 2010 年～2011 年には 1 千万本台へ大きく減少した。

最近 5 年間（2007-2011 年）の月、海区別の漁獲努力量とミナミマグロ漁獲尾数とを Table 3、Table 4 に示す。近年の漁獲努力量・漁獲尾数は、主要漁場である 4,7,8,9 海区に集中している。そのなかでも、8・9 海区には従来から漁獲努力量・漁獲尾数が集中する傾向があったが、2010 年以降、8 海区では漁獲努力量の減少に伴い、その漁獲尾数は減少した。その一方で、7 海区での漁獲尾数が増加している。4 海区でも多くの漁獲努力量が見られるが、ミナミマグロの盛漁期となるのは主に 5-7 月であり、その他の月には 2 海区と同様に主にメバチを対象とした漁場となっている。なお、2011 年の漁業データは主に RTMP に基づくため、ミナミマグロを対象とした漁獲以外の努力量の報告が少ない可能性に留意する必要がある。

3. ノミナル CPUE　Nominal CPUE

1952 年から最近年までの CPUE（ノミナル CPUE）を Table 2、Fig.1 に示す。全海域における CPUE は 1957 年に急増し、1959 年に最高値となった後に 1963-1968 年にかけて急減した。CPUE はその後も

1980 年代前半にかけて低下し、1986 年以降はほぼ同レベルで推移した。1990 年から 1993 年にかけて CPUE は一旦増加し、1994 年から 1997 年までは再度低下した。1997 年以降 CPUE はほぼ横ばいであったが、2009 年以降上昇傾向に転じている。

現在の主漁場である 4-9 海区に限定した CPUE の傾向は全海域の場合とほぼ同じであるが、値は全海域のものよりもやや高くなる。CPUE は 1996-1998 年に低下しているが、その水準は 1986-1989 年並みであり、その後は若干の変動があるものの低位で安定して推移してきた。2009 年以降の CPUE は上昇傾向にある。

2007-2011 年の月・海区別のノミナル CPUE を、全海区について Table 5 に、主漁場である 4, 7, 8, 9 海区について Fig.2 に示す。2008 年から 2009 年にかけての CPUE の上昇は顕著であり、その漁獲物の主体は小型個体であった（後述）。この CPUE の上昇は、近年の若齢魚の高い加入水準を反映したと考えられる。2011 年の CPUE も多くの海域で 2010 年と同様に高水準で推移した。詳細は CCSBT-ESC/1208/32 を参照されたい。

4. サイズ組成　Size composition

過去の一部の漁業者による体長測定には 5cm 単位で測定される傾向があったので、これを緩和するために、1996 年までは全船の体長頻度を 5cm ごとの移動平均にしてデータとして用いた。1997-1999 年の体長データはこの平滑化処理をしていない。2000 年以降のデータでは、各年において 5cm 単位の体長値が全体の 40%以上であった船のデータについては測定頻度を 5cm ごとに移動平均して用いた。

1990 年以前に日本が収集したサイズデータは少なく、また 1980 年代には体重データの占める割合が高い（Fig. 3）。1991 年に RTMP が始まると体長測定データ数は急増し、1995 年以降は、RTMP が全船に拡大されたことで、日本の大半の漁獲個体から体長・体重の測定データが得られるようになった。その割合は、2010 年は 99.9%、2011 年は 99.4%であった。

10 年ごとの合計漁獲尾数から求めた体長組成を Fig.4 に示す。体長モードは 1960-1980 年代には 150cmFL にあったが、1990 年代に 120cmFL へ小型化した。この小型化は操業パターンの変化および資源の年齢組成変化の両方を反映したものと思われる。2000 年代は明瞭なモードがない。

近年 5 年間（2007-2011 年）の体長組成を Fig.5 に示す。近年、日本延縄漁業では小型個体の漁獲が目立つ。2007 年・2008 年には約 100cmFL・120cmFL に、2009 年には 90cmFL・110cmFL にモードを持つ小型個体の漁獲が多数報告されている。2010 年には 100cmFL 以下の個体の漁獲が少なかったが、2011 年には、再び 100cmFL の個体の漁獲も多く確認されている。このような小型個体の漁獲増加は、ミナミマグロの加入水準が高いことを反映していると考えられる。

5. 漁船数と分布　Fleet size and distribution

データベースに船別の情報が含まれている 1983 年以降のデータを用いて、4-9 海区においてミナミマグロを 1 尾以上並びに 100 尾より多く漁獲した年別の隻数を、日本の遠洋延縄船の全隻数と共に Table 6 に示す。2011 年については、操業情報の大部分が RTMP の情報に基づくため、2011 年の RTMP の隻数を示すと共に、比較のために 1995 年以降の RTMP の隻数も示す。

日本は延縄漁船に対し、1981 年に 69 隻、1982 年に 100 隻の減船を実施しており、1980 年代前半にはミナミマグロを漁獲する漁船数は既に減少傾向にあった。ミナミマグロを対象とした操業を行う延

縄漁船数の減少幅は 1991・1999・2006 年に特に大きい。1991 年の操業隻数の減少はクォータ有効利用のために出漁隻数を自主的に制限したことの影響と考えられる。1999 年の減少は 1998 年に日本延縄漁船全体で行われた 132 隻の減船の影響と考えられる。また 2006 年の減少は漁船毎の個別枠割当制度への管理方策の変更や燃油の高騰に伴う経営戦略の変化の影響と解釈される。2011 年のミナミマグロ操業隻数は 83 隻であり、2005 年と比べて半減している。

ミナミマグロ漁獲尾数および努力量の四半期、5x5 度別の分布を、1960～2000 年代については 10 年間ごとに、2007-2011 年については 1 年ごとに Fig.6～9 に示す。これらの図は、毎年 CCSBT へ提出している 5x5 度区画で月別に集計したデータを基に作製した。1～9 海区、14・15 海区の努力量は、ミナミマグロの漁獲の有無に関わらず、他の魚種を目的とした操業も含めて全て合計している。1950 年代には 1,2,5 海区に限られた操業海域は、1960 年代には全海区に広がった。1970 年代には 9 海区での努力量・漁獲尾数が増加した一方で、1・2 海区での漁獲尾数が大きく減少した。これは 1・2 海区での操業がミナミマグロを対象としたものからメバチ等の他魚種を対象としたものへ変化したことを示している。1990・2000 年代は、1970・1980 年代に比較して、第 1 四半期の 4～9 海区や、第 4 四半期の 7 海区の努力量・漁獲尾数が減少した。これらは漁場ごとの漁期規制の影響と考えられる。また 1990 年代半ばより、5・6 海区での努力量・漁獲尾数は少なくなっている。近年 5 年間の 4-9 海区では、漁獲努力の分布範囲やミナミマグロの漁獲の地理的分布に大きな変化はみられない。

6. 科学オブザーバプログラム　Scientific observer program

2011 年にミナミマグロを対象とした操業許可を持つ 16 隻の日本延縄漁船へ派遣した。そのうち 12 隻がミナミマグロ主要漁場にてミナミマグロを漁獲した。4～9 海区での調査カバー率は、隻数で 14.8%、使用釣鈎数で 11.8%、ミナミマグロ漁獲尾数で 14.8%であった。詳細は別文書（CCSBT-ESC/1208/27）を参照されたい。

7. 他の関連情報　Other relevant information

【科学調査活動】

ミナミマグロ 1 歳魚の加入量指数を求めるためのピストンライン曳縄調査を 2012 年 1-2 月に実施した。18 日間調査した結果、本調査により得られた指数はピストンライン上で 1.6 群/100km であった。この調査で漁獲されたミナミマグロ 91 個体には CCSBT 通常標識とアーカイバルタグの装着放流を実施した。また、別の 10 個体にはポップアップアーカイバルタグを装着放流した。承認された調査死亡枠のもとで、耳石、筋肉、および胃内容物の採集のために死亡したミナミマグロは 324.9kg（98 個体）である。詳細は別文書（CCSBT-ESC/1208/28, 33 および 38）に示す。

日本の延縄漁船から報告された通常標識の再捕は 43 本（31 個体分）であった（うち、2011 年度のオブザーバからの報告は 9 件）。アーカイバルタグの再捕は 1 本であった。詳細は別文書（CCSBT-ESC/1208/27 および 28）に示す。

【耳石収集活動および分析】

2011 年にオブザーバ活動にて 200 個体分、2011 年の曳縄調査にて 222 個体分の耳石を収集した（合計 422 個体分）。これらの耳石は現在分析を進めている。詳細は別文書（CCSBT-ESC/1208/29）に示す。

1. Introduction

This document is a review of the Japanese longline fisheries of Southern Bluefin tuna (SBT). All of statistical values written on this document are based on the catch and effort information from Japanese commercial longline vessels. SBT catches under the scientific research is written at the section of "Other relevant information" in this document.

[History]

All Japanese commercial fisheries for SBT have used longline gear. This fisheries started in 1952 around the low latitudes of Eastern Indian Ocean (CCSBT statistical area 1 and 2), as the bycatch of post-spawning adult SBT during the targeting of bigeye tuna and yellowfin tuna. The grade of fish meat in this area was not good, and then Japanese fishermen extended the fishing ground to the high latitudes area. Japanese longline fleets reached the Northeastern region of New Zealand (Area 5) in 1956, around the Tasman Sea (Area 4, 7) in 1961, Southern Indian Ocean (Area 8) in 1965, and around the off Cape Town (Area 9) in 1967. Number of Japanese vessels that caught SBT in the 1960s was estimated about 300. Eastern Pacific (Area 12) and off Argentina (Area 10) was not established as SBT fishing grounds because of the lower fish density.

In the 1970s, because of increasing proportion of small SBT in the catch and decreasing catches of adult SBT, Japan had adopted the voluntary area-closures in domestic longline fisheries since October 1971. Spawning ground was closed between December and March to protect migrating adults, and some fishing grounds was closed seasonally to protect small SBT (off Sydney in May-July; Great Australian Bight in October-March; off Cape Town in October-January). In addition, because Japanese fishermen began to target high-quality SBT, the number of fishing operation in Area 1 and 2 dropped drastically. In these days, Japanese vessels began using "deep tuna longline" in 1973-1974, and then considerable number of vessels changed their target from SBT to bigeye tuna.

In the early 1980s, SBT catches by Australian surface fisheries increased rapidly while Japanese longline catches decreased. In 1982, Japan, Australia, and New Zealand organized SBT voluntary trilateral management framework, and began to apply quotas to their fisheries from 1985. Japanese quota was 23,150 t in 1985, and decreased to 19,500 t, 8,800 t, and 6,065 t at 1986, 1988, and 1989 trilateral meeting, respectively. After 1989, Japan adopted official area/time-closures to domestic longline fisheries to manage the Japanese SBT quota (Table 1). In 1994, the Convention for the Conservation of Southern Bluefin Tuna (CCSBT) came into force. Japan was applied 6,065 t as the Japanese quota in 1989-1997, and continued it as the self-regulation every year to 2003. Japanese quota was 6,065 t in 2004-2006, but Japan set a quota of 4,275 t for 2006 because of 1,790 t exceeding in 2005. The Commission Meeting in 2006 (CCSBT13), it was decided the decrease of Japanese quota (3,000 t) in next 5 years (2007-2011), but further reduce of catch allocation in 2010-2011 was decided due to the poor stock status estimated in 2009. For the 2010 and 2011 fishing years, Japanese quotas were 2200 t and 2600 t[2]

[2] Allocation for each year includes annual transfer (139 t) from New Zealand. Refer to CCSBT-EC/1010/14 for more information.

as the national catch limit, respectively. Japanese quota in 2012 is 2,519 t.

Area/time-closures in main fishing ground by the "Olympic system" had been used to manage the Japanese quota before 2005. Under this management system, Fisheries Agency of Japan set the quota beforehand to each fishing ground, monitored the SBT catches of authorized vessels, and closed the fishing grounds before the over quota. In 2006, Japan adopted an individual quota (IQ) system for SBT fisheries, and abolished the seasonal area/time-closures at the same time. In addition, catch monitoring tag was adopted as a part of strengthening of national management measure. This IQ was relatively small for each vessel considering the recent higher CPUE, thus Japanese vessels tended to consume all of quotas by few operations targeting SBT in recent years. The details of operation pattern in 2011 are given in document CCSBT-ESC/1208/34.

2. Catch and Effort

Catch and effort for Japanese longline vessels by calendar year are provided in Table 2 and Fig. 1. Japanese usual product type is "GG (Gilled and Gutted, tail removed)", thus total SBT catch weight in Table 2 were produced using the conversion factors "1.15" from the processed weight. Total catch weight in the 2011 fishing year was 2,585 t (2,519 t in calendar year), and total catch number was about 60 thousand. These are provisional values base on the Real Time Monitoring Program (RTMP) and will be updated next year. There is a possibility that statistical value before 2010 will be also updated slightly. Based on the RTMP data, Japanese longline vessels released and discarded 3,988 SBT in 2011 calendar year. The details of releases and discards in 2011 are given in document CCSBT-ESC/1208/40.

SBT catches for Japanese longline vessels increased rapidly from 1958. Japanese SBT catch numbers peaked in 1961 at 1.2 million, and monotonically decreased after that. In the early-2000s, Japanese catch number was around 110-140 thousand. After 2006, it decreased along with the reduction of Japanese catch allocation. Most of Japanese catch has been in Area 4-9 since 1970.

Efforts (total hook numbers) by Japanese longline vessels increased between the 1950s and 1970s, reached the peak of about 130 million hooks in 1980. Since then, the efforts had been about 100 million hooks except for the early 1990s (60-70 million hooks). After 2006, efforts have drastically decreased along with the reduction of Japanese catch allocation, recent annual total efforts were 20-30 million hooks. These efforts were calculated as the total hooks used in Area 1-10 and the total effort in 5x5 degree cells where have SBT catch in the year, and these were included not only the efforts targeting the SBT but also the efforts targeting the other tunas (e.g. bigeye tuna and/or yellowfin tuna).

Most of efforts were in Area 4-9 between 1972 and 1993. After 1994, the efforts were increased in Area 2, 14, and 15 which are north of Area 8 of 9 and the fishing ground of bigeye tuna. In these areas, SBT catches are far lower than main fishing ground (Area 4-9). Total efforts in Area 4-9 were 70-720 million hooks in the early-1970s and remained 40-60 million hooks for many years after 1990. However, after 2006, total efforts in Area 4-9 have decreased with the reduction of Japanese catch quota (33 million hooks in 2006, and 15-25 million hooks in 2007-2011).

Catch and effort in recent 5 years (2007-2011) for Japanese longline vessels by month and area are

provided in Table 3 and Table 4. Japanese catch and effort tend to be concentrated in Area 4, 7, 8, and 9 in recent years, and a lot of SBT catch and effort have been observed especially in Area 8 and 9. After 2010, catch and effort in Area 8 were decreased, while catches in Area 7 were increased. There are a lot of fishing efforts in Area 4, however most of the efforts were used targeting the bigeye tuna as with Area 2, except for the efforts in SBT fishing season (May-July). Catch and effort in 2011 were mainly based on the RTMP, thus there are possibility that some efforts targeting the other tunas (bigeye tuna, yellowfin tuna, and albacore) were not included yet.

3. Nominal CPUE

Nominal CPUE which were calculated by calendar year are provided in Table 2 and Fig.1. CPUE for Japanese longline vessels in all areas increased rapidly from 1957, peaked in 1959, and decreased rapidly in 1963-1968. After that, CPUE has monotonically decreased, and been stable in lower level after 1986. In the 1990s, temporary increase and decrease of nominal CPUE was observed. After 2008, Japanese nominal CPUE increased again.

Considering the CPUE in Area 4-9, CPUE value was higher than that calculated for all areas. CPUE in Area 4-9 increased in 1990-1993 decreased in 1993-1996. After that, it has been stable in the end-1980s level. Since 2008, CPUE in Area 4-9 has increased.

Nominal CPUE in recent 5 years by month and area are provided in Table 5 and Fig. 2. CPUE increase between 2008 and 2009 were remarkable, and a lot of small SBT tended to be caught at that time. Therefore, this CPUE increase would be the result of recent higher recruitment condition. Nominal CPUE in 2011 was still higher level. The details of CPUE trend are given in document CCSBT-ESC/1208/32.

4. Size composition

Size compositions which were mainly based on the measurement by fishermen are provided in Fig.4 and Fig. 5. Size data provided from some fishermen tended to be measured in 5 cm for past years, thus Fig. 4 were made using the 5 cm moving average for the size composition before 1996. After the 2000s, 5 cm moving average were adopted for the size data which was provided by the vessel measuring in 5 cm for over 40% fishes.

Limited size data are available before 1990. And, most of size data in the 1980s were based on the weight measurement (Fig. 3). Since 1991, RTMP has been started, and the availability of length measurement data was drastically improved. Because all of authorizes Japanese vessels joined RTMP, Japan has been able to provide the sized data (length and weight) for most of SBT which were caught by Japanese vessels since 1995. Japan provided the size data for 99.9% and 99.4% of SBT caught in 2010 and 2011, respectively.

In the 1960s-1980s, the size composition of Japanese longline catches had a mode at 150cm FL. This was changed to a mode at 120cm FL in the 1990s, and there was no sharply-defined mode in the 2000s (Fig. 4). In recent 5 years (2007-2011), Japanese longline tended to catch small sized SBT (Fig. 5).

The size composition of Japanese longline catches had the modes at 100cm FL and 120cm FL in 2007-2008, at 90cm FL and 110cm FL in 2009. There were not clear modes which indicated the catch of less than 100cm FL SBT in 2010, though a mode at 100cm FL was observed again in 2011. Catches of small sized SBT would reflect relatively high recruitment level of recent SBT stock.

5. Fleet size and distribution

Total number of Japanese high sea tuna longline vessels and authorized SBT longline vessels in 1983-2011 are provided in Table 6. Most recent year's data was mainly based on the RTMP data, thus the data from RTMP also showed for 1995-2011.

Japan conducted the drastic cut of the total number of longline vessels to help preserve tuna resources; reduction of 69 vessels in 1981, 100 vessels in 1982, and 132 vessels in 1998. The number of authorized SBT longline vessels was already on a declining trend in the 1980s. In 1991, 1999, and 2006, the number of SBT vessels declined sharply. The decrease in 1991 would be the result of voluntary restraint of fishing vessels for the effective use of national quota. The decrease in 1999 would be the result of the drastic cut of longline vessels in 1998. The cause of decrease in 2006 would be the change of business strategy corresponding to the change from Olympic system to IQ system and the escalating fuel prices. Total number of SBT longline vessels in 2011 was 83, which is almost half the number in 2005.

The spatial distribution of fishing efforts and SBT catches are provided in Fig. 6-9. These figures were based on the officially reported data (5x5 degree aggregated catch and effort data) to CCSBT. Plotted efforts in Area 4-9 and Area 14-15 were based on the all operations, whether they were targeting SBT or not. In the 1960s, efforts of Japanese longline vessels were spread out all CCSBT areas. After that, in the 1970s, SBT catch and effort in Area 9 increased while catches in Area 1 and 2 decreased. This decrease in Area 1 and 2 was the results of the changing target from SBT to the other tunas. In the 1990s-2000s, SBT catch and effort decreased in Area 4-9 during first-quarter and in Area 7 during fourth quarter, compared to those in the 1970s-1980s. These changes would be the results of the area/time closure as the quota management. In addition, catch and effort in Area 5 and 6 have been reduced since the mid-1990s. During the recent 5 years (2007-2011), there are little temporal-spatial change for the distribution of SBT catch and effort.

6. Scientific observer program

Japan sent scientific observers to 16 authorized Japanese longline vessels in 2011. 12 vessels of them operated in Area 4-9 and caught SBT, while remaining four vessels caught no SBT in main fishing area during the observers were on board. Observer coverage against Japanese SBT longline fishing was 14.8% in the number of vessels, 11.8% in the number of hooks used, and 14.8% in the number of SBT caught in Area 4-9 between April and December 2011. The details of scientific observer activities are given in document CCSBT-ESC/1208/27.

7. Other relevant information

[Scientific research]

The trolling research survey that provides the recruitment index of age-1 SBT was carried out in January-February 2012. The recruitment index, the number of age-1 SBT schools per 100 km searched, was 1.6. During this survey, total of 91 SBT were tagged the CCSBT conventional tag and archival tag. Pop up archival tags were also attached 10 SBT. Under the Research Mortality Allowance (RMA), 98 SBT (324.9 kg) were killed and collected their otoliths, muscle, and stomach contents in this survey. The details are given in documents CCSBT-ESC/1208/28, 33, and 38.

From June 2011 to July 2012, CCSBT conventional tags from the total of 30 individuals (42 tags) were recovered from Japanese longline vessels. CSIRO conventional tag from the total of 1 individual (1 tag) was also recovered. Scientific observers retrieved the 12 conventional tags of them (from 9 individuals). One archival tag was also recovered. The details are given in documents CCSBT-SC/1208/27 and 28.

[Activities of otolith collection]

In 2011, Japan collected otoliths from a total of 422 SBT. 200 of them came from commercial longline vessels through the scientific observer program. Remaining 222 of them came from the trolling survey in January-February 2011. These otoliths samples are now in the process of analyzing. The details are given in document CCSBT-SC/1208/29.

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Table 1 Fishing season of Japanese SBT longliners.

The area ranges are roughly identical to those of the CCSBT statistical area.

	Off Cape (Area 9)			Tasmania (Area 4 & 7)			South Indian Ocean (Area 8)			Total
Year	Start	End	Days	Start	End	Days	Start	End	Days	days
1989	1-Mar	25-Dec	299	1-Mar	25-Dec	299	1-Mar	25-Dec	299	897
1990	1-Apr	31-Jul	122	1-Apr	25-Jun	86	1-Jul	15-Aug	46	254
1991	15-Apr	31-Jul	108	15-May	31-Jul	78	15-Aug	30-Sep	47	233
1992	15-Apr	31-Jul	108	15-May	31-Jul	78	15-Aug	7-Oct	54	240
1993	15-Apr	3-Jul	80	15-May	30-Jun	47	15-Sep	17-Sep	3	130
1994	15-May	26-Jun	43	1-Jun	15-Jun	15	1-Sep	5-Oct	35	93
1995	15-May	25-Jun	42	15-May	20-Jun	37	1-Sep	10-Nov	71	150
1996	1-May	31-Jul	92	15-May	24-Jun	41	1-Sep	30-Nov	91	224
1997	1-May	31-Jul	92	21-Apr	8-Jul	79	1-Sep	14-Dec	105	276
1998	1-May	10-Aug	102	21-Apr	31-Jul	102	5-Sep	5-Dec	92	296
1999	1-May	10-Aug	102	15-Apr	10-Aug	118	1-Sep	1-Dec	92	312
2000	1-May	1-Aug	93	15-Apr	1-Aug	109	1-Sep	27-Dec	118	320
2001	1-May	1-Aug	93	15-Apr	15-Jul	92	1-Sep	28-Nov	89	274
2002	1-May	5-Jul	66	15-Apr	19-Jul	96	1-Sep	28-Nov	89	251
2003	1-May	8-Jul	69	15-Apr	30-Jul	107	1-Sep	16-Dec	107	283
2004	1-May	9-Aug	101	15-Apr	31-Jul	108	1-Sep	23-Dec	114	323
2005	1-May	27-Aug	119	15-Apr	31-Jul	108	1-Sep	13-Dec	104	331
2006	Fishing season was started at 1-May in all area. There was no regulation as the seasonal area closure.									
2007										
2008										
2009	Fishing season was started at 1-April in all area. There was no regulation as the seasonal area closure.									
2010										
2011										

Table 2 Number of SBT caught, effort and nominal CPUE of SBT by Japanese commercial longline.

