

A review of the Shark Fishery Statistics available from the IATTC Observer Program

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Inter-American Tropical Tuna Commission (IATTC)

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USA



Outline

- Description of fishery
- Observer program
- Shark bycatch statistics (FAL and OCS)
 - Fishing Effort (numbers of sets)
 - Capture per set (observed shark bycatch)
 - Length frequency
 - Size and sex distribution

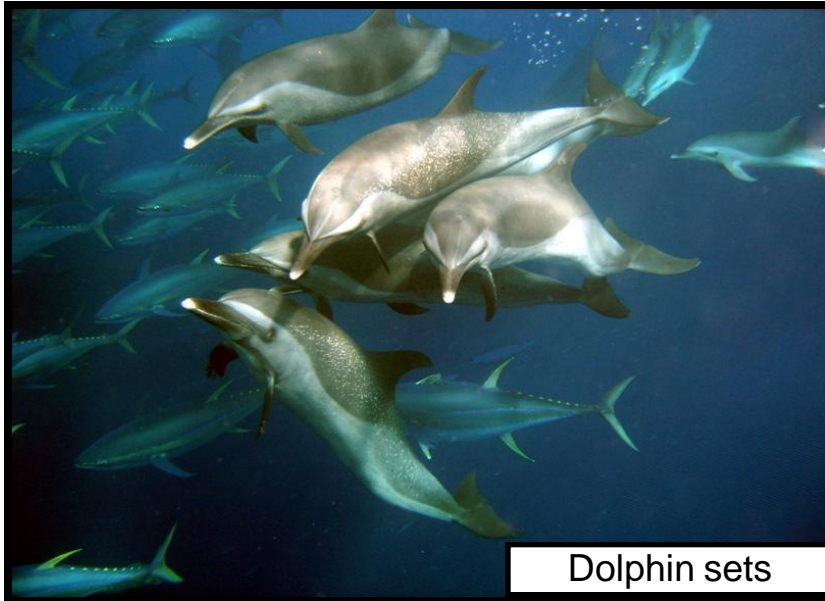
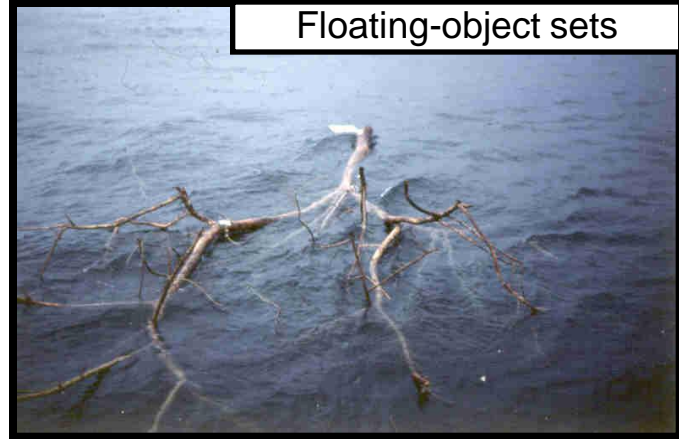


Three types of purse-seine sets

Unassociated sets



Floating-object sets

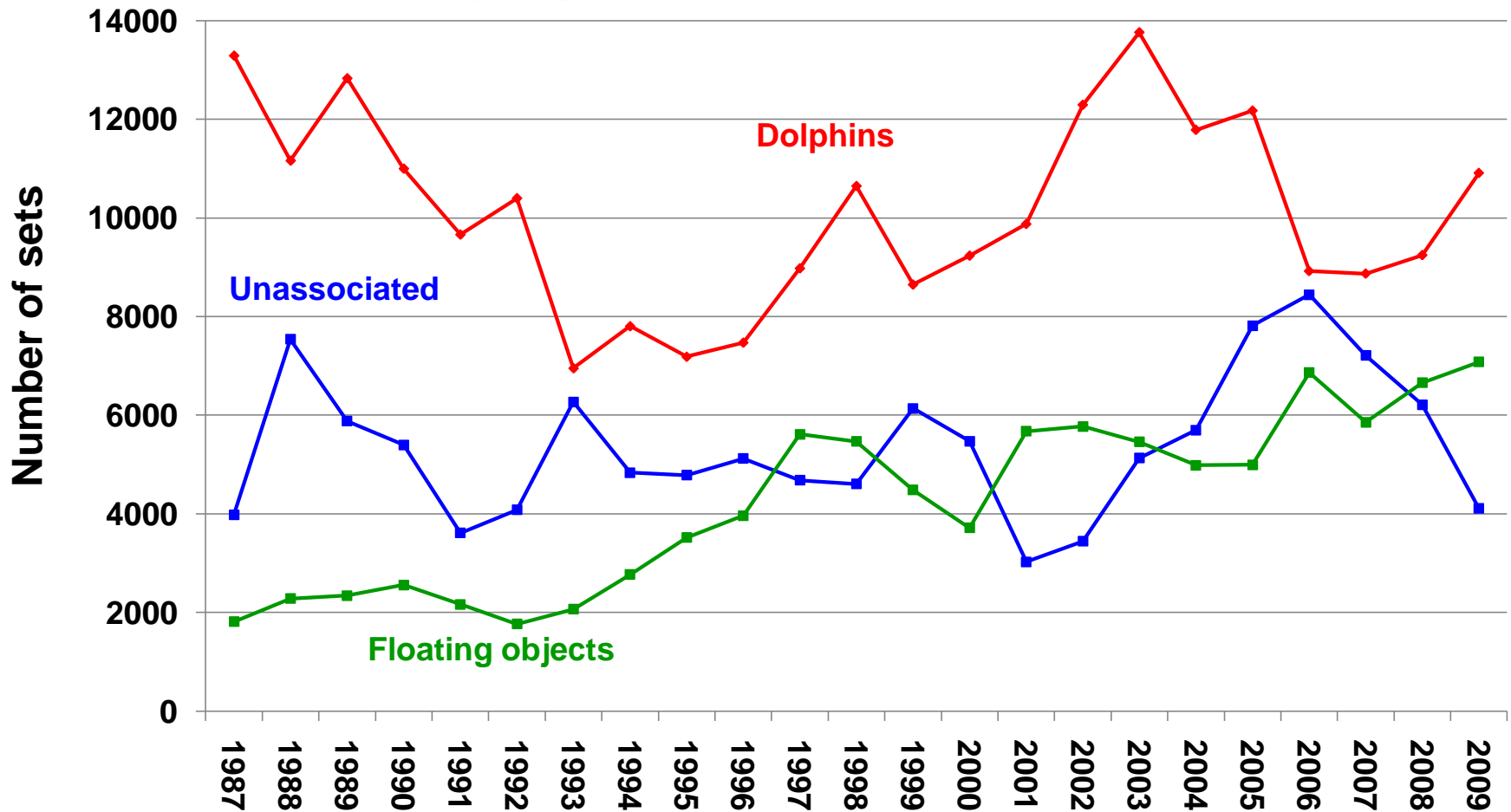


Dolphin sets

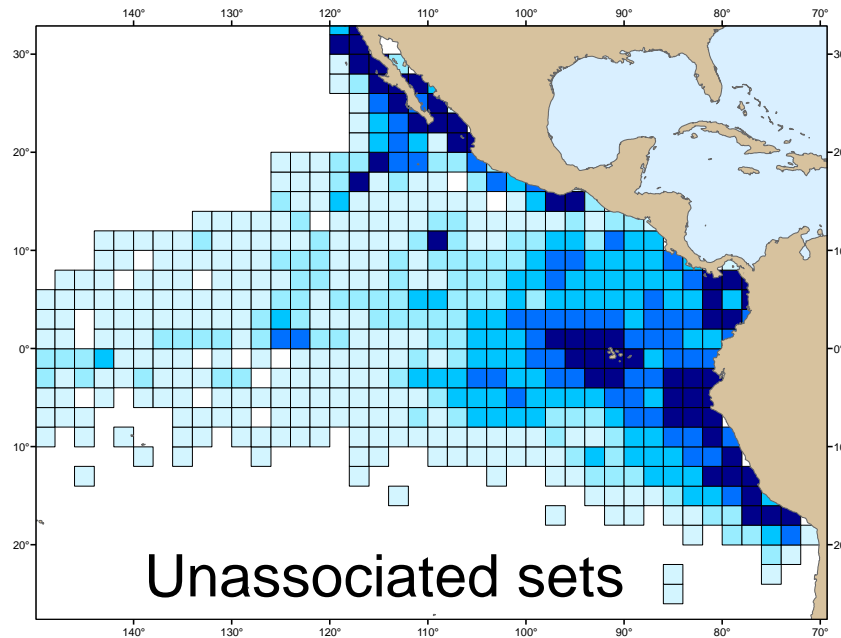
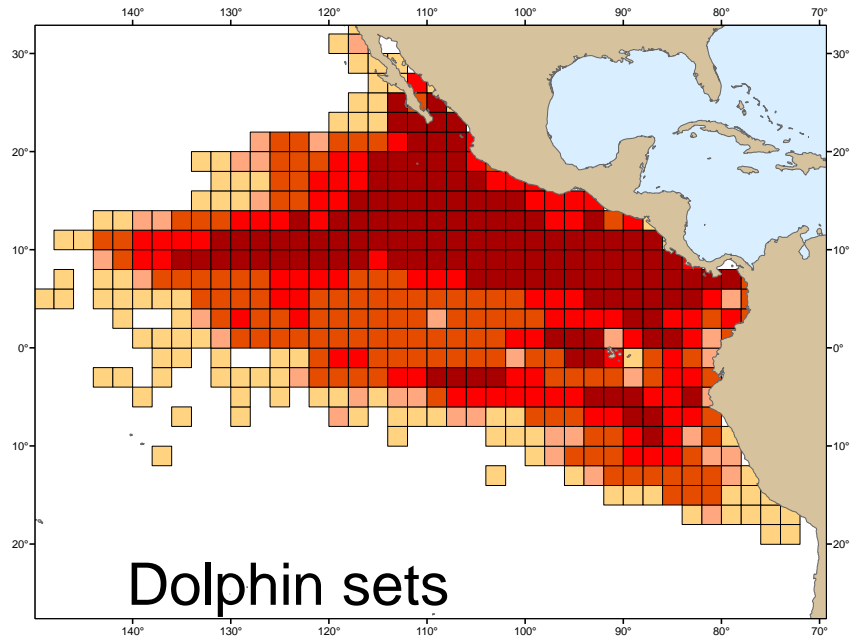
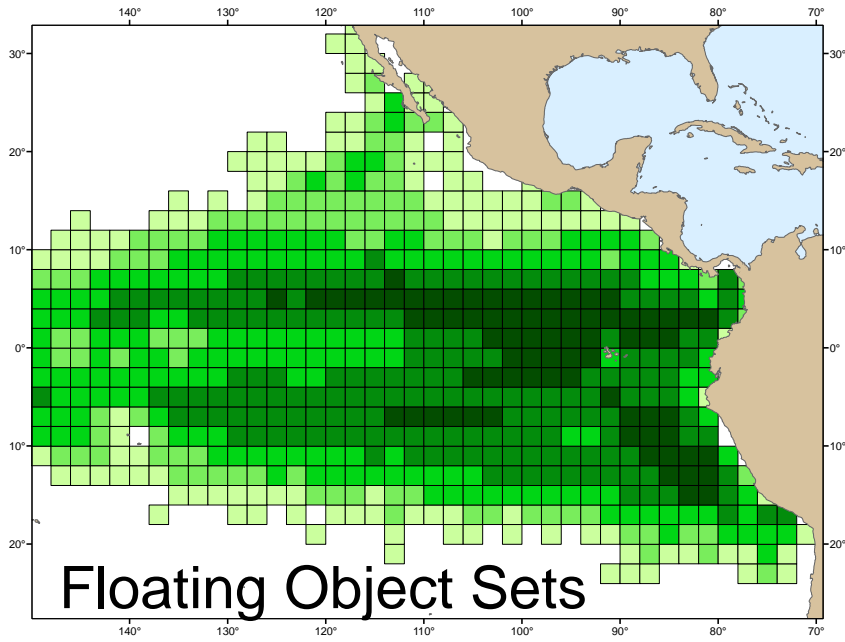


