INTER-AMERICAN TROPICAL TUNA COMMMISSION
COMISIÓN INTERAMERICANA DEL ATÚN TROPICAL

QUARTERLY REPORT—INFORME TRIMESTRAL

January-March 2007—Enero-Marzo 2007

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The

QUARTERLY REPORT

January-March 2007

of the

INTER-AMERICAN TROPICAL TUNA COMMISSION

is an informal account, published in English and Spanish, of the current status of the tuna fisheries in the eastern Pacific Ocean in relation to the interests of the Commission, and of the research and the associated activities of the Commission's scientific staff. The research results presented should be regarded, in most instances, as preliminary and in the nature of progress reports.

El

INFORME TRIMESTRAL

Enero-Marzo 2007

de la

COMISIÓN INTERAMERICANA DEL ATÚN TROPICAL

es un relato informal, publicado en inglés y español, de la situación actual de la pesca atunera en el Océano Pacífico oriental con relación a los intereses de la Comisión, y de la investigación científica y demás actividades del personal científico de la Comisión. Gran parte de los resultados de investigación presentados en este informe son preliminares y deben ser considerados como informes del avance de la investigación.

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INTRODUCTION

The Inter-American Tropical Tuna Commission (IATTC) operates under the authority and direction of a convention originally entered into by Costa Rica and the United States. The convention, which came into force in 1950, is open to adherence by other governments whose nationals fish for tropical tunas and tuna-like species in the eastern Pacific Ocean (EPO). Under this provision Panama adhered in 1953, Ecuador in 1961, Mexico in 1964, Canada in 1968, Japan in 1970, France and Nicaragua in 1973, Vanuatu in 1990, Venezuela in 1992, El Salvador in 1997, Guatemala in 2000, Peru in 2002, Spain in 2003, and the Republic of Korea in 2005. Canada withdrew from the IATTC in 1984.

The IATTC's responsibilities are met with two programs, the Tuna-Billfish Program and the Tuna-Dolphin Program.

The principal responsibilities of the Tuna-Billfish Program specified in the IATTC's convention were (1) to study the biology of the tunas and related species of the eastern Pacific Ocean to estimate the effects that fishing and natural factors have on their abundance and (2) to recommend appropriate conservation measures so that the stocks of fish could be maintained at levels that would afford maximum sustainable catches. It was subsequently given the responsibility for collecting information on compliance with Commission resolutions.

The IATTC's responsibilities were broadened in 1976 to address the problems arising from the incidental mortality in purse seines of dolphins that associate with yellowfin tuna in the EPO. The Commission agreed that it "should strive to maintain a high level of tuna production and also to maintain [dolphin] stocks at or above levels that assure their survival in perpetuity, with every reasonable effort being made to avoid needless or careless killing of [dolphins]" (IATTC, 33rd meeting, minutes: page 9). The principal responsibilities of the IATTC's Tuna-Dolphin Program are (1) to monitor the abundance of dolphins and their mortality incidental to purse-seine fishing in the EPO, (2) to study the causes of mortality of dolphins during fishing operations and promote the use of fishing techniques and equipment that minimize these mortalities, (3) to study the effects of different modes of fishing on the various fish and other animals of the pelagic ecosystem, and (4) to provide a secretariat for the International Dolphin Conservation Program, described below.

On 17 June 1992, the Agreement for the Conservation of Dolphins ("the 1992 La Jolla Agreement"), which created the International Dolphin Conservation Program (IDCP), was adopted. The main objective of the Agreement was to reduce the mortality of dolphins in the purse-seine fishery without harming the tuna resources of the region and the fisheries that depend on them. This agreement introduced such novel and effective measures as Dolphin Mortality Limits (DMLs) for individual vessels and the International Review Panel to monitor the performance and compliance of the fishing fleet. On 21 May 1998, the Agreement on the International Dolphin Conservation Program (AIDCP), which built on and formalized the provisions of the 1992 La Jolla Agreement, was signed, and it entered into force on 15 February 1999. In 2007 the Parties to this agreement consisted of Costa Rica, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Peru, the United States, Vanuatu, and Venezuela, and Bolivia, Colombia, and the European Union were applying it provisionally. These were "committed to ensure the sustainability of tuna stocks in the eastern Pacific Ocean

and to progressively reduce the incidental mortalities of dolphins in the tuna fishery of the eastern Pacific Ocean to levels approaching zero; to avoid, reduce and minimize the incidental catch and the discard of juvenile tuna and the incidental catch of non-target species, taking into consideration the interrelationship among species in the ecosystem." This agreement established Stock Mortality Limits, which are similar to DMLs except that (1) they apply to all vessels combined, rather than to individual vessels, and (2) they apply to individual stocks of dolphins, rather than to all stocks of dolphins combined. The IATTC provides the Secretariat for the International Dolphin Conservation Program (IDCP) and its various working groups and panels and coordinates the On-Board Observer Program and the Tuna Tracking and Verification System (both described later in this report).

At its 70th meeting, on 24-27 June 2003, the Commission adopted the Resolution on the Adoption of the Convention for the Strengthening of the Inter-American Tropical Tuna Commission Established by the 1949 Convention between the United States of America and the Republic of Costa Rica ("the Antigua Convention"). This convention will replace the original one 15 months after it has been ratified by seven signatories that were Parties to the 1949 Convention on the date that the Antigua Convention was open for signature. It was ratified by Mexico on 14 January 2005, El Salvador on 10 March 2005, the Republic of Korea on 13 December 2005, the European Union on 7 June 2006, and Nicaragua on 13 December 2006.

To carry out its responsibilities, the IATTC conducts a wide variety of investigations at sea, in ports where tunas are landed, and in its laboratories. The research is carried out by a permanent, internationally-recruited research and support staff appointed by the Director, who is directly responsible to the Commission.

The scientific program is now in its 57th year. The results of the IATTC staff's research are published in the IATTC's Bulletin and Stock Assessment Report series in English and Spanish, its two official languages, in its Special Report and Data Report series, and in books, outside scientific journals, and trade journals. Summaries of each year's activities are reported upon in the IATTC's Annual Reports and Fishery Status Reports, also in the two languages.

MEETINGS

IATTC meetings

The following IATTC meetings were held in La Jolla, California, in February 2007:

Meeting	Number	Dates
Ad hoc meeting to consider management options for bigeye and yellowfin tuna		5-6 February 2007
Working Group on Finance	8	7-8 February 2007
Working Group on Bycatch	6	9 February 2007

Other meetings

Dr. Mark N. Maunder participated in the EURING [European Union for Bird Ringing] 2007 Technical Meeting, in Dunedin, New Zealand, on 14-21 January 2007. He gave a presentation entitled "Comparison of estimators for mark-recapture models using AD Model

Builder," by Mark N. Maunder, Hans J. Skaug, and Simon D. Hoyle. In addition, he presented a poster entitled "Evaluating fishery impact on a yellow-eyed penguin population using mark-recapture data," by Mark N. Maunder, David M. Houston, Alistair Dunn, Philip J. Seddon, and Terese H. Kendrick. Funding for the trip was obtained from his PFRP [Pelagic Fisheries Research Program of the University of Hawaii] Protected Species modeling project.

Dr. Robin Allen and Mr. Brian S. Hallman participated in the first Joint Meeting of Tuna RFMOs [Regional Fishery Management Organizations, held in Kobe, Japan, on 22-26 January 2007. Representatives of 54 members and cooperating non-members of five tuna RFMOs, plus representatives of the RFMO secretariats and of non-governmental organizations, participated in the meeting. The meeting developed a Course of Action on Cooperation and Coordination among the five RFMOs, which describes priority work areas and challenges for the RFMOs, and follow-up actions to address them.

Dr. Mark N. Maunder participated in a workshop on pelagic longline catch rate standardizations in Honolulu, Hawaii, on 12-16 February 2007, at which he gave the following presentations:

Developing indices of abundance using habitat data in a statistical framework, by Mark N. Maunder, Michael G. Hinton, Keith A. Bigelow, and Adam D. Langley;

Methods used to standardize longline catch and effort data in the EPO, by Mark N. Maunder and Simon D. Hoyle;

Dealing with missing covariates, by Mark N. Maunder;

Filling in missing spatial cells by integrating CPUE standardization with a population dynamics model, by Mark N. Maunder

His travel expenses were paid by the Pelagic Fisheries Research Program of the University of Hawaii.

A paper, "Computers, software, and the future of fisheries stock assessment," by Mark N. Maunder, Jon T. Schnute, and James N. Ianelli, was presented by Dr. Ianelli at the 50th Anniversary Symposium of the American Institute of Fishery Research Biologists, Future of Fishery Science in North America, which took place in Seattle, Washington, USA, on 13-15 February 2007.

Dr. Robin Allen participated in the inaugural meeting of the Steering Committee for the Asia Pacific Bycatch Consortium in Honolulu, Hawaii, on 15-16 February 2007.

Mr. Witold L. Klawe participated in "An International Symposium on the Role of Selenium in the Mercury Issue," held in La Jolla, California, on 23-24 February 2007. It was led by Professor Emeritus Gerhard N. Schrauzer of the University of California at San Diego, and Mr. Klawe was one of several people who assisted him in organizing it. The topics of the meeting were the occurrence and biochemistry of selenium, the importance of selenium in human nutrition, and selenium's role in reducing bioaccumulation and toxicity, with special emphasis on mercury-selenium interactions and the safety of seafood.

Dr. Robin Allen participated in meetings of the Steering Committee of the Fisheries Resources Monitoring System (FIRMS) and the Coordinating Working Party on Fisheries Statistics (CWP) at the FAO Headquarters in Rome on 26 February 26-1 March 2007.

Dr. Mark N. Maunder participated in the Stock Synthesis 2 Training Workshop in Seattle, Washington, USA, on 27-28 February 2007.

Dr. Robin Allen spent the period of 26 February-13 March 2007, in Rome, where he participated in the biennial FAO Committee on Fisheries and the following associated meetings: Coordinating Working Party of Fishery Statistics (CWP), 26-28 February; Fisheries Resources Monitoring System (FIRMS) Steering Committee, 28 February-2 March; FAO Committee of Fisheries (COFI 27), 5-9 March; eighth meeting of Secretariats of Tuna RFMOs and agencies, 9 March; fifth meeting of Regional Fisheries Bodies secretariats, 12-13 March.

Dr. Robert J. Olson participated in a workshop on 5-9 March 2007 at the headquarters of the Secretariat of the Pacific Community (SPC), Noumea, New Caledonia. The objectives of the workshop were to develop a mass-balance ecosystem model for the western Pacific Ocean and the Australian eastern tuna and billfish fishery, to run physical-forcing simulations, to consider comparisons with the ecosystem in the eastern Pacific Ocean, and to discuss alternative ecosystem models. Dr. Olson's travel expenses were paid by the SPC.

Dr. Michael G. Hinton participated in the "International Symposium on Tuna and Pelagic Fish Stock Assessment and Management," at Shanghai Fisheries University, Shanghai, China, on 12-14 March 2007, at which he presented a manuscript entitled "Eastern Pacific Ocean tuna fisheries: status of stocks, management, and issues for the future." His participation in this meeting was sponsored by the Shanghai Fisheries University.

Dr. Hinton also participated in a joint workshop of the Marlin and Swordfish Working Group of the International Scientific Committee for Tuna and Tuna-like Species in the North Pacific Ocean (ISC), held at the National Taiwan University Institute of Oceanography, Taipei, Chinese Taipei, on 19-26 March 2007. At this meeting a preliminary assessment of striped marlin in the North Pacific Ocean was developed. The assessment will be completed at a workshop to be held in Pusan, Republic of Korea, in July 2007, prior to a meeting of the ISC plenary session. At the Taipei meeting Dr. Hinton presented a manuscript entitled "Stock structure of swordfish in the North Pacific," by M.G. Hinton and J.R. Alvarado-Bremer.

DATA COLLECTION

The IATTC had field offices at Las Playas and Manta, Ecuador; Manzanillo and Mazatlan, Mexico; Panama, Republic of Panama; Mayaguez, Puerto Rico, USA; and Cumaná, Venezuela, during the first quarter of 2007.

Personnel at these offices collected 366 length-frequency samples from 202 wells and abstracted logbook information for 281 trips of commercial fishing vessels during the first quarter of 2007.

Also during the first quarter members of the field office staffs placed IATTC observers on 152 fishing trips by vessels that participate in the AIDCP On-Board Observer Program. In addition, 95 IATTC observers completed trips during the quarter, and were debriefed by field office personnel.

Surface fleet and surface catch statistics

Statistical data are continuously being collected by personnel at the IATTC's field offices and processed at its headquarters in La Jolla. As a result, estimates of fisheries statistics with varying degrees of accuracy and precision are available, the most accurate and precise being those made after all available information has been entered into the data base, processed, and verified. The estimates for the current quarter are the most preliminary, while those made six months to a year after monitoring of the fishery are much more accurate and precise. While it may require a year or more to obtain some final information, much of the catch information is processed and available within two to three months of the return of a vessel from a fishing trip.

Fleet statistics

The estimated total carrying capacity of the purse-seine and pole-and-line vessels that are fishing, or are expected to fish, in the eastern Pacific Ocean (east of 150°W; EPO) during 2007 is about 228,000 cubic meters (m^3) (Table 1). The weekly average at-sea capacity for the fleet, for the weekly periods ending January 1 through April 1, was about 162,000 m^3. The changes of flags and vessel names and additions to and deletions from the IATTC's fleet list during that period are given in Table 2.

Catch statistics

Catch statistics for the first quarter of 2007

The estimated total retained catches of tunas in the EPO during the report period, in metric tons, were:

Species	2007	2002-2006			Weekly average, 2006
		Average	Minimum	Maximum	
Yellowfin	52,600	92,700	57,500	112,600	4,000
Skipjack	65,600	56,300	43,200	79,600	5,000
Bigeye	12,400	9,300	5,600	14,100	1,000

Summaries of the preliminary estimated retained catches, by flag of vessel, are shown in Table 3.