N_hooks is the number of hooks in thousand. CPUE = Total SBT/Total Hooks x 1000.
W_SBT is the whole weight of SBT in ton. Figures for 2010 and 2011 are preliminary.

Area	ALL	Area4-9	ALL[1]	Area4-9	ALL	Area4-9	ALL
Calendar year	N_SBT	N_SBT	N_Hook	N_Hook	CPUE	CPUE	W_SBT
1952	6,178	5	1,158	1	5.81	6.42	565
1953	49,888		6,290		9.19		3,890
1954	30,734		5,557		6.44		2,447
1955	24,381		4,368	20	6.16		1,964
1956	119,878	1,102	10,022	169	12.98	6.52	9,603
1957	417,506	215,534	12,108	2,954	34.94	72.96	22,908
1958	225,917	106,306	8,959	1,342	27.26	79.21	12,462
1959	1,003,570	310,294	21,978	3,989	46.48	77.78	61,892
1960	1,189,823	118,269	30,697	1,502	39.49	78.73	75,826
1961	1,215,941	306,323	36,297	5,168	33.82	59.27	77,927
1962	663,558	263,039	30,618	4,270	22.25	61.59	40,397
1963	1,018,040	416,741	43,154	11,280	24.19	36.95	59,724
1964	745,402	278,303	44,287	8,464	17.59	32.88	42,838
1965	722,448	317,388	49,028	14,229	14.74	22.31	40,689
1966	683,668	431,044	69,503	26,667	9.84	16.16	39,644
1967	933,364	714,625	81,634	46,113	11.43	15.50	59,281
1968	831,302	766,092	96,185	61,268	8.64	12.50	49,657
1969	845,692	807,924	94,005	74,839	9.00	10.80	49,769
1970	704,760	685,109	101,472	75,509	6.95	9.07	40,929
1971	698,070	690,172	110,822	92,194	6.30	7.49	38,149
1972	803,335	801,929	98,072	92,746	8.19	8.65	39,458
1973	651,462	649,602	104,310	95,420	6.25	6.81	31,225
1974	673,071	667,237	105,344	91,039	6.39	7.33	34,005
1975	441,100	435,903	94,586	81,643	4.66	5.34	24,134
1976	634,432	628,518	111,677	107,797	5.68	5.83	34,099
1977	536,115	531,027	89,574	87,128	5.99	6.09	29,600
1978	451,655	438,597	87,641	79,006	5.15	5.55	23,632
1979	519,987	517,975	109,581	104,019	4.75	4.98	27,828
1980	585,760	579,872	130,524	122,290	4.49	4.74	33,653
1981	476,696	468,346	124,894	110,758	3.82	4.23	27,981
1982	330,634	326,001	108,967	99,888	3.03	3.26	20,789
1983	426,360	425,454	115,295	107,031	3.70	3.98	24,881
1984	364,993	363,431	133,174	111,861	2.74	3.25	23,328
1985	304,430	303,351	127,095	111,831	2.40	2.71	20,396
1986	212,546	211,671	122,045	110,277	1.74	1.92	15,182
1987	193,670	191,924	121,316	105,120	1.60	1.83	13,964
1988	164,945	164,382	104,232	93,120	1.58	1.77	11,422
1989	175,217	174,885	97,852	89,429	1.79	1.96	9,222
1990	138,979	138,250	63,760	56,506	2.18	2.45	7,056
1991	153,194	152,721	79,463	58,923	1.93	2.59	6,477
1992	147,653	146,995	71,324	55,827	2.07	2.63	6,121
1993	175,874	174,611	75,412	47,860	2.33	3.65	6,318
1994	132,264	130,999	80,809	43,167	1.64	3.03	6,063
1995	123,805	121,058	128,989	47,928	0.96	2.53	5,867
1996	120,109	118,855	110,406	59,846	1.09	1.99	6,392
1997	119,538	118,253	106,771	61,978	1.12	1.91	5,588
1998	129,684	128,940	108,289	60,915	1.20	2.12	7,500
1999	111,108	110,253	94,683	48,372	1.17	2.28	7,554
2000	113,221	112,053	76,730	50,969	1.48	2.20	6,000
2001	139,083	132,809	103,480	52,839	1.34	2.51	6,674
2002	119,243	116,960	86,943	42,353	1.37	2.76	6,192
2003	105,335	103,883	65,068	42,969	1.62	2.42	5,770
2004	105,686	103,417	58,487	47,885	1.81	2.16	5,982
2005	128,661	116,381	73,198	53,630	1.76	2.17	7,855
2006	79,382	67,812	51,040	33,745	1.56	2.01	4,207
2007	56,968	54,557	34,416	24,962	1.66	2.19	2,840
2008	48,579	48,078	38,732	25,675	1.25	1.87	2,950
2009	56,320	56,111	34,890	20,662	1.61	2.72	2,659
2010	*49,990*	*48,382*	*23,651*	*14,588*	*2.11*	*3.32*	*2,223*
2011	*58,742*	*55,480*	*27,576*	*17,629*	*2.13*	*3.15*	*2,519*

*1: Effort of "ALL" area is the sum of the all effort in Area 1-10 and the total effort in 5x5 degree cells where has SBT catch in the year.

Table 3 Number of SBT caught by area, year and month by Japanese commercial longline. Data in 2010 and 2011 are preliminary.

Year	Month	Area 1	Area 2	Area 3	Area 4	Area 5	Area 6	Area 7	Area 8	Area 9	Others	Total
2007	1	15	1008									1023
	2	4									34	38
	3		582									582
	4						128	49		959		1136
	5				317		407	3155		1166		5045
	6				5263		322	1154		1837	10	8586
	7		10		1231	133	53		413	5012	24	6876
	8		192		35	57			4401	9785	146	14616
	9		3			6			3931	5334	46	9320
	10	1	292		2			3	1786	1753		3837
	11							5	5279	46		5330
	12		44						535			579
2008	1	19	45					2	4			70
	2	24	89									113
	3	3							419	165		587
	4				101		344	3161	10	342		3958
	5		8		1757		1021	3317	279	1583	138	8103
	6		2		1255		30			6941		8228
	7		23		664				667	7463	9	8826
	8		17			27			5221	3372	12	8649
	9				27	21			3022	2019	3	5092
	10		2		11	2			636	999	69	1719
	11								1921	326	27	2274
	12		11						910	39		960
2009	1	27	2						13			42
	2	1										1
	3				1							1
	4				826		116	3285		395		4622
	5		6		3269		1631	1210		2882		8998
	6		4		1569		1531			3644	11	6759
	7				1976	161	3		498	7845	25	10508
	8		12		33	2			7320	2668	9	10044
	9	10	64		9				6397	1685	16	8181
	10								1449	1067	16	2532
	11								2646			2646
	12	4	2						1980			1986
2010	1	132	130						381			643
	2	49	173		39			27		4	1	293
	3	2	122		199			485		1211	32	2051
	4		81		43			6710	179	5320	13	12346
	5		200		3020			1947	90	6659		11916
	6		431		1195				416	5109	35	7186
	7		161			1			35	4021	2	4220
	8				7				3265	1639	21	4932
	9		4		4				154	334		496
	10								70	198	1	269
	11								1135	705	2	1842
	12								15	3		18
2011	1	9										9
	2											
	3				8			249		178		435
	4		26		48			11297	1	2149		13521
	5		419		1601			2858	70	5746		10694
	6		767		1144				30	10092	175	12208
	7		885		45				147	8850	337	10264
	8		221		55	92			1662	2020	392	4442
	9	12	6		5	7			1839	2360	1	4230
	10	2	3		1	2			870	288	7	1173
	11								1305			1305
	12								461			461
2007	Total	20	2131		6848	196	910	4366	16345	25892	260	56968
2008	Total	46	197		3815	50	1395	6480	13089	23249	258	48579
2009	Total	42	90		7683	163	3281	4495	20303	20186	77	56320
2010	Total	183	1302		4507	1		9169	5740	25203	107	46212
2011	Total	23	2327		2907	101		14404	6385	31683	912	58742

Table 4 Number of hooks (x1,000) by area, year and month by Japanese commercial longline. Data in 2010 and 2011 are preliminary.

Year	Month	Area 1	Area 2	Area 3	Area 4	Area 5	Area 6	Area 7	Area 8	Area 9	Others	Total
2007	1	85	364								183	632
	2	106									225	332
	3	58	56		188					5	89	397
	4	3	36		333		139	134		229	35	909
	5	26	308		221		217	1196		554	89	2611
	6		1065		1221		178	291		1869	788	5413
	7		1457		288	256	18		326	2268	1035	5647
	8		317		6	382			2506	2429	536	6176
	9	187	241		25	239			2066	2073	227	5059
	10	138	151		259	18		4	1302	644	334	2849
	11	38			32			7	2544	15	533	3169
	12	257	56						477		431	1222
2008	1	440	132					16	21		401	1010
	2	446	50								193	688
	3	266			145				89	130	206	836
	4	108	370		255		80	614	27	675	65	2193
	5		989		617		193	644	219	1149	150	3962
	6	3	1911		1242		11		17	2801	628	6614
	7	78	1581		863	154			579	3685	222	7162
	8	30	465			410			3050	2298	268	6520
	9	680	64		142	101			1622	767	498	3874
	10	815	122		150	58			446	397	571	2561
	11	99							1268	93	582	2042
	12	75	26						629	17	524	1271
2009	1	1196	4						11	25	573	1808
	2	591			55					56	302	1003
	3	130			431					78	95	734
	4	69	195		387		21	634		311	483	2099
	5	6	1078		1024		358	222		664	571	3923
	6		1403		872	49	332			1466	538	4660
	7		2126		334	384	7		189	1557	397	4995
	8	131	507		26	371			3304	1066	702	6106
	9	779	167		324	19			1975	630	929	4822
	10	347	43		14	54			550	529	227	1764
	11								1232	127	138	1498
	12	436	16						976		52	1479
2010	1	672	105		14				216		811	1817
	2	267	137		354			24		11	484	1278
	3	68	113		878	29		104		317	214	1724
	4		550		357			969	203	1119	274	3472
	5		1206		1144			208	444	1766	283	5050
	6		1787		835	14			304	1821	887	5648
	7		1969		27	284			16	996	1029	4321
	8	139	593		113	31			849	739	978	3443
	9	527	243		88				43	529	508	1937
	10	615							27	332	361	1334
	11	185							334	125	368	1013
	12	30							7	4	576	617
2011	1	56			78						4	138
	2	27	6		393				43			470
	3	50	24		741			81	91	218	31	1235
	4		380		190			1526	88	693	272	3149
	5		987		960			386	172	1795	835	5135
	6		1147		682				106	1811	1164	4909
	7		1149		518	158			48	1169	1733	4774
	8	3	355		25	847			633	783	870	3516
	9	106	83		259	456			693	620	435	2651
	10	105	6		129	174			221	196	118	949
	11				95				407	16		518
	12	4							130			133
2007	Total	900	4050		2574	895	552	1631	9221	10088	4504	34416
2008	Total	3041	5709		3415	723	283	1274	7967	12013	4307	38732
2009	Total	3683	5539		3466	877	718	856	8238	6507	5006	34890
2010	Total	2503	6703		3810	359		1304	2442	7758	6773	31653
2011	Total	351	4136		4068	1635		1993	2631	7302	5461	27576

*1: Effort of "Others" is the total efforts in 5x5 degree cells where has SBT catch in the year in Area 11-15 and total efforts of Area 10.

Table 5 Nominal CPUE of SBT by area, year and month by Japanese commercial longline. Data in 2010 and 2011 are preliminary. CPUE=1000x Total_N SBT_N/Total_N Hooks.

	Month	Area 1	Area 2	Area 3	Area 4	Area 5	Area 6	Area 7	Area 8	Area 9	Others	Total
2007	1	0.18	2.77								0.00	1.62
	2	0.04									0.15	0.11
	3	0.00	10.38		0.00					0.00	0.00	1.47
	4	0.00	0.00		0.00		0.92	0.37		4.18	0.00	1.25
	5	0.00	0.00		1.43		1.87	2.64		2.10	0.00	1.93
	6		0.00		4.31		1.81	3.96		0.98	0.01	1.59
	7		0.01		4.28	0.52	2.99		1.27	2.21	0.02	1.22
	8		0.61		5.47	0.15			1.76	4.03	0.27	2.37
	9	0.00	0.01		0.00	0.03			1.90	2.57	0.20	1.84
	10	0.01	1.94		0.01	0.00		0.86	1.37	2.72	0.00	1.35
	11	0.00			0.00			0.72	2.08	3.06	0.00	1.68
	12	0.00	0.78						1.12		0.00	0.47
2008	1	0.04	0.34					0.13	0.19		0.00	0.07
	2	0.05	1.78								0.00	0.16
	3	0.01			0.00				4.73	1.27	0.00	0.70
	4	0.00	0.00		0.40		4.33	5.15	0.36	0.51	0.00	1.80
	5		0.01		2.85		5.29	5.15	1.27	1.38	0.92	2.05
	6	0.00	0.00		1.01		2.73		0.00	2.48	0.00	1.24
	7	0.00	0.01		0.77	0.00			1.15	2.02	0.04	1.23
	8	0.00	0.04			0.07			1.71	1.47	0.04	1.33
	9	0.00	0.00		0.19	0.21			1.86	2.63	0.01	1.31
	10	0.00	0.02		0.07	0.03			1.42	2.51	0.12	0.67
	11	0.00							1.52	3.50	0.05	1.11
	12	0.00	0.42						1.45	2.32	0.00	0.76
2009	1	0.02	0.56						1.16	0.00	0.00	0.02
	2	0.00			0.00					0.00	0.00	0.00
	3	0.00			0.00					0.00	0.00	0.00
	4	0.00	0.00		2.14		5.59	5.18		1.27	0.00	2.20
	5	0.00	0.01		3.19		4.56	5.45		4.34	0.00	2.29
	6		0.00		1.80	0.00	4.61			2.49	0.02	1.45
	7		0.00		5.91	0.42	0.42		2.63	5.04	0.06	2.10
	8	0.00	0.02		1.28	0.01			2.22	2.50	0.01	1.65
	9	0.01	0.38		0.03	0.00			3.24	2.68	0.02	1.70
	10	0.00	0.00		0.00	0.00			2.63	2.02	0.07	1.44
	11								2.15	0.00	0.00	1.77
	12	0.01	0.13						2.03		0.00	1.34
2010	1	0.20	1.24		0.00				1.77		0.00	0.35
	2	0.18	1.26		0.11			1.13		0.36	0.00	0.23
	3	0.03	1.08		0.23	0.00		4.66		3.82	0.15	1.19
	4		0.15		0.12			6.93	0.88	4.75	0.05	3.56
	5		0.17		2.64			9.38	0.20	3.77	0.00	2.36
	6		0.24		1.43	0.00			1.37	2.81	0.04	1.27
	7		0.08		0.00	0.00			2.15	4.04	0.00	0.98
	8	0.00	0.00		0.06	0.00			3.85	2.22	0.02	1.43
	9	0.00	0.02		0.05				3.61	0.63	0.00	0.26
	10	0.00							2.61	0.60	0.00	0.20
	11	0.00							3.40	5.64	0.01	1.82
	12	0.00							2.08	0.86	0.00	0.03
2011	1	0.16			0.00						0.00	0.07
	2	0.00	0.00		0.00				0.00			
	3	0.00	0.00		0.01			3.09	0.00	0.82	0.00	0.35
	4		0.07		0.25			7.40	0.01	3.10	0.00	4.29
	5		0.42		1.67			7.40	0.41	3.20	0.00	2.08
	6		0.67		1.68				0.28	5.57	0.15	2.49
	7		0.77		0.09	0.00			3.08	7.57	0.19	2.15
	8	0.00	0.62		2.18	0.11			2.63	2.58	0.45	1.26
	9	0.11	0.07		0.02	0.02			2.65	3.81	0.00	1.60
	10	0.02	0.46		0.01	0.01			3.94	1.47	0.06	1.24
	11				0.00				3.21	0.00		2.52
	12	0.00							3.56			3.46
2007	Total	0.02	0.53		2.66	0.22	1.65	2.68	1.77	2.57	0.06	1.66
2008	Total	0.02	0.03		1.12	0.07	4.92	5.09	1.64	1.94	0.06	1.25
2009	Total	0.01	0.02		2.22	0.19	4.57	5.25	2.46	3.10	0.02	1.61
2010	Total	0.07	0.19		1.18	0.00		7.03	2.35	3.25	0.02	1.46
2011	Total	0.07	0.56		0.71	0.06		7.23	2.43	4.34	0.17	2.13

Table 6 Number of Japanese longline vessels that caught SBT.

The numbers of vessel that caught SBT more than 0 and that more than 100 are shown.
Data in recent years are preliminary.

Year	All longline (1)	SBT>0 (2)	SBT>100 (2)	RTMP_SBT>0 (3)	RTMP_SBT>100 (3)
1983	770	270	265		
1984	761	287	276		
1985	773	293	275		
1986	771	271	253		
1987	770	276	248		
1988	759	255	223		
1989	764	256	229		
1990	758	250	240		
1991	737	196	187		
1992	723	205	192		
1993	722	209	186		
1994	716	201	193		
1995	703	210	201	184	177
1996	674	230	218	210	200
1997	661	213	205	207	201
1998	663	220	205	211	200
1999	528	188	183	185	180
2000	529	180	168	167	163
2001	529	196	187	186	182
2002	523	187	175	173	167
2003	517	173	162	163	159
2004	506	171	167	169	165
2005	491	164	160	160	156
2006	435	133	125	133	125
2007	420	137	128	136	127
2008	407	125	123	126	124
2009	313	99	96	100	94
2010	*296*	*84*	*82*	*86*	*83*
2011	*288*	*82*	*77*	*83*	*80*

*(1): The total number of Japanese high sea longline vessels.

*(2): The total number of Japanese high sea longline vessels operated in the statistical area 4-9.

*(3): The total number of Japanese high sea longline vessels based on the RTMP data (for all the statistical areas).

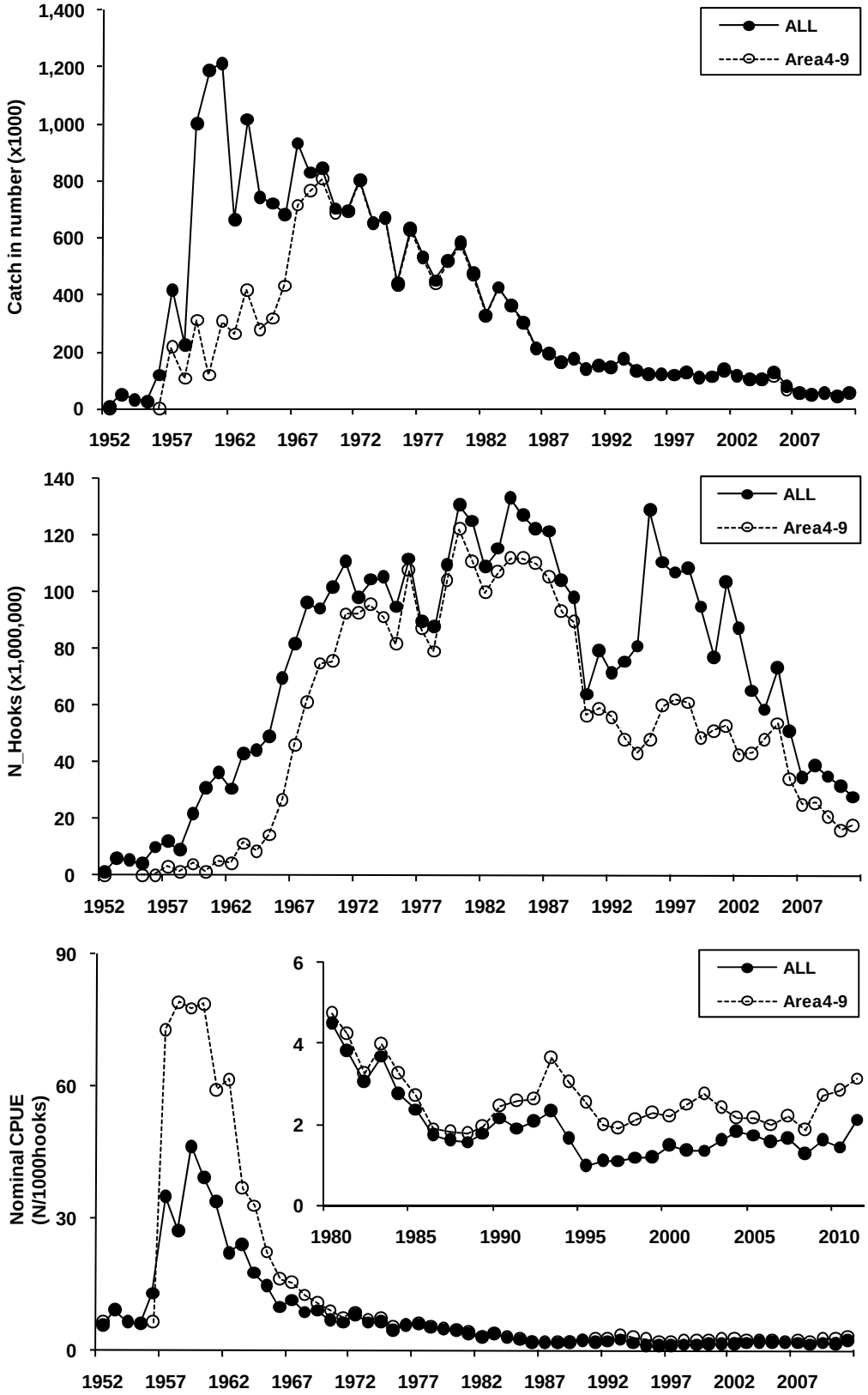

Fig. 1 Number of SBT caught, effort and nominal CPUE of SBT by Japanese longline.