Total fishing effort

Number of purse-seine sets by set type, 1987-2009
(large vessels, >364 mt)

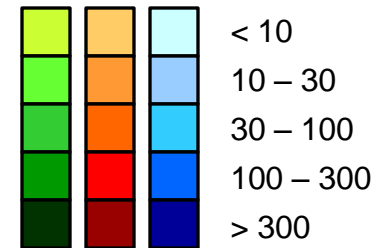


Spatial distribution of fishing effort



1993 - 2009

Num of sets



IATTC Observer program



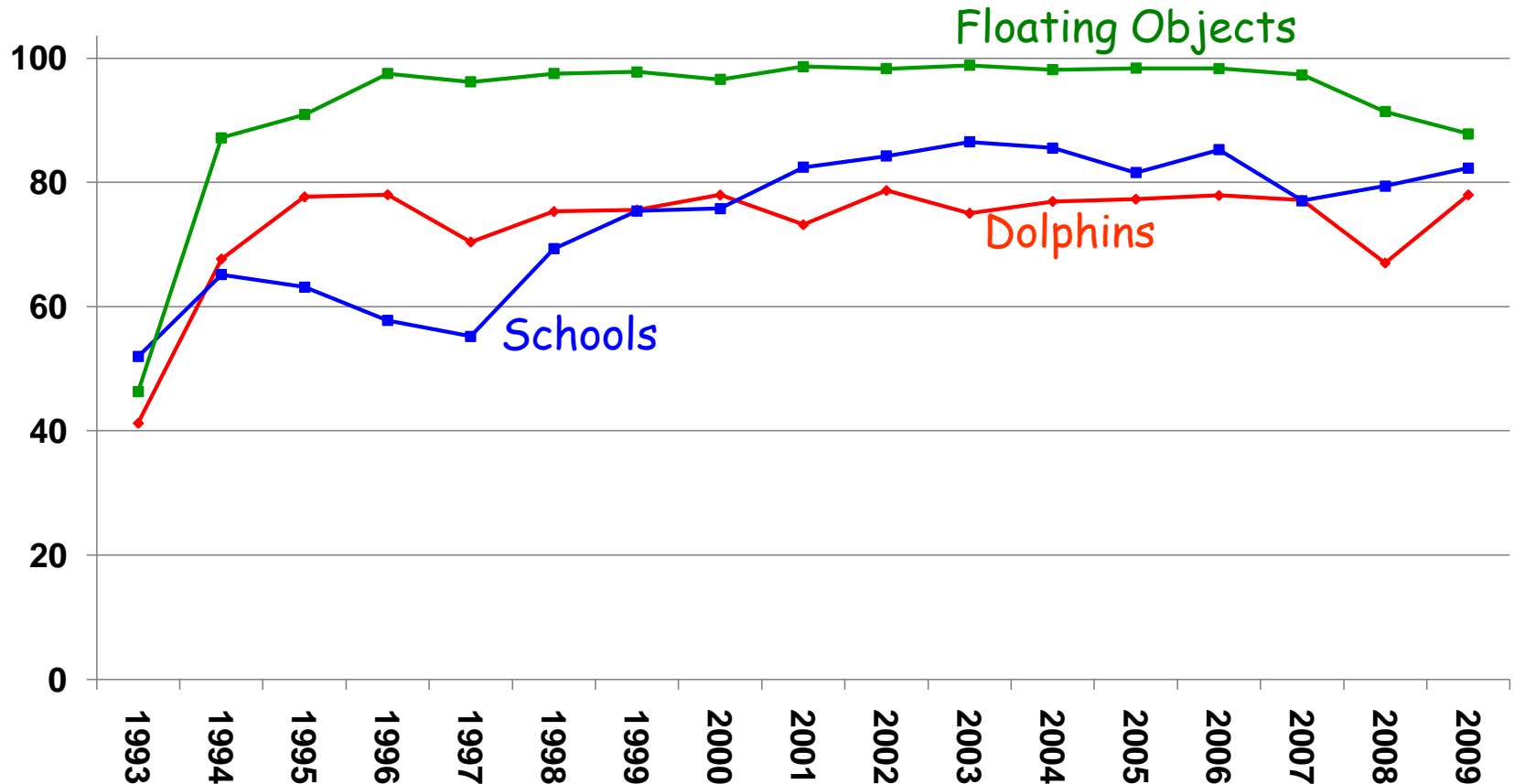
- Observer program began in 1979, sampling almost exclusively large vessels (≥ 364 mt)



- By 1992, 100% of trips of large vessels sampled by a combination of IATTC and national observer programs
- By 1993, IATTC and national programs began collecting data on non-mammal bycatch (including sharks)

Sampling coverage (%)

Observer sampling coverage for shark bycatch of the international fleet (large vessels, >364 mt)



Shark bycatch data collected by IATTC observers

- 1993-2004
 - Amount of bycatch (number of animals OR weight), by size category: small (<90cm), medium (90-150cm), large (>150cm) - for following groups (other sharks, oceanic whitetip, blacktip, silky, hammerhead pooled, unidentified)
- From 2005
 - Size frequency data
 - Sex determinations
 - Taxonomic resolution increase



Registro de tiburones (2005 – Present)

Comisión Interamericana del Atún Tropical

REGISTRO DE TIBURONES

No. de Crucero	No. de Registro	No. de Lance	Especie	No. total de tiburones

REGISTRO INDIVIDUAL

Longitud total (cm)	Estimación	Sexo			Destino (código)
		M	H	D	
	[]	[]	[]	[]	
	[]	[]	[]	[]	
	[]	[]	[]	[]	
	[]	[]	[]	[]	
	[]	[]	[]	[]	
	[]	[]	[]	[]	
	[]	[]	[]	[]	
	[]	[]	[]	[]	
	[]	[]	[]	[]	
	[]	[]	[]	[]	
	[]	[]	[]	[]	
	[]	[]	[]	[]	
	[]	[]	[]	[]	
	[]	[]	[]	[]	
	[]	[]	[]	[]	
	[]	[]	[]	[]	




REGISTRO COLECTIVO

Estimación por número de individuos				Destino (código)
Pequeño < 90 cm	Mediano 90 – 150 cm	Grande > 150 cm	Total	

CÓDIGOS DE DESTINO

- 1 - Consumo humano
- 2 - Desechado
- 3 - Liberado vivo
- 4 - Otro
- 5 - Desconocido

FORMA DE LA ALETA CAUDAL

 [] 1
 [] 2
 [] 3

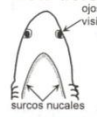
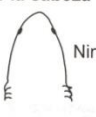
Ninguna de las anteriores [] 4

Imposible observar [] 5

Complete la parte derecha si marca esta opción

Vista dorsal de la cabeza

ojos muy visibles


 [] 3.1
 [] 3.2

Ninguna de las anteriores [] 3.3

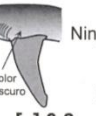
Imposible observar [] 3.4

Coloración de los flancos

color blanco

 [] 3.1


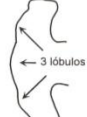


color oscuro

 [] 3.2

Ninguna de las anteriores [] 3.3

Imposible observar [] 3.4





FORMA DE LA CABEZA

 [] 1
 [] 2
 [] 3
 [] 4
 [] 5
 [] 6

Ninguna de las anteriores [] 7

Imposible observar [] 8

FORMA DE LA PRIMERA ALETA DORSAL

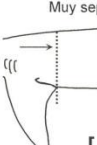
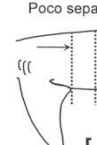
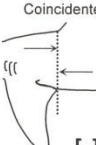
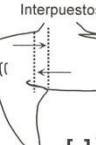
 [] 1
 [] 2
 [] 3
 [] 4

Ninguna de las anteriores [] 5

Imposible observar [] 6

RELACIÓN ENTRE LA PRIMERA ALETA DORSAL Y LA PECTORAL

Muy separados Poco separados Coincidentes Interpuestos

 [] 1
 [] 2
 [] 3
 [] 4

Ninguna de las anteriores [] 5

Imposible observar [] 6

LONGITUD DEL BORDE INTERNO DE LA SEGUNDA ALETA DORSAL

Largo es dos o más veces la altura Largo mayor que la altura (no dos veces) Largo es igual que la altura Largo es menor que la altura


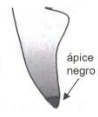

 [] 1
 [] 2
 [] 3
 [] 4

Ninguna de las anteriores [] 5

Imposible observar [] 6

COLORACIÓN DE LA ALETA PECTORAL (cara externa)

color gris uniforme ápice negro con o sin manchas

 [] 1
 [] 2
 [] 3


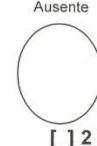
Ninguna de las anteriores [] 4

Imposible observar [] 5

macho hembra

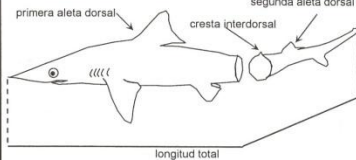
PRESENCIA - AUSENCIA DE LA CRESTA INTERDORSAL