Catch statistics for 2006

Estimates of the annual retained and discarded catches of the various species of tunas and other fishes by purse seiners and pole-and line vessels fishing at least part of the year in the EPO for yellowfin, skipjack, bigeye, or bluefin during 1977-2006 are shown in Table 4. The retained catch data for skipjack and bluefin are essentially complete except for insignificant catches made by the longline, recreational (for skipjack), and artisanal fisheries. The catch data for yellowfin and bigeye do not include catches by longline vessels, as the data for these fisheries are received much later than those for the surface fisheries. About 5 to 10 percent of the total catch of yellowfin is taken by longlines. Until recently, the great majority of the catch of bigeye had been harvested by the longline fishery.

There were no restrictions on fishing for tunas in the EPO during 1980-1997. However, there were restrictions on fishing for yellowfin in the Commission's Yellowfin Regulatory Area (CYRA) (IATTC Annual Report for 2001: Figure 1) from 26 November through 31 December, 1998, from 13 October 14 through 31 December, 1999, from 1 through 31 December, 2000, and from 27 October through 31 December, 2001. Purse-seine fishing for tunas was prohibited in the EPO from 1 through 31 December, 2002, and in a portion of the EPO from 1 through 31 December, 2003. In 2006, as in 2004 and 2005 there were restrictions on purse-seine fishing for tunas for vessels of some countries from 1 August through 11 September, and from 20 November through 31 December for vessels of other countries. In addition, fishing for tunas associated with fish-aggregating devices (FADs) was prohibited in the EPO from 9 November through 31 December, 1999, and from 15 September through 15 December, 2000. Furthermore, regulations placed on purse-seine vessels directing their effort at tunas associated with dolphins have probably affected the way these vessels operate, especially since the late 1980s. There was a major El Niño event, which began in mid-1982 and persisted until late 1983. The catch rates in the EPO were low before and during this El Niño episode, which caused a shift of fishing effort from the eastern to the western Pacific, and the fishing effort remained relatively low during 1984-1986. During 1997-1998 another major El Niño event occurred in the EPO, but the effects of this on the vulnerability of the fish to capture were apparently less severe.

The retained catches, in metric tons, based on the current species composition program, described in the IATTC Annual Report for 2000 and in IATTC Stock Assessment Report 4, of yellowfin, skipjack, and bigeye in the EPO during 2006, the 1991-2005 annual averages for yellowfin and skipjack, and the 1994-2005 annual average for bigeye are as follows:

Species	2006	Average	Minimum	Maximum
			1991-2005	
Yellowfin	167,432	275,598	212,033	413,357
Skipjack	308,577	156,918	63,945	275,128
			1994-2005	
Bigeye	71,195	58,686	34,900	93,753

The 2006 catch of yellowfin was about 108 thousand t (39 percent) less than the average for 1991-2005. The 2006 skipjack catch was about 152 thousand t (97 percent) greater than the average for 1991-2005. The 2006 bigeye catch was about 13 thousand t (21 percent) greater than the average for 1994-2005.

The average annual distributions of the logged retained purse-seine catches of yellowfin, skipjack, and bigeye, by set type, in the EPO during the 1996-2005 period are shown in Figures 1a, 2a, and 3a, and the preliminary estimates for 2006 are shown in Figures 1b, 2b, and 3b. In comparison to 1996-2005, the catches of yellowfin were low off Mexico and Central American in 2006, as had been the case in 2004 and 2005. The yellowfin catches off South America were also less than the 1996-2005 average. The skipjack catches in 2006 were considerably greater than those of 1996-2005. Significant catches of skipjack were made throughout the year from about 5°N to 15°S. As had been the case in 2004 and 2005, the catches of skipjack in the inshore areas off Mexico were greater, possibly due to changes in fishing strategy due to poor yellowfin fishing. Bigeye are not often caught by surface gear north of about 7°N. The catches of bigeye have decreased in the inshore areas off South America for several years. With the development of the fishery for tunas associated with floating objects since 1993, the relative importance of the

inshore areas has decreased, while that of the offshore areas has increased. Most of the bigeye catches are taken in association with fish-aggregating devices (FADs) between 5°N and 5°S.

While yellowfin, skipjack, and bigeye comprise most of the catches of fish made by tuna vessels in the EPO, bluefin, albacore, bonito, black skipjack, and other species contribute to the overall harvest in this area. The total retained catch of these other species in the EPO was about 16 thousand t in 2006, which is considerably greater than the 1991-2005 annual average retained catch of about 6 thousand t (range: 2 to 10 thousand t).

The estimated retained catch of all species in the EPO in 2006 was about 563 thousand t, which is 16 percent greater than the average of 487 thousand t for 1991-2005, but 25 percent less than the previous record total catch of 752 thousand t, taken in 2003.

Preliminary estimates of the retained catches in the EPO in 2006, by flag, and the landings of EPO-caught fish, by country, are given in Table 5. The landings are fish unloaded during a calendar year, regardless of the year of catch. The country of landing is that in which the fish were unloaded from the fishing vessel or, in the case of transshipments, the country that received the transshipped fish.

Preliminary estimates of the most significant (equal to or greater than about 5 percent of the total) retained catches and landings, of all species combined, during 2006 were as follows:

Flag	Retained catches		Landings	
	Metric tons	Percentage	Metric tons	Percentage
Colombia	-	-	29,800	5
Ecuador	203,600	36	334,500	59
Mexico	103,200	18	102,000	18
Panama	81,100	14	-	-
Venezuela	47,300	8	-	-

It is important to note that when final information is available the landings currently assigned to the various countries may change due to exports from storage facilities to processors in other nations.

Catch statistics for the longline fishery

The catches of bigeye by longline gear in the EPO during 2006 and the first quarter of 2007 are shown in Tables 6a and 6b, respectively. Equivalent data are not available for the other species of tunas, or for billfishes.

Size compositions of the surface catches of tunas

Length-frequency samples are the basic source of data used for estimating the size and age compositions of the various species of fish in the landings. This information is necessary to obtain age-structured estimates of the population for various purposes, including the integrated modeling that the staff has employed during the last several years. The results of such studies have been described in several IATTC Bulletins, in its Annual Reports for 1954-2002, and in its Stock Assessment Reports.

Length-frequency samples of yellowfin, skipjack, bigeye, Pacific bluefin, and, occasionally, black skipjack from the catches of purse-seine, pole-and-line, and recreational vessels in the EPO are collected by IATTC personnel at ports of landing in Ecuador, Mexico, Panama, the USA, and Venezuela. The catches of yellowfin and skipjack were first sampled in 1954, bluefin in 1973, and bigeye in 1975. Sampling has continued to the present.

The methods for sampling the catches of tunas are described in the IATTC Annual Report for 2000 and in IATTC Stock Assessment Report 4. Briefly, the fish in a well of a purse-seine or pole-and-line vessel are selected for sampling only if all the fish in the well were caught during the same calendar month, in the same type of set (floating-object, unassociated school, or dolphin), and in the same sampling area. These data are then categorized by fishery (Figure 4).

Data for fish caught during the fourth quarter of 2001-2006 are presented in this report. Two sets of length-frequency histograms are presented for each species; the first shows the data by stratum (gear type, set type, and area) for the fourth quarter of 2006, and the second shows the combined data for the fourth quarter of each year of the 2001-2006 period. Samples from 214 wells were taken during the fourth quarter of 2006. No samples were taken from the negligible catches of yellowfin and skipjack taken by pole-and-line vessels during the fourth quarter. The estimates of the size distributions of these catches were obtained by using length-frequency data from fish caught in unassociated schools by purse seiners.

There are ten surface fisheries for yellowfin defined for stock assessments: four associated with floating objects, two unassociated school, three associated with dolphins, and one pole-and-line (Figure 4). The last fishery includes all 13 sampling areas. Of the 214 wells sampled, 152 contained yellowfin. The estimated size compositions of these fish during the fourth quarter of 2006 are shown in Figure 5a. The majority of the yellowfin catch during the fourth quarter was taken by sets on unassociated schools and on schools associated with dolphins. There were also catches of yellowfin taken in floating-object sets, with most of these fish being about 40 cm in length. Larger fish (>100 cm) were taken in the unassociated fishery in the South, and fish of about 50 to 150 cm were taken in the dolphin fishery in the Northern and Inshore areas.

The estimated size compositions of the yellowfin caught by all fisheries combined during the fourth quarter of 2001-2006 are shown in Figure 5b. The average weights of the yellowfin caught during the fourth quarter of 2006 were considerably less than those of the fish caught during the previous five years. A mode of yellowfin between 40 and 50 cm in length appeared during the fourth quarter. This mode has been present during the fourth quarter of every year since 2000.

There are eight fisheries for skipjack defined for stock assessments: four associated with floating objects, two unassociated school, one associated with dolphins, and one pole-and-line (Figure 4). The last two fisheries include all 13 sampling areas. Of the 214 wells sampled, 189 contained skipjack. The estimated size compositions of these fish during the fourth quarter of 2006 are shown in Figure 6a. The catches of skipjack continued to be good in the floating-object fishery in the Equatorial region. Relative to the third quarter of 2006, the catches increased in the Southern unassociated and floating-object fisheries and decreased in the Northern floating-

object and unassociated fisheries. Small amounts of skipjack were taken by pole-and-line vessels and in the dolphin fisheries.

The estimated size compositions of the skipjack caught by all fisheries combined during the fourth quarter of 2001-2006 are shown in Figure 6b. The majority of the skipjack caught during the fourth quarter ranged between about 50 and 70 cm. The average weight of the fish caught during 2006 was greater than those of the fish caught during 2001-2002 and 2004-2005, but less than that of the fish caught during 2003.

There are seven surface fisheries for bigeye defined for stock assessments: four associated with floating objects, one unassociated school, one associated with dolphins, and one pole-and-line (Figure 4). The last three fisheries include all 13 sampling areas. Of the 214 wells sampled, 76 contained bigeye. The estimated size compositions of these fish during the fourth quarter of 2006 are shown in Figure 7a. During the fourth quarter the bigeye catches remained high in the Northern floating-object fishery and increased relative to the third quarter of 2006 in both the Equatorial and Southern floating-object fisheries. The mode centered at about 115 cm in the Equatorial floating-object fishery during the fourth quarter had been virtually absent during the third quarter. Negligible amounts of bigeye were caught in the Inshore floating-object fishery and the unassociated fishery. No catches of bigeye in dolphin sets or by pole-and-line vessels during the fourth quarter were recorded.

The estimated size compositions of the bigeye caught by all fisheries combined during the fourth quarter of 2001-2006 are shown in Figure 7b. The average weight of bigeye caught during the fourth quarter of 2006 was greater than those of the fourth quarter catches of 2001-2002 and 2004-2005, but less than that of the fourth quarter catch of 2003.

Observer program

Coverage

The Agreement on the International Dolphin Conservation Program (AIDCP) requires 100-percent coverage by observers on trips by purse seiners with carrying capacities greater than 363 metric tons that fish for tunas in the eastern Pacific Ocean (EPO). This mandate is carried out by the AIDCP On-Board Observer Program, made up of the IATTC's international observer program and the observer programs of Colombia, Ecuador, the European Union, Mexico, Nicaragua, Panama, and Venezuela. The observers are biologists trained to collect a variety of data on the mortalities of dolphins associated with the fishery, sightings of dolphin herds, catches of tunas and bycatches of fish and other animals, oceanographic and meteorological data, and other information used by the IATTC staff to assess the conditions of the various stocks of dolphins, study the causes of dolphin mortality, and assess the effect of the fishery on tunas and other components of the ecosystem. The observers also collect data relevant to compliance with the provisions of the AIDCP, and data required for the tuna-tracking system established under the AIDCP, which tracks the "dolphin-safe" status of tuna caught in each set from the time it is captured until it is unloaded (and, after that, until it is canned and labeled).

In 2007 the observer programs of Colombia, the European Union, Mexico, Nicaragua, Panama, and Venezuela are to sample half, and that of Ecuador approximately one-third, of the

trips by vessels of their respective fleets, while IATTC observers are to sample the remainder of those trips. Except as described in the next paragraph, the IATTC is to cover all trips by vessels registered in other nations that are required to carry observers.

At the fifth meeting of the Parties to the AIDCP in June 2001, observers from the international observer program of the South Pacific Forum Fisheries Agency (FFA) were approved to collect pertinent information for the On-Board Observer Program, pursuant to Annex II (9) of the AIDCP in cases for which the Director determines that the use of an observer from the AIDCP On-Board Observer Program is not practical.

Observers from the On-Board Observer Program departed on 240 fishing trips aboard purse seiners covered by that program during the first quarter of 2007. Preliminary coverage data for these vessels during the quarter are shown in Table 7.

Training

One IATTC observer training course was conducted during the quarter. It was held in Panama, R.P, on 18 January-2 February, 2007, for 16 trainees, 6 of whom were from the Panamanian national observer program.

RESEARCH

Tuna tagging

During the period of 8 January to 5 February 2007, 38 yellowfin tuna were tagged and released with Lotek LTD 2310 geolocating archival tags off the IATTC Achotines Laboratory, Panama, in the vicinity of the Islas Los Frailes. The fish ranged in length from 54 to 77 cm, with an average of 62.4 cm. This project was done in conjunction with the Tagging of Pacific Pelagics (TOPP) program, which is being conducted within the framework of the Census of Marine Life (COML). TOPP is a program using electronic tagging technology to study the movements of large open-ocean animals and the oceanographic factors influencing their behavior. The project calls for the expanded geographical distribution of deployments of archival tags in yellowfin tuna in the eastern Pacific Ocean (EPO). Deployments of archival tags on yellowfin by the IATTC staff since 2002 have taken place mostly off northern and southern Baja California, Mexico, but also, during 2006, at the Revillagigedo Islands and in the equatorial EPO west of Ecuador.