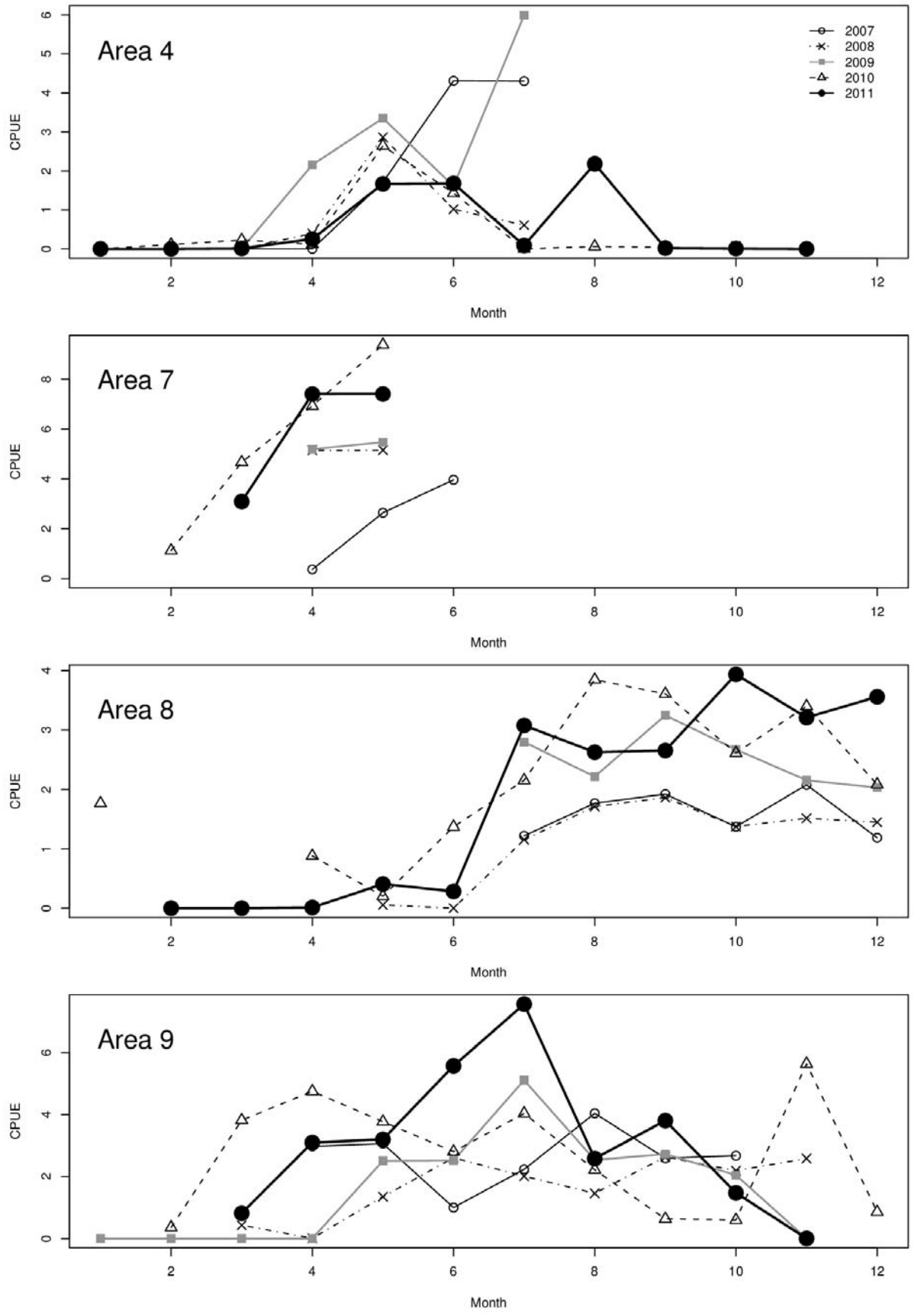

Fig. 2 Nominal CPUE of SBT by area, year and month.

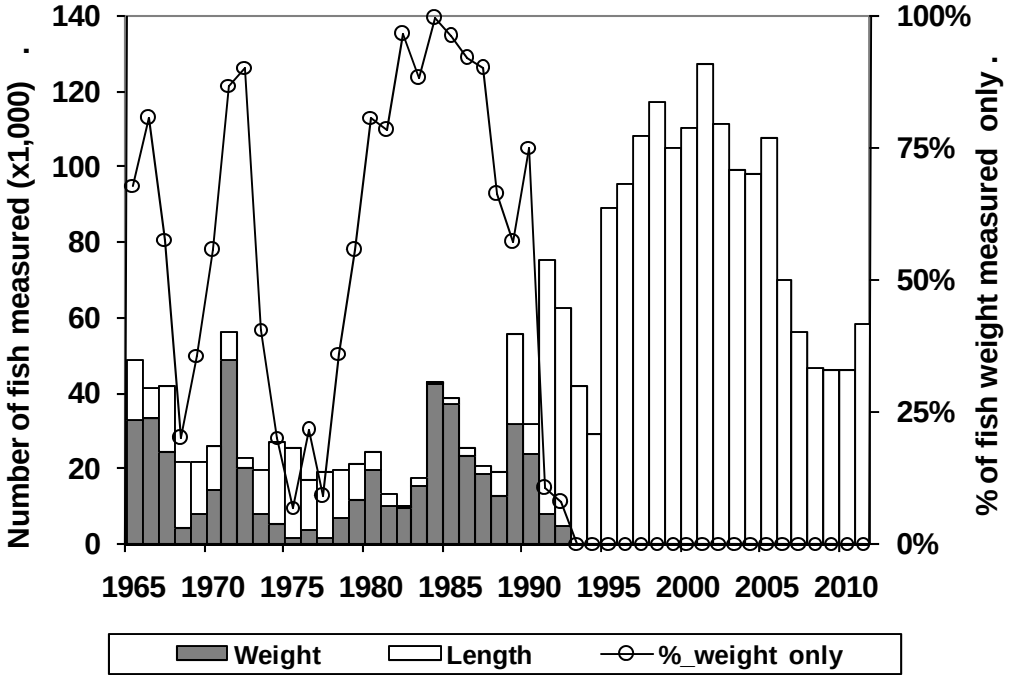

Fig. 3 Number of size measured SBT in length or weight.

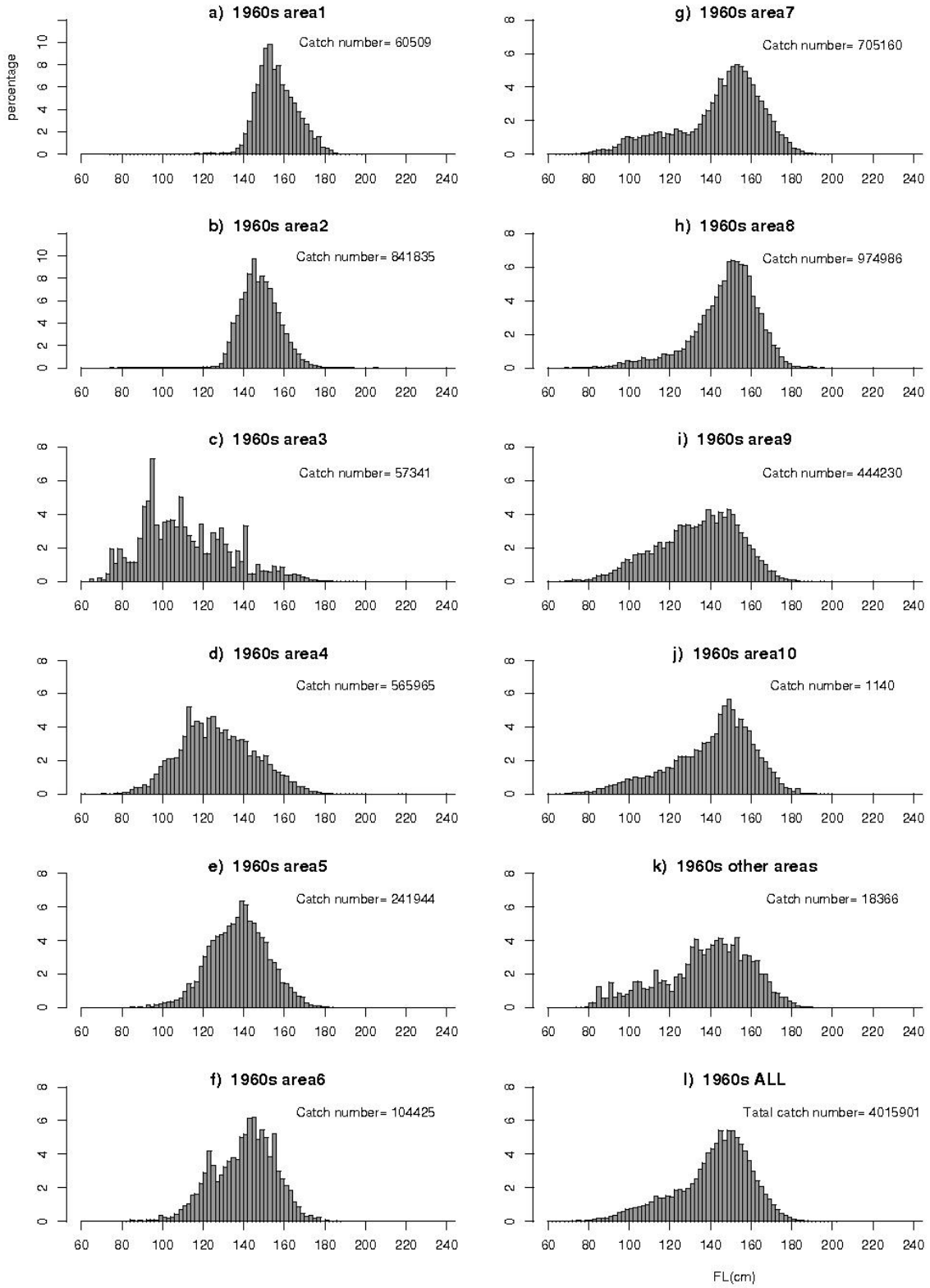

Fig. 4 (1) Length frequency distribution (by Area, the 1960s)

X-axis is fork length in cm and Y-axis is %.
These histograms included the estimated data based on the length frequency of all areas.
This estimation was made following the procedure of 1994 workshop.

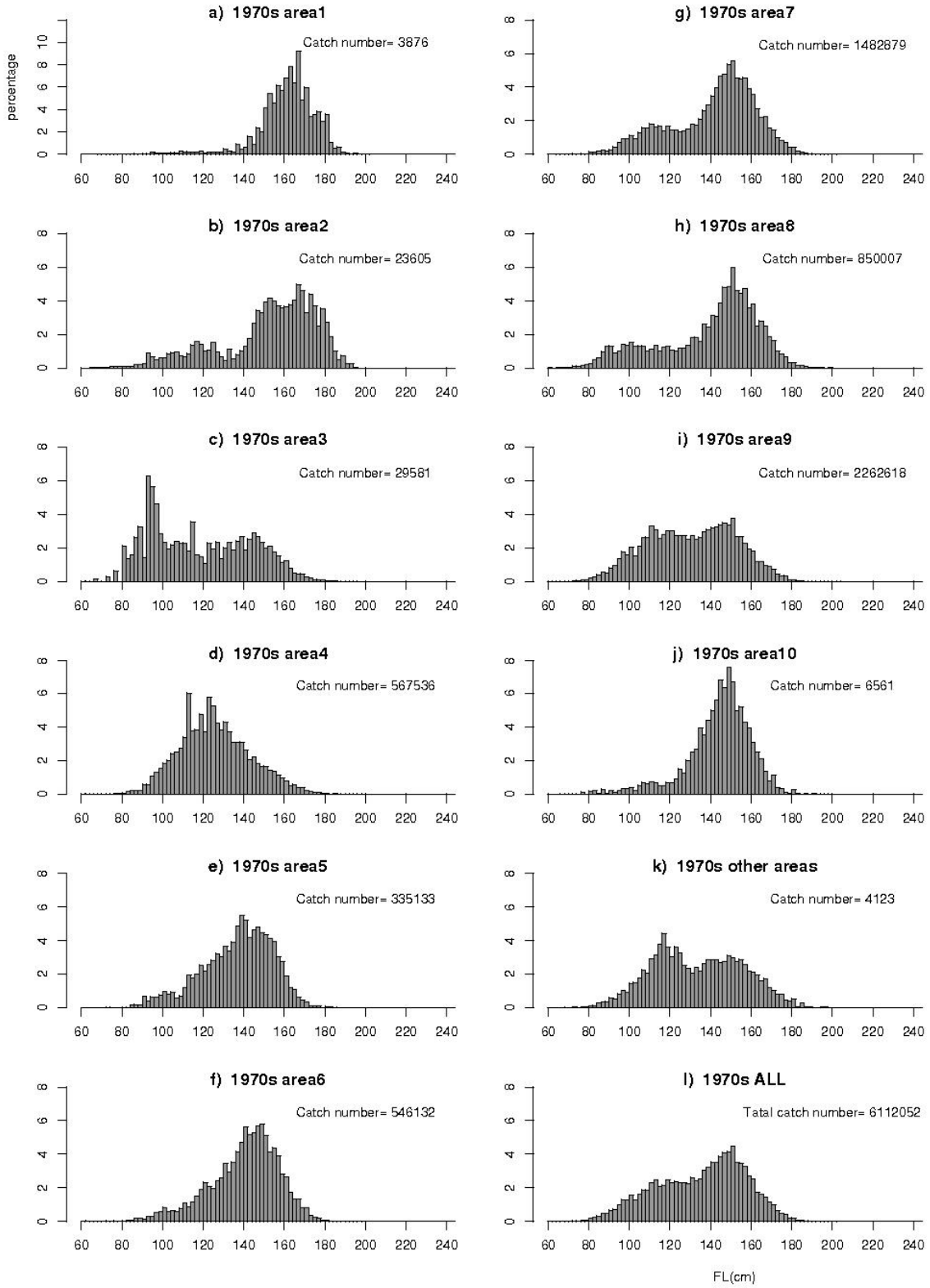

Fig. 4 (2) Length frequency distribution (by Area, the 1970s)

X-axis is fork length in cm and Y-axis is %.
These histograms included the estimated data based on the length frequency of all areas.
This estimation was made following the procedure of 1994 workshop.

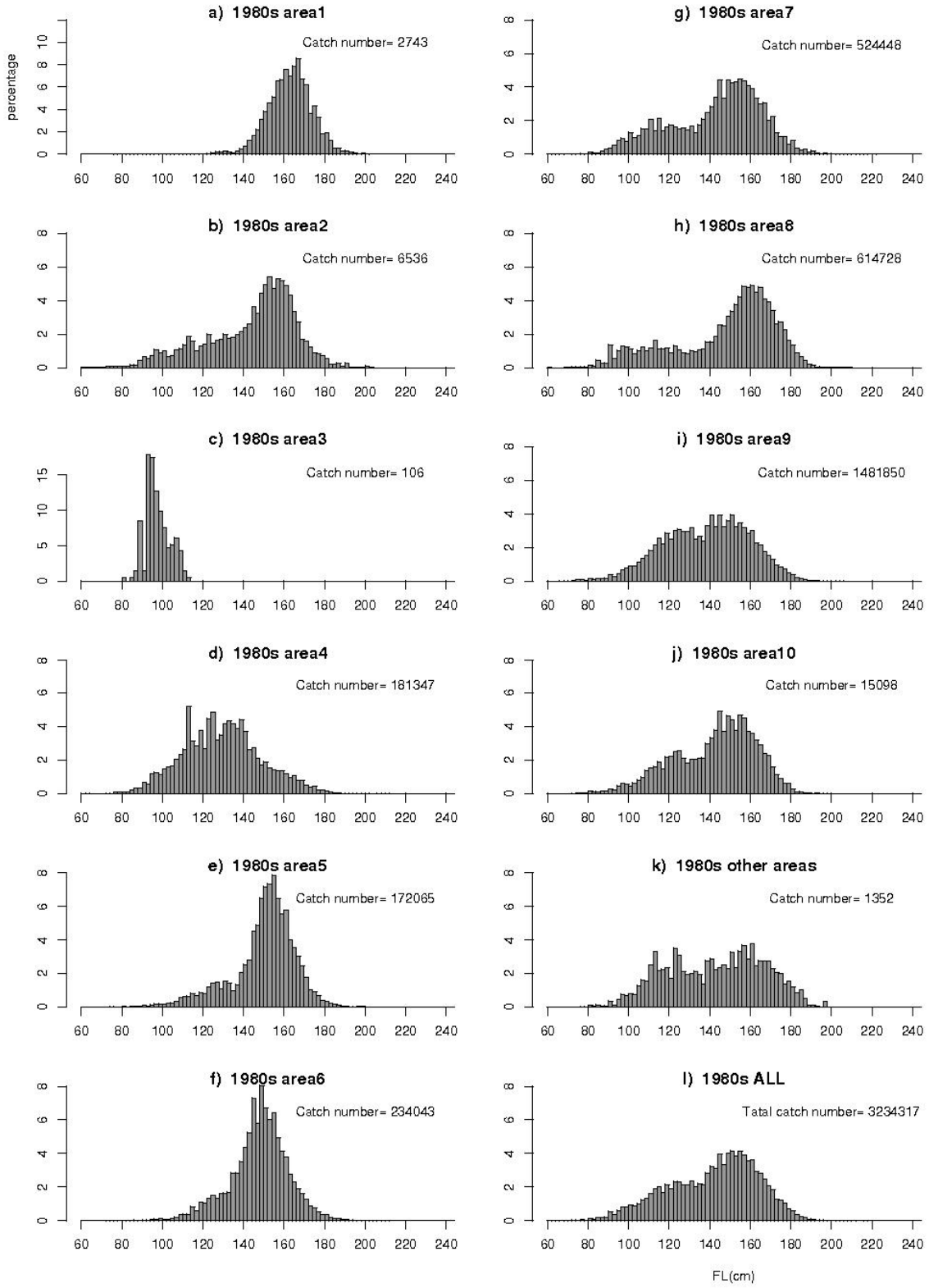

Fig. 4 (3) Length frequency distribution (by Area, the 1980s)

X-axis is fork length in cm and Y-axis is %.
These histograms included the estimated data based on the length frequency of all areas.
This estimation was made following the procedure of 1994 workshop.

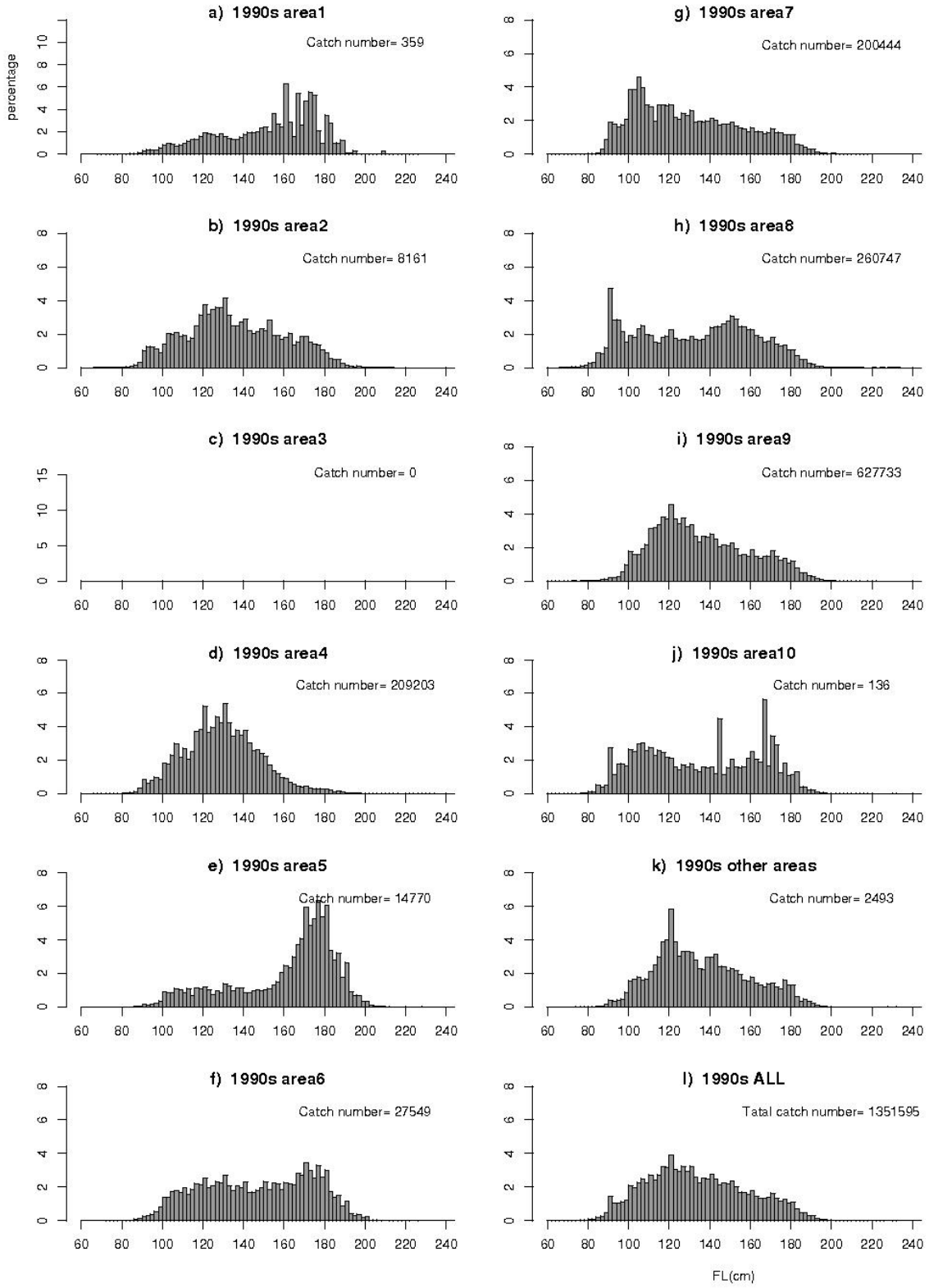

Fig. 4 (4) Length frequency distribution (by Area, the 1990s)

X-axis is fork length in cm and Y-axis is %.
These histograms included the estimated data based on the length frequency of all areas.
This estimation was made following the procedure of 1994 workshop.