Presente Ausente

 [] 1
 [] 2

No está seguro [] 3

Imposible observar [] 4

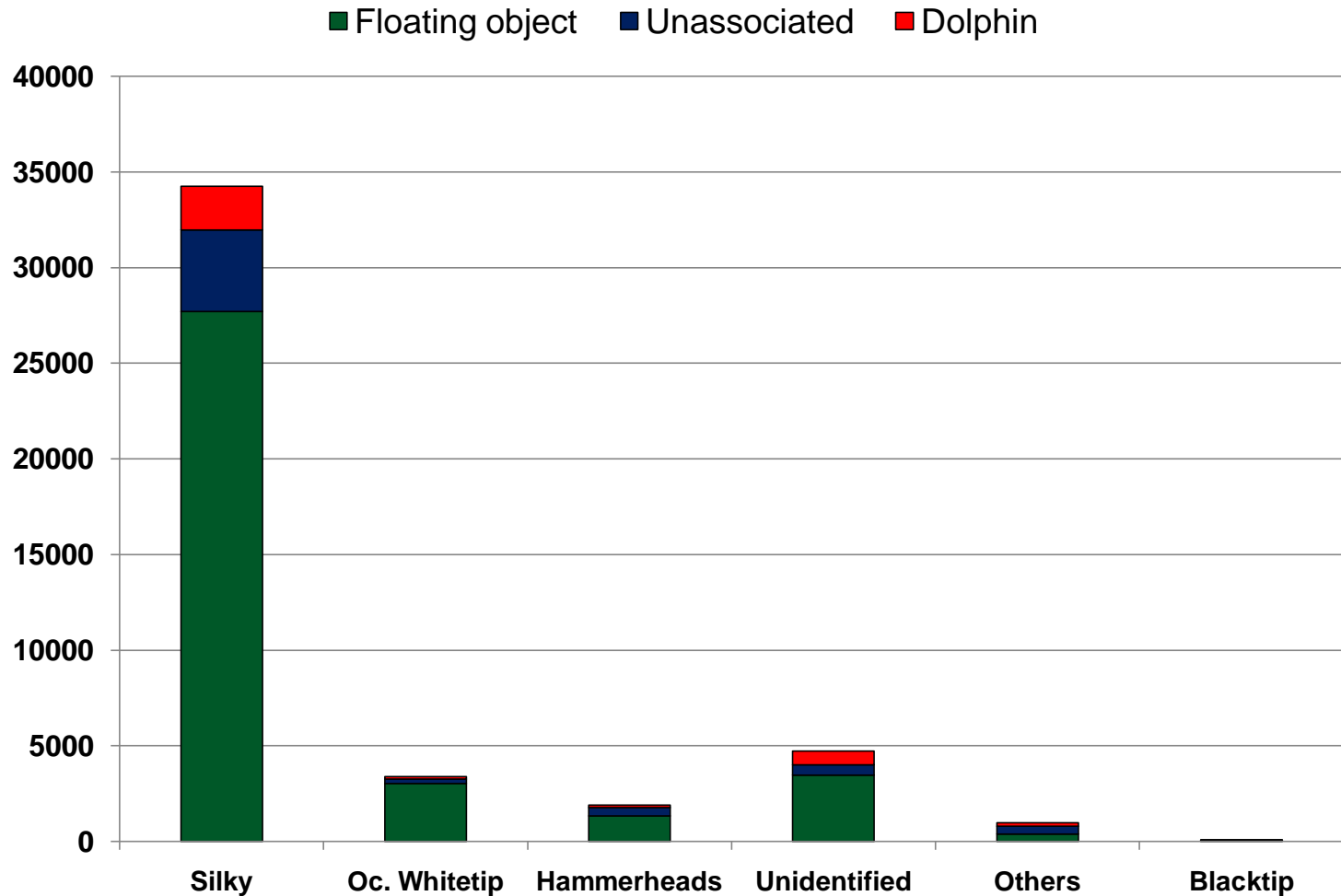


primera aleta dorsal cresta interdorsal segunda aleta dorsal longitud total

COMENTARIOS ADICIONALES:



Estimated yearly avg. of capture of shark species (num. individuals) 1993 – 2009

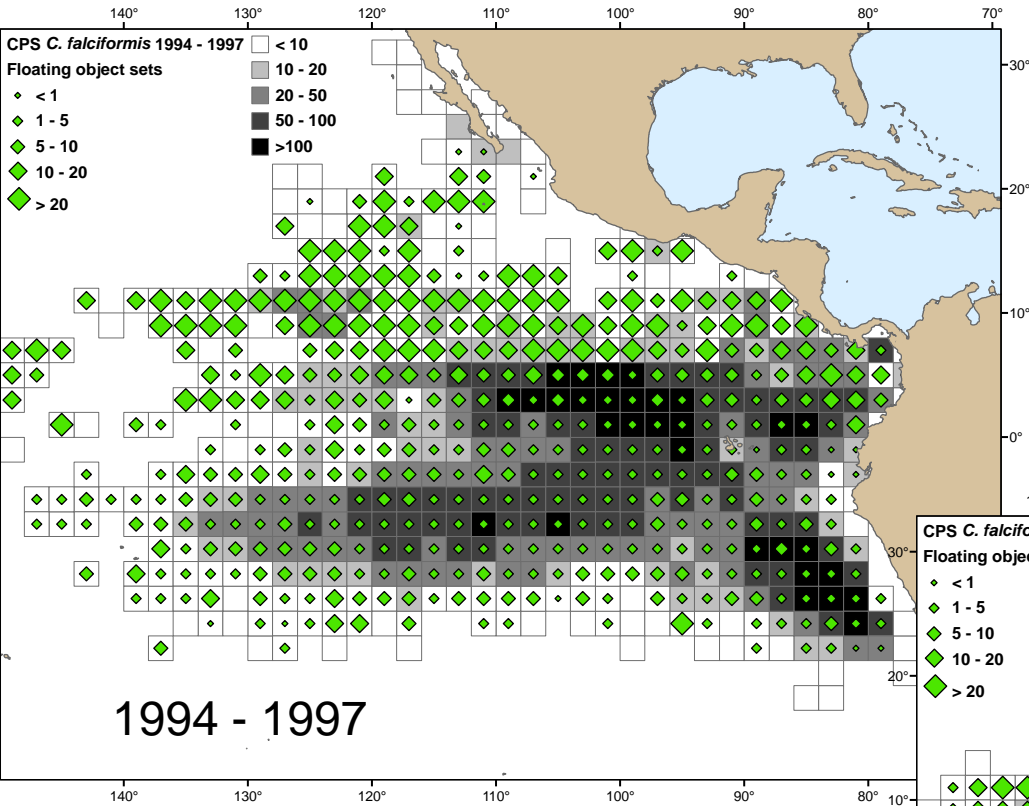


IATTC Observer database shark composition 1994 - 2008

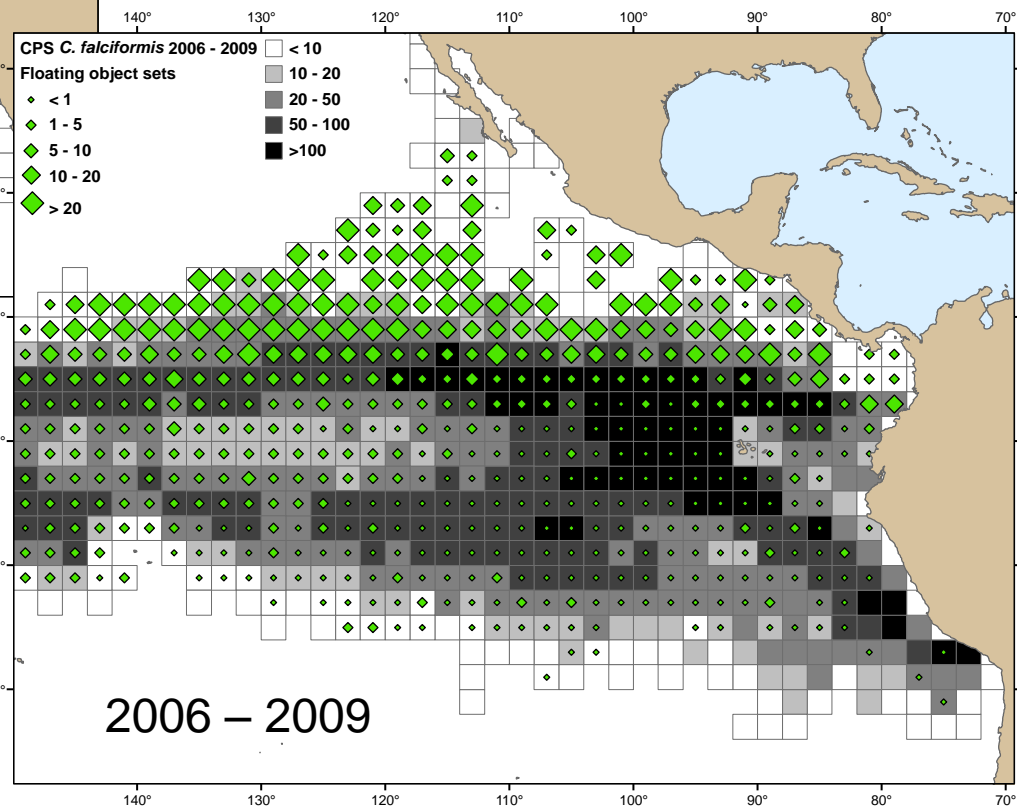
Species	%
<i>Carcharhinus falciformis</i>	76.1
<i>Carcharhinus longimanus</i>	8.8
Unidentified sharks	8.1
<i>Sphyrna</i> sp.	3.6
Other <i>Carcharhinus</i>	1.9
<i>Alopias</i> sp.	0.9
Other species	0.4
<i>Isurus</i> sp.	0.2

Video de identificación de tiburones:
<http://www.iattc.org/DownloadsSPN.htm>

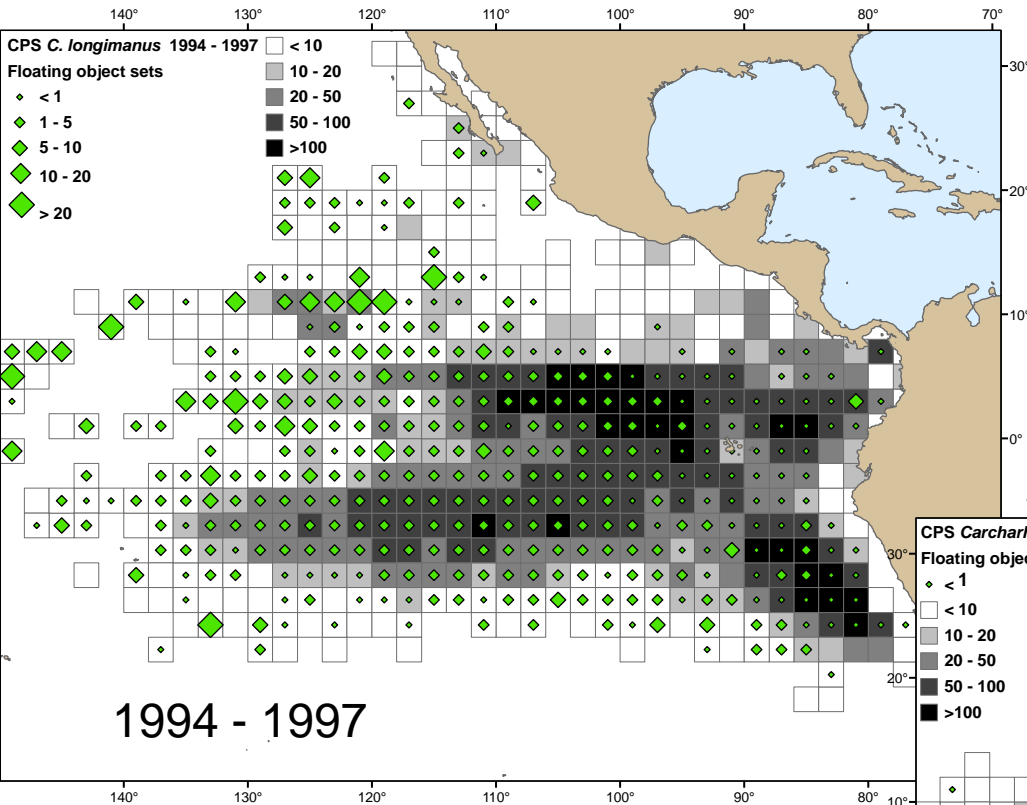
Fishing effort and CPS (num. individuals) – silky sharks