During the period of 11-28 February 2007, yellowfin and skipjack tunas and wahoo were tagged and released aboard the 28-m San Diego-based long-range sport-fishing vessel *Royal Star,* within the Revillagigedo Islands Marine Reserve, Mexico. The yellowfin were tagged with archival tags, conventional dart tags, or intramuscular tags, the skipjack with archival tags, and the wahoo with conventional or intramuscular tags. (Intramuscular tags are applied, with tagging poles, in the water, which reduces the stress to the fish, but makes it infeasible to measure them. They were used on the larger yellowfin, except those that were tagged with archival tags, and on nearly all of the wahoo.) This project, a collaborative effort between the IATTC, the Instituto Nacional de la Pesca of Mexico, and the owners of the *Royal Star*, provides a unique opportunity to conduct a scientific evaluation of the movements and behavior of yellowfin tuna and wahoo within the Reserve and in areas to which the fish might move. The cruise was highly successful,

as 537 yellowfin, 160 of which weighed between 45 and 110 kg, were tagged with conventional or intramuscular tags. In addition, 65 yellowfin, of which 35 weighed between 45 and 90 kg, were tagged with archival tags. Also, 12 skipjack (6-7 kg) were tagged with archival tags and 120 wahoo (mostly 9-18 kg) were tagged with conventional or intramuscular tags.

Early life history studies

Yellowfin broodstock

The yellowfin broodstock in Tank 1 (1,362,000 L) at the Achotines Laboratory spawned daily during the quarter, except on 12, 14, 19, 21, and 22 January and on 9, 11, and 24-26 February. Spawning occurred between 3:20 p.m. and 11:45 p.m. The numbers of eggs collected after each spawning event ranged from about 4,000 to 884,000. The water temperatures in the tank ranged from 23.6° to 28.4°C during the quarter.

Two males (24 and 30 kg) and two females (3 and 36 kg) died during the quarter. The two males died from striking the tank wall, the small female from post-transfer stress, and the large female from starvation. At the end of March there were 13 47- to 59-kg and 9 6- to 14-kg yellowfin tuna in Tank 1.

From January 2003 through July 2005 archival tags had been implanted in yellowfin tuna (IATTC Quarterly Reports for January-March 2003, April-June 2004, October-December 2004, and July-September 2005), and at the end of December, five fish from those groups remained in Tank 1. In late January 2007 10 yellowfin (4 to 10 kg) held in the 170,000-L reserve broodstock tank (Tank 2) were implanted with prototype archival tags and transferred to Tank 1.

Rearing of yellowfin eggs, larvae, and juveniles

During the quarter the following parameters were recorded for most spawning events: times of spawning, egg diameter, duration of egg stage, hatching rate, lengths of hatched larvae, and duration of yolk-sac stage. The weights of the eggs, yolk-sac larvae, and first-feeding larvae, and the lengths and selected morphometrics of these, were measured periodically.

Studies of snappers

The work on spotted rose snappers (*Lutjanus guttatus*) was carried out by the Panamanian government organization Dirección General de Recursos Marinos y Costeros (DGRMC) until late 2006, at which time the DGRMC was integrated into the new Autoridad de los Recursos Acuáticos de Panamá (ARAP).

Two separate broodstocks of snappers are being kept in two 85,000-L tanks. The first consists of 15 individuals from the original broodstock caught in 1996. They spawned six times during the quarter.

The second group consists of 25 individuals from a group bred at the Laboratory from eggs obtained from spawning in 1998. These fish did not spawn during the quarter.

Mr. Amado Cano of ARAP and Achotines Laboratory staff members raised several thousand juvenile Pacific spotted rose snappers during the latter part of 2006. These juvenile snappers were used for simulated and actual shipment trials to determine the best methods, age, and size for shipping young snappers to grow-out facilities. The majority of these fish were taken from the Achotines Laboratory on 11 January 2007 and arrived the same day at an ARAP aquaculture facility in Vacamonte, Panama. There was very little mortality during this transfer. Several hundred fish were held back for further simulated shipment trials, and were then released in Achotines Bay on 30 January 2007. A grant from the Secretaría Nacional de Ciencia, Tecnología e Innovación **(**SENACYT) of Panama covered the cost of these trials and transfers.

Visitors at the Achotines Laboratory

Mr. Bill Boyce, host of the television show "IGFA Anglers Digest," visited the Achotines Laboratory on 22 January 2007, where he filmed the implantation of archival tags and some general laboratory scenes for use in his show. (IGFA stands for International Game Fish Association.)

Oceanography and meteorology

Surface winds blow almost constantly over northern South America, which causes upwelling of cool, nutrient-rich subsurface water along the equator east of 160ºW, in the coastal regions off South America, and in offshore areas off Mexico and Central America. El Niño events are characterized by weaker-than-normal easterly surface winds, which cause above-normal sea-surface temperatures (SSTs) and sea levels and deeper-than-normal thermoclines over much of the tropical eastern Pacific Ocean (EPO). In addition, the Southern Oscillation Indices (SOIs) are negative during El Niño episodes. (The SOI is the difference between the anomalies of sea-level atmospheric pressure at Tahiti, French Polynesia, and Darwin, Australia. It is a measure of the strength of the easterly surface winds, especially in the tropical Pacific in the Southern Hemisphere.) Anti-El Niño events, which are the opposite of El Niño events, are characterized by stronger-than-normal easterly surface winds, below-normal SSTs and sea levels, shallower-than-normal thermoclines, and positive SOIs. Two additional indices, the NOI* (Progress Ocean., 53 (2-4): 115-139) and the SOI*, have recently been devised. The NOI* is the difference between the anomalies of sea-level atmospheric pressure at the North Pacific High (35°N-130°W) and Darwin, Australia, and the SOI* is the difference between the anomalies of sea-level atmospheric pressure at the South Pacific High (30°S-95°W) and Darwin. Ordinarily, the NOI* and SOI* values are both negative during El Niño events and positive during anti-El Niño events.

During 2005 the SSTs were nearly normal, although there were small areas of cool water, mostly near the coast, and small areas of warm water, mostly offshore, during nearly every month. During the first quarter of 2006 there was a narrow band of cool water that extended along the equator from as far east as about 90°W (in March) to as far west as about 180° (in February). In addition, there were large areas of warm water, mostly south of 20°S, during the first quarter. The narrow band of cool water that had occurred along the equator during the first quarter was not present during the second quarter. The large area of warm water that was present south of 20°S during March persisted in April, extending as far eastward as 100°W, but its area decreased considerably in May and it was absent in June. During July there was a fairly

extensive area of cool water off Mexico. During August there was a small area of warm water off northern Mexico and some small areas of warm water along the equator. In September there were three larger areas of warm water along the equator from the coast of South America to west of 180° and a small area of warm water off Baja California. The SSTs were more than 1°C above normal along the equator from near the coast to about 170°E throughout the fourth quarter. In addition, there were areas of warm water off northern and central Mexico and in a few other scattered areas during that quarter (IATTC Quarterly Report for October-December 2006: Figure 11). During January 2007 there was a narrow strip of warm water extending along the equator from the Galapagos Islands to about 130°W and an area of cool water off Mexico at about 10°N. In February the former was replaced by a narrow strip of cool water extending from about 120°W to about 135°W. The latter persisted in February. An area of warm water appeared off northern Chile during that month. In March a narrow band of cool water extended along the equator from the coast to about 110°W (Figure 8). The data in Table 8 are mixed, but overall they are indicative of transition from a weak El Niño event to an anti-El Niño event. Most notably, the thermocline was shallow along the equator at 80°W and 110°W. No patterns are evident in the data for the SOIs, SOI*s, and NOI*s. However, the NOI* value for January, 8.06, is the second-greatest value on record, being exceeded only by a value of 8.10 for December 1998. (The series of data for NOI* extends from January 1948 to March 2007.) According to the Climate Diagnostics Bulletin of the U.S. National Weather Service for March 2007, "A transition from ENSO-neutral to [anti-El Niño] conditions is possible during the next 3 months."

GEAR PROGRAM

During the first quarter IATTC staff members participated in seven dolphin safety-gear inspection and safety-panel alignment procedures, all aboard Mexican-flag purse seiners.

COLLECTION OF AT-SEA AND SUPPLEMENTAL RETAINED CATCH DATA FOR SMALL PURSE SEINERS

The U.S. National Oceanic and Atmospheric Administration has awarded the IATTC a contract to place observers, on a voluntary basis, on sufficient numbers of trips of "Class-5" purse seiners (vessels with carrying capacities of 273-363 metric tons) based in ports on the Pacific Coast of Latin America to obtain data on "catch, bycatch, interaction with protected species, and gear" for 1,000 days at sea per year and to "sample 100 percent of the in-port unloadings of Class 4-5 purse seine vessels [vessels with well capacities of 182-363 metric tons]." If that is not possible, observers can be placed on sufficient numbers of trips of Class-3 and/or -4 vessels (vessels with well capacities of 92-272 metric tons) to bring the total numbers of days at sea observed to 1,000.

No observers were placed on vessels during the first quarter. The numbers of trips completed and the numbers of samples taken were as follows:

Month	Trips completed	Samples taken	Fish sampled		
			Yellowfin	Skipjack	Bigeye
January	13	13	3,308	550	100
February	15	15	6,349	800	50
March	21	21	3,922	850	0
Total	49	49	13,579	2,200	150

INTER-AGENCY COOPERATION

Mr. Vernon P. Scholey visited the southern bluefin tuna broodstock facilities and kingfish hatchery of Clean Seas Tuna in Arno Bay, Australia, on 20-23 February 2007. During his stay he discussed areas of potential joint research for biologists from Clean Seas and the IATTC that could be carried out at the Achotines Laboratory. His travel expenses were paid for by Clean Seas Tuna.

Two grant proposals submitted to the Secretaría Nacional de Ciencia, Tecnología e Innovación **(**SENACYT) of Panama were approved and will provide funding over three years for research to be carried out at the Achotines Laboratory. The first, "*Estudio sobre métodos de colecta, transferencia, y cultivo de pez vela del Indo pacificó {sic.] (*Istiophorus platypterus*) y de wahoo (*Acanthocybium solandri*) a el [sic.] Laboratorio Achotines, Republica de Panamá,*" will restart efforts to capture, transfer, and maintain sailfish in captivity (and will now add wahoo as a target) in a joint project that had been in progress with the University of Miami for several years. The second, "*Actualizar técnicas de cultivo, mantenimiento y optimización de microalgas marinas, con el fin de organizar una colección con especies de uso en la acuicultura,*" will support the establishment of a microalgae culture collection at the Achotines Laboratory. Only 28 of the 249 proposals submitted to SENACYT were financed.

PUBLICATIONS

IATTC

Status of the tuna and billfish stocks in 2005. IATTC Stock Assessment Report 7: 297 pp.

Outside journals

Harley, Shelton J., and Jenny M. Suter. 2007. The potential use of time-area closures to reduce catches of bigeye tuna (*Thunnus obesus*) in the purse-seine fishery of the eastern Pacific Ocean. U.S. Nat. Mar. Fish. Serv., Fish. Bull., 105 (1): 49-61.

Minami, M., C. E. Lennert-Cody, W. Gao, and M. Román-Verdesoto. 2007. Modeling shark bycatch: the zero-inflated negative binomial regression model with smoothing. Fish. Res., 84 (2): 210-221.

Olson, Robert J., and Jock W. Young. 2007. CLIOTOP/PFRP workshop: the role of squid in pelagic marine ecosystems. PFRP [Pelagic Fisheries Research Program, University of Hawaii at Manoa], 12 (1): 2-4.

Wexler, Jeanne B., Seinen Chow, Toshie Wakabayashi, Kenji Nohara, and Daniel Margulies. 2007. Temporal variation in growth of yellowfin tuna (*Thunnus albacares*) larvae in the Panama Bight, 1990-97. U.S. Nat. Mar. Fish. Serv., Fish. Bull., 105 (1):1-18.

Young, J. and R. Olson. 2007. Workshop report: the ecological role of squid in pelagic ecosystems, University of Hawaii, Honolulu 16-17 November 2006. GLOBEC International Newsletter 13 (1): 43-44.

ADMINISTRATION

Mr. Alejandro Pérez Rodríguez, a graduate of the Universidad de La Laguna in San Cristobal de La Laguna, Spain, began employment as a "Fisheries Information Systems Specialist" at the IATTC's La Jolla office on January 16, 2007. More specifically, he will be responsible for assembling and archiving catch, effort, and length-frequency data gathered by IATTC staff members and furnished by outside agencies, creating and maintaining data bases necessary for meeting the IATTC staff's responsibilities, using these data bases to assemble information for IATTC reports and for the IATTC web site, and complying with requests for statistical and length-frequency information from outside organizations and individuals.

Mr. Alexandre Aires-da-Silva, a Ph.D. candidate at the University of Washington, Seattle, Washington, USA, joined the IATTC staff on 23 March 2007. He has replaced Mr. Simon D. Hoyle, who resigned in July 2006.

Ms. Alejandra Ferreira resigned her position as secretary to the Director on 31 March 2007. Ms. Ferreira began working for the IATTC in February 2002, and quickly established herself as an excellent worker. She will be missed, but everyone wishes her the best in her future endeavors.

Ms. Mónica Galván, another member of the secretarial staff, has taken Ms. Ferreira's place, and Ms. Cynthia Sacco, a graduate of Universidad Columbia, Asunción, Paraguay, who began work on 26 March 2007, has taken Ms. Galván's place.