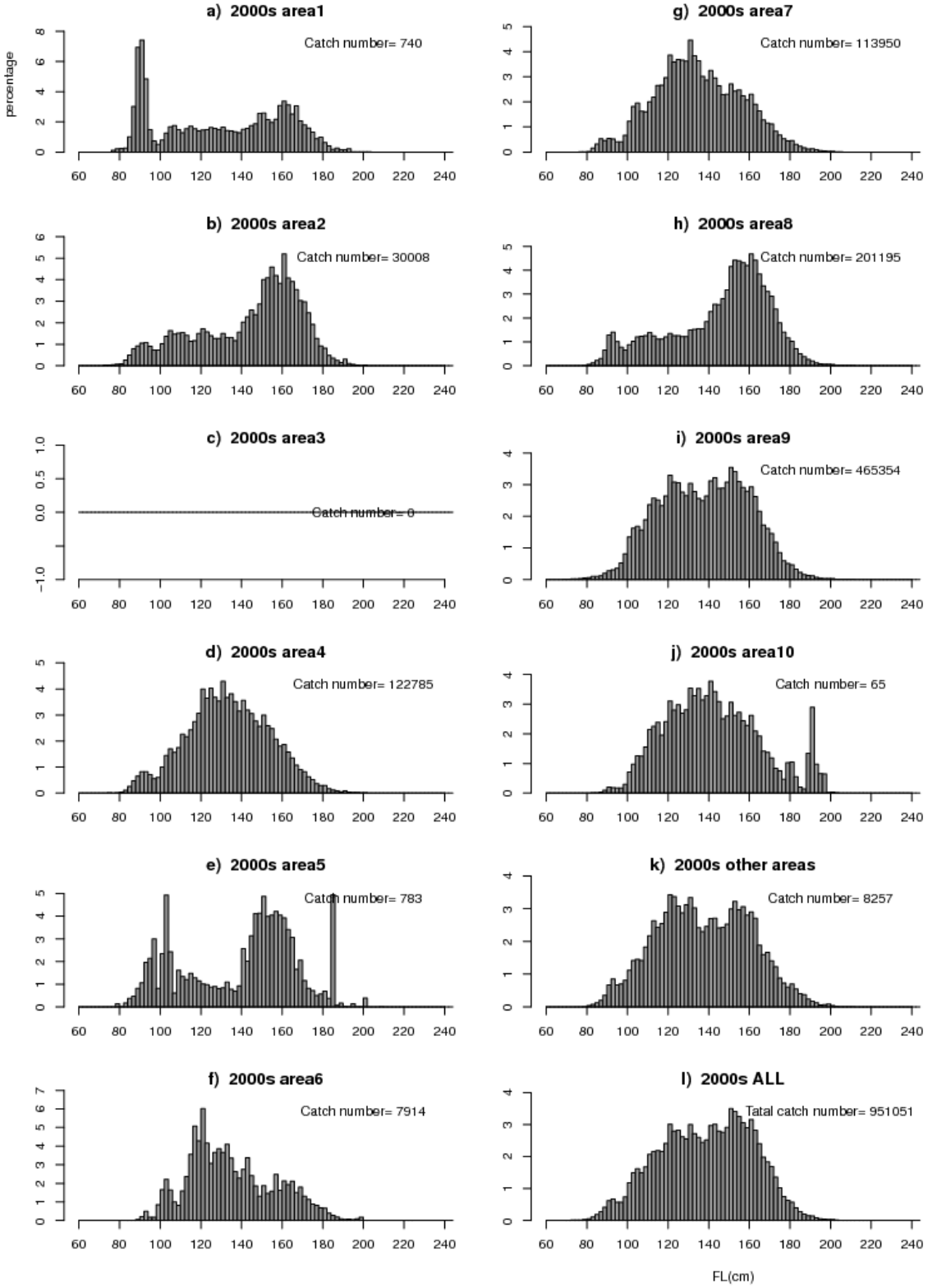

Fig. 4 (5) Length frequency distribution (by Area, the 2000s)

X-axis is fork length in cm and Y-axis is %.
These histograms included the estimated data based on the length frequency of all areas.
This estimation was made following the procedure of 1994 workshop.

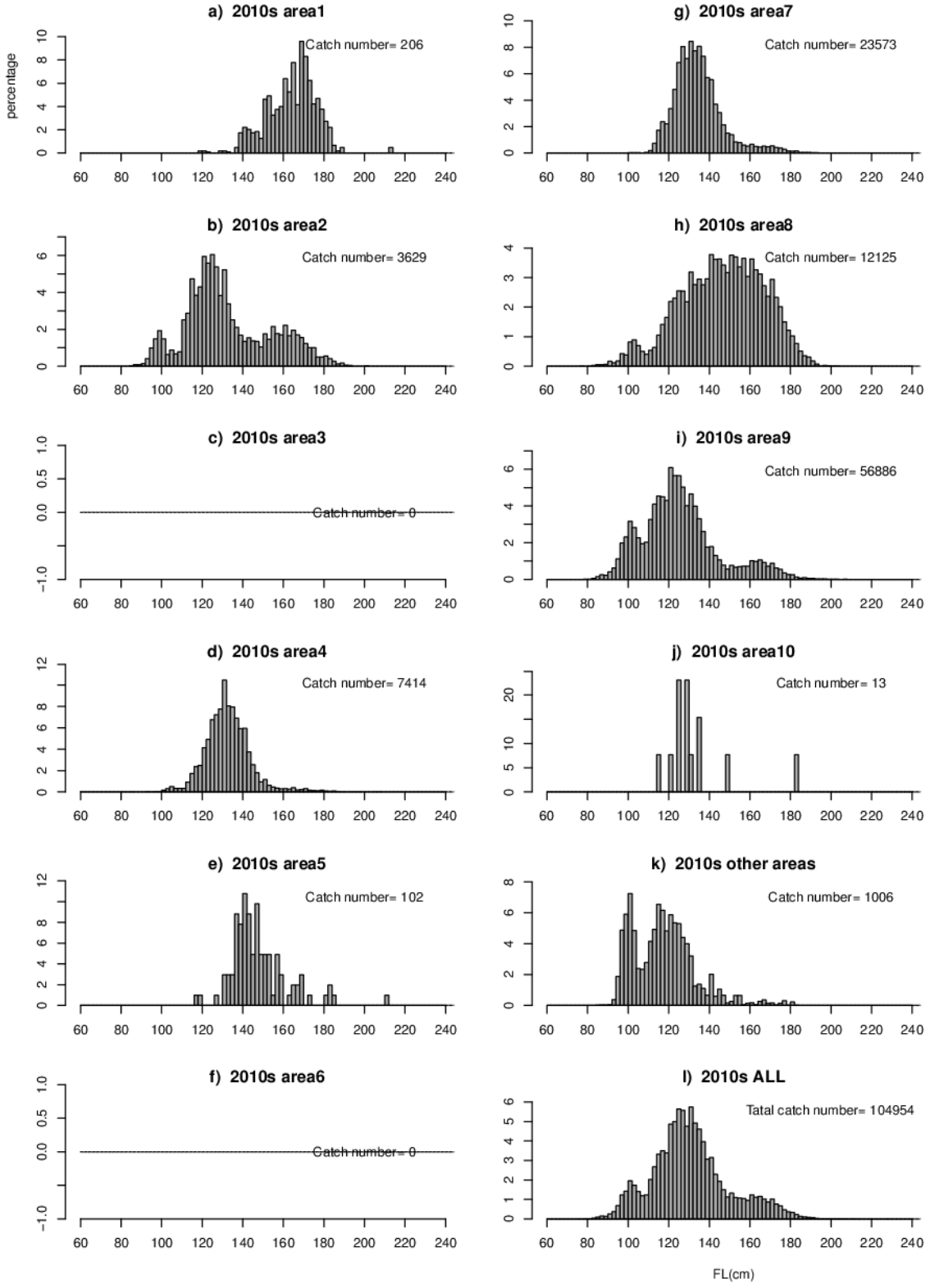

Fig. 4 (6) Length frequency distribution (by Area, the 2010s)

X-axis is fork length in cm and Y-axis is %.
These histograms included the estimated data based on the length frequency of all areas.
This estimation was made following the procedure of 1994 workshop.
Data are up to 2012.

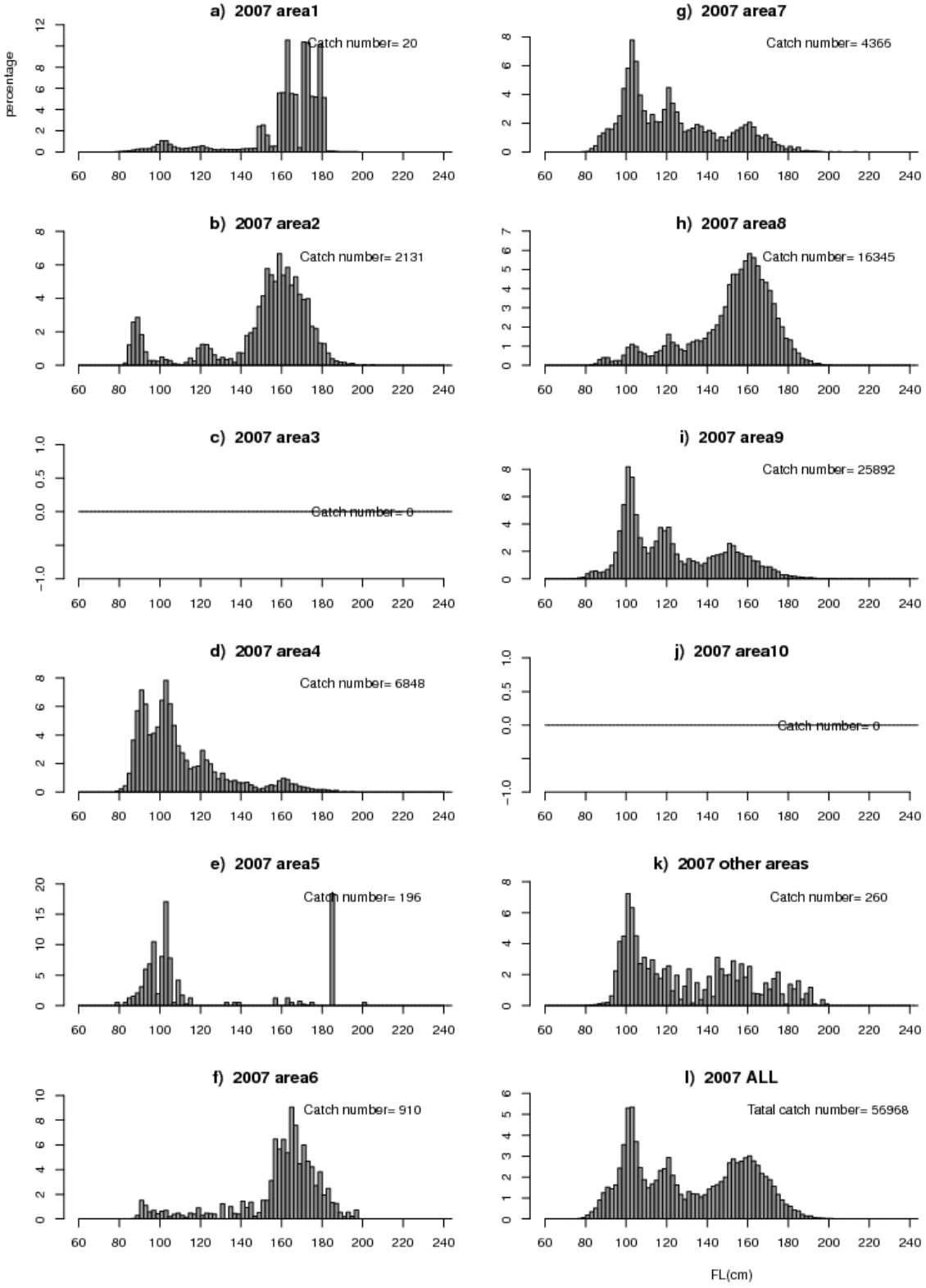

Fig. 5 (1) Length frequency distribution (by Area, year=2007)

X-axis is fork length in cm and Y-axis is %.
These histograms included the estimated data based on the length frequency of all areas.
This estimation was made following the procedure of 1994 workshop.

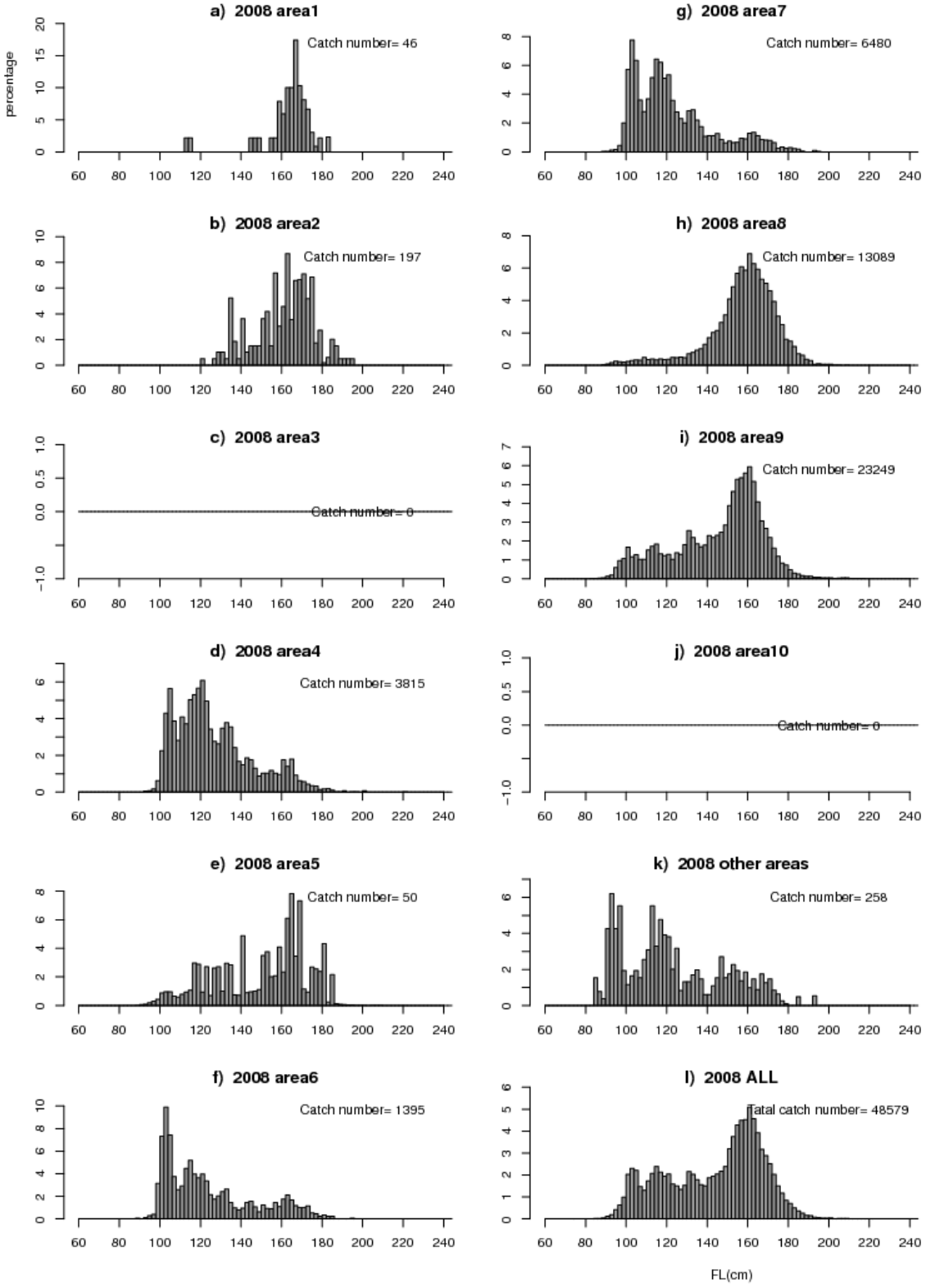

Fig. 5 (2) Length frequency distribution (by Area, year=2008)

X-axis is fork length in cm and Y-axis is %.
These histograms included the estimated data based on the length frequency of all areas.
This estimation was made following the procedure of 1994 workshop.

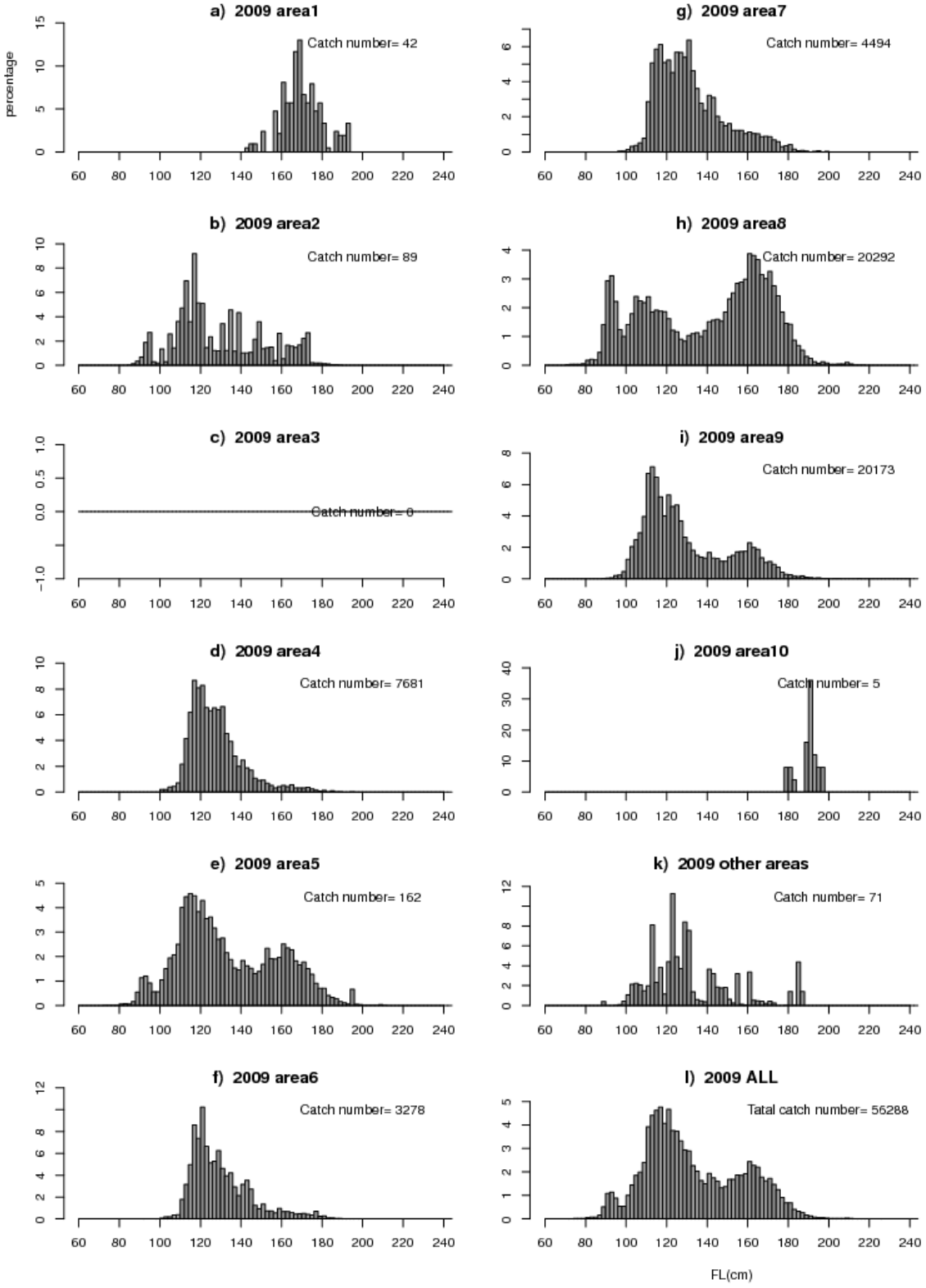

Fig. 5 (3) Length frequency distribution (by Area, year=2009)

X-axis is fork length in cm and Y-axis is %.
These histograms included the estimated data based on the length frequency of all areas.
This estimation was made following the procedure of 1994 workshop.

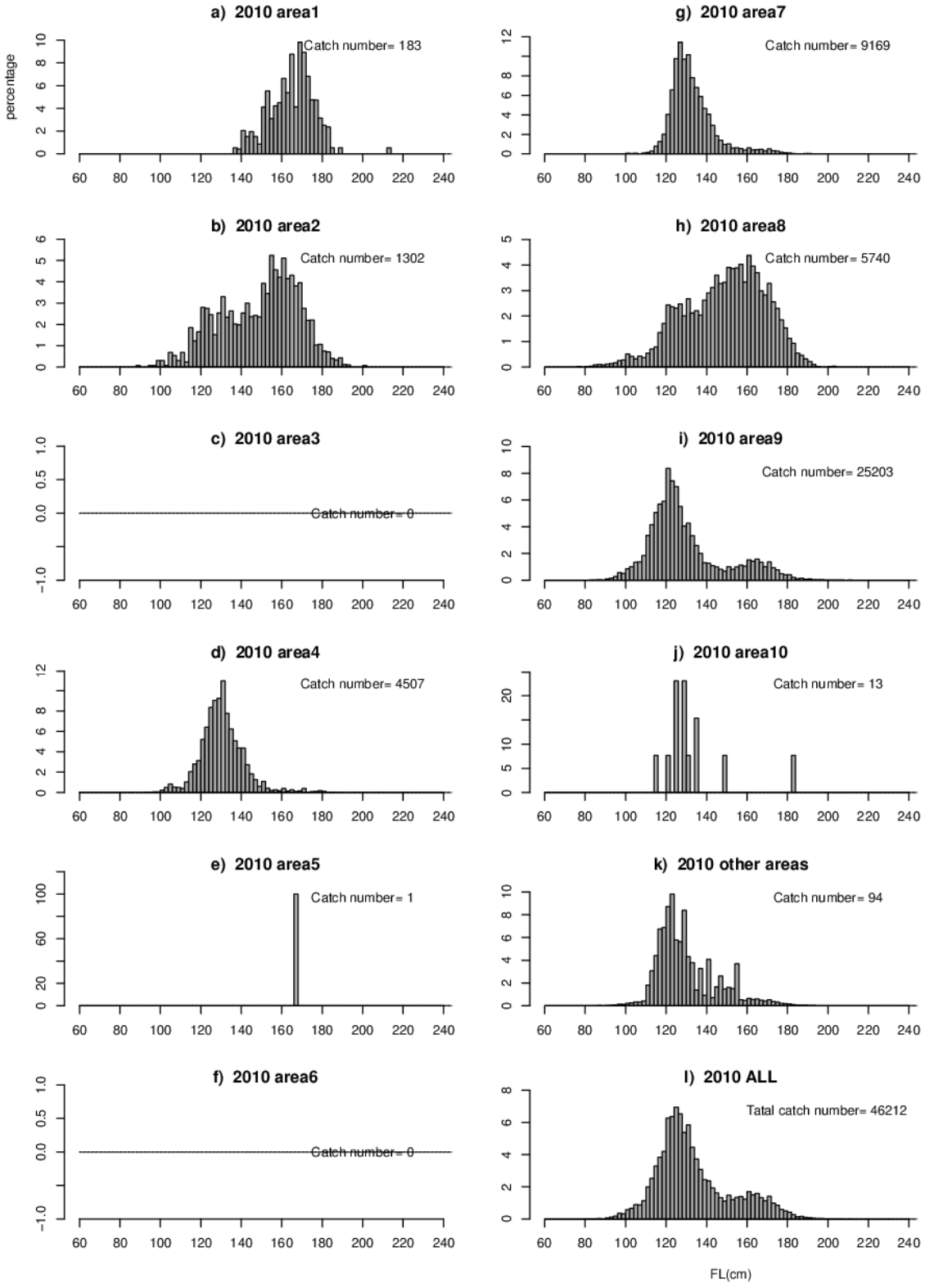

Fig. 5 (4) Length frequency distribution (by Area, year=2010)

X-axis is fork length in cm and Y-axis is %.
These histograms included the estimated data based on the length frequency of all areas.
This estimation was made following the procedure of 1994 workshop.