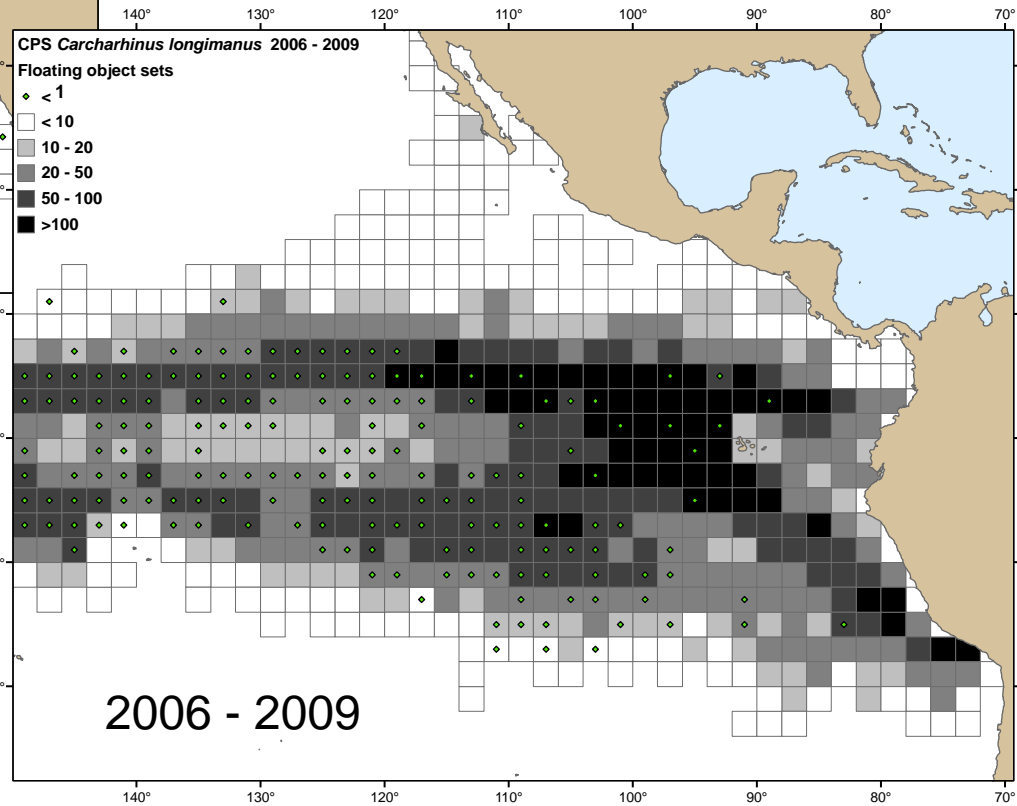
Floating object sets



Fishing effort and CPS (num. individuals) – Oc. whitetip

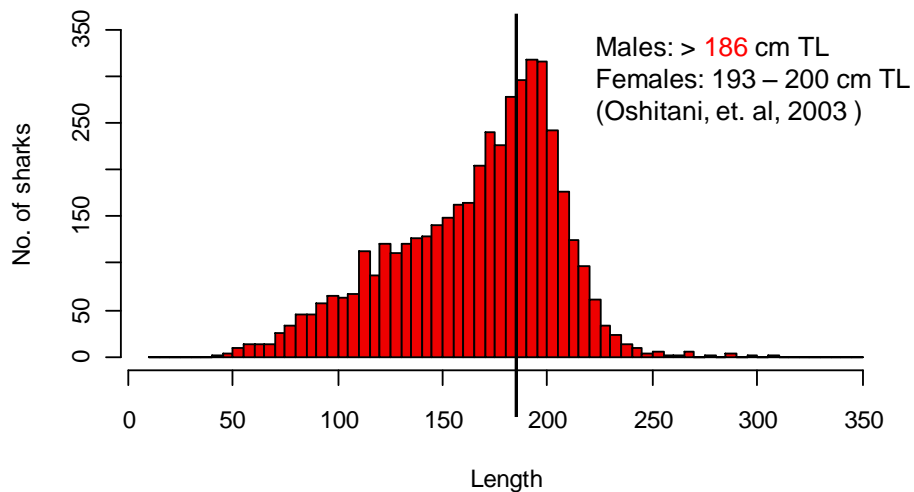


Floating object sets

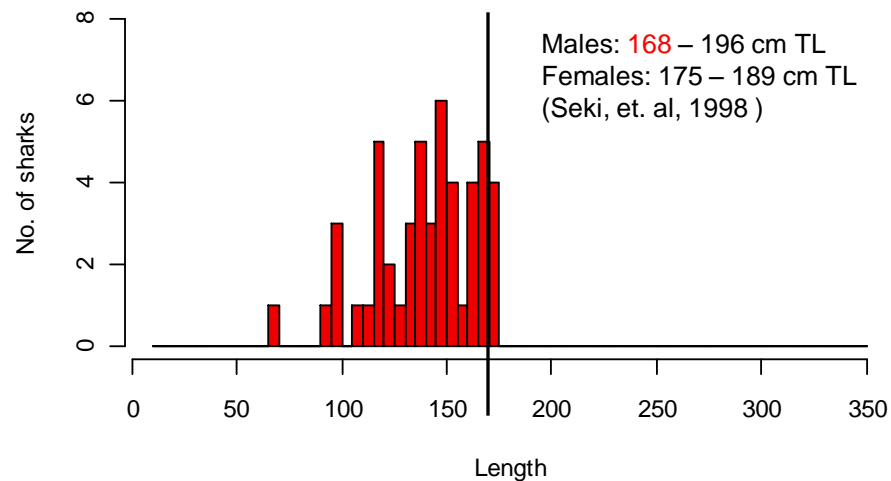


Length frequency distribution (cm) for Silky (*Carcharhinus falciformis*) and Oceanic whitetip shark (*Carcharhinus longimanus*) caught by set type on sets made from 2005 to 2009.

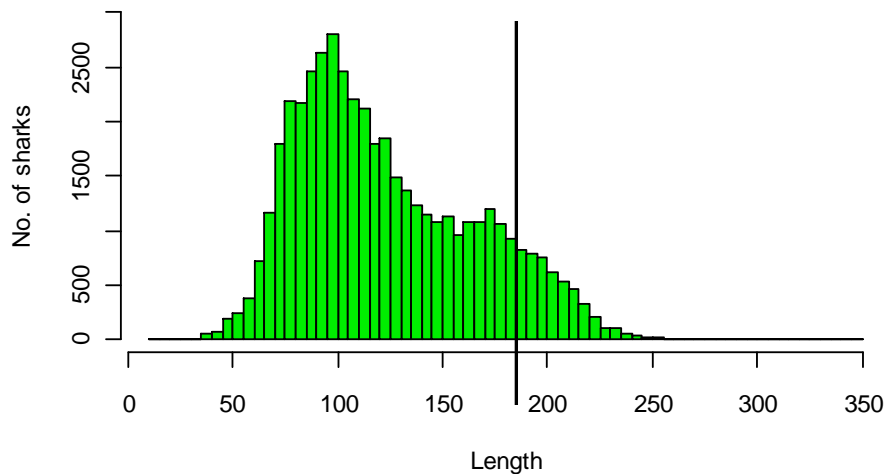
Silky Sharks
Dolphin - Unassociated



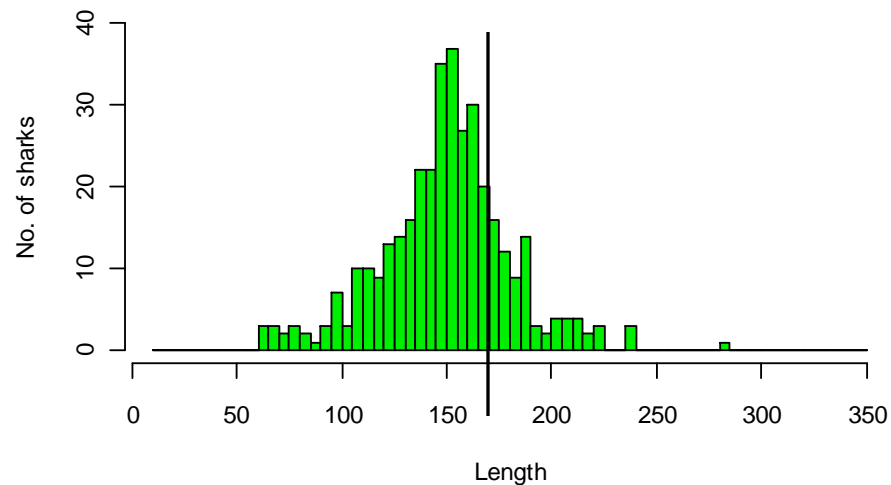
Oceanic whitetip sharks
Dolphin - Unassociated