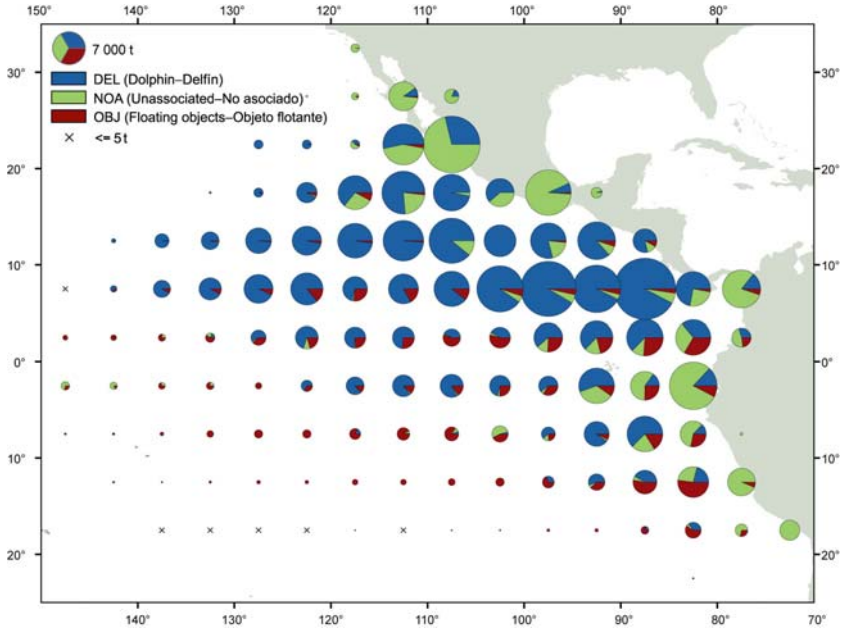

FIGURE 1a. Average annual distributions of the purse-seine catches of yellowfin, by set type, 1996-2005. The sizes of the circles are proportional to the amounts of yellowfin caught in those 5° by 5° areas.
FIGURA 1a. Distribución media anual de las capturas cerqueras de aleta amarilla, por tipo de lance, 1996-2005. El tamaño de cada círculo es proporcional a la cantidad de aleta amarilla capturado en la cuadrícula de 5° x 5° correspondiente.

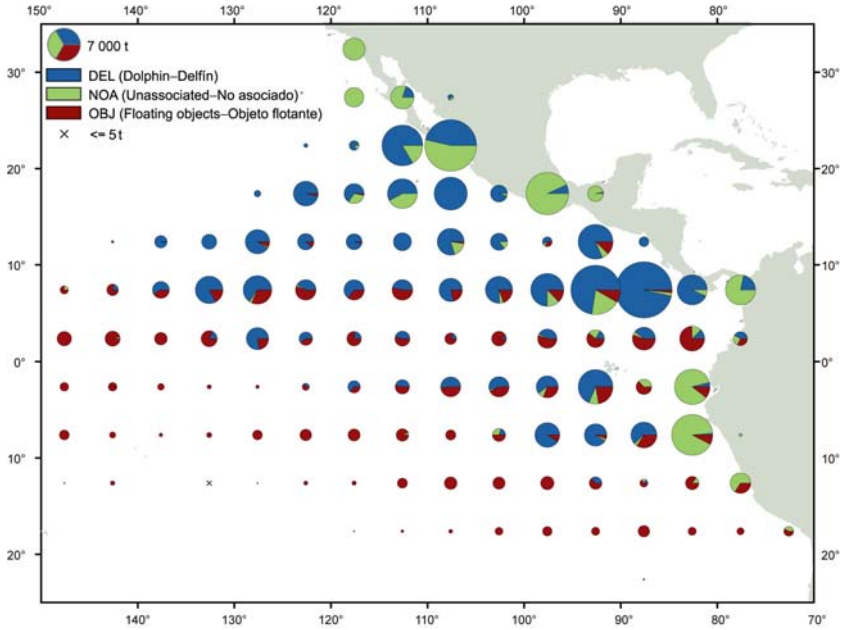

FIGURE 1b. Average annual distributions of the purse-seine catches of yellowfin, by set type, 2006. The sizes of the circles are proportional to the amounts of yellowfin caught in those 5° by 5° areas.
FIGURA 1b. Distribución media anual de las capturas cerqueras de aleta amarilla, por tipo de lance, 2006. El tamaño de cada círculo es proporcional a la cantidad de aleta amarilla capturado en la cuadrícula de 5° x 5° correspondiente.

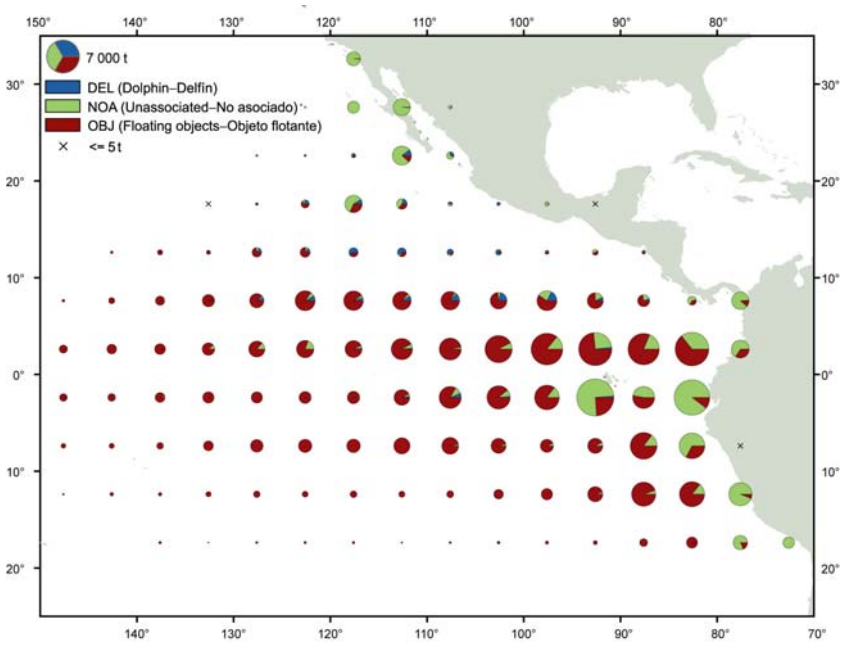

FIGURE 2a. Average annual distributions of the purse-seine catches of skipjack, by set type, 1996-2005. The sizes of the circles are proportional to the amounts of skipjack caught in those 5° by 5° areas.
FIGURA 2a. Distribución media anual de las capturas cerqueras de barrilete, por tipo de lance, 1996-2005. El tamaño de cada círculo es proporcional a la cantidad de barrilete capturado en la cuadrícula de 5° x 5° correspondiente.

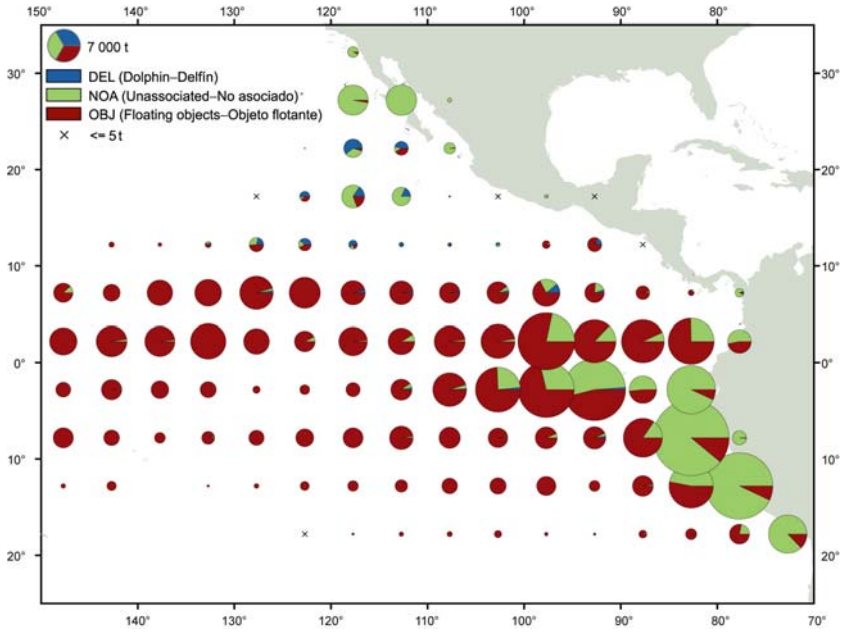

FIGURE 2b. Average annual distributions of the purse-seine catches of skipjack, by set type, 2006. The sizes of the circles are proportional to the amounts of skipjack caught in those 5° by 5° areas.
FIGURA 2b. Distribución media anual de las capturas cerqueras de barrilete, por tipo de lance, 2006. El tamaño de cada círculo es proporcional a la cantidad de barrilete capturado en la cuadrícula de 5° x 5° correspondiente.

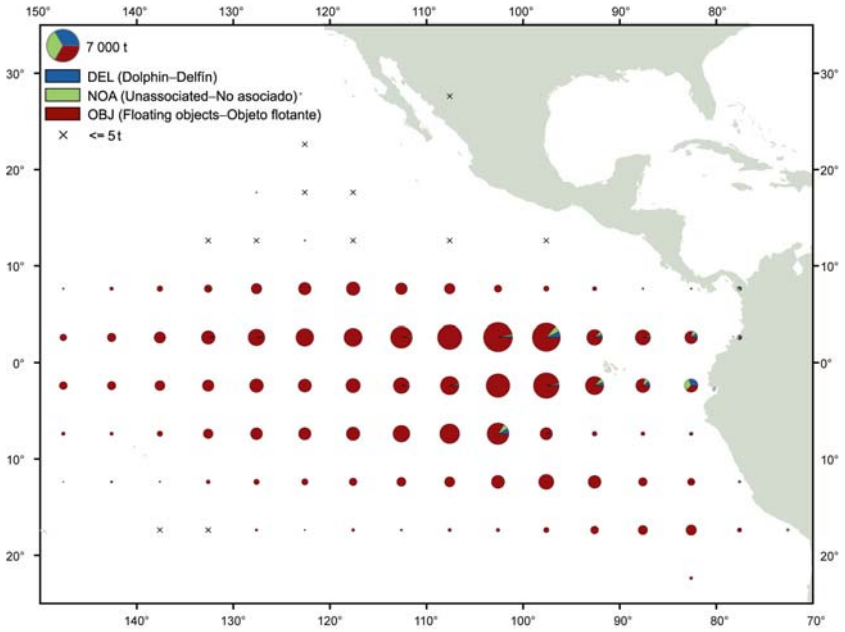

FIGURE 3a. Average annual distributions of the purse-seine catches of bigeye, by set type, 1996-2005. The sizes of the circles are proportional to the amounts of bigeye caught in those 5° by 5° areas.
FIGURA 3a. Distribución media anual de las capturas cerqueras de patudo, por tipo de lance, 1996-2005. El tamaño de cada círculo es proporcional a la cantidad de patudo capturado en la cuadrícula de 5° x 5° correspondiente.

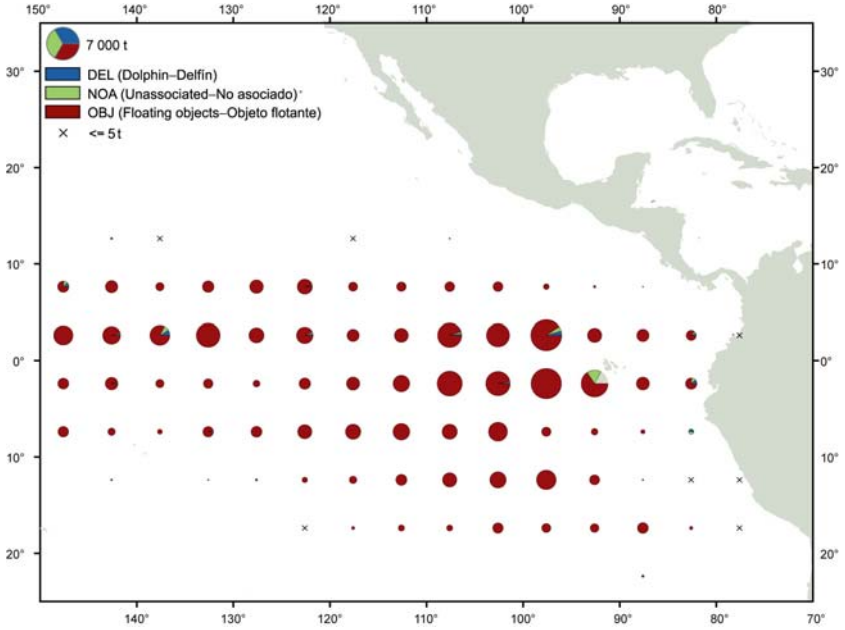

FIGURE 3b. Average annual distributions of the purse-seine catches of bigeye, by set type, 2006. The sizes of the circles are proportional to the amounts of bigeye caught in those 5° by 5° areas.
FIGURA 3b. Distribución media anual de las capturas cerqueras de patudo, por tipo de lance, 2006. El tamaño de cada círculo es proporcional a la cantidad de patudo capturado en la cuadrícula de 5° x 5° correspondiente.