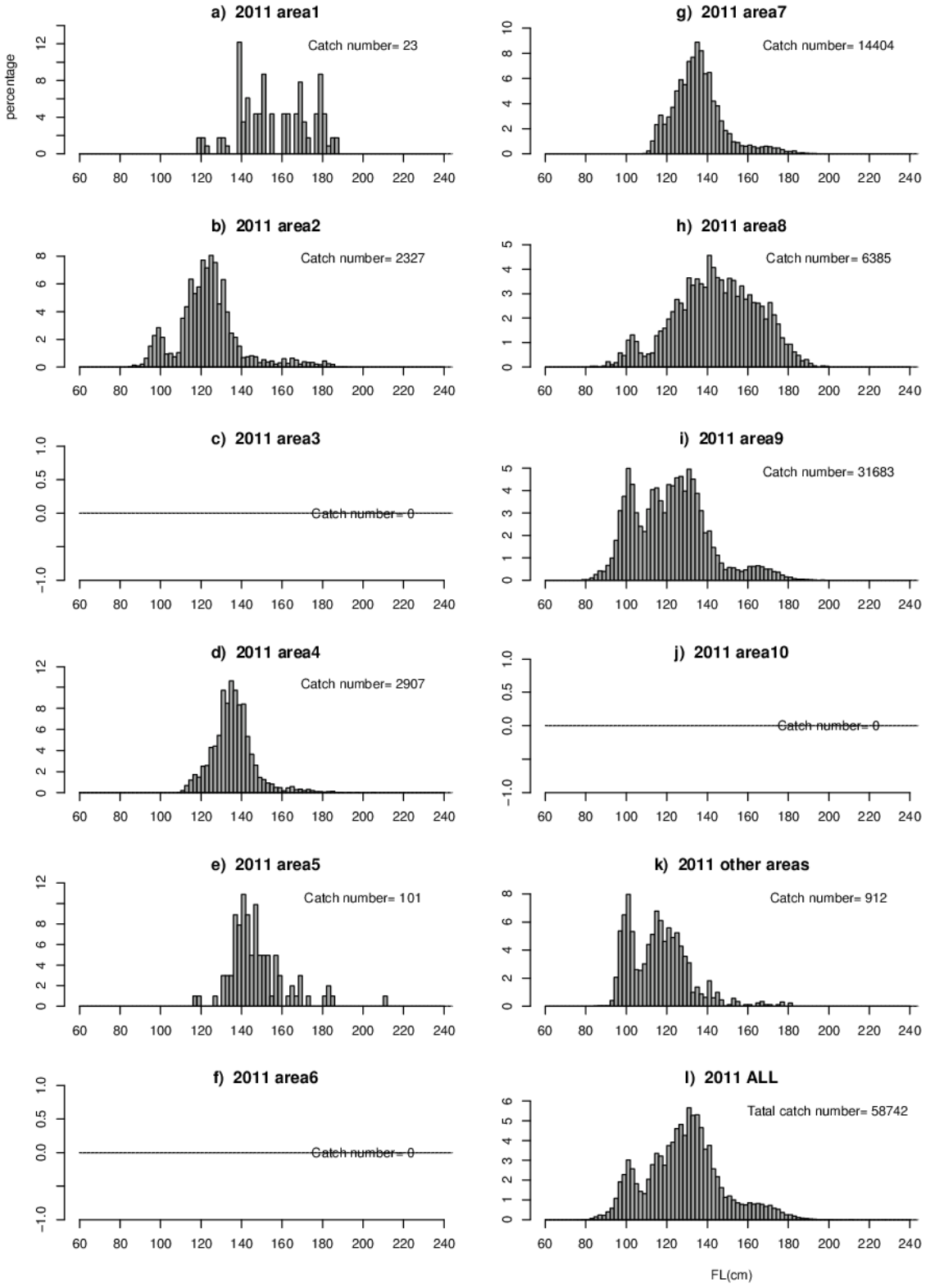

Fig. 5 (5) Length frequency distribution (by Area, year=2011)

X-axis is fork length in cm and Y-axis is %.
These histograms included the estimated data based on the length frequency of all areas.
This estimation was made following the procedure of 1994 workshop.

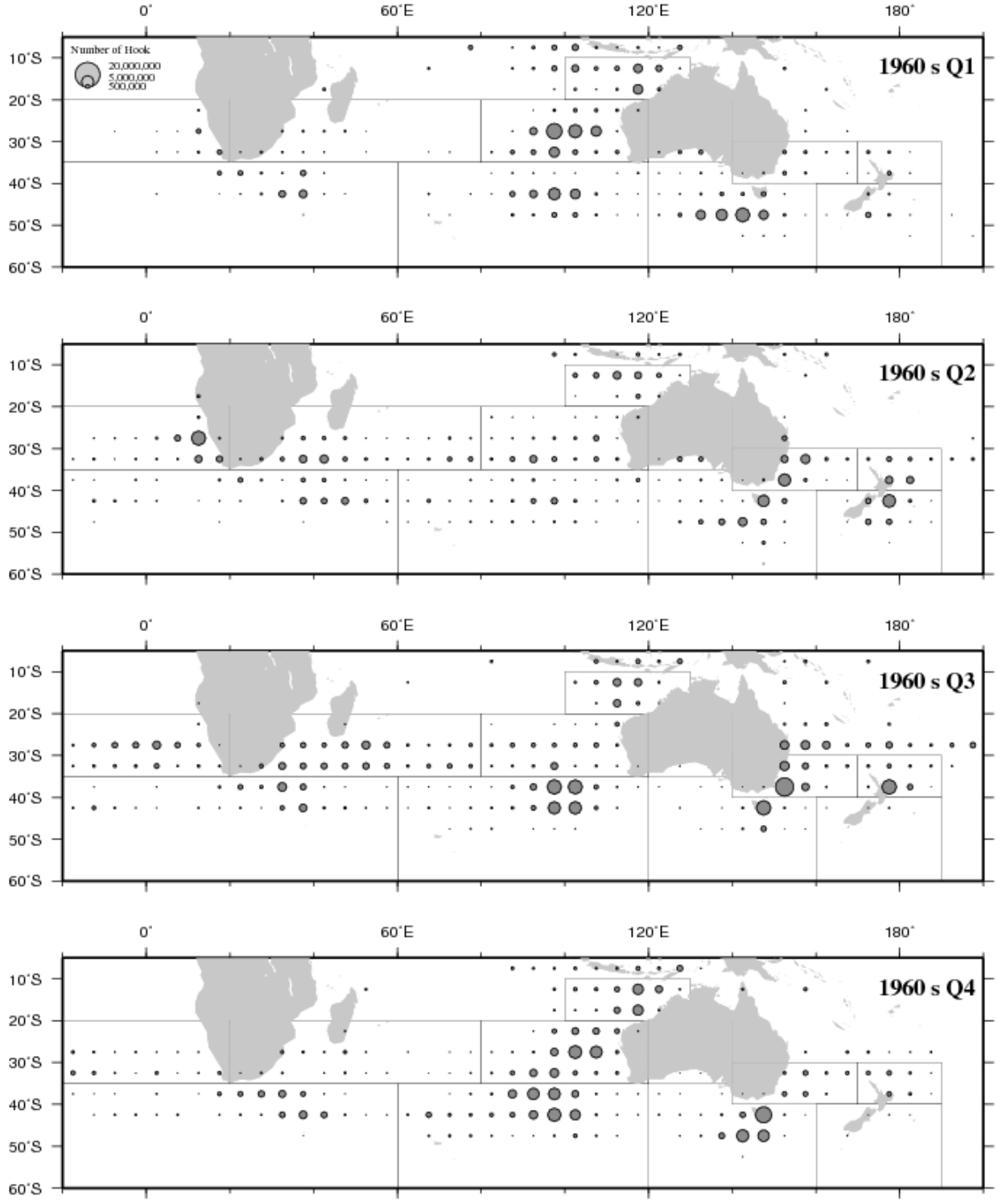

Fig.6 (1) Number of Hooks by decade, quarter and 5x5 degrees square (1960s)

Data are between 1965 and 1969.

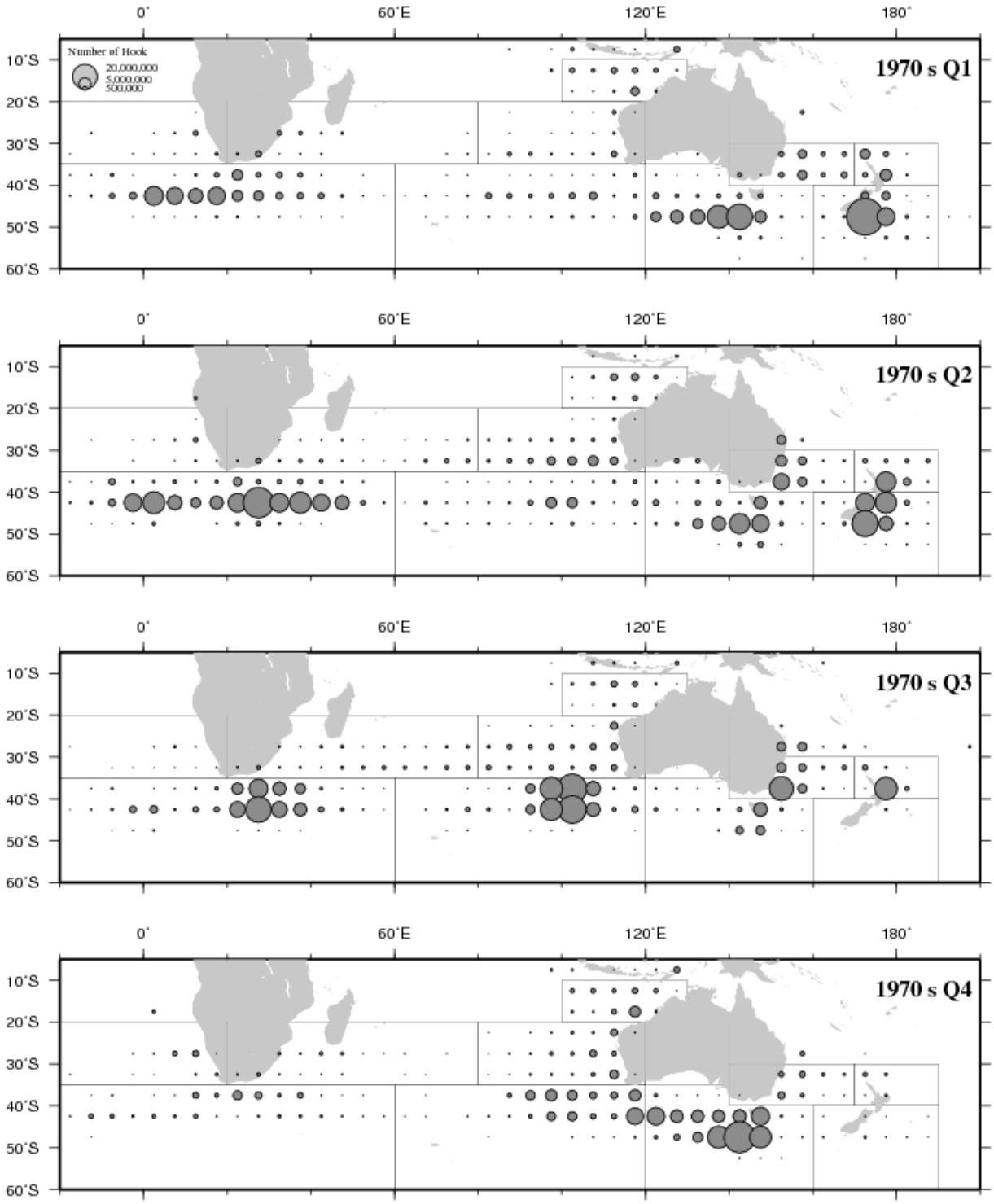

Fig.6 (2) Number of Hooks by decade, quarter and 5x5 degrees square (1970s)

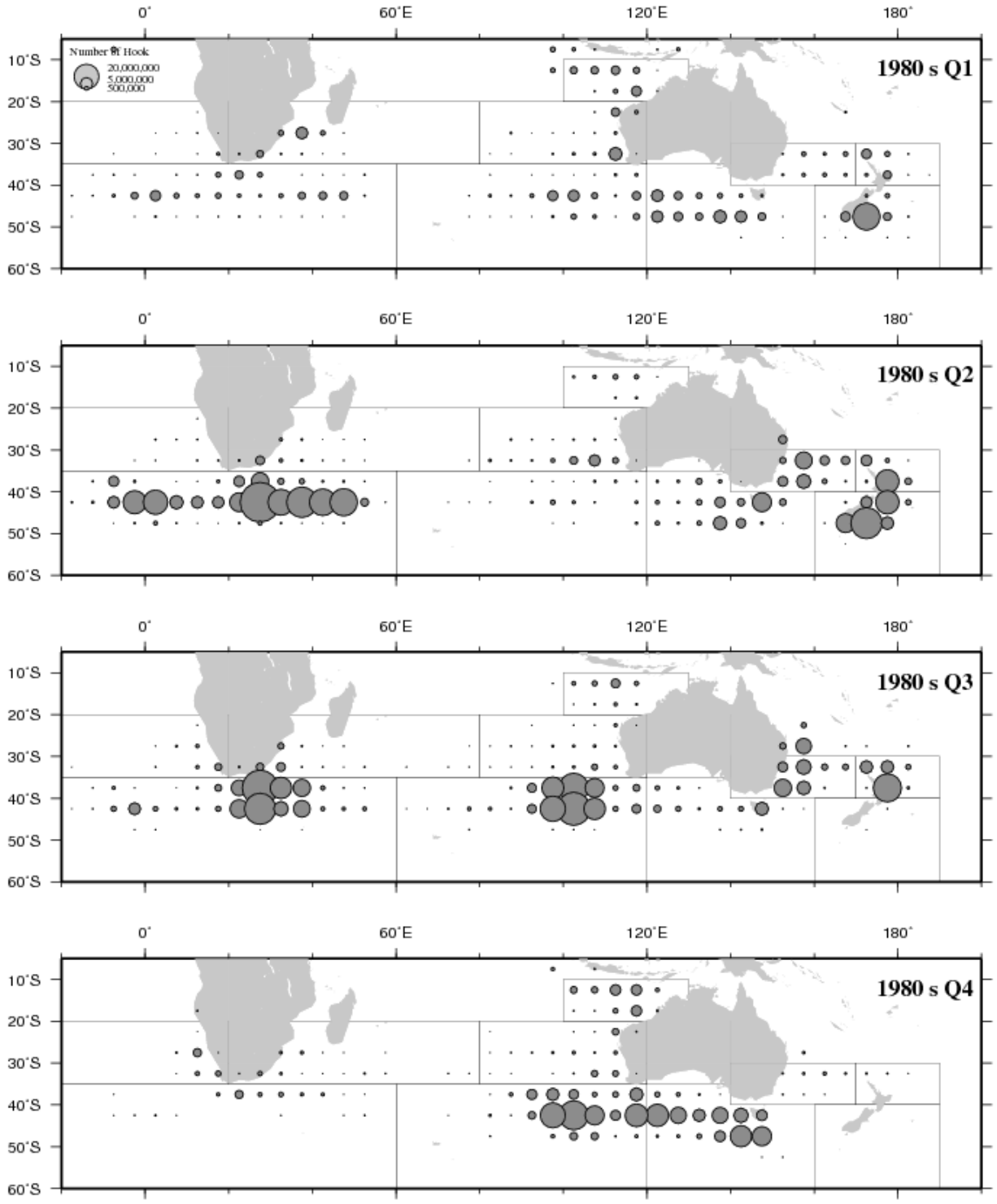

Fig.6 (3) Number of Hooks by decade, quarter and 5x5 degrees square (1980s)

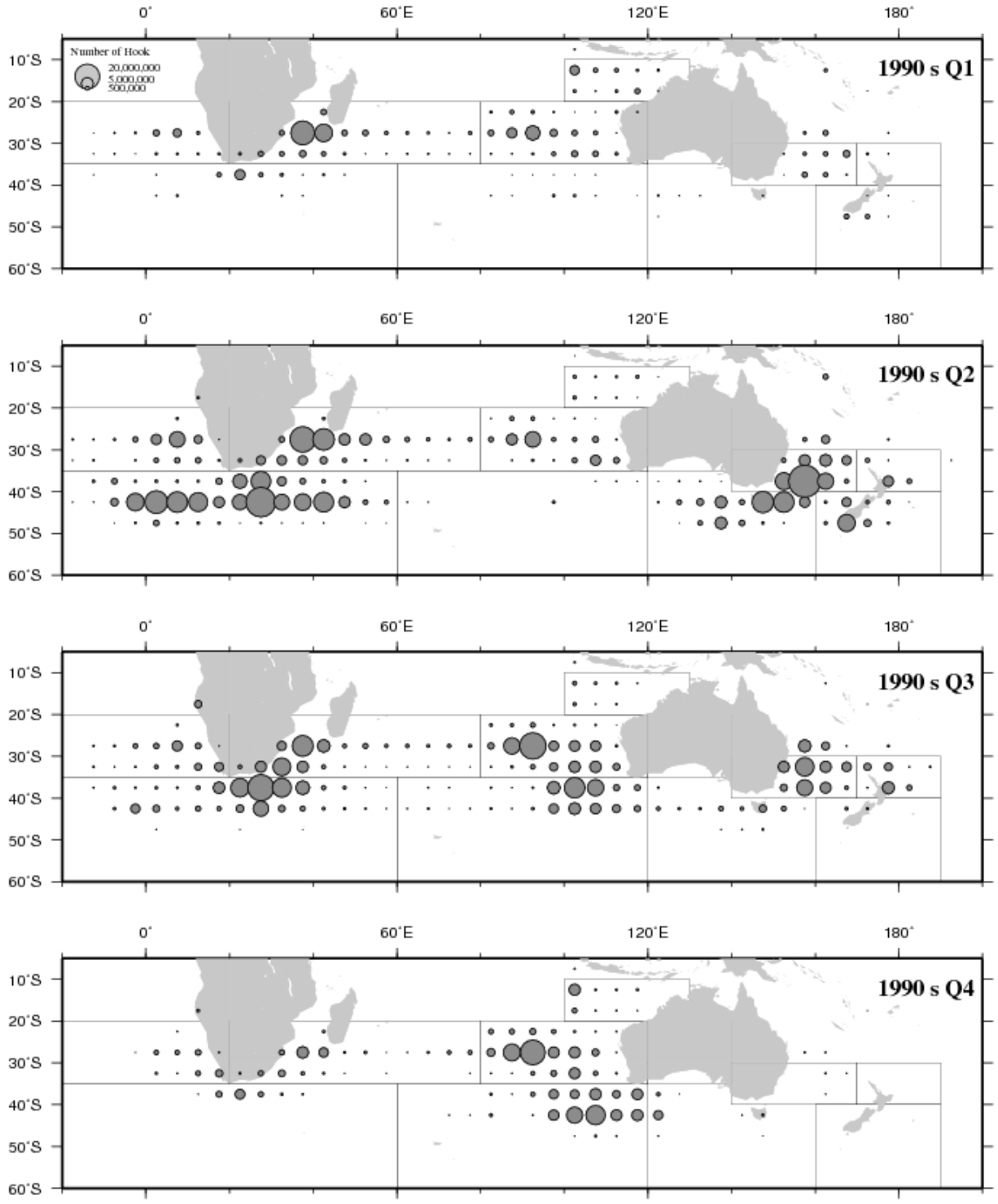

Fig.6 (4) Number of Hooks by decade, quarter and 5x5 degrees square (1990s)