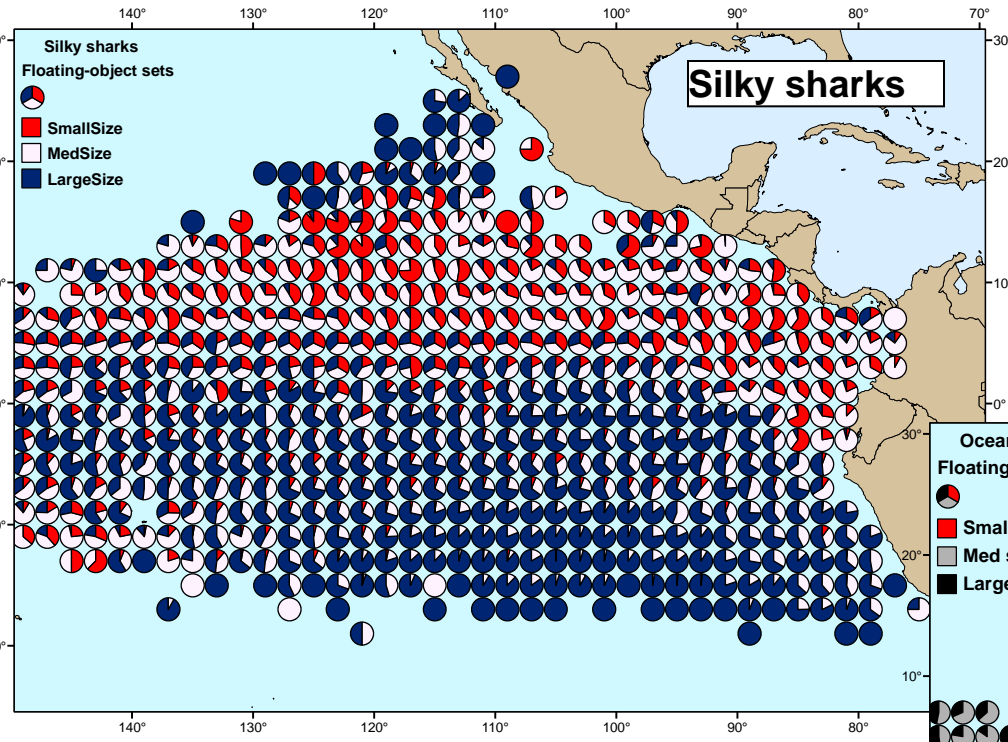
Floating object



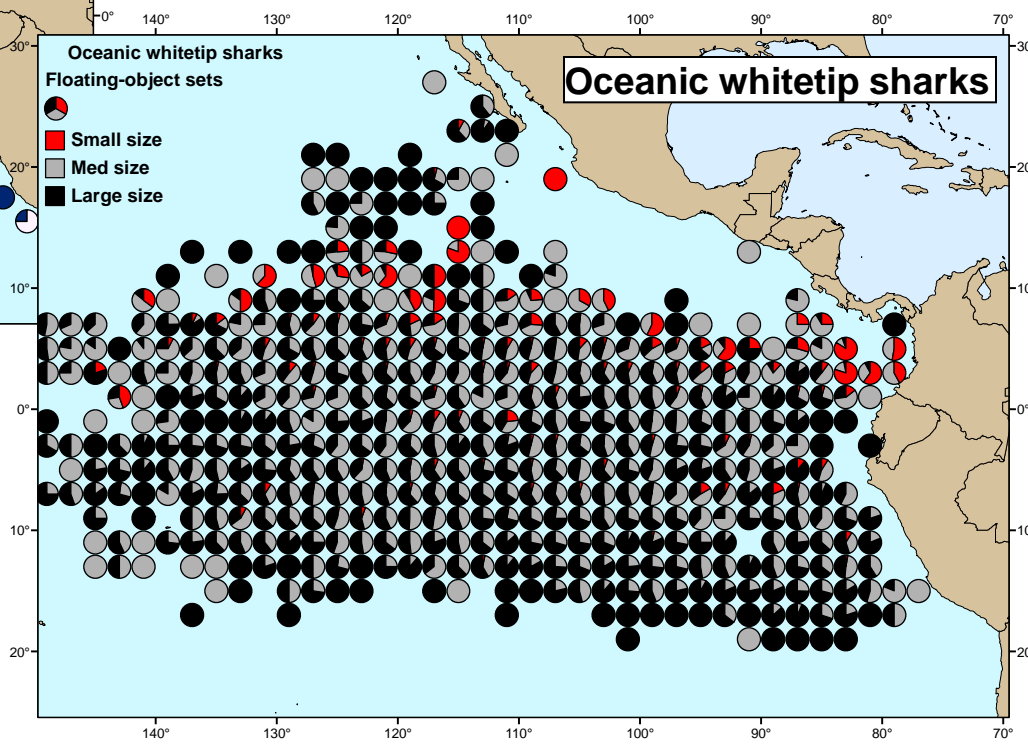
Floating object



FAL and OCS size distribution 1994 – 2008 (Floating object sets)



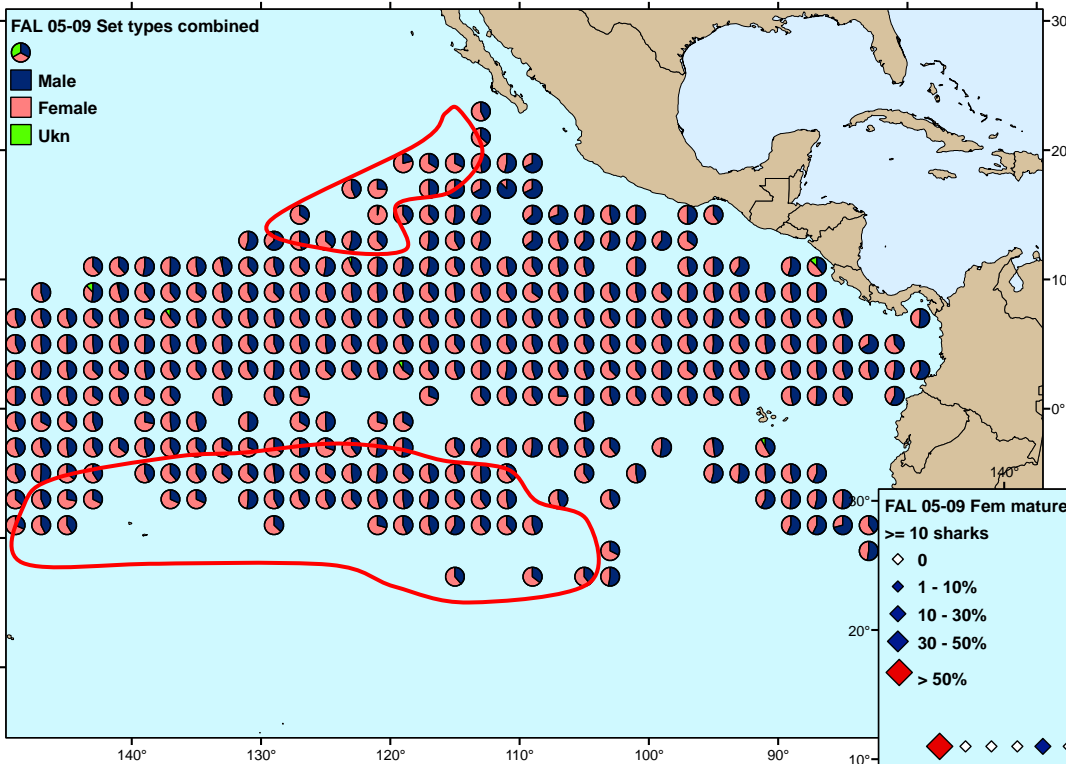
M. Roman; A. Aires-da-Silva; C. Lennert-Cody and M. Hall, 2009



Watson et al, 2008

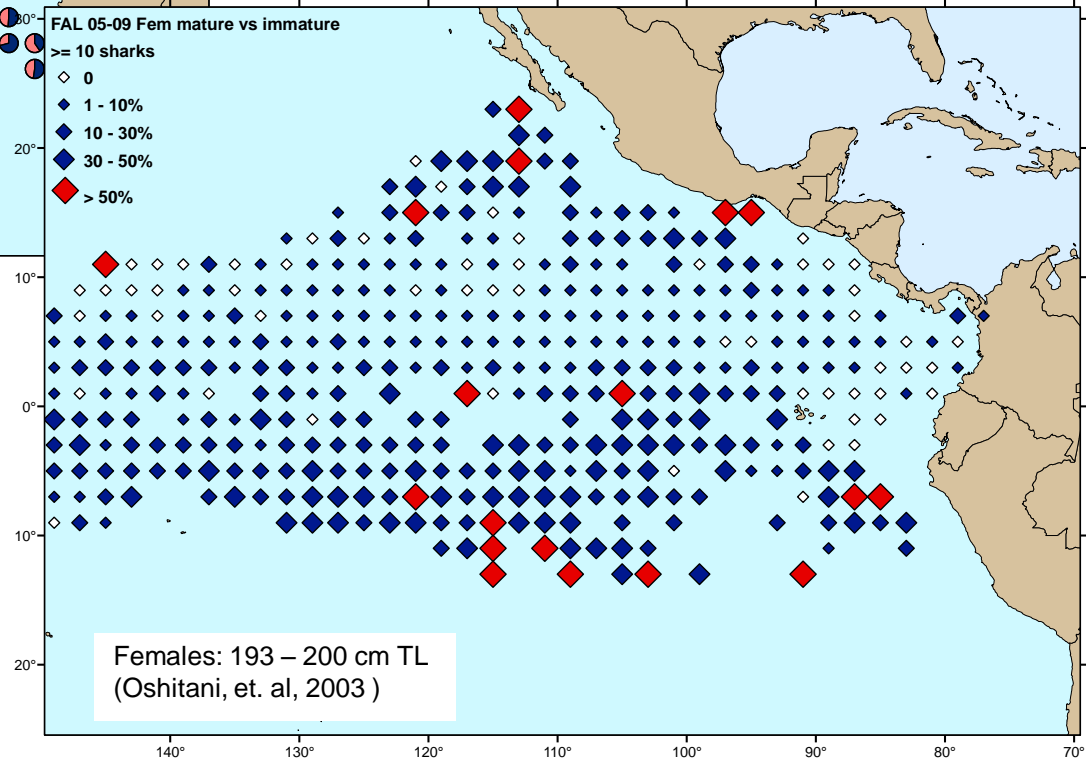
Roman-Verdesoto and Orozco, 2005

FAL sex distribution ≥ 30 ind

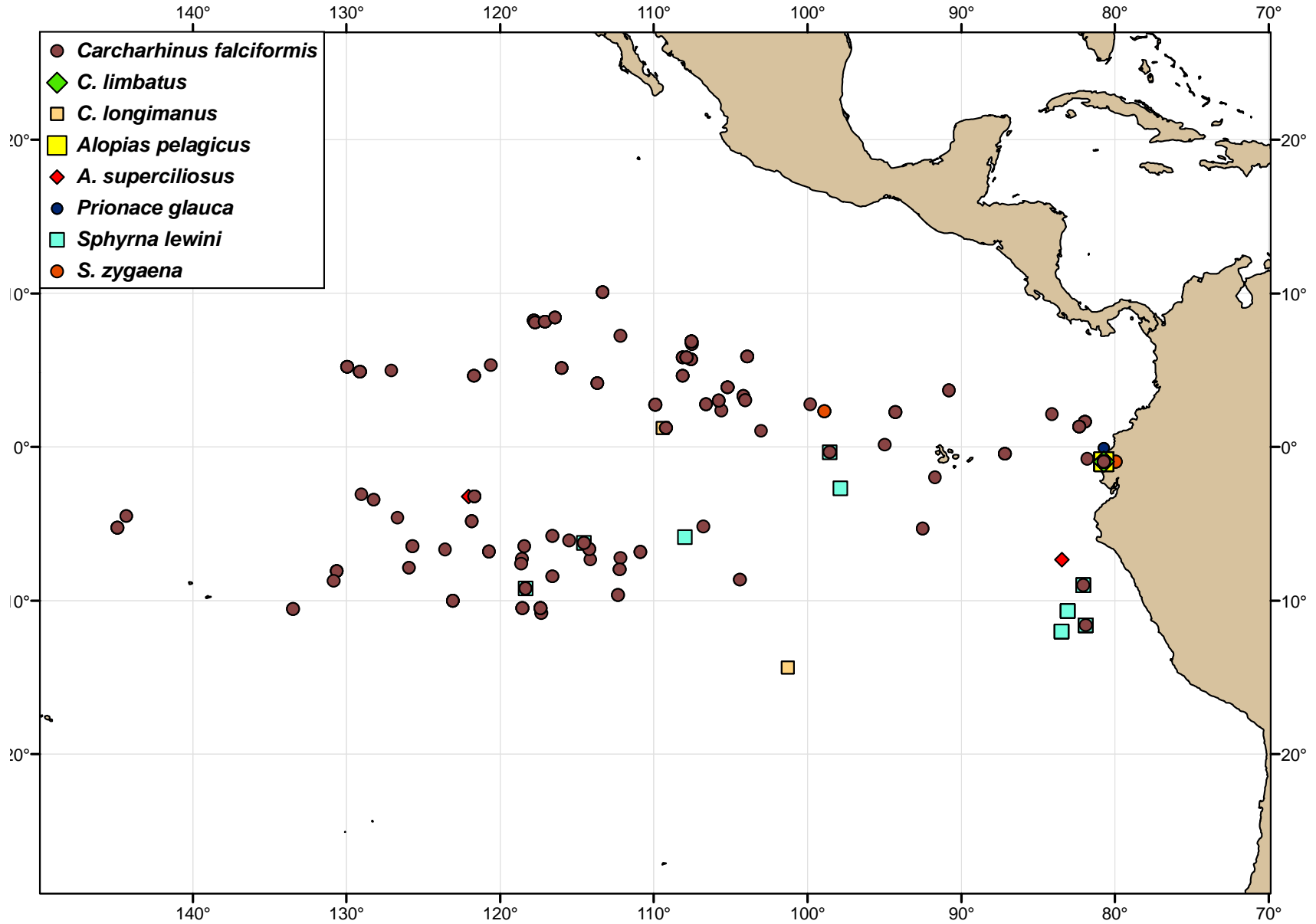


2005 – 2009 (All set types)