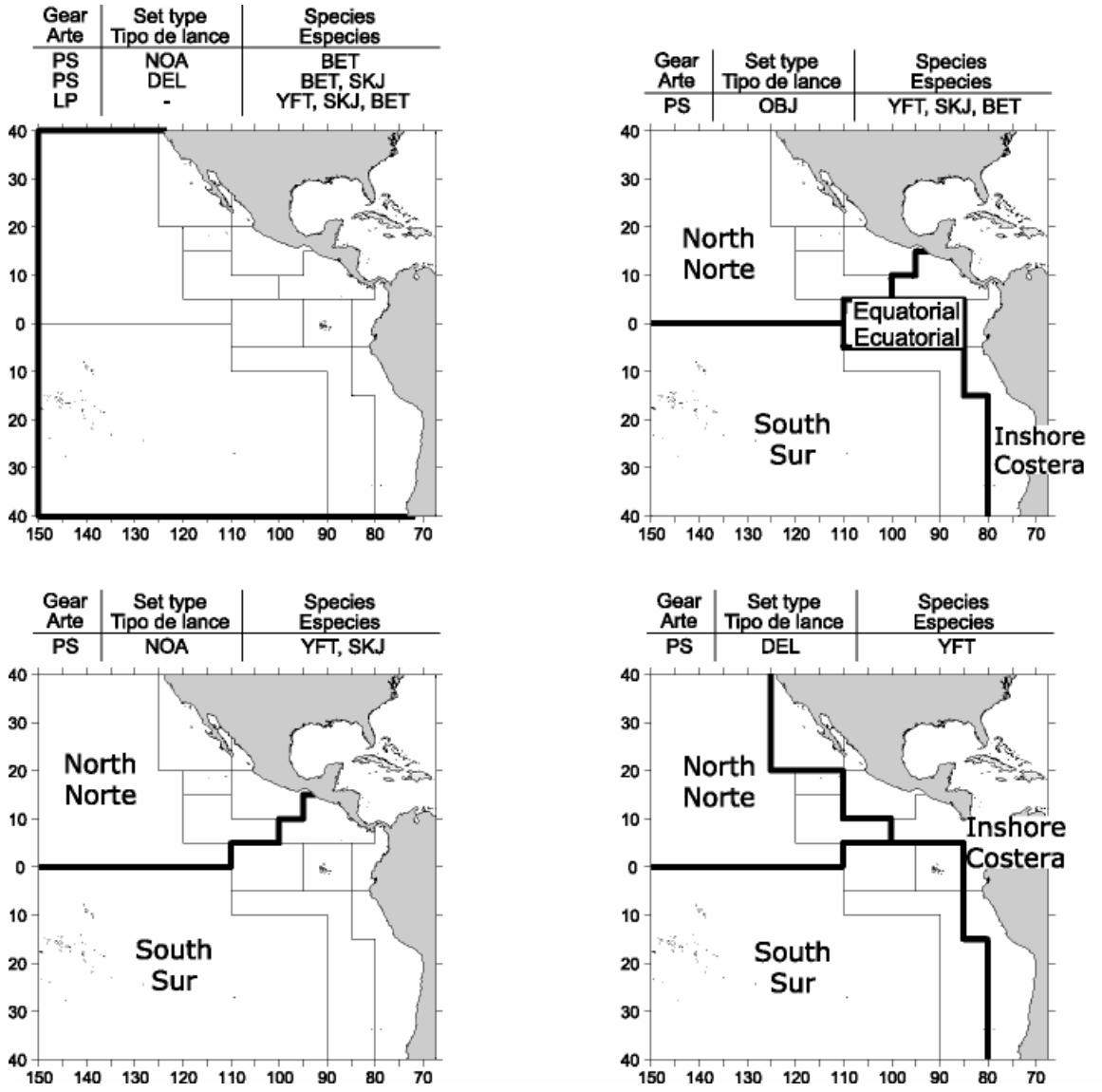

FIGURE 4. Spatial extents of the fisheries defined by the IATTC staff for stock assessment of yellowfin, skipjack, and bigeye in the EPO. The thin lines indicate the boundaries of the 13 length-frequency sampling areas, and the bold lines the boundaries of the fisheries. Gear: PS = purse seine, LP = pole and line; Set type: NOA = unassociated, DEL = dolphin, OBJ = floating object; Species: YFT = yellowfin, SKJ = skipjack, BET = bigeye.

FIGURA 4. Extensión espacial de las pesquerías definidas por el personal de la CIAT para la evaluación de las poblaciones de atún aleta amarilla, barrilete, patudo, y aleta azul en el OPO. Las líneas delgadas indican los límites de las 13 zonas de muestreo de frecuencia de tallas, y las líneas gruesas los límites de las pesquerías. Artes: PS = red de cerco, LP = caña; Tipo de lance: NOA = no asociado, DEL = delfín; OBJ = objeto flotante; Especies: YFT = aleta amarilla, SKJ = barrilete, BET = patudo.

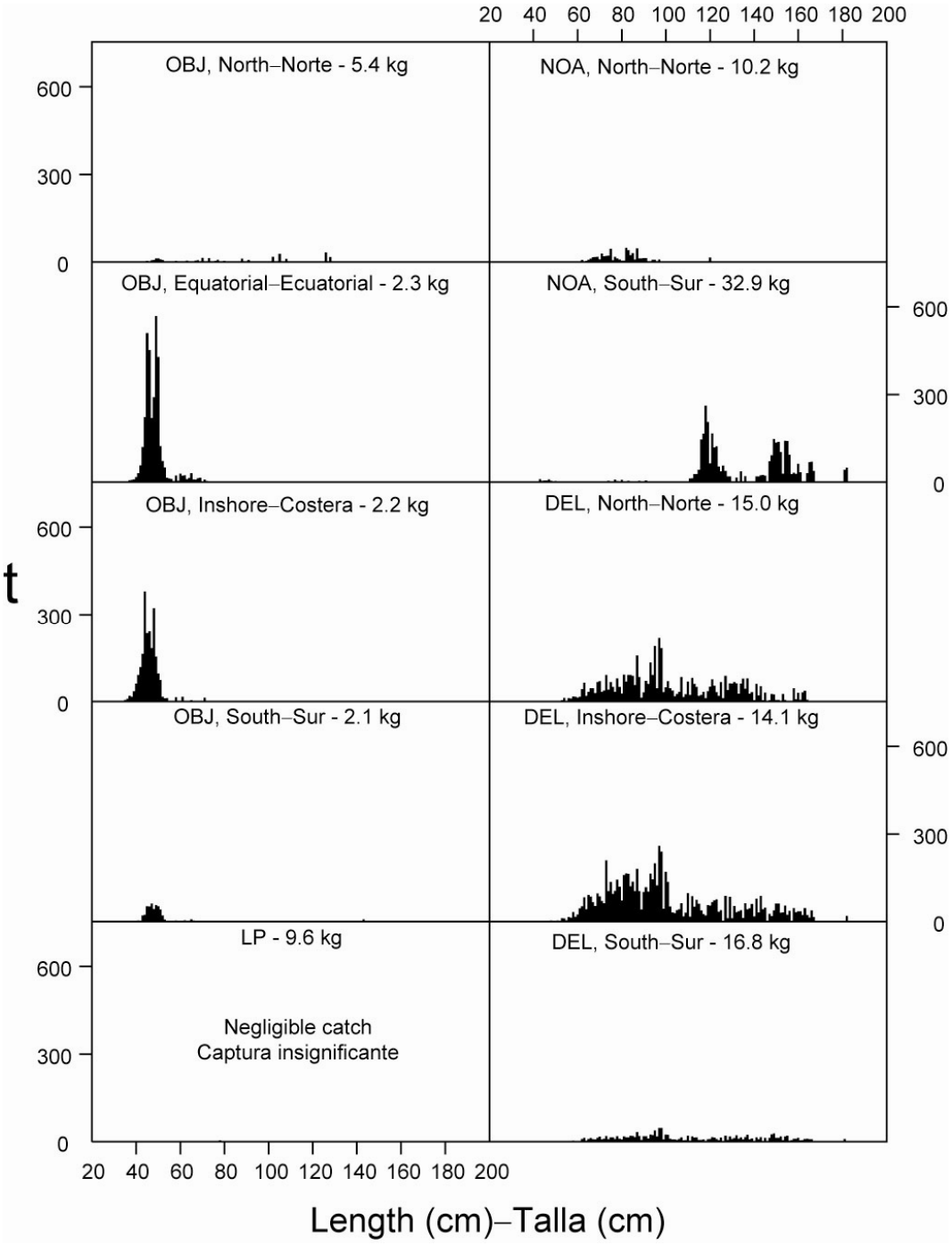

FIGURE 5a. Estimated size compositions of the yellowfin caught in each fishery of the EPO during the fourth quarter of 2006. The average weights of the fish in the samples are given at the tops of the panels. t = metric tons; OBJ = floating object; LP = pole and line; NOA = unassociated; DEL = dolphin.

FIGURA 5a. Composición por tallas estimada para el aleta amarilla capturado en cada pesquería del OPO durante el cuarto trimestre de 2006. En cada recuadro se detalla el peso promedio de los peces en las muestras. t = toneladas métricas; OBJ = objeto flotante; LP = caño; NOA = unassociated; DEL = delfín.

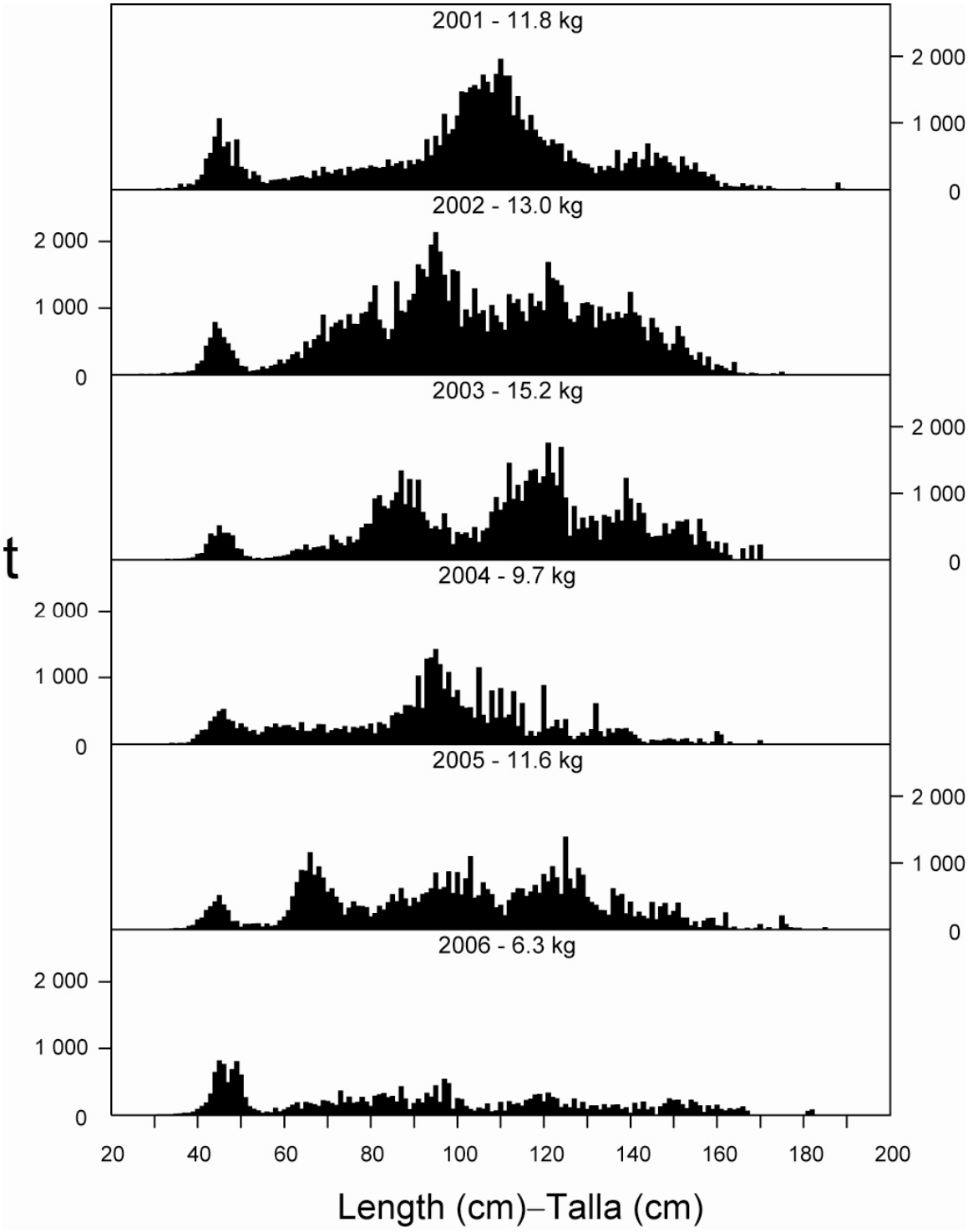

FIGURE 5b. Estimated size compositions of the yellowfin caught in the EPO during the fourth quarter of 2001-2006. The average weights of the fish in the samples are given at the tops of the panels. t = metric tons.

FIGURA 5b. Composición por tallas estimada para el aleta amarilla capturado en el OPO en el cuarto trimestre de 2001-2006. En cada recuadro se detalla el peso promedio de los peces en las muestras. t = toneladas métricas.

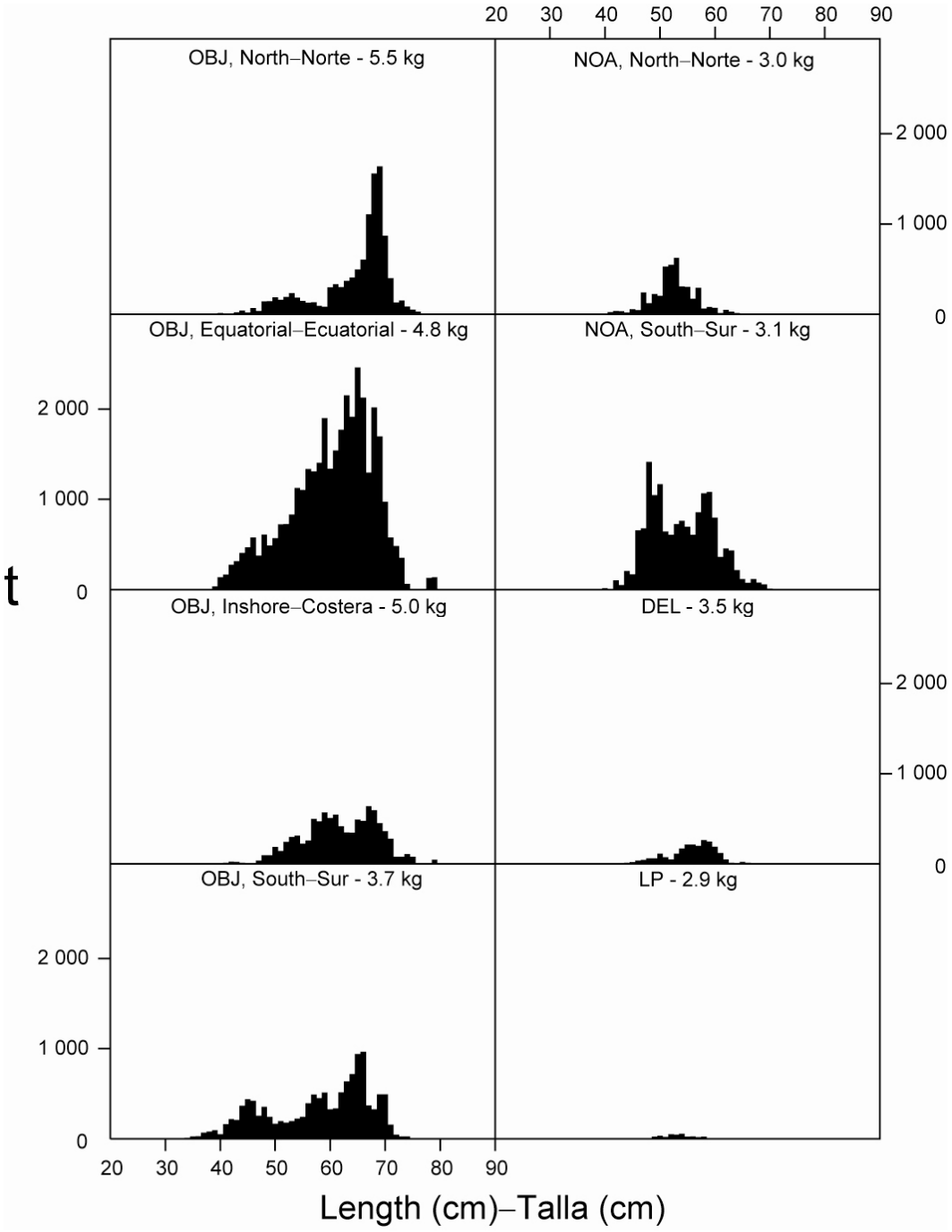

FIGURE 6a. Estimated size compositions of the skipjack caught in each fishery of the EPO during the fourth quarter of 2006. The average weights of the fish in the samples are given at the tops of the panels. t = metric tons; OBJ = floating object; LP = pole and line; NOA = unassociated; DEL = dolphin.