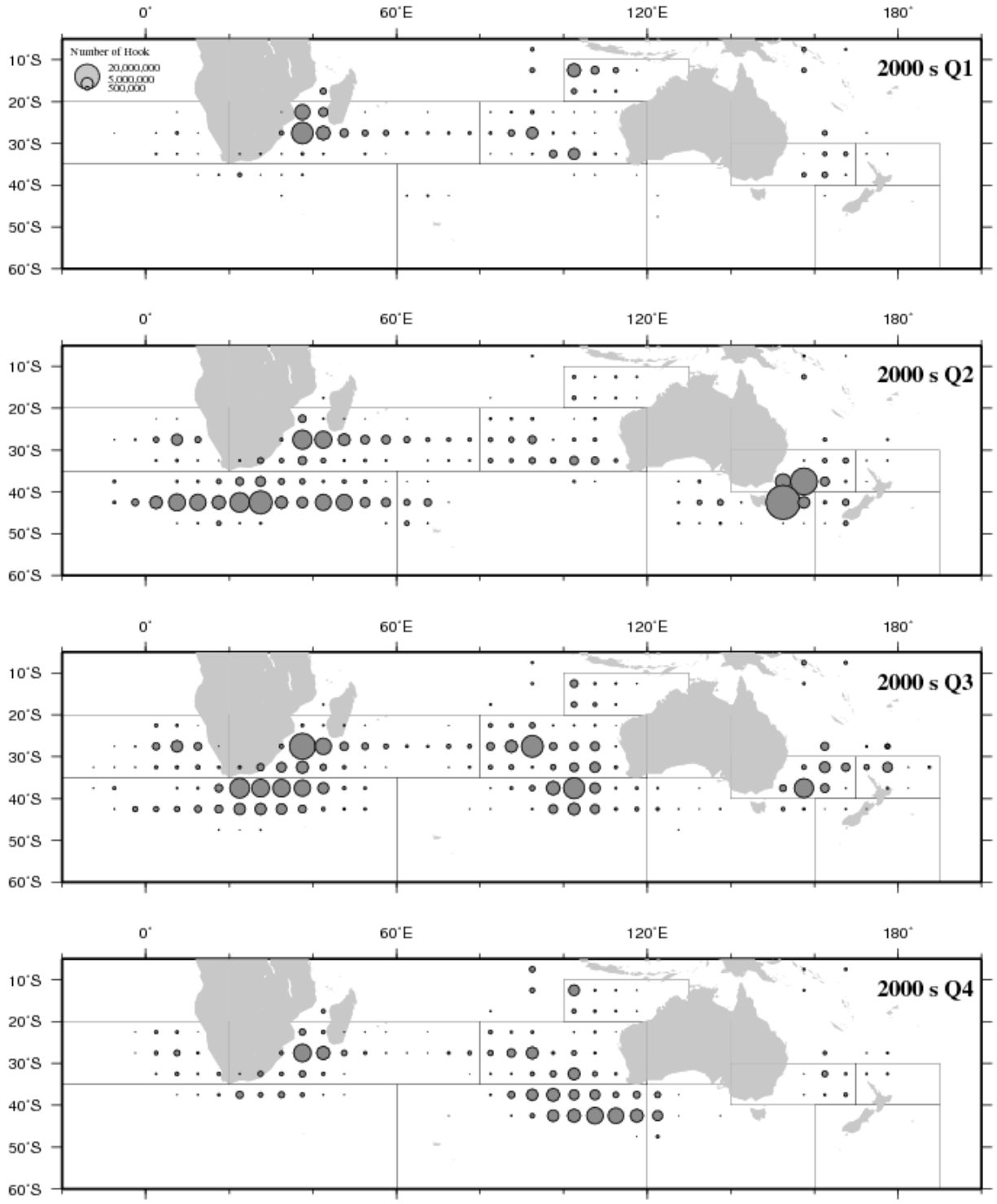

Fig.6 (5) Number of Hooks by decade, quarter and 5x5 degrees square (2000s)

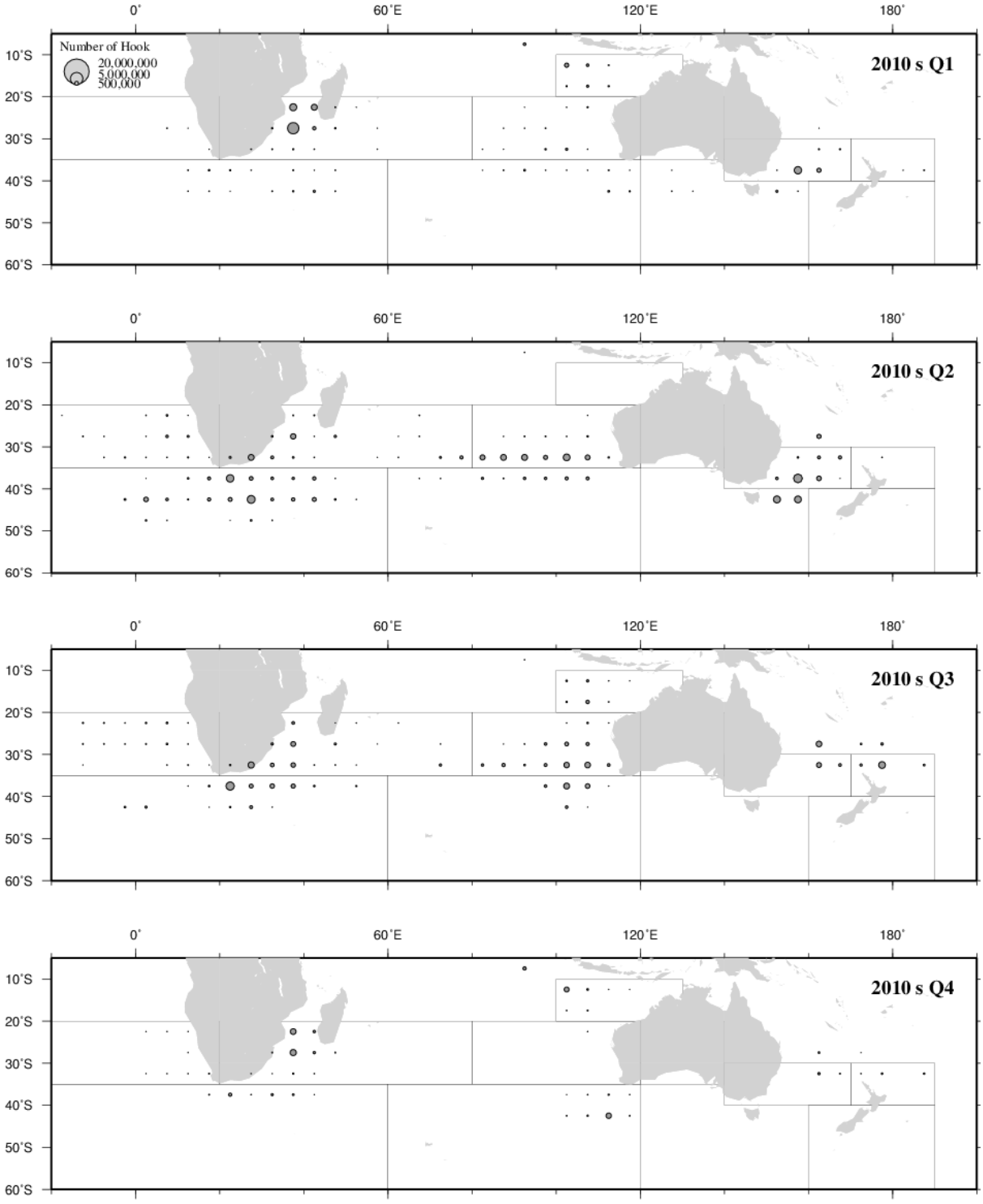

Fig.6 (6) Number of Hooks by decade, quarter and 5x5 degrees square (2010s)

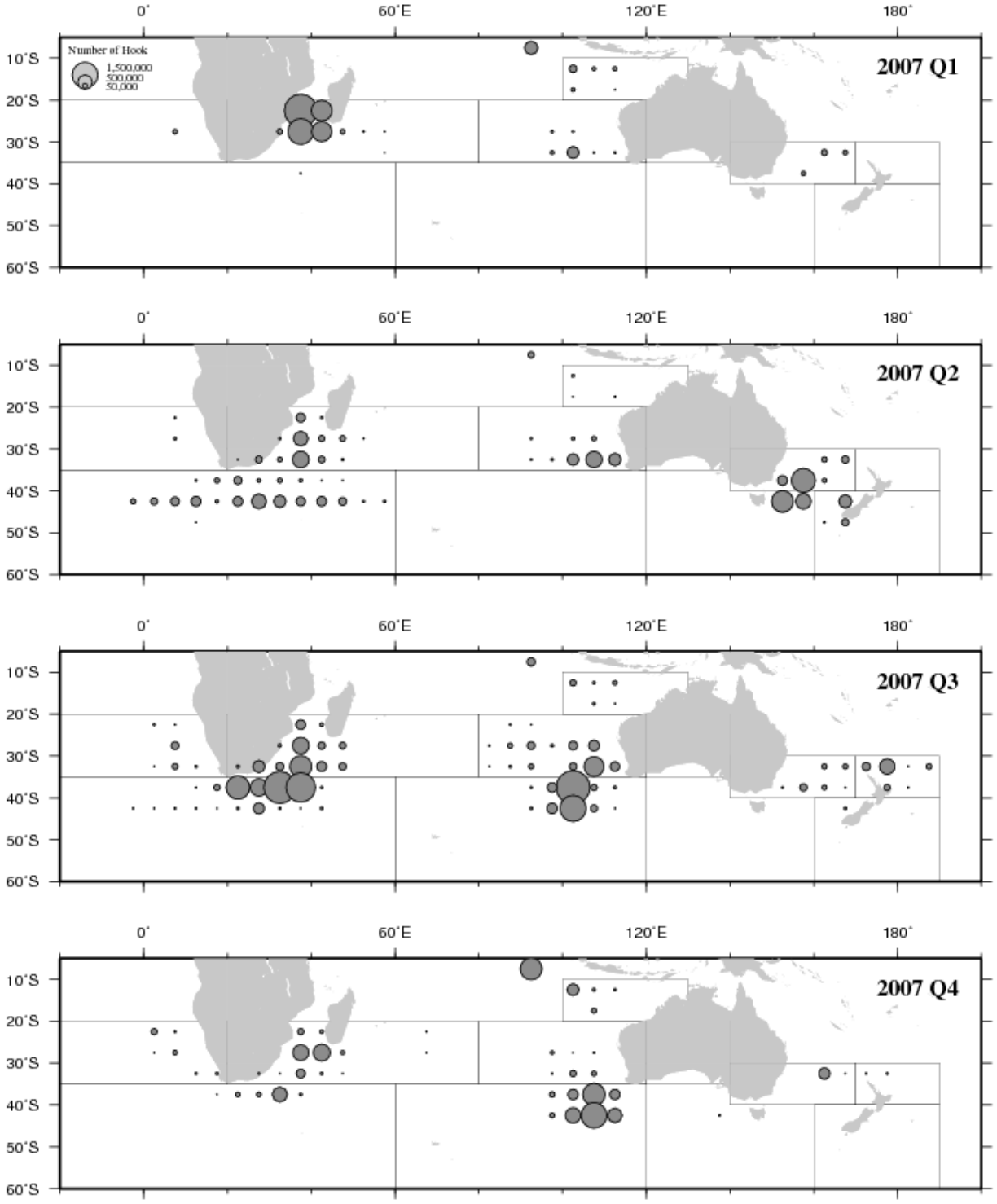

Fig.7 (1) Number of Hooks by year, quarter and 5x5 degrees square (2007)

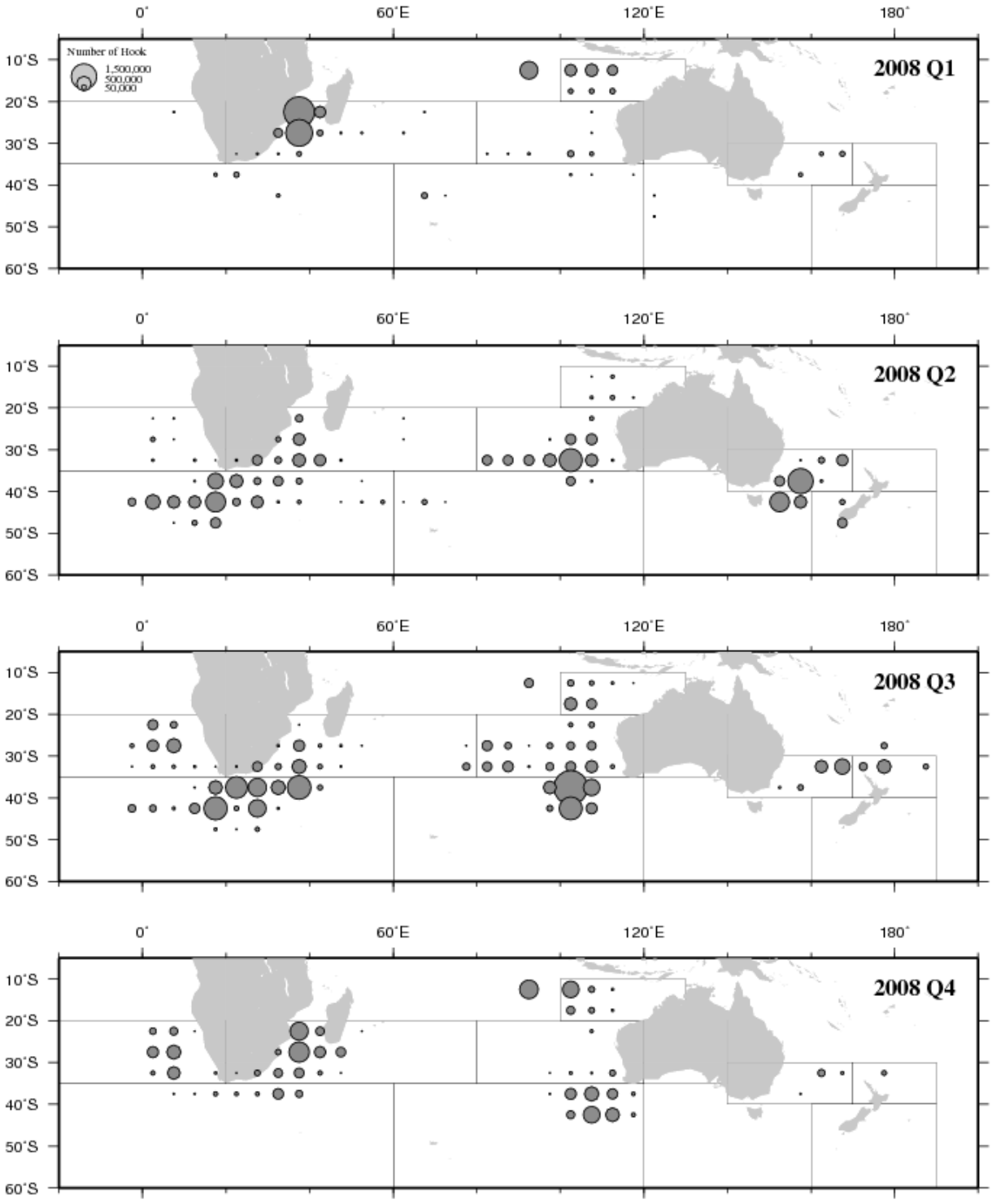

Fig.7 (2) Number of Hooks by year, quarter and 5x5 degrees square (2008)

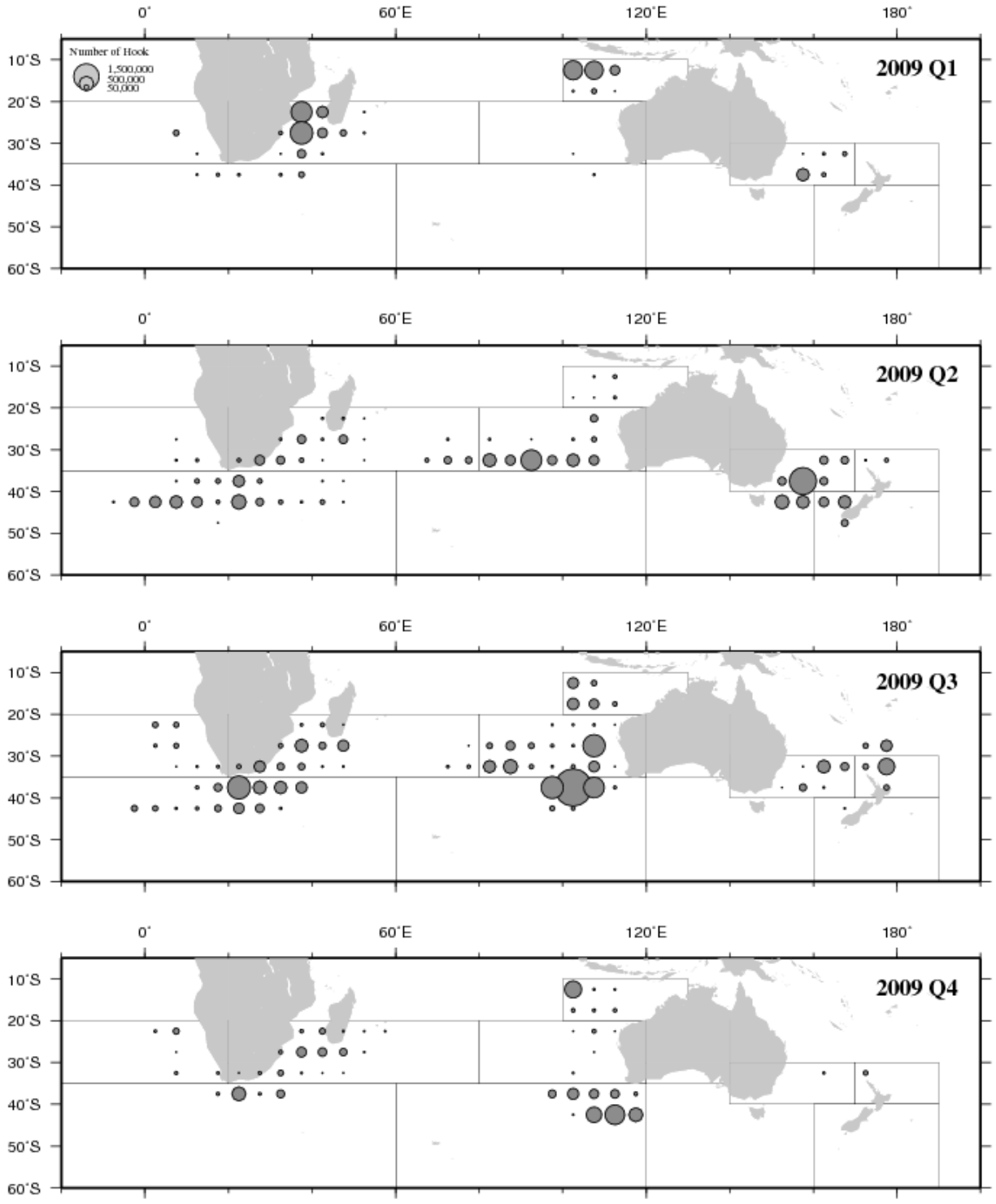

Fig.7 (3) Number of Hooks by year, quarter and 5x5 degrees square (2009)

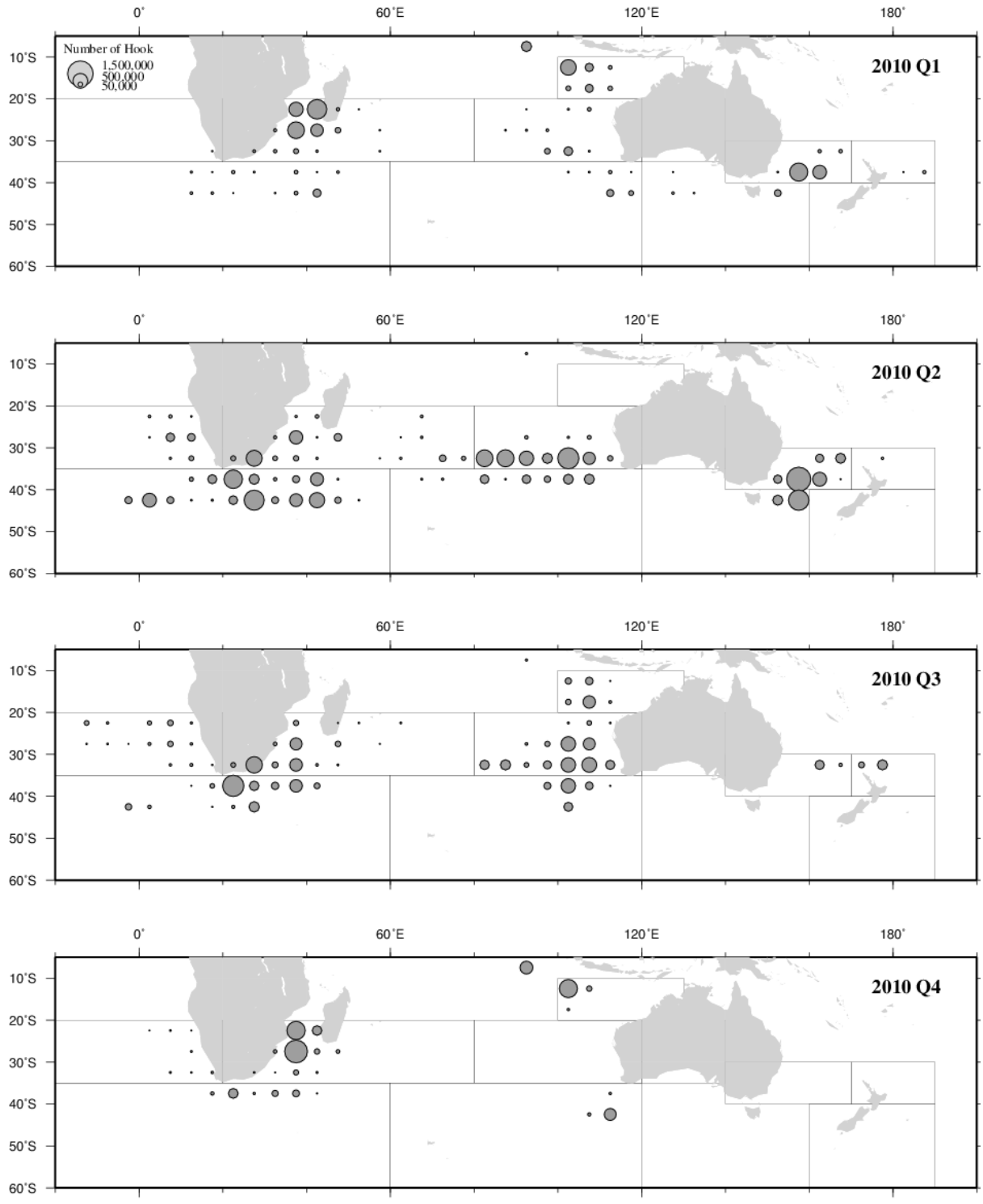

Fig.7 (4) Number of Hooks by year, quarter and 5x5 degrees square (2010)