FAL female mature distribution ≥ 10 females



Tissue samples collected for large-scale stock structure

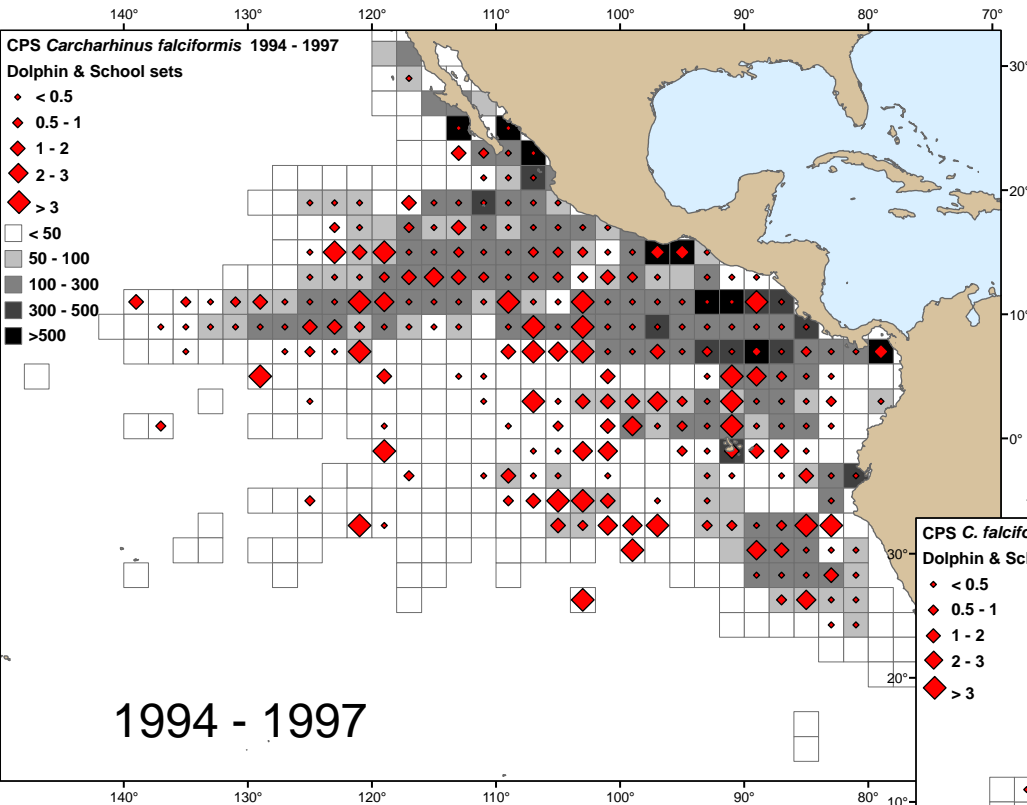


Acknowledgments

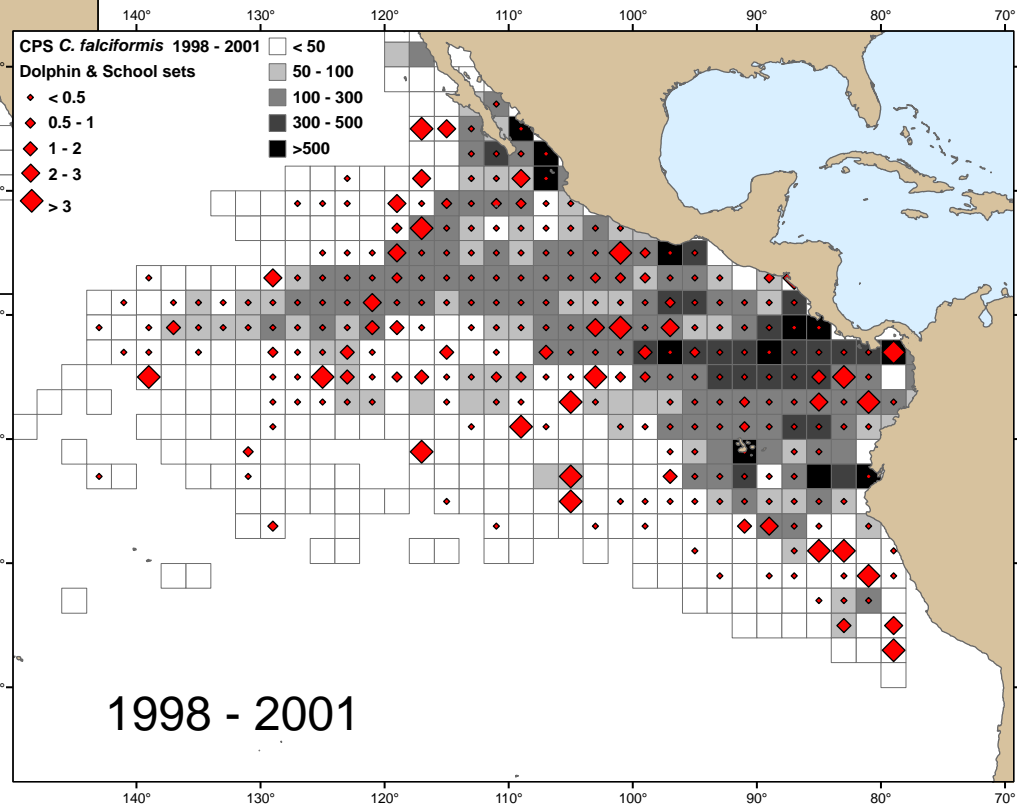
- IATTC staff (observers and data editing)

Additional slides

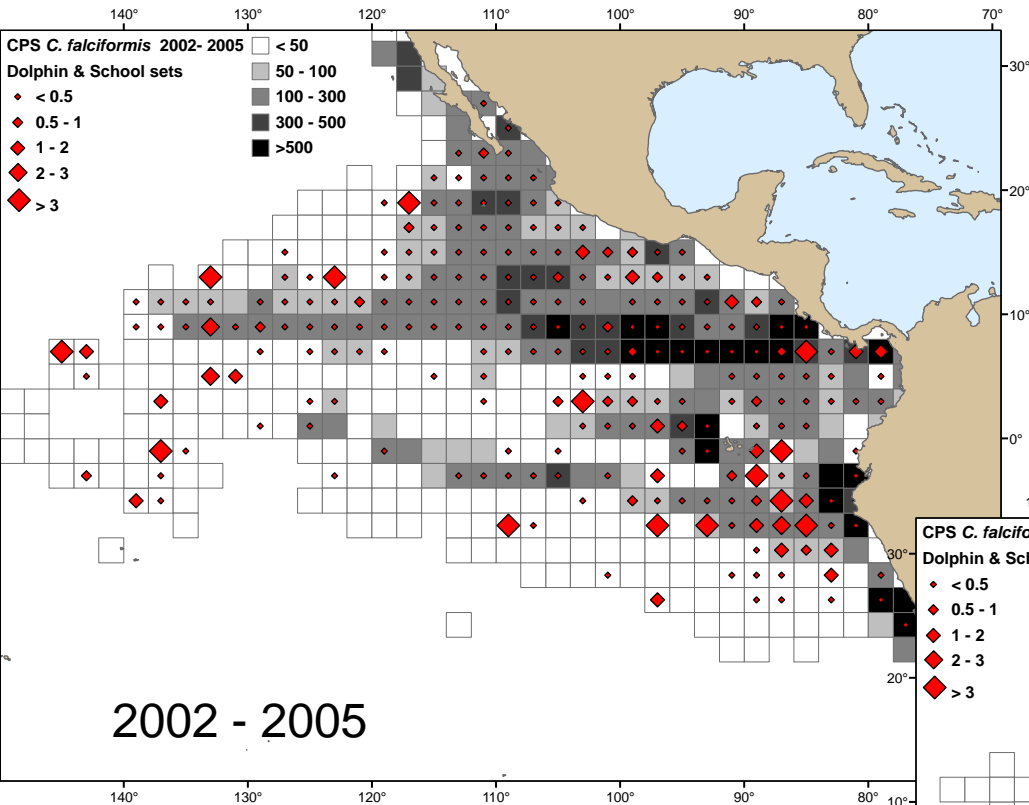
Fishing effort and CPS (num. individuals) – silky sharks