FIGURA 6a. Composición por tallas estimada para el barrilete capturado en cada pesquería del OPO durante el cuarto trimestre de 2006. En cada recuadro se detalla el peso promedio de los peces en las muestras. t = toneladas métricas; OBJ = objeto flotante; LP = caño; NOA = unassociated; DEL = delfín.

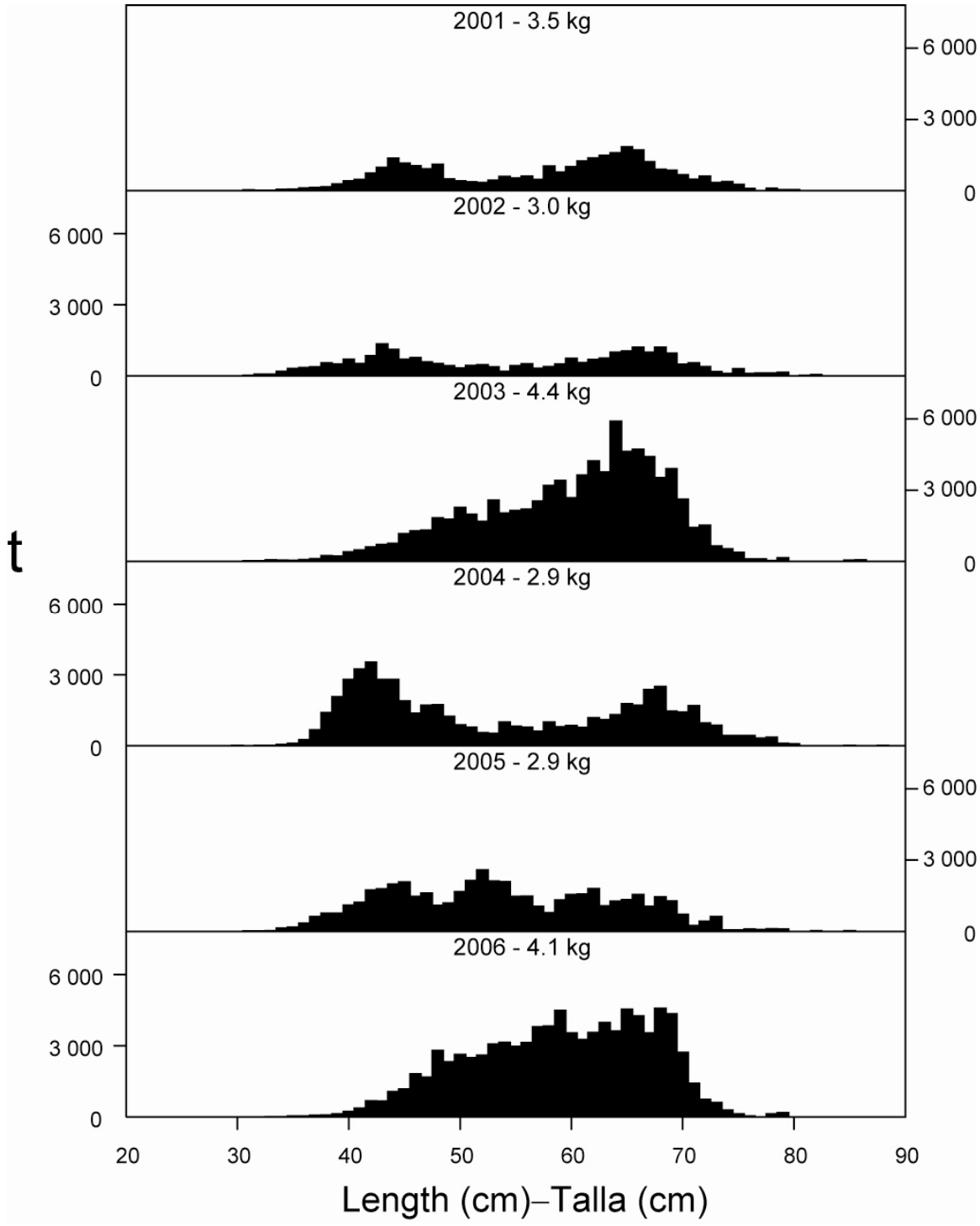

FIGURE 6b. Estimated size compositions of the skipjack caught in the EPO during the fourth quarter of 2001-2006. The average weights of the fish in the samples are given at the tops of the panels. t = metric tons.
FIGURA 6b. Composición por tallas estimada para el barrilete capturado en el OPO en el cuarto trimestre de 2001-2006. En cada recuadro se detalla el peso promedio de los peces en las muestras. t = toneladas métricas.

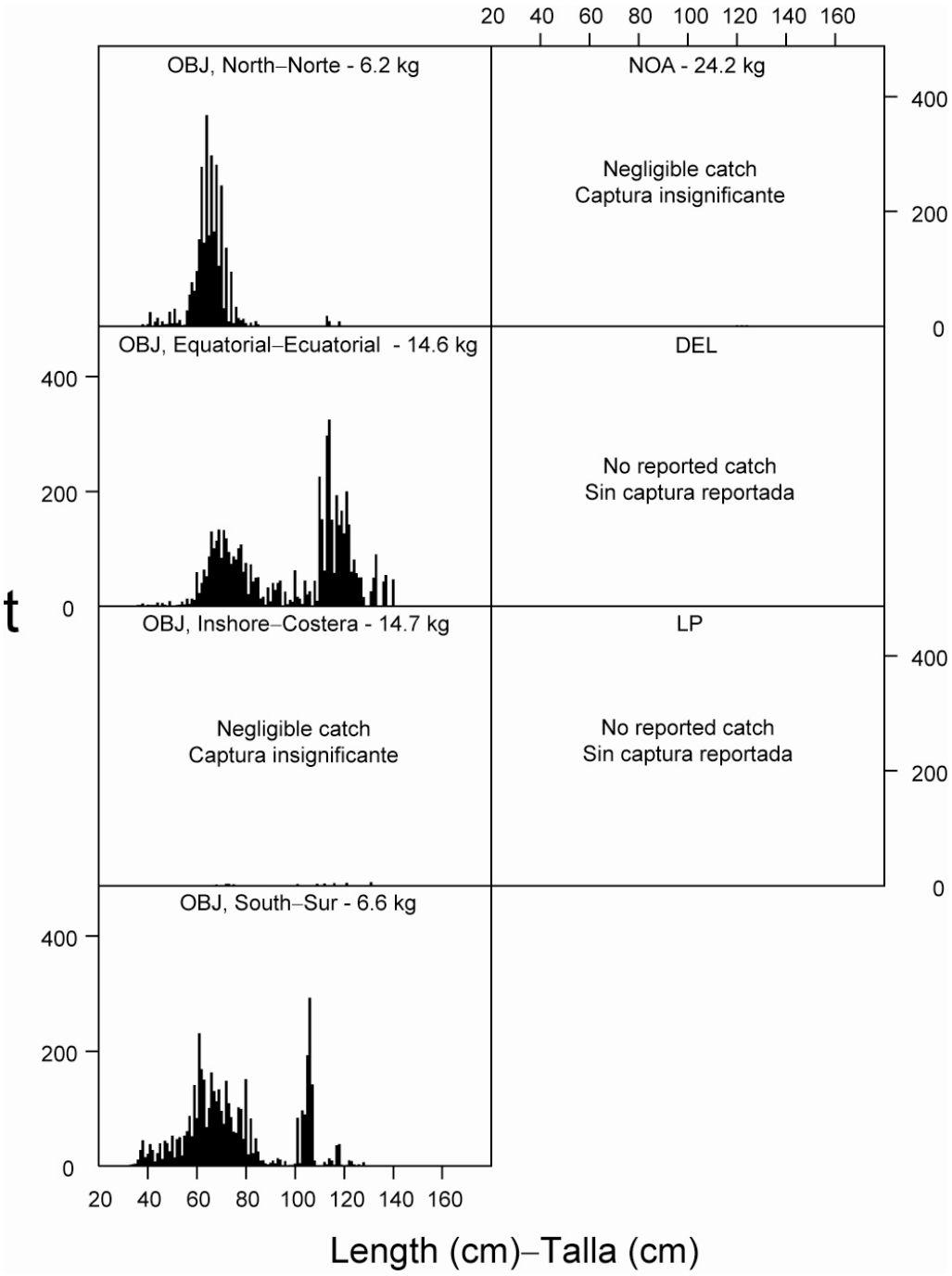

FIGURE 7a. Estimated size compositions of the bigeye caught in each fishery of the EPO during the fourth quarter of 2006. The average weights of the fish in the samples are given at the tops of the panels. t = metric tons; OBJ = floating object; LP = pole and line; NOA = unassociated; DEL = dolphin.

FIGURA 7a. Composición por tallas estimada para el patudo capturado en cada pesquería del OPO durante el cuarto trimestre de 2006. En cada recuadro se detalla el peso promedio de los peces en las muestras. t = toneladas métricas; OBJ = objeto flotante; LP = caño; NOA = unassociated; DEL = delfín.

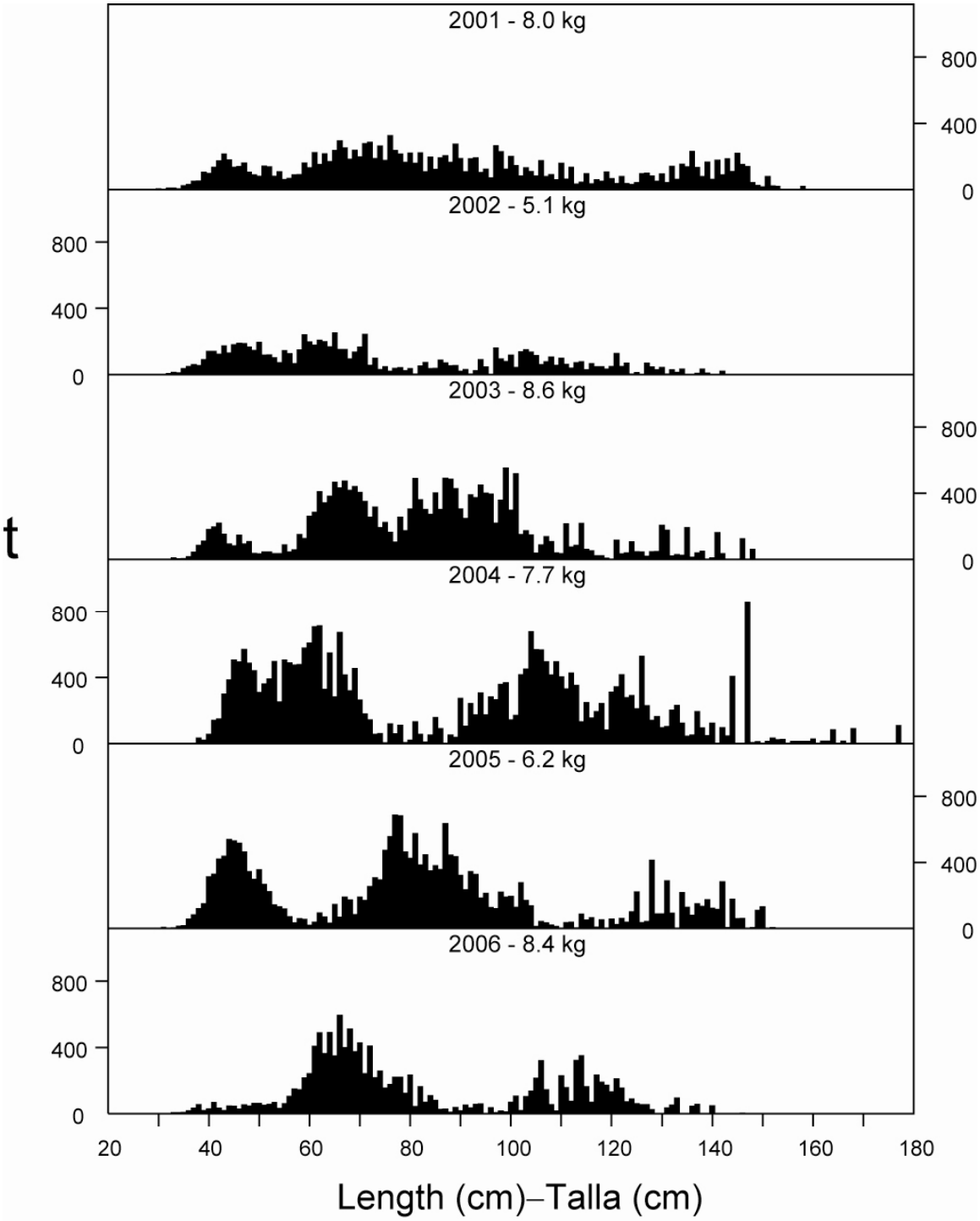

FIGURE 7b. Estimated size compositions of the bigeye caught in the EPO during the fourth quarter of 2001-2006. The average weights of the fish in the samples are given at the tops of the panels. t = metric tons.
FIGURA 7b. Composición por tallas estimada para el patudo capturado en el OPO en el cuarto trimestre de 2001-2006. En cada recuadro se detalla el peso promedio de los peces en las muestras. t = toneladas métricas.