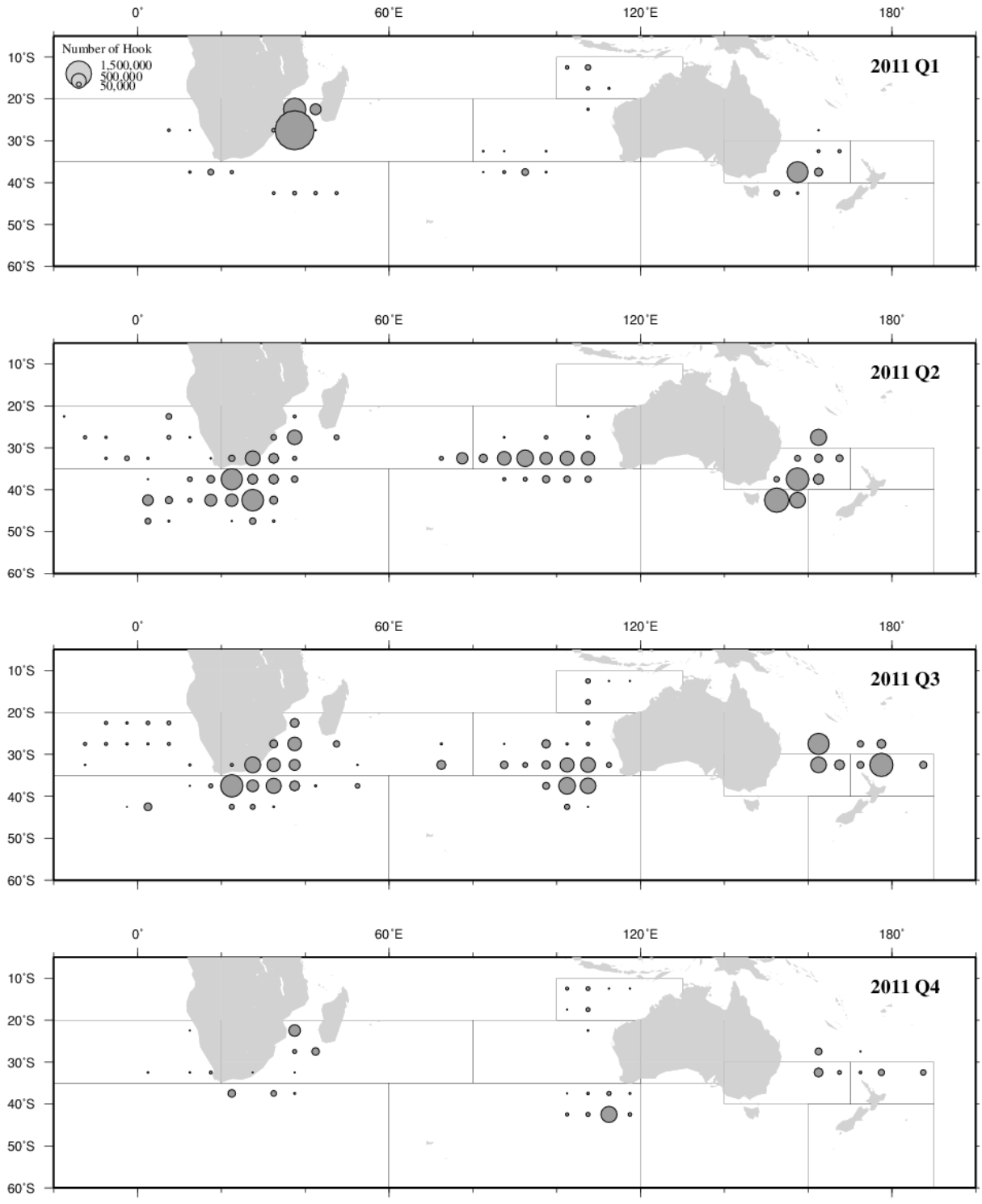

Fig.7 (5) Number of Hooks by year, quarter and 5x5 degrees square (2011)

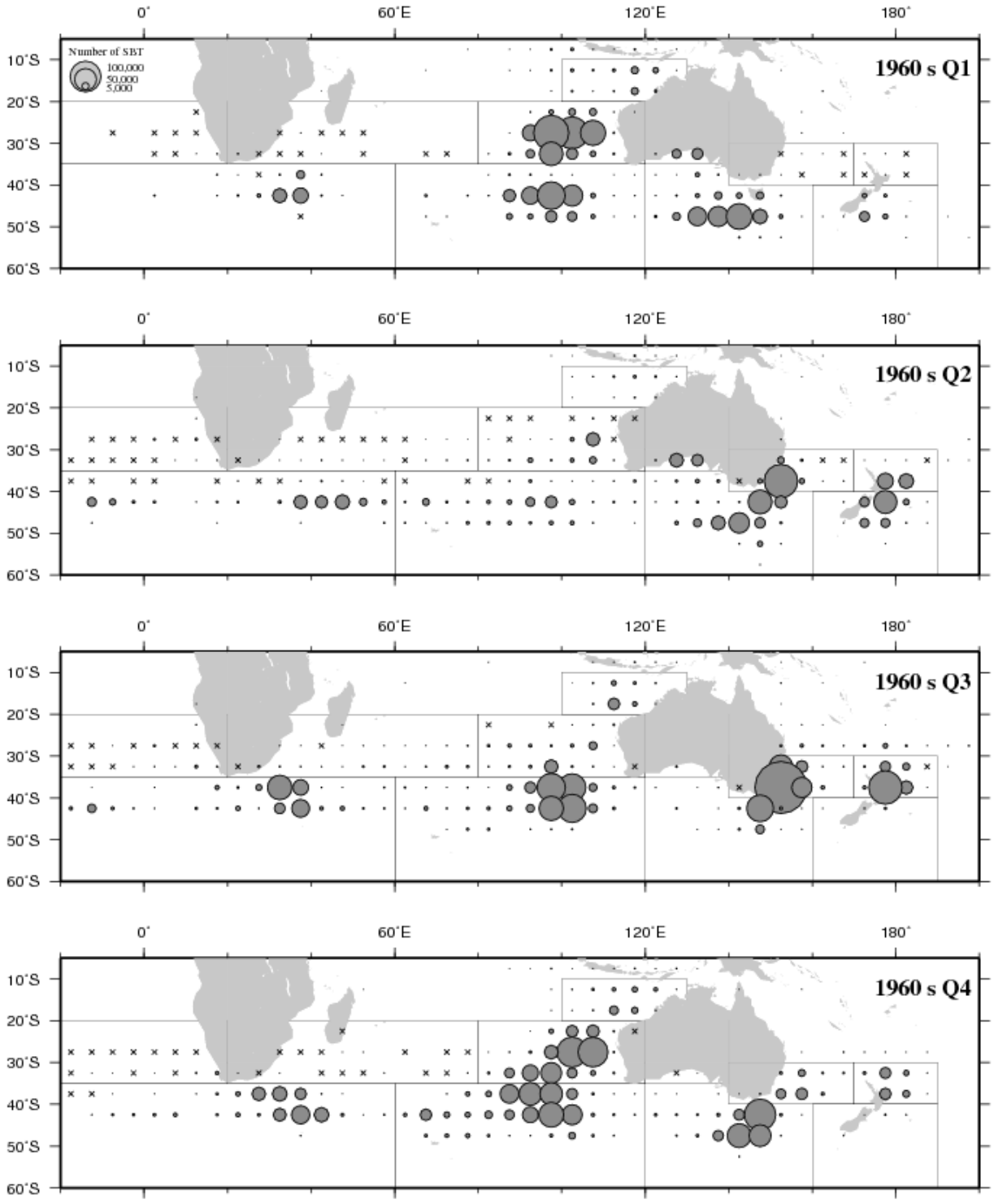

Fig.8 (1) Number of SBT caught by decade, quarter and 5x5 degrees square (1960s)

"x" indicates where longline operation conducted.
Data are between 1965 and 1969.

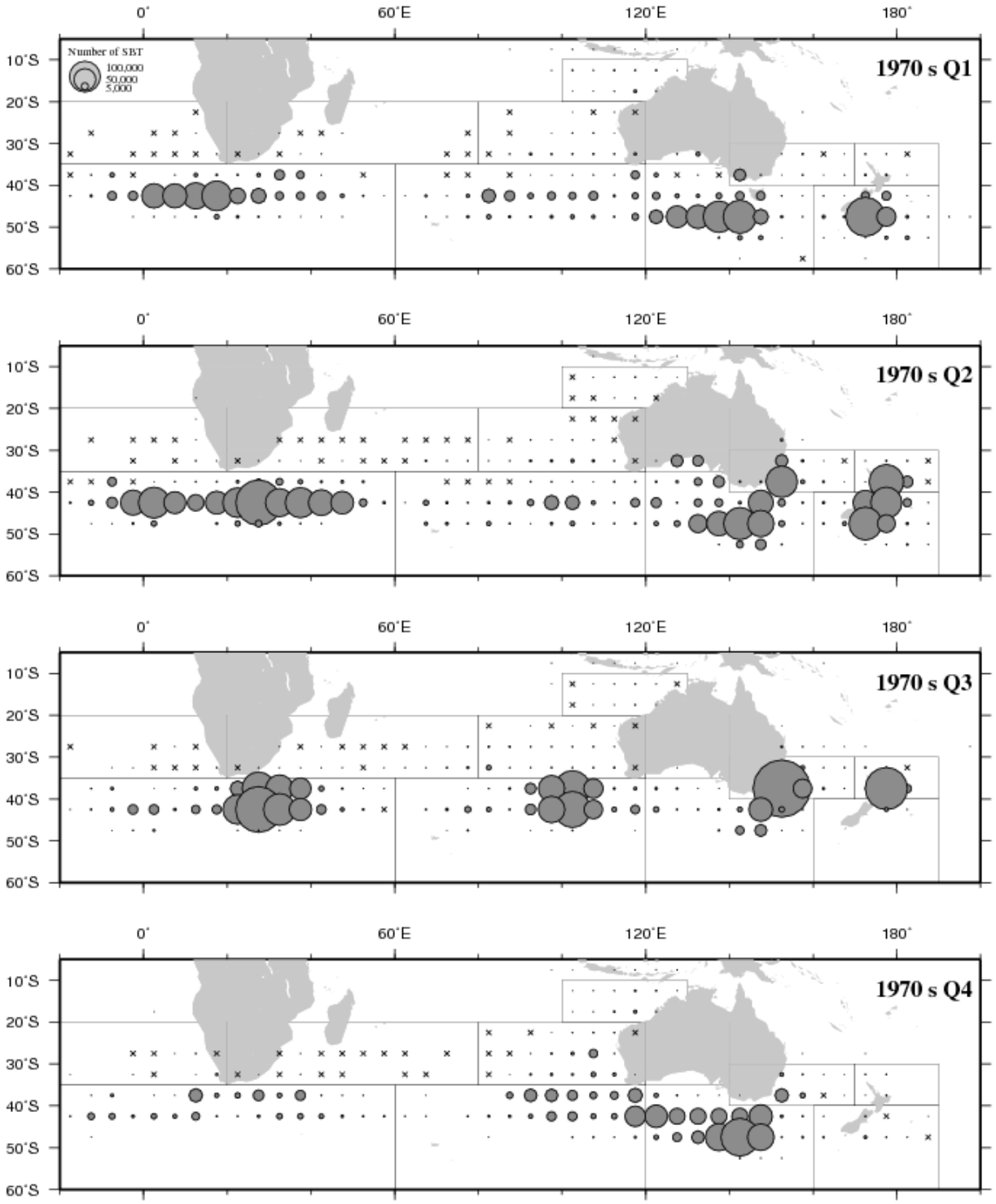

Fig.8 (2) Number of SBT caught by decade, quarter and 5x5 degrees square (1970s)

"x" indicates where longline operation conducted.

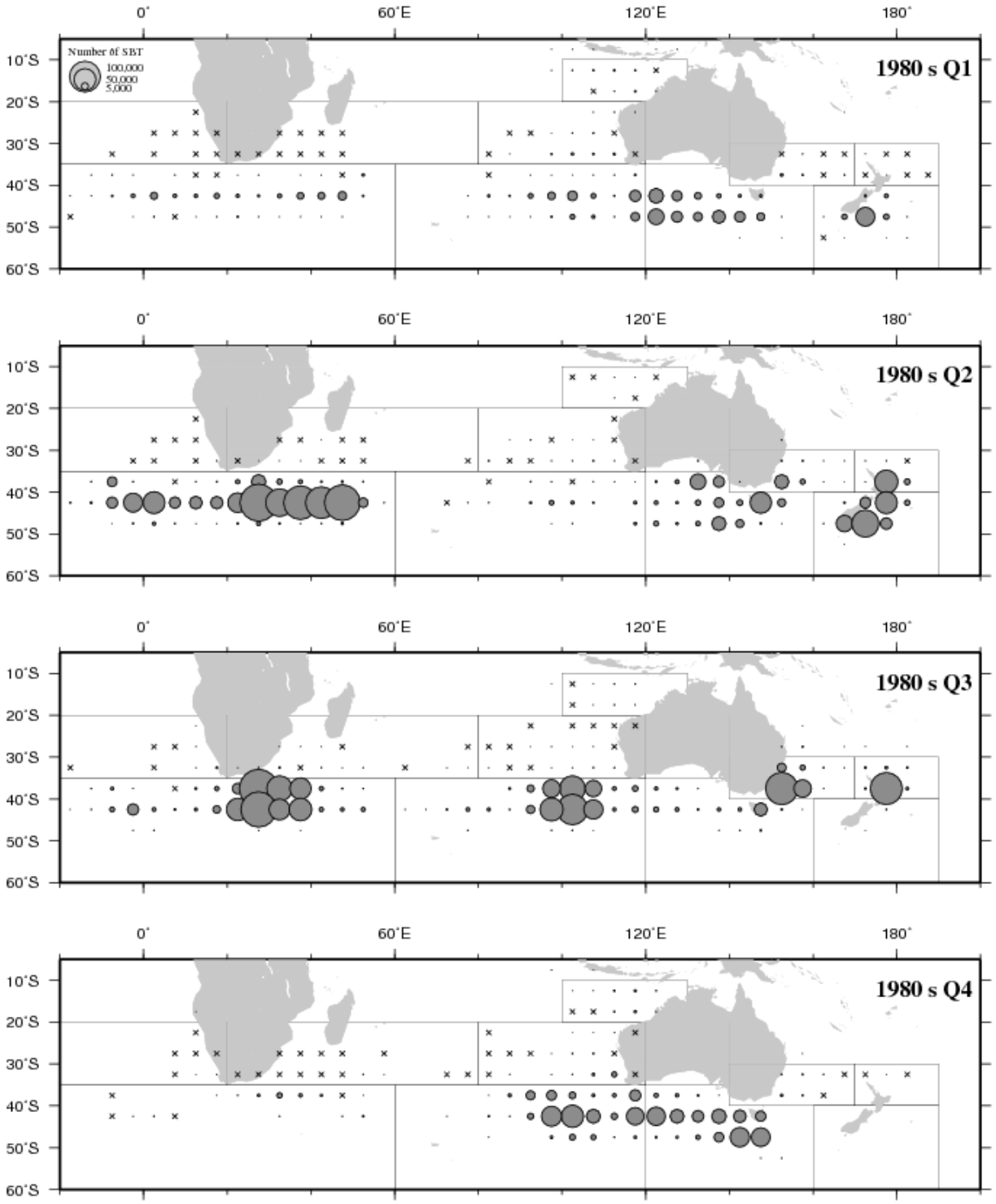

Fig.8 (3) Number of SBT caught by decade, quarter and 5x5 degrees square (1980s)

"x" indicates where longline operation conducted.

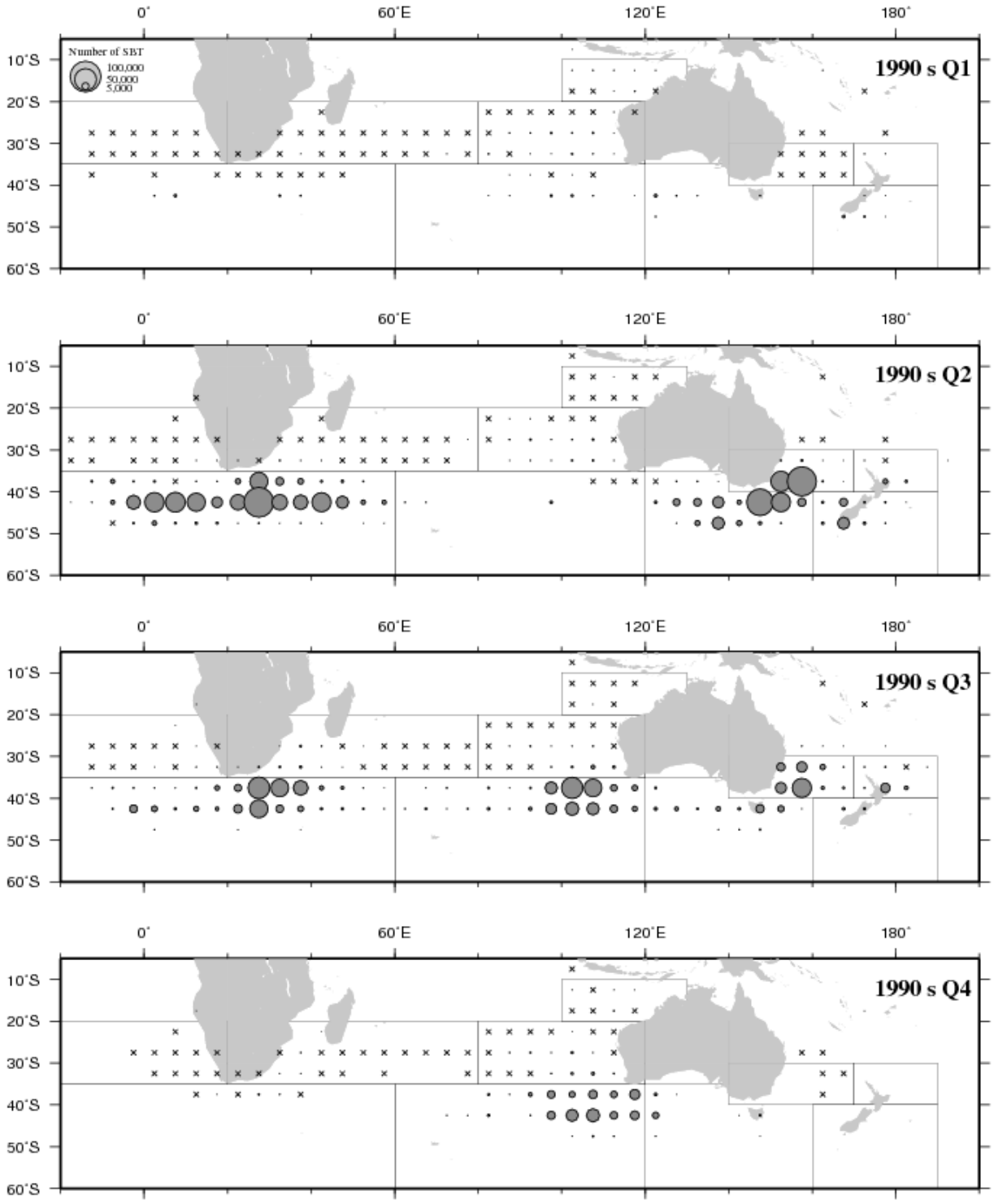

Fig.8 (4) Number of SBT caught by decade, quarter and 5x5 degrees square (1990s)

"x" indicates where longline operation conducted.

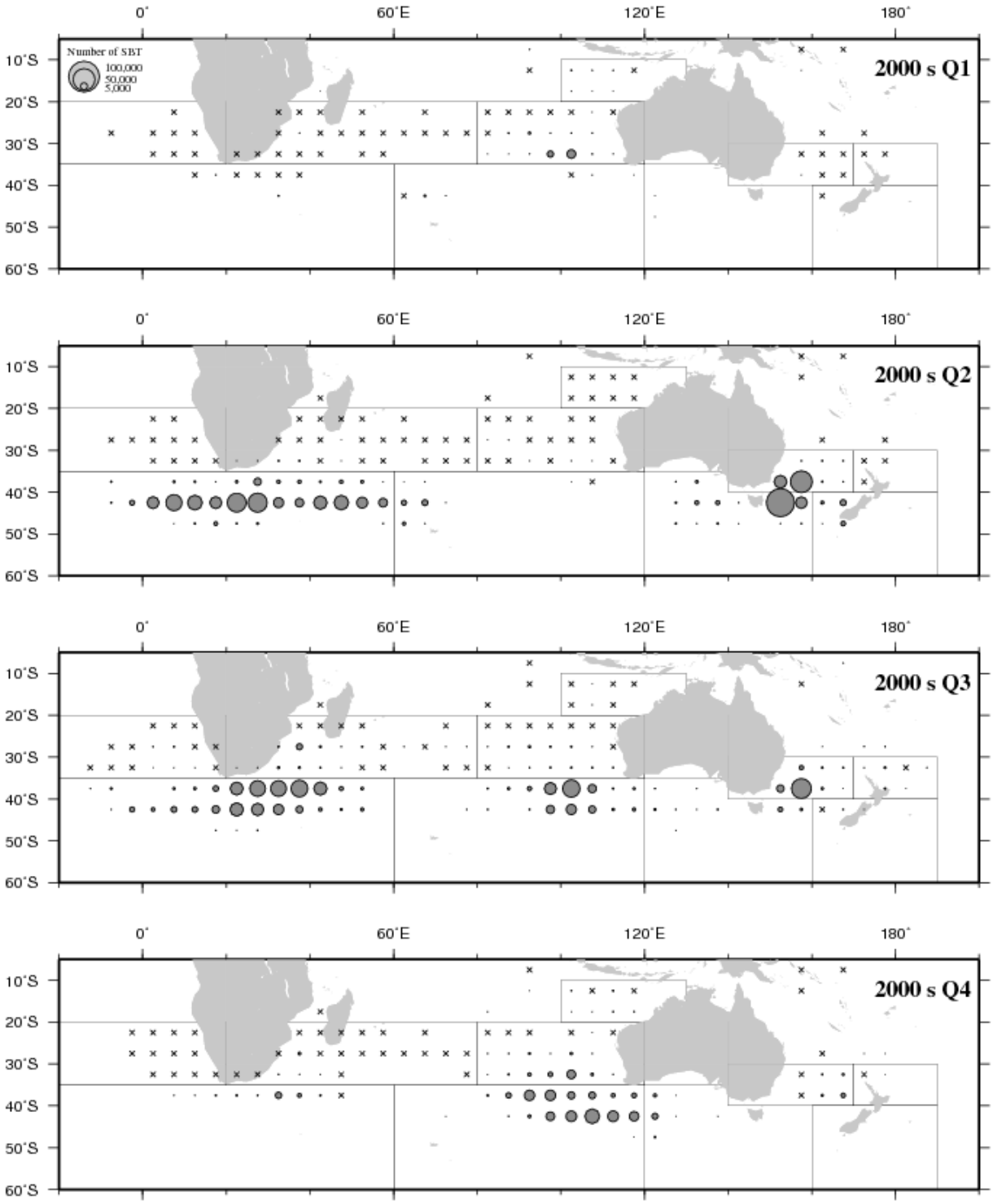

Fig.8 (5) Number of SBT caught by decade, quarter and 5x5 degrees square (2000s)

"x" indicates where longline operation conducted.