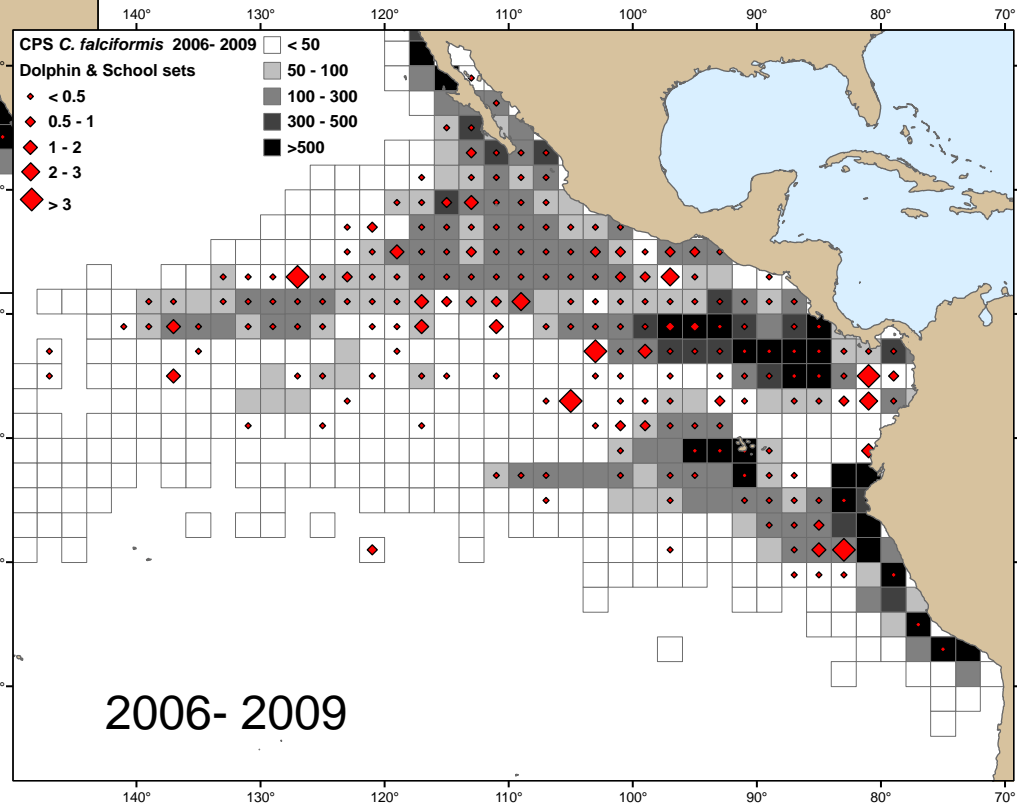
Dolphin and unassociated sets



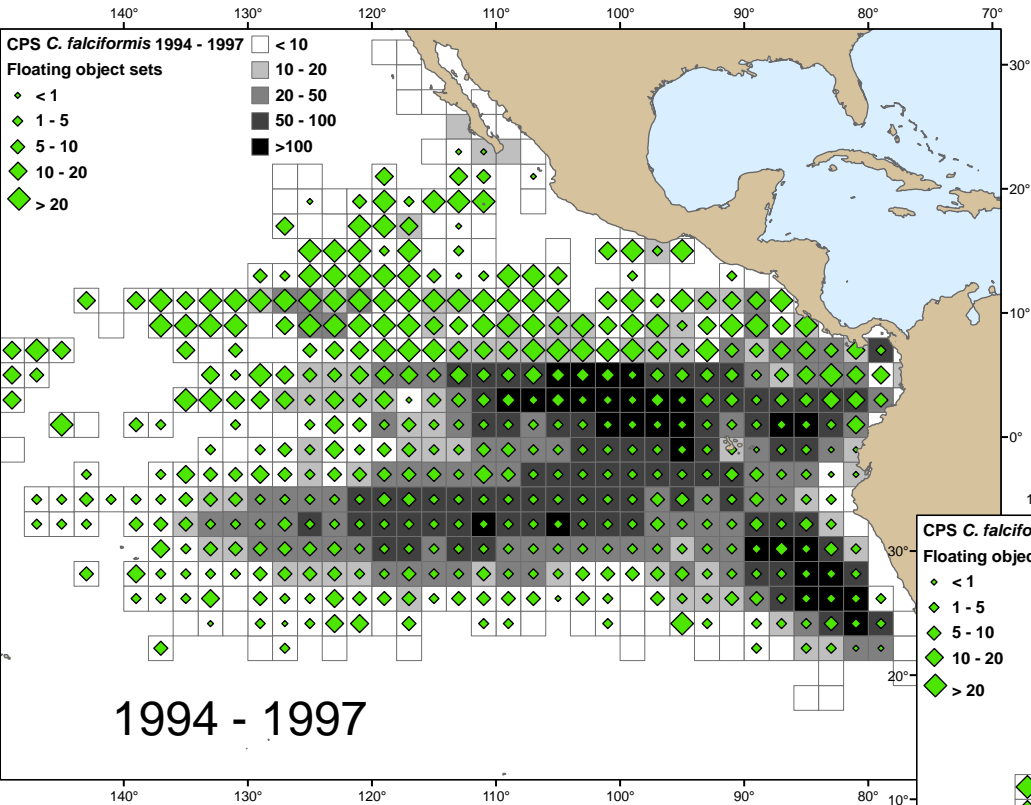
Fishing effort and CPS (num. individuals) – silky sharks



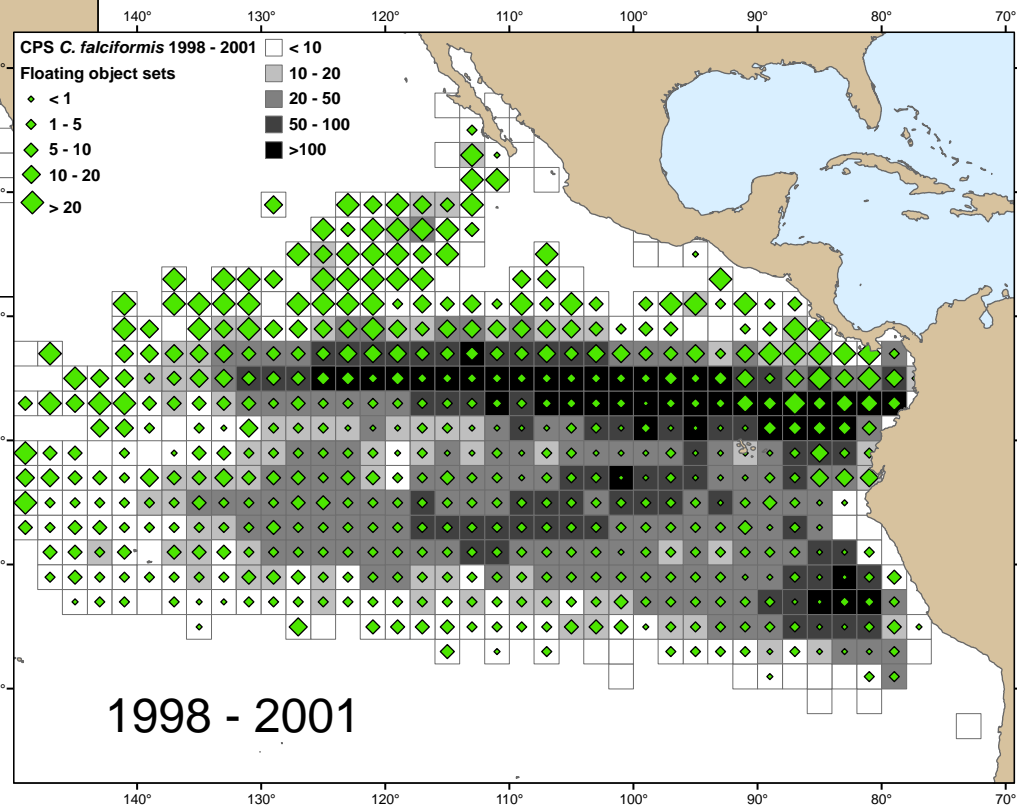
Dolphin and unassociated sets



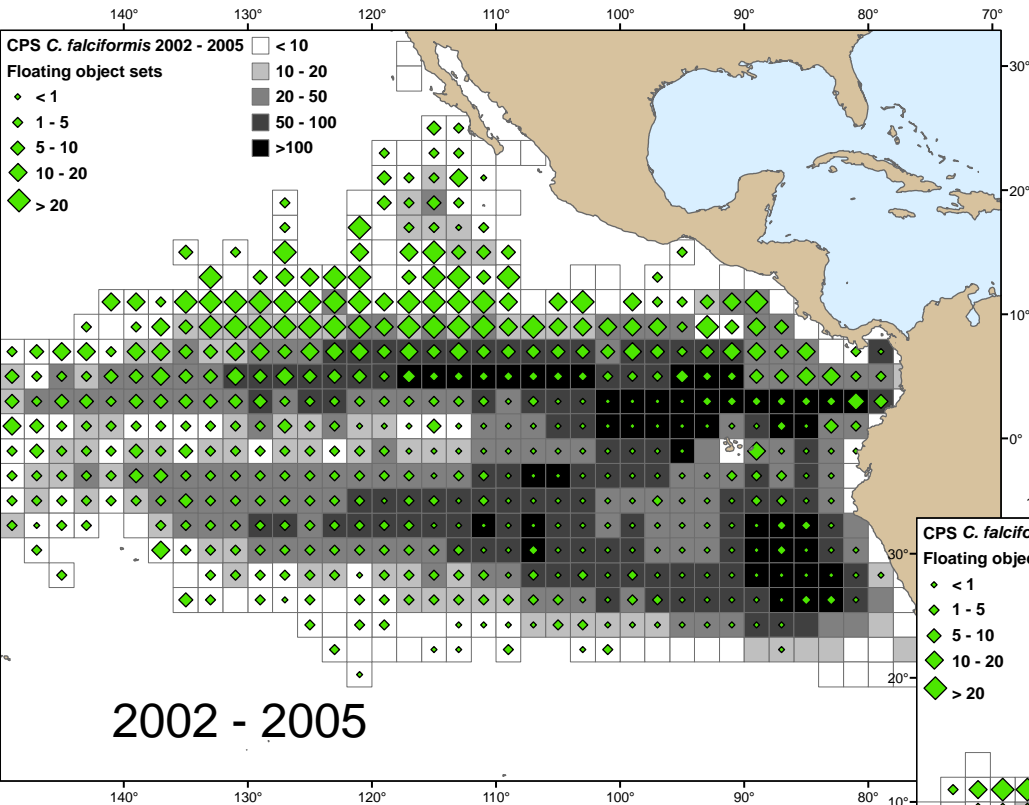
Fishing effort and CPS (num. individuals) – silky sharks