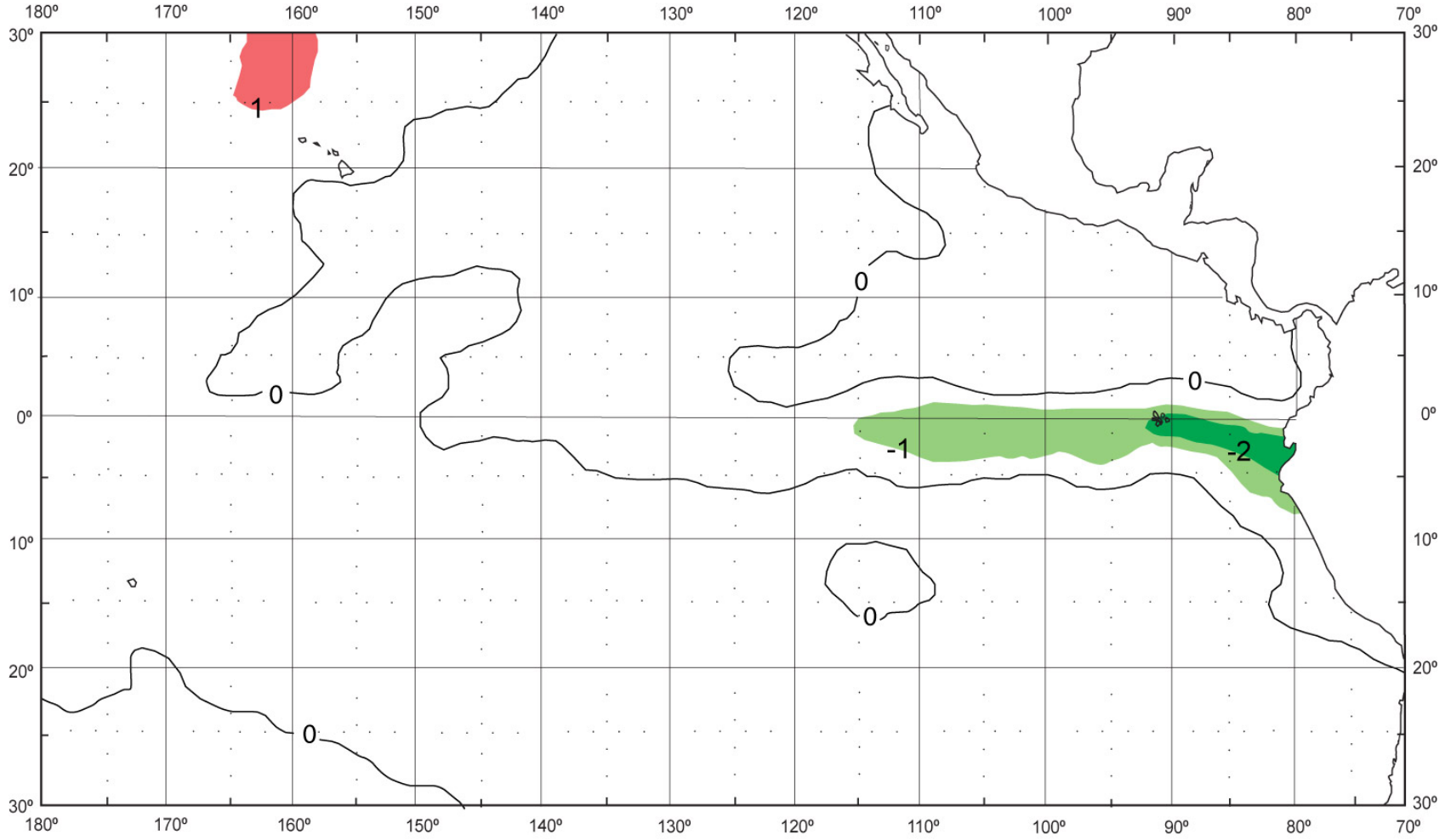

FIGURE 8. Sea-surface temperature (SST) anomalies (departures from long-term normals) for March 2007, based on data from fishing boats and other types of commercial vessels.
FIGURA 8. Anomalías (variaciones de los niveles normales a largo plazo) de la temperatura superficial del mar (TSM) en marzo de 2007, basadas en datos tomados por barcos pesqueros y otros buques comerciales.

TABLE 1. Preliminary estimates of the numbers and capacities, in cubic meters, of purse seiners and pole-and-line vessels operating in the EPO in 2007 by flag, gear, and well volume. Each vessel is included in the totals for each flag under which it fished during the year, but is included only once in the fleet total. Therefore the totals for the fleet may not equal the sums of the individual flag entries. PS = purse seine; LP = pole-and-line.

TABLA 1. Estimaciones preliminares del número de buques cerqueros y cañeros que pescan en el OPO en 2007, y de la capacidad de acarreo de los mismos, en metros cúbicos, por bandera, arte de pesca, y volumen de bodega. Se incluye cada buque en los totales de cada bandera bajo la cual pescó durante el año, pero solamente una vez en el total de la flota; por consiguiente, los totales de las flotas no son siempre iguales a las sumas de las banderas individuales. PS = cerquero; LP = cañero.

Flag Bandera	Gear Arte	Well volume–Volumen de bodega				Capacity Capacidad
		1-900	901-1700	>1700	Total	
			Number—Número			
Bolivia	PS	1	-	-	1	222
Colombia	PS	3	10	-	13	14,439
Ecuador	PS	59	16	8	83	57,925
España—Spain	PS	-	-	3	3	6,955
Guatemala	PS	-	1	-	1	1,475
Honduras	PS	1	2	-	3	2,729
México	PS	22	33	1	56	56,406
	LP	4	-	-	4	498
Nicaragua	PS	-	5	-	5	6,024
Panamá	PS	5	17	6	28	38,398
El Salvador	PS	-	1	3	4	7,415
USA—EE.UU.	PS	-	2	-	2	3,118
Unknown—Desconocida	PS	1	-	-	1	285
Venezuela	PS	-	20	2	22	29,577
Vanuatu	PS	1	1	-	2	2,163
All flags—Todas banderas	PS	93	108	23	224	
	LP	4	-	-	4	
	PS + LP	97	108	23	228	
			Capacity—Capacidad			
All flags—Todas banderas	PS	41,375	138,221	47,535	227,131	
	LP	498	-	-	498	
	PS + LP	41,873	138,221	47,535	227,629	

TABLE 2. Changes in the IATTC fleet list recorded during the first quarter of 2007. PS = purse seine.
TABLA 2. Cambios en la flota observada por la CIAT registrados durante el primer trimestre de 2007. PS = cerquero.

Vessel name	Flag	Gear	Capacity (m^3)	Remarks	
Nombre del buque	**Bandera**	**Arte**	**Capacidad (m^3)**	**Comentarios**	
Vessels added to the fleet—Buques añadidos a la flota					
New entry—1er ingreso					
				Now—Ahora	
Hanna	México	PS	1,610		
Re-entries—Reingresos					
				Now—Ahora	
Roberto M	Panamá	PS	1,161	*Pescatun*	
Cape Cod	U.S.A.	PS	1,525		
Mary Lynn	Unknown	PS	285		
Changes of name or flag—Cambios de nombre o pabellon					
				Now—Ahora	
J M Martinac	Guatemala	PS	1,475	*Antonia F*	
Maria Del Mar	México	PS	1,242	*Cabo Marzo*	
Gabriela F	Nicaragua	PS	1,449		Panamá
Victoria F	Nicaragua	PS	1,449	*Vicente F*	Panamá
Vessels removed from fleet—Buques retirados de la flota					
Tunapuy	El Salvador	PS	769		
Juan Pablo II	México	PS	250		
Tutankamon	México	PS	784	Sunk–Hundido	

TABLE 3. Preliminary estimates of the retained catches of tunas in the EPO from 1 January through 1 April 2007, by species and vessel flag, in metric tons.
TABLA 3. Estimaciones preliminares de las capturas retenidas de atunes en el OPO del 1 de enero al 1 de abril 2007, por especie y bandera del buque, en toneladas métricas**.**

Flag	Yellowfin	Skipjack	Bigeye	Pacific bluefin	Bonitos (*Sarda* spp.)	Albacore	Black skipjack	Other[1]	Total	Percentage of total
Bandera	**Aleta amarilla**	**Barrilete**	**Patudo**	**Aleta azul del Pacífico**	**Bonitos (*Sarda* spp.)**	**Albacora**	**Barrilete negro**	**Otras[1]**	**Total**	**Porcentaje del total**
Ecuador	5,361	26,259	6,361	-	-	-	-	31	38,012	29.1
Honduras	322	1,525	414	-	-	-	-	-	2,261	1.7
México	22,206	5,038	-	-	28	-	142	6	27,420	21.0
Nicaragua	1,458	1,286	433	-	-	-	-	-	3,177	2.4
Panamá	9,150	7,467	2,375	-	23	-	-	4	19,019	14.5
Venezuela	6,822	11,914	253	-	-	-	1	-	18,990	14.5
Other—Otros[2]	7,297	12,080	2,544	-	-	-	-	-	21,921	16.8
Total	52,616	65,569	12,380	-	51	-	143	41	130,800	

[1] Includes other tunas, sharks, and miscellaneous fishes
[1] Incluye otros túnidos, tiburones, y peces diversos
[2] Includes Colombia, El Salvador, Guatemala, Spain, United States, Vanuatu, and Unknown; this category is used to avoid revealing the operations of individual vessels or companies.
[2] Incluye Colombia, El Salvador, España, Estados Unidos, Guatemala, Vanuatu, y Desconocida; se usa esta categoría para no revelar información sobre faenas de buques o empresas individuales.

TABLE 4. Estimated retained and discarded catches, in metric tons, by purse-seine and pole-and-line vessels of the EPO tuna fleet. "Other" includes other tunas, sharks, and miscellaneous fishes. The 2005 and 2006 data are preliminary. Discard data were first collected by observers in 1993.

TABLA 4. Estimaciones de capturas retenidas y descartadas, en toneladas métricas, de buques cerqueros y caneros de la flota atunera del OPO. "Otros" incluye otros atunes, tiburones, y peces diversos. Los datos de 2005 y 2006 son preliminares. Los observadores toman datos sobre descartes desde 1993.

Year	Yellowfin			Skipjack			Bigeye			Pacific bluefin		
	Retained	Discarded	Total	Retained	Discarded	Total	Retained	Discarded	Total	Retained	Discarded	Total
Año	Aleta amarilla			Barrilete			Patudo			Aleta azul del Pacífico		
	Retenido	Descartado	Total	Retenido	Descartado	Total	Retenido	Descartado	Total	Retenido	Descartado	Total
1977	186,763	-	186,763	92,127	-	92,127	11,164	-	11,164	5,459	-	5,459
1978	162,687	-	162,687	178,340	-	178,340	18,539	-	18,539	5,391	-	5,391
1979	175,438	-	175,438	140,041	-	140,041	12,097	-	12,097	6,107	-	6,107
1980	144,522	-	144,522	136,138	-	136,138	21,939	-	21,939	2,909	-	2,909
1981	169,712	-	169,712	125,071	-	125,071	14,922	-	14,922	1,086	-	1,086
1982	116,292	-	116,292	104,258	-	104,258	6,981	-	6,981	3,145	-	3,145
1983	87,935	-	87,935	61,238	-	61,238	4,614	-	4,614	836	-	836
1984	138,776	-	138,776	62,743	-	62,743	8,862	-	8,862	839	-	839
1985	212,529	-	212,529	51,776	-	51,776	6,058	-	6,058	3,996	-	3,996
1986	263,049	-	263,049	67,556	-	67,556	2,685	-	2,685	5,040	-	5,040
1987	267,114	-	267,114	66,252	-	66,252	1,177	-	1,177	980	-	980
1988	281,016	-	281,016	91,437	-	91,437	1,540	-	1,540	1,380	-	1,380
1989	282,140	-	282,140	97,876	-	97,876	2,031	-	2,031	1,107	-	1,107
1990	265,926	-	265,926	75,194	-	75,194	5,920	-	5,920	1,491	-	1,491
1991	234,113	-	234,113	63,946	-	63,946	4,901	-	4,901	419	-	419
1992	231,910	-	231,910	86,239	-	86,239	7,179	-	7,179	1,928	-	1,928
1993	224,444	4,722	229,166	87,601	10,588	98,189	9,657	645	10,302	579	-	579
1994	212,034	4,691	216,725	73,367	10,472	83,839	34,900	2,261	37,160	969	-	969
1995	216,702	5,275	221,977	132,298	16,378	148,676	45,319	3,251	48,570	629	-	629
1996	242,367	6,314	248,681	106,531	24,837	131,368	61,312	5,689	67,001	8,223	-	8,223
1997	249,296	5,516	254,812	156,716	31,558	188,274	64,270	5,482	69,752	2,610	3	2,613
1998	259,043	4,718	263,761	142,315	22,856	165,171	44,128	2,853	46,982	1,772	-	1,772
1999	283,703	6,638	290,341	263,609	26,851	290,460	51,158	5,176	56,334	2,558	54	2,612
2000	257,456	6,796	264,252	205,690	26,415	232,105	93,753	5,649	99,402	3,773	-	3,773
2001	386,145	7,808	393,953	144,232	13,233	157,466	61,408	1,294	62,702	892	3	896
2002	413,357	4,019	417,376	154,014	12,625	166,639	57,437	937	58,374	1,711	6	1,718
2003	381,617	5,338	386,955	275,128	23,302	298,430	54,509	2,260	56,769	3,236	-	3,236
2004	271,347	2,967	274,314	199,206	17,555	216,761	67,337	1,588	68,925	8,880	19	8,900
2005	270,429	3,180	273,609	262,877	19,425	282,302	68,699	1,972	70,671	4,743	15	4,758
2006	167,432	1,494	168,926	308,577	13,155	321,731	71,195	1,848	73,043	9,795	-	9,795