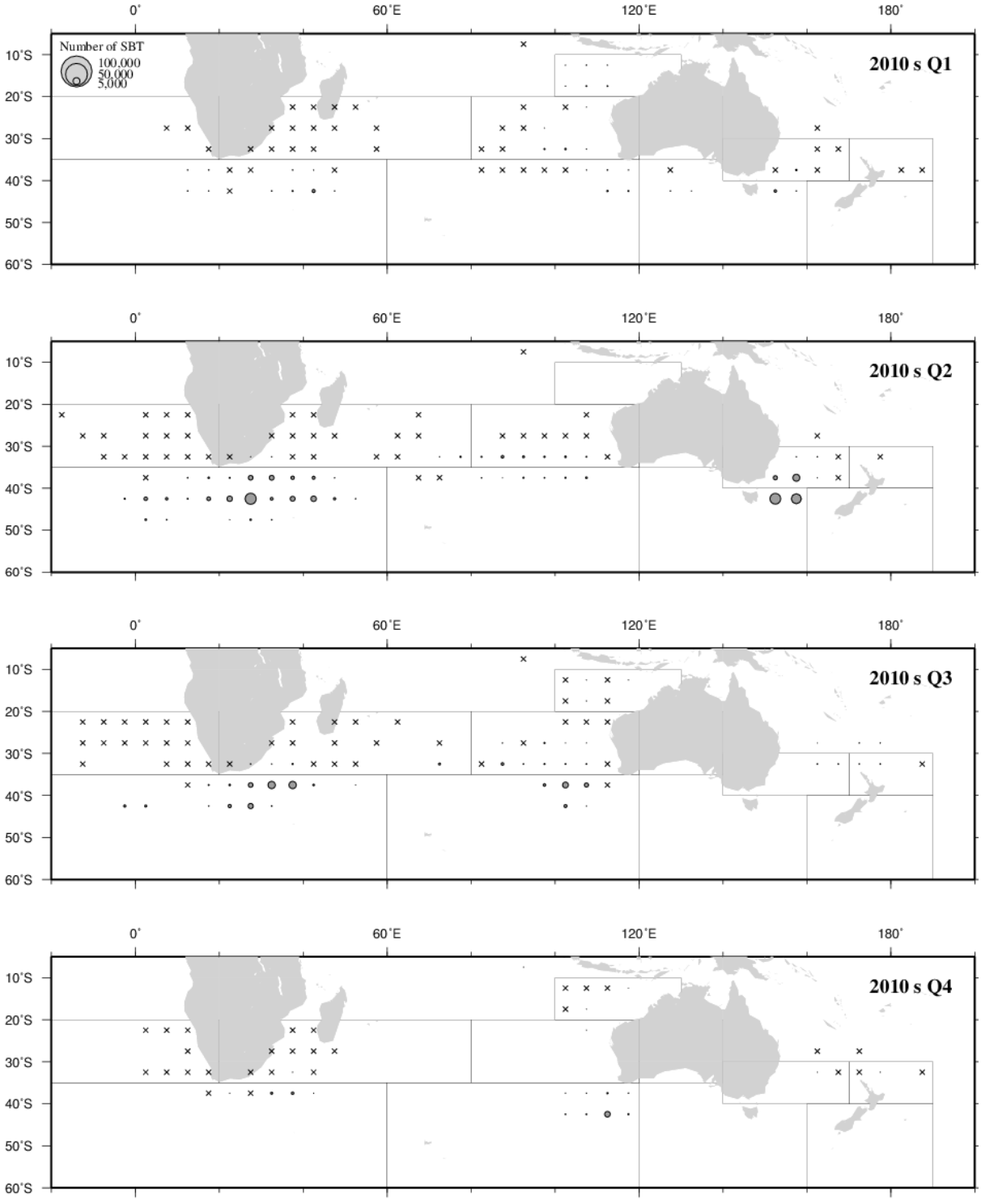

Fig.8 (6) Number of SBT caught by decade, quarter and 5x5 degrees square (2010s)

"x" indicates where longline operation conducted.

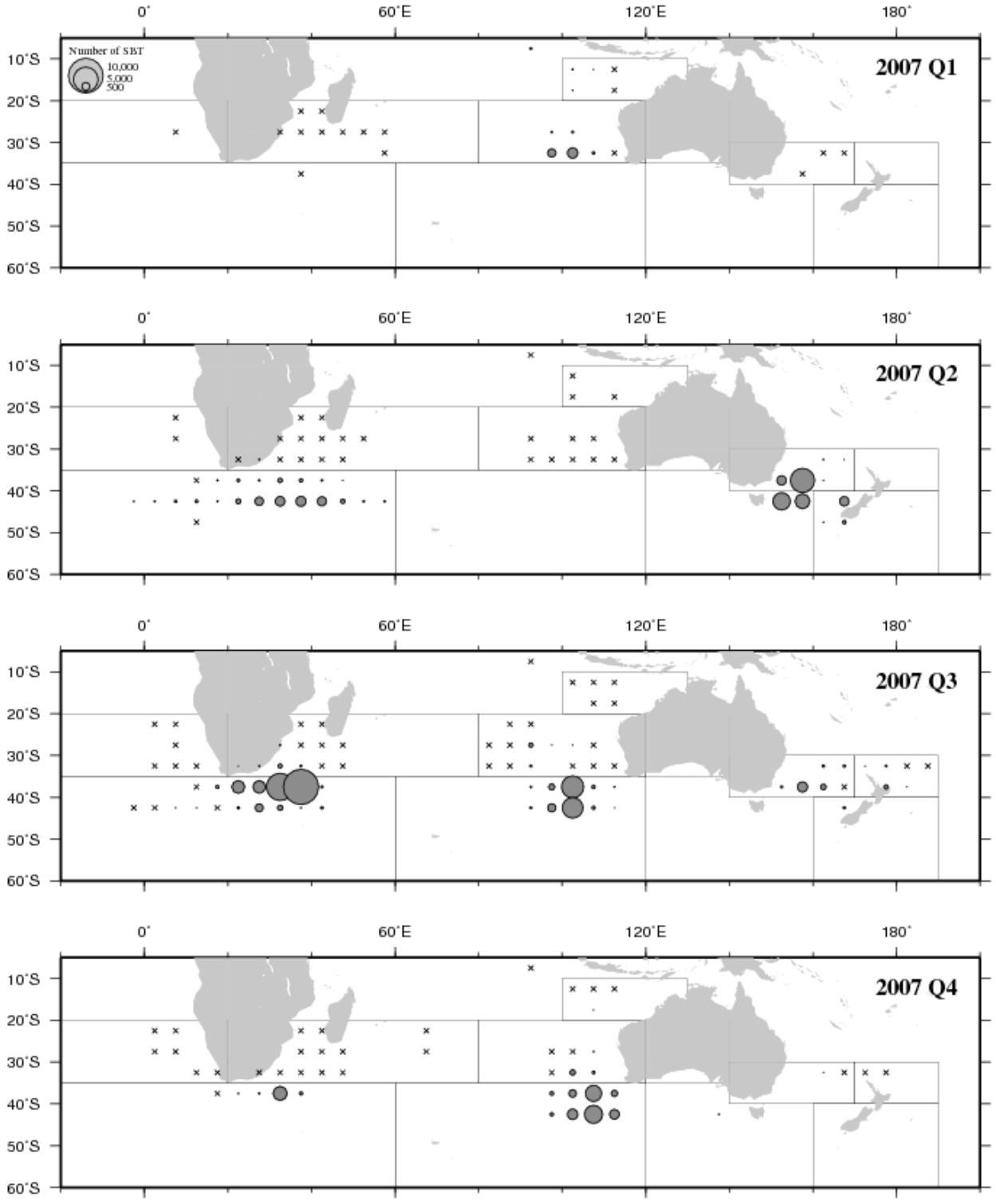

Fig.9 (1) Number of SBT caught by year, quarter and 5x5 degrees square (2007)
"x" indicates where longline operation conducted.

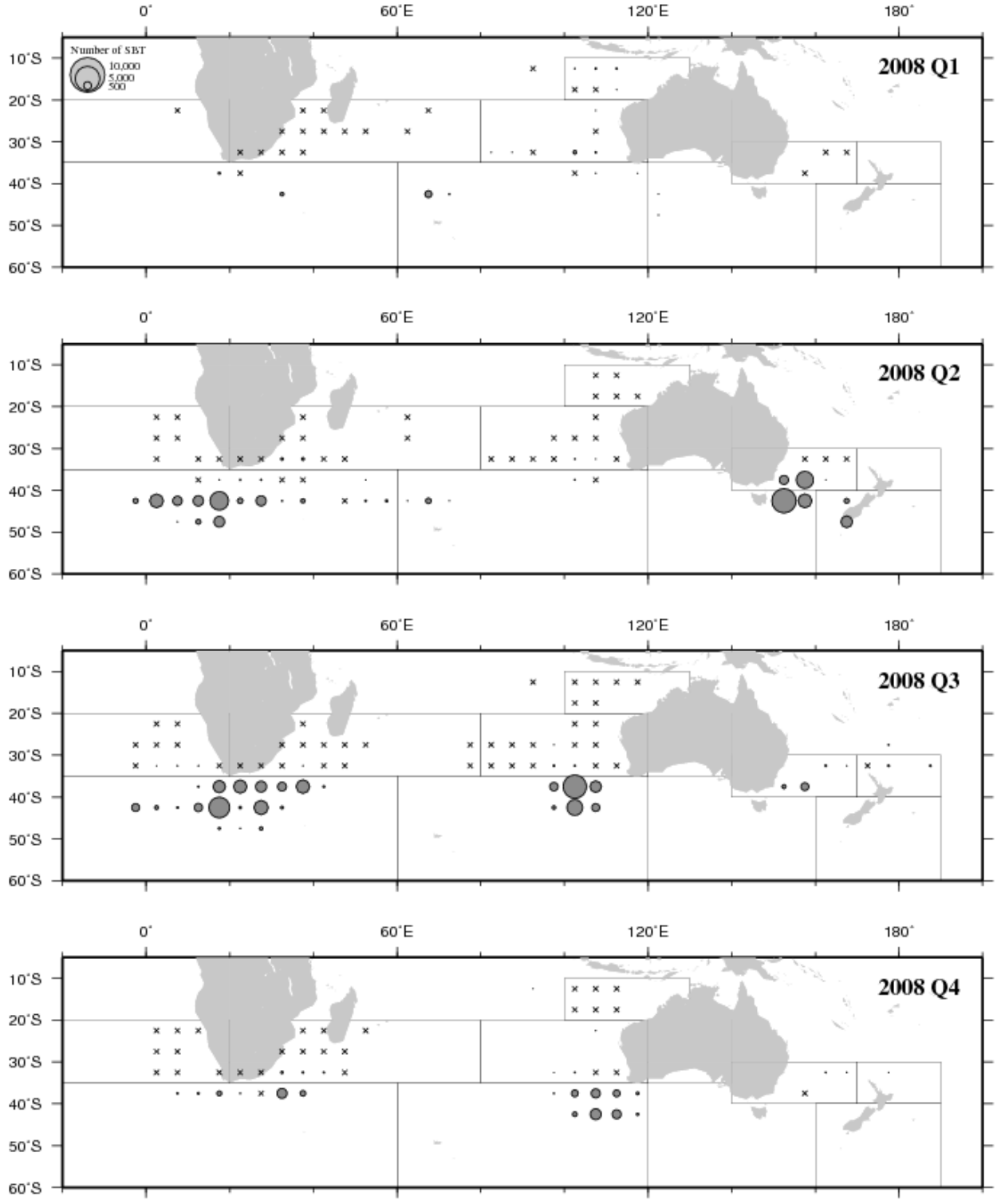

Fig.9 (2) Number of SBT caught by year, quarter and 5x5 degrees square (2008)
"x" indicates where longline operation conducted.

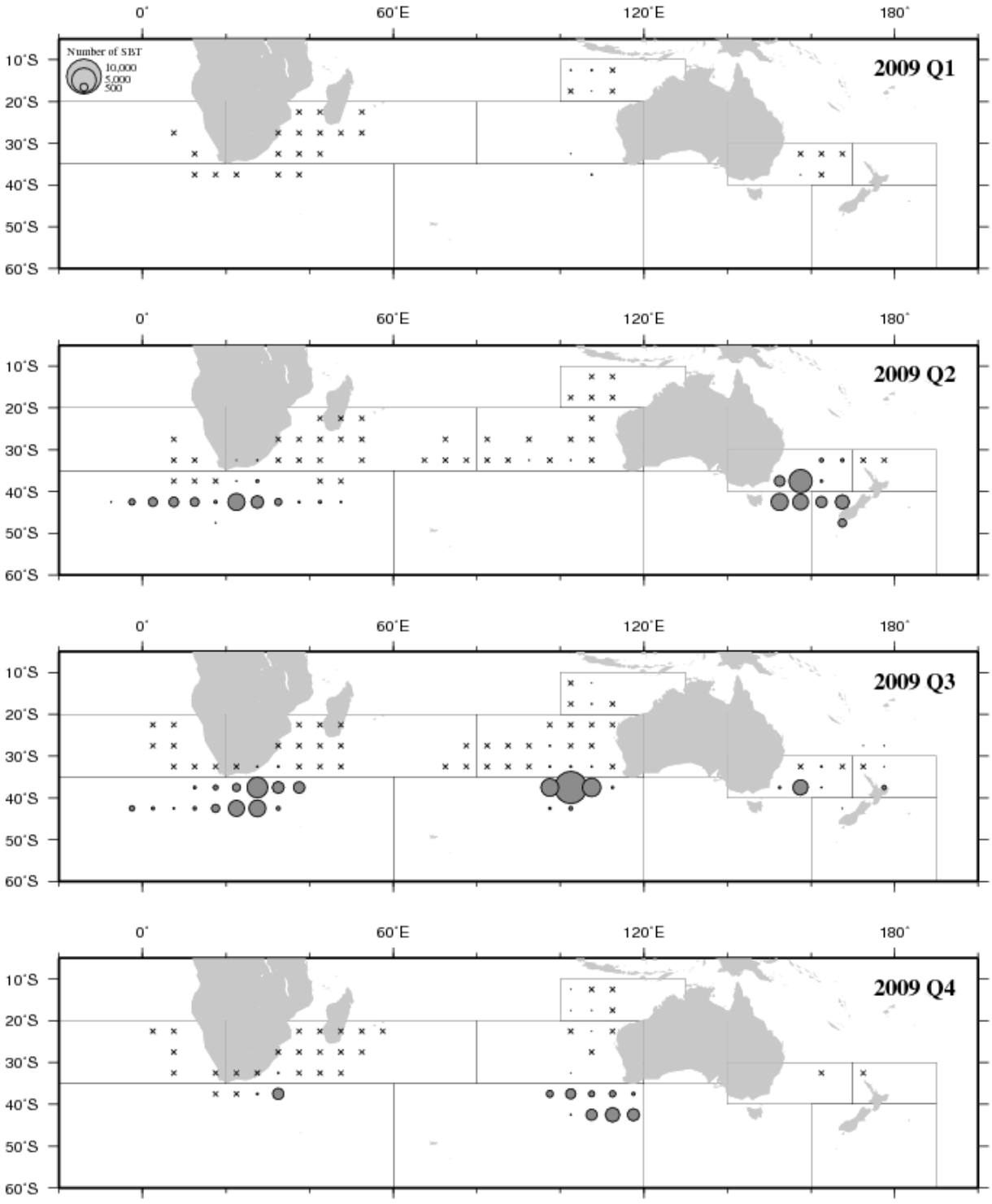

Fig.9 (3) Number of SBT caught by year, quarter and 5x5 degrees square (2009)
"x" indicates where longline operation conducted.

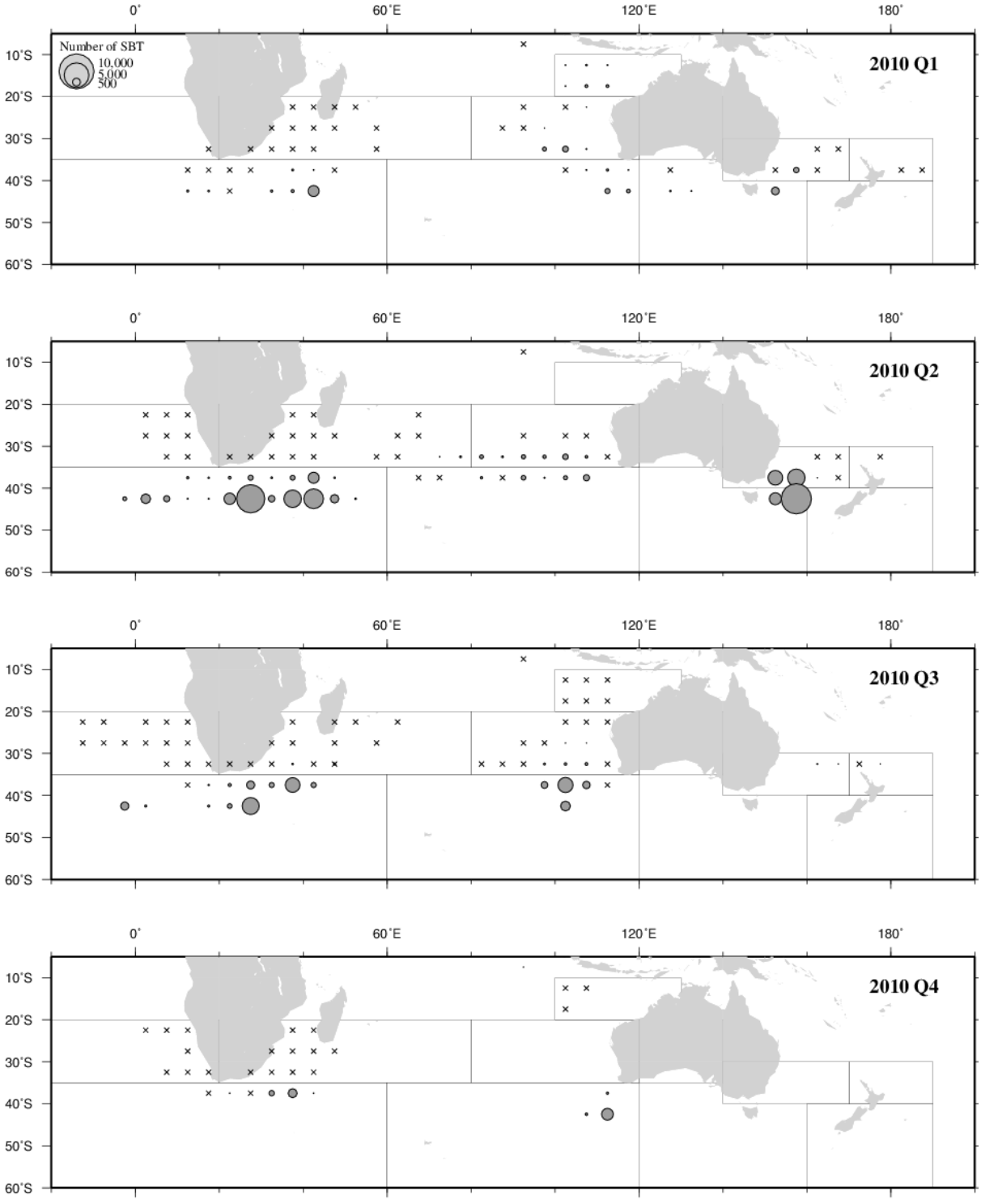

Fig.9 (4) Number of SBT caught by year, quarter and 5x5 degrees square (2010)
"x" indicates where longline operation conducted.

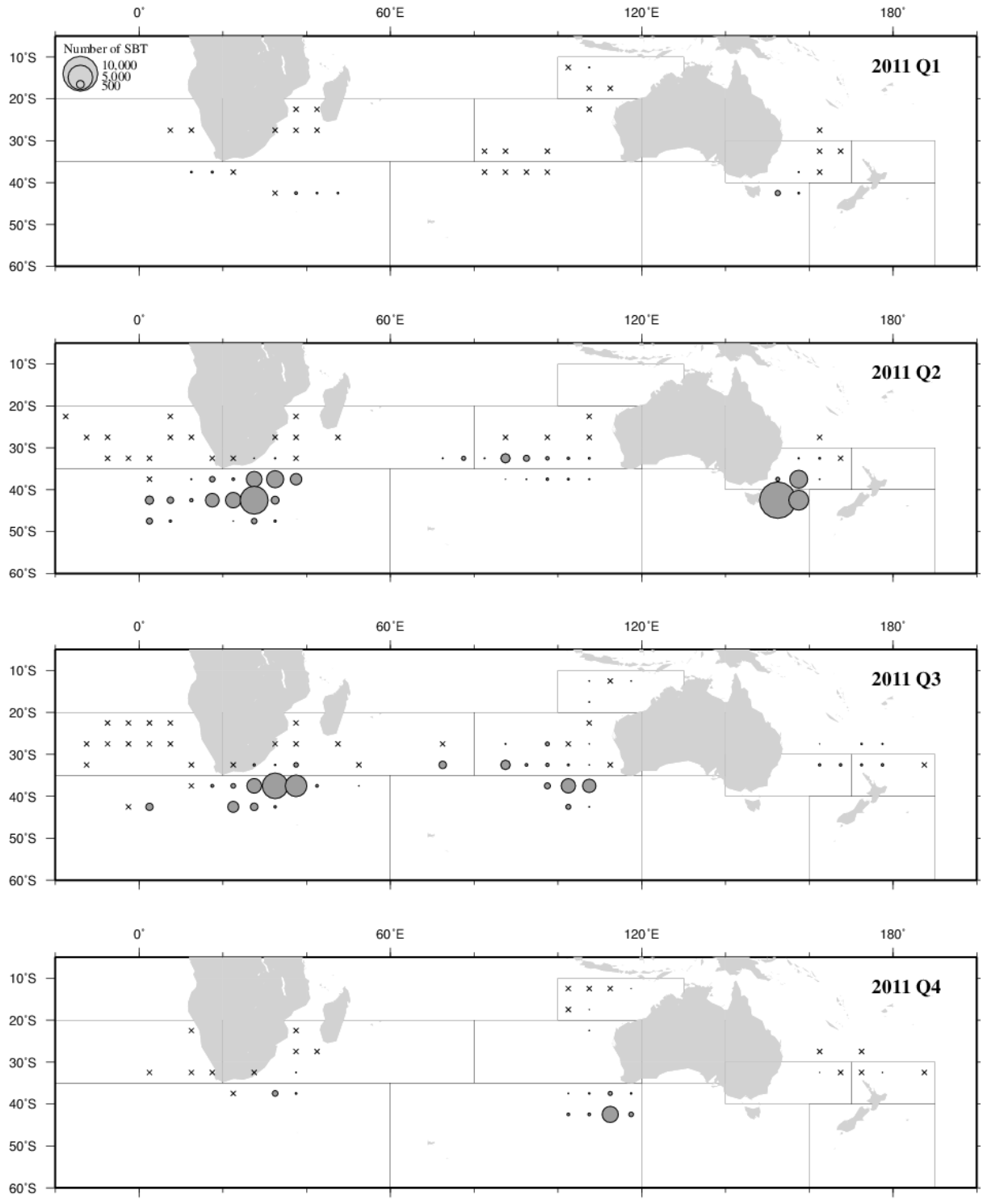

Fig.9 (5) Number of SBT caught by year, quarter and 5x5 degrees square (2011)
"x" indicates where longline operation conducted.