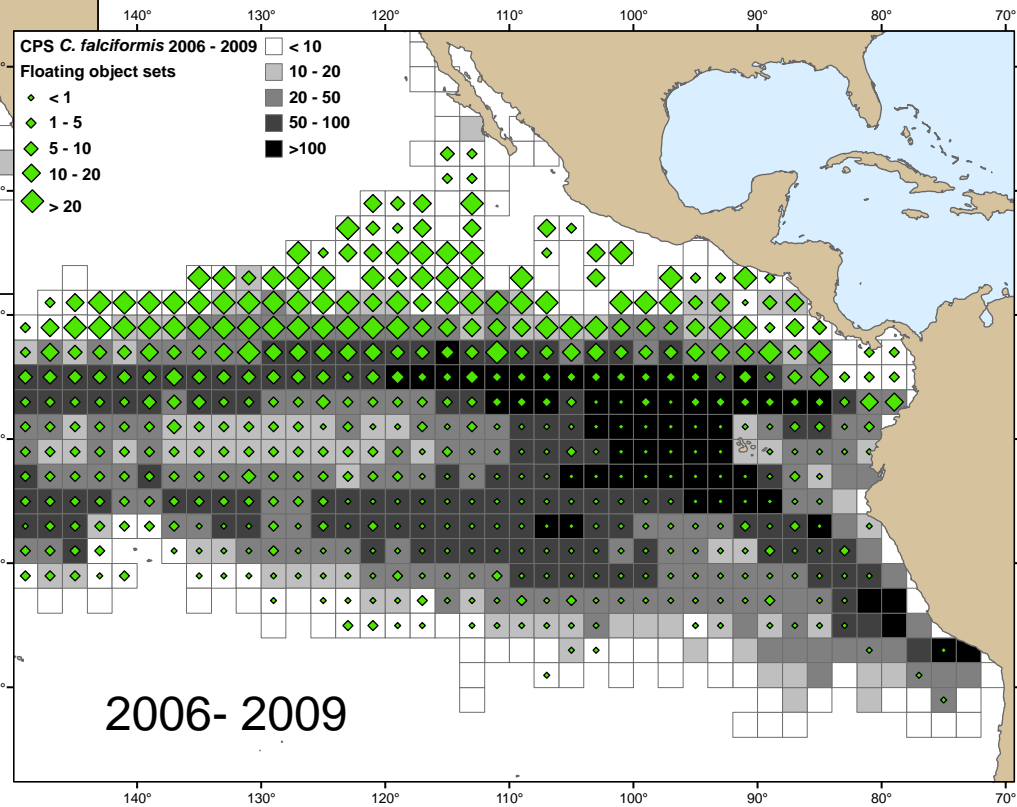
Floating object sets



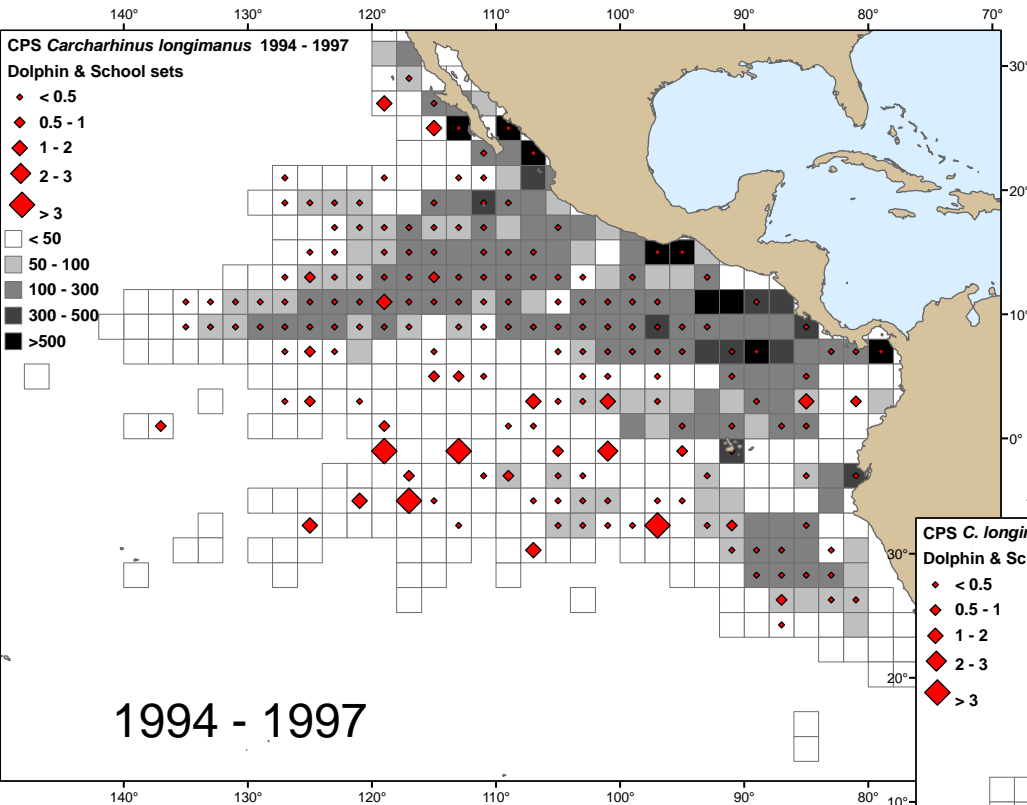
Fishing effort and CPS (num. individuals) – silky sharks



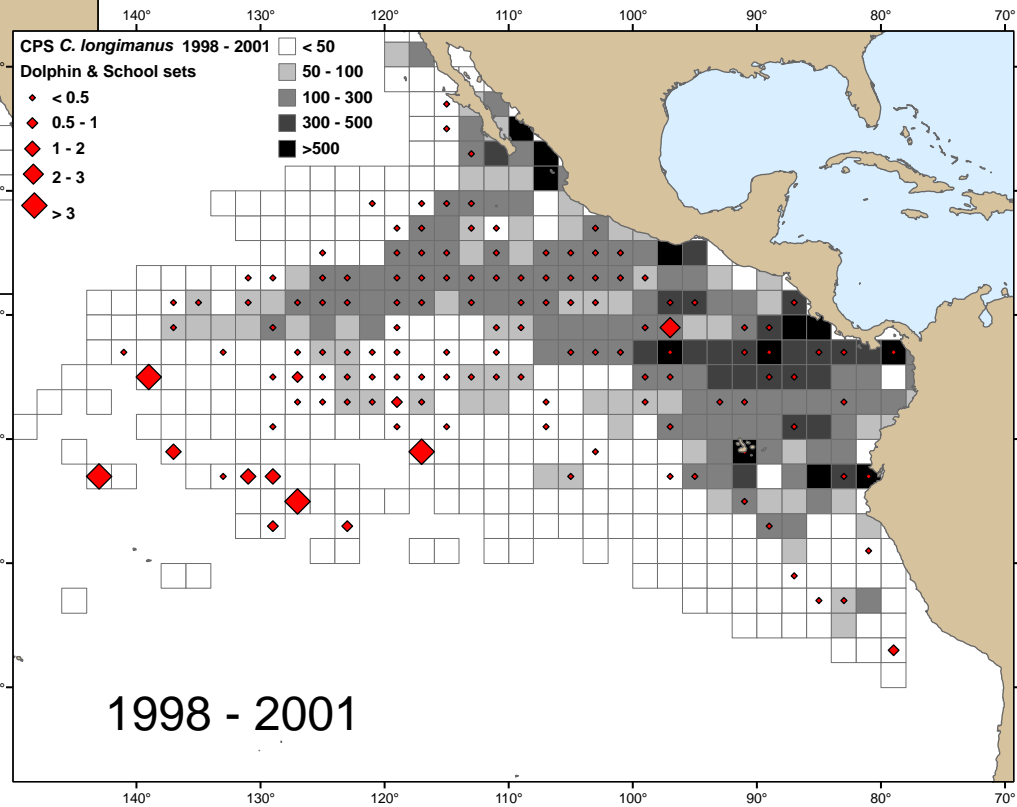
Floating object sets



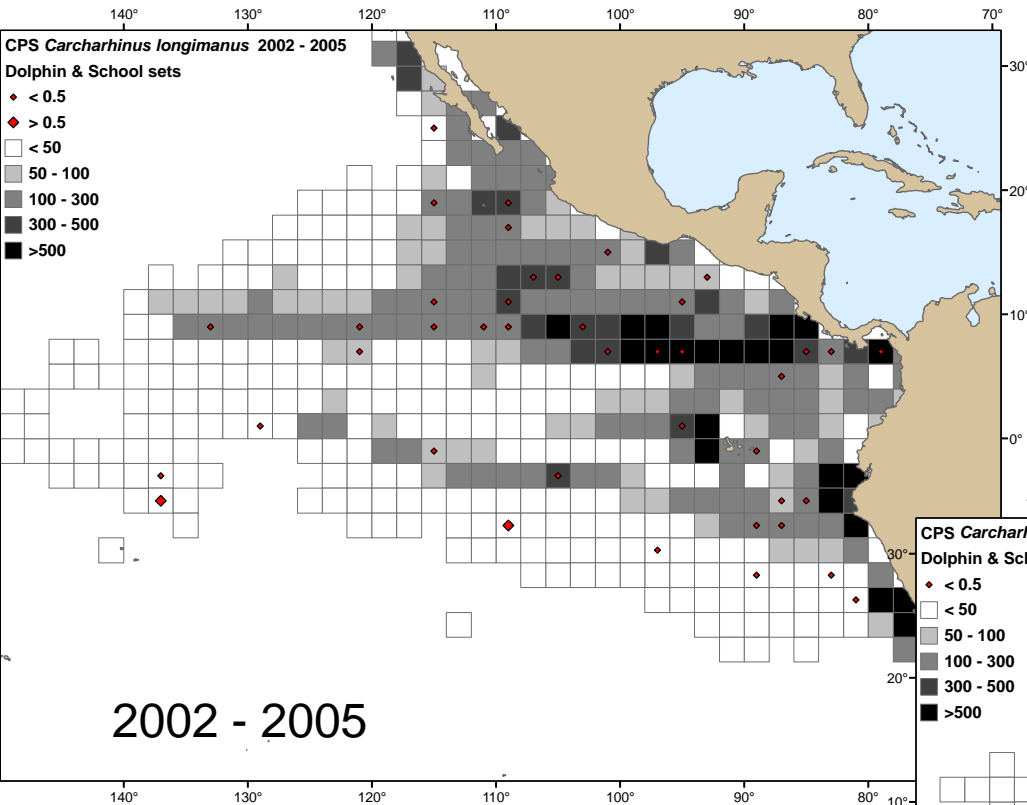
Fishing effort and CPS (num. individuals) – Oc. whitetip



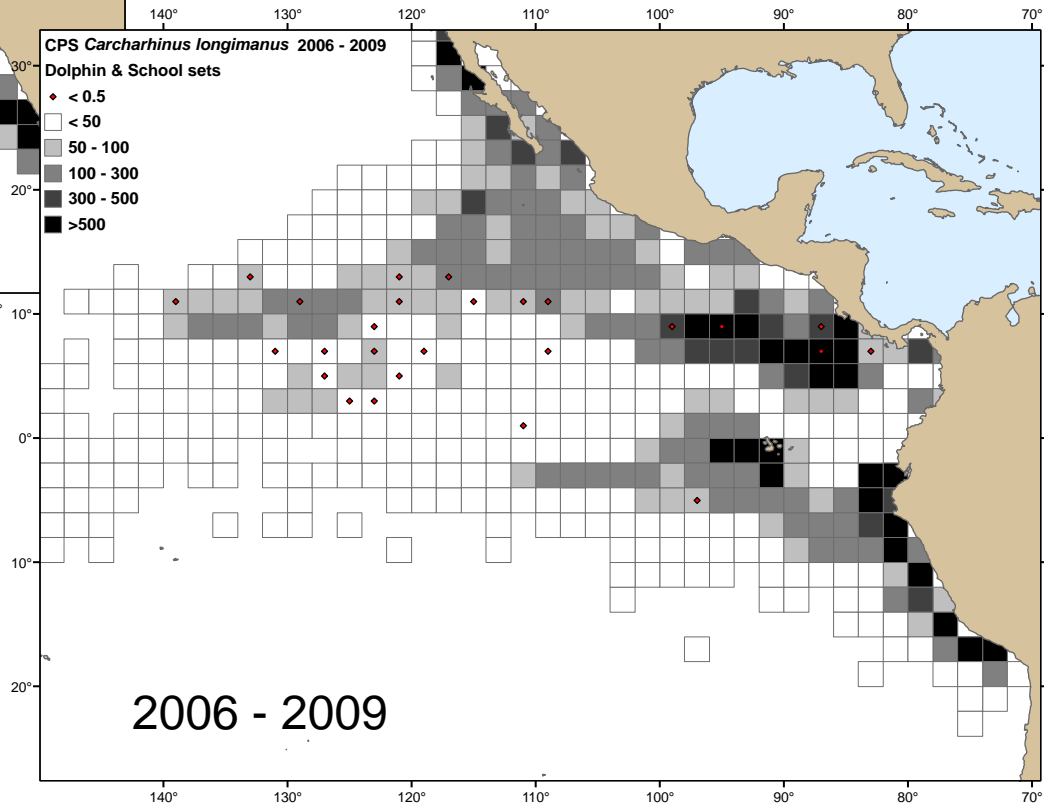
Dolphin and unassociated sets