TABLE 4. (continued)

TABLA 4. (continuación)

Year	Albacore			Bonitos (*Sarda* spp.)			Black skipjack			Other			Total		
	Retained	Discarded	Total	Retained	Discarded	Total	Retained	Discarded	Total	Retained	Discarded	Total	Retained	Discarded	Total
Año	Albacora			Bonitos (*Sarda* spp.)			Barrilete negro			Otros			Total		
	Retenido	Descartado	Total	Retenido	Descartado	Total	Retenido	Descartado	Total	Retenido	Descartado	Total	Retenido	Descartado	Total
1977	1,975	-	1,975	11,275	-	11,275	1,456	-	1,456	1,949	-	1,949	312,169	-	312,169
1978	1,734	-	1,734	4,836	-	4,836	2,170	-	2,170	807	-	807	374,504	-	374,504
1979	327	-	327	1,804	-	1,804	1,366	-	1,366	1,248	-	1,248	338,427	-	338,427
1980	601	-	601	6,125	-	6,125	3,683	-	3,683	1,109	-	1,109	317,025	-	317,025
1981	707	-	707	5,717	-	5,717	1,910	-	1,910	1,008	-	1,008	320,134	-	320,134
1982	553	-	553	2,122	-	2,122	1,338	-	1,338	784	-	784	235,473	-	235,473
1983	456	-	456	3,829	-	3,829	1,222	-	1,222	1,712	-	1,712	161,842	-	161,842
1984	5,351	-	5,351	3,514	-	3,514	663	-	663	986	-	986	221,734	-	221,734
1985	919	-	919	3,604	-	3,604	289	-	289	537	-	537	279,708	-	279,708
1986	133	-	133	490	-	490	568	-	568	1,140	-	1,140	340,661	-	340,661
1987	321	-	321	3,317	-	3,317	571	-	571	1,627	-	1,627	341,358	-	341,358
1988	288	-	288	9,550	-	9,550	956	-	956	1,295	-	1,295	387,462	-	387,462
1989	22	-	22	12,096	-	12,096	803	-	803	1,007	-	1,007	397,081	-	397,081
1990	209	-	209	13,856	-	13,856	787	-	787	910	-	910	364,293	-	364,293
1991	834	-	834	1,289	-	1,289	421	-	421	648	-	648	306,571	-	306,571
1992	255	-	255	977	-	977	104	-	104	750	-	750	329,342	-	329,342
1993	1	-	1	600	12	612	104	4,116	4,220	314	5,688	6,002	323,299	25,770	349,069
1994	85	-	85	8,693	147	8,840	188	834	1,022	418	4,953	5,371	330,651	23,358	354,009
1995	465	-	465	8,010	55	8,065	202	1,448	1,650	153	5,405	5,558	403,783	31,811	435,594
1996	83	-	83	654	1	655	704	2,304	3,008	218	5,655	5,873	420,092	44,800	464,892
1997	60	-	60	1,105	4	1,109	101	2,512	2,613	149	9,166	9,315	474,308	54,241	528,549
1998	123	-	123	1,337	4	1,341	529	1,876	2,405	158	6,858	7,016	449,405	39,166	488,571
1999	273	-	273	1,719	-	1,719	171	3,424	3,595	226	7,714	7,940	603,417	49,858	653,275
2000	157	-	157	636	-	636	294	1,877	2,170	360	5,441	5,801	562,118	46,178	608,297
2001	160	-	160	18	-	18	2,258	1,253	3,511	354	6,370	6,724	595,468	29,962	625,430
2002	413	-	413	-	-	-	1,467	2,207	3,674	621	5,892	6,513	629,020	25,687	654,707
2003	93	-	93	1	-	1	439	1,606	2,045	104	4,764	4,868	715,127	37,271	752,398
2004	231	-	231	16	35	51	883	392	1,275	381	4,731	5,112	548,281	27,287	575,568
2005	68	-	68	313	18	332	1,472	2,482	3,954	561	4,768	5,329	609,162	31,861	641,023
2006	109	-	109	3,488	84	3,572	2,000	1,789	3,789	858	5,977	6,835	563,455	24,346	587,800

TABLE 5. Preliminary estimates of the retained catches and landings, in metric tons, of tunas caught by purse-seine, pole-and-line, and recreational vessels in the EPO in 2006, by species and vessel flag (upper panel) and location where processed (lower panel). Miscellaneous = other species, including other tunas, sharks, and miscellaneous fishes. * = data not available.

TABLA 5. Estimaciones preliminares de las capturas retenidas y descargas de atún capturado con buques cerqueros, cañeros y deportivos en el OPO en 2006, por especie y bandera del buque (panel superior) y localidad donde fue procesado (panel inferior), en toneladas métricas. Misceláneo = otras especies, incluyendo otros túnidos, tiburones, y peces diversos. * = datos no disponibles.

Flag	Yellowfin	Skipjack	Bigeye	Pacific bluefin	Albacore	Bonitos (*Sarda* spp.)	Black skipjack	Miscel-laneous	Total	Percent of total
Bandera	**Aleta amarilla**	**Barrilete**	**Patudo**	**Aleta azul del Pacífico**	**Albacora**	**Bonitos (*Sarda* spp.)**	**Barrilete negro**	**Misce-láneo**	**Total**	**Porcentaje de total**
Retained catches—Capturas retenidas										
Ecuador	26,152	143,094	34,176	*	*	*	79	67	203,568	36.1
Honduras	1,694	6,483	3,061	*	*	*	*	*	11,238	2.0
México	68,552	19,547	*	9,795	109	3,240	1,897	31	103,171	18.3
Nicaragua	7,257	5,371	1,878	*	*	*	*	1	14,507	2.6
Panamá	23,673	46,742	10,645	*	*	*	8	*	81,068	14.4
VVenezuela	17,226	25,725	4,135	*	*	248	11	*	47,345	8.4
Other—Otras[1]	23,519	61,631	17,300	96	376	*	5	*	102,927	18.3
Total	168,073	308,593	71,195	9,891	485	3,488	2,000	99	563,824	
Landings—Descargas										
Colombia	11,549	15,416	2,845	*	*	*	8	*	29,818	5.2
Ecuador	52,921	223,969	57,252	*	*	248	81	67	334,538	58.8
México	68,209	18,733	*	9,795	109	3,240	1897	31	102,014	17.9
Venezuela	12,116	15,623	1,500	*	*	*	11	*	29,250	5.1
Other—Otras[2]	33,068	31,750	8,362	96	376	*	3	1	73,656	12.9
Total	177,863	305,491	69,959	9,891	485	3,488	2,000	99	569,276	

[1]Includes Bolivia, Colombia, El Salvador, Guatemala, Spain, United States, and Vanuatu. This category is used to avoid revealing the operations of individual vessels or companies.

[1] Incluye Bolivia, Colombia, El Salvador, España, Estados Unidos, Guatemala, y Vanuatú. Se usa esta categoría para no revelar información sobre las actividades de buques o empresas individuales.

[2] Includes Costa Rica, El Salvador, Guatemala, Peru, United States, and Unknown. This category is used to avoid revealing the operations of individual vessels or companies.

[2] Incluye Costa Rica, El Salvador, Estados Unidos, Guatemala ,Perú, y Desconocido Se usa esta categoría para no revelar información sobre las actividades de buques o empresas individuales.

TABLE 6a. Catches of bigeye tuna, in metric tons, in the eastern Pacific Ocean during 2006 by longline vessels more than 24 meters in overall length.
TABLA 6a. Capturas de atún patudo, en toneladas métricas, en el Océano Pacífico oriental durante 2006 por buques palangreros de más de 24 metros en eslora total.

Flag	Quarter				Total
	1	2	3	4	
Bandera	**Trimestre**				**Total**
	1	**2**	**3**	**4**	
China	195	133	63	318	709
Japan—Japón	3,819	2,980	3,715	3,104	13,618
Republic of Korea—República de Corea*	2,252	2,435	1,754	2,253	8,694
Chinese Taipei—Taipei Chino	2,082	1,640	1,248	1,908	6,878
United States—Estados Unidos	17	55	6	0	78
Vanuatu	426	163	222	95	906

* Round weight obtained by adjustment applied to processed weight—Peso entero obtenido mediante ajuste aplicado al peso procesado provisto

TABLE 6b. Preliminary estimates of the catches of bigeye tuna, in metric tons, in the eastern Pacific Ocean during the first quarter of 2007 by longline vessels more than 24 meters in overall length.
TABLA 6b. Estimaciones preliminares de las capturas de atún patudo, en toneladas métricas, en el Océano Pacífico oriental durante el primer trimestre de 2007 por buques palangreros de más de 24 metros en eslora total.

Flag—Bandera	Month—Mes			
	1	2	3	Total
China	-	-	-	
Japan—Japón	1,198	1,058	937	3,193
Republic of Korea—República de Corea*	719	598	509	1,826
Chinese Taipei—Taipei Chino	391	372	333	1,096
United States— Estados Unidos	16	62	28	106
Vanuatu	60	81	46	187

* Round weight obtained by adjustment applied to processed weight—Peso entero obtenido mediante ajuste aplicado al peso procesado provisto

TABLE 7. Preliminary data on the sampling coverage of trips by vessels with capacities greater than 363 metric tons by the IATTC program and the national programs of Colombia, Ecuador, the European Union, Mexico, Nicaragua, Panama, and Venezuela during the first quarter of 2007.

TABLA 7. Datos preliminares de la cobertura de muestreo de viajes de buques con capacidad más que 363 toneladas métricas por el programa de la CIAT y los programas nacionales de Colombia, Ecuador, México, Nicaragua, Panamá, el Unión Europea, y Venezuela durante el primero trimestre de 2007.

Flag	Trips	Observed by program			Percent observed
		IATTC	National	Total	
Bandera	**Viajes**	**Observado por programa**			**Porcentaje observado**
		CIAT	**Nacional**	**Total**	
Colombia	19	9	10	19	100.0
Ecuador	91	64	27	91	100.0
España—Spain	7	5	2	7	100.0
Guatemala	2	2		2	100.0
Honduras	6	6		6	100.0
México	64	34	30	64	100.0
Nicaragua	7	4	3	7	100.0
Panamá	39	20	19	39	100.0
El Salvador	11	11		11	100.0
U.S.A—EE.UU.	2	2		2	100.0
Venezuela	37	18	19	37	100.0
Vanuatu	3	3		3	100.0
Total	288[1]	178	110	288[1]	100.0

[1] Includes 48 trips, 26 by vessels with observers from the IATTC program and 22 by vessels with observers from the national programs, that began in late 2006 and ended in 2007

[1] Incluye 48 viajes, 26 por buques con observadores del programa del CIAT y 22 por buques con observadores de los programas nacionales, iniciados a fines de 2006 y completados en 2007

TABLE 8. Oceanographic and meteorological data for the Pacific Ocean, October 2006-March 2007. The values in parentheses are anomalies. SST = sea-surface temperature; SOI = Southern Oscillation Index; SOI* and NOI* are defined in the text.
TABLA 8. Datos oceanográficos y meteorológicos del Océano Pacífico, octubre 2006-marzo 2007. Los valores en paréntesis son anomalías. TSM = temperatura superficie del mar; IOS = Índice de Oscilación del Sur; IOS* y ION* están definidas en el texto.

Month—Mes	10	11	12	1	2	3
SST—TSM (°C)						
Area 1 (0°-10°S, 80°-90°W)	22.1 (1.2)	22.7 (1.0)	23.3 (0.5)	25.0 (0.5)	26.3 (0.2)	25.8 (-0.7)
Area 2 (5°N-5°S, 90°-150°W	26.0 (1.1)	26.1 (1.1)	26.3 (1.3)	26.5 (0.9)	26.5 (0.1)	26.8 (-0.3)
Area 3 (5°N-5°S, 120°-170°W)	27.4 (0.9)	27.7 (1.2)	27.8 (1.3)	27.3 (0.7)	26.8 (0.1)	27.1 (0.0)
Area 4 (5°N-5°S, 150W°-160°E)	29.4 (1.0)	29.6 (1.3)	29.5 (1.2)	28.9 (0.8)	28.6 (0.6)	28.6 (0.5)
Thermocline depth—Profundidad de la termoclina, 0°, 80°W (m)	45	45	40	25	20	20
Thermocline depth—Profundidad de la termoclina, 0°, 110°W (m)	80	90	95	50	35	30
Thermocline depth—Profundidad de la termoclina, 0°, 150°W (m)	140	170	160	120	120	125
Thermocline depth—Profundidad de la termoclina, 0°, 180°W (m)	175	170	170	160	170	170
Sea level—Nivel del mar, Baltra, Ecuador (cm)	195.4 (18.2)	195.8 (16.9)	200.3 (20.5)	197.7 (17.0)	186.1 (3.9)	184.7 (2.9)
Sea level—Nivel del mar, Callao, Peru				117.0 (5.5)	109.1 (-4.8)	109.3 (-5.4)
SOI—IOS	-1.7	0.1	-0.5	-1.1	-0.5	-0.4
SOI*—IOS*	-1.43	0.80	0.35	0.36	0.92	2.85
NOI*—ION*	-1.14	0.90	2.74	8.06	2.21	5.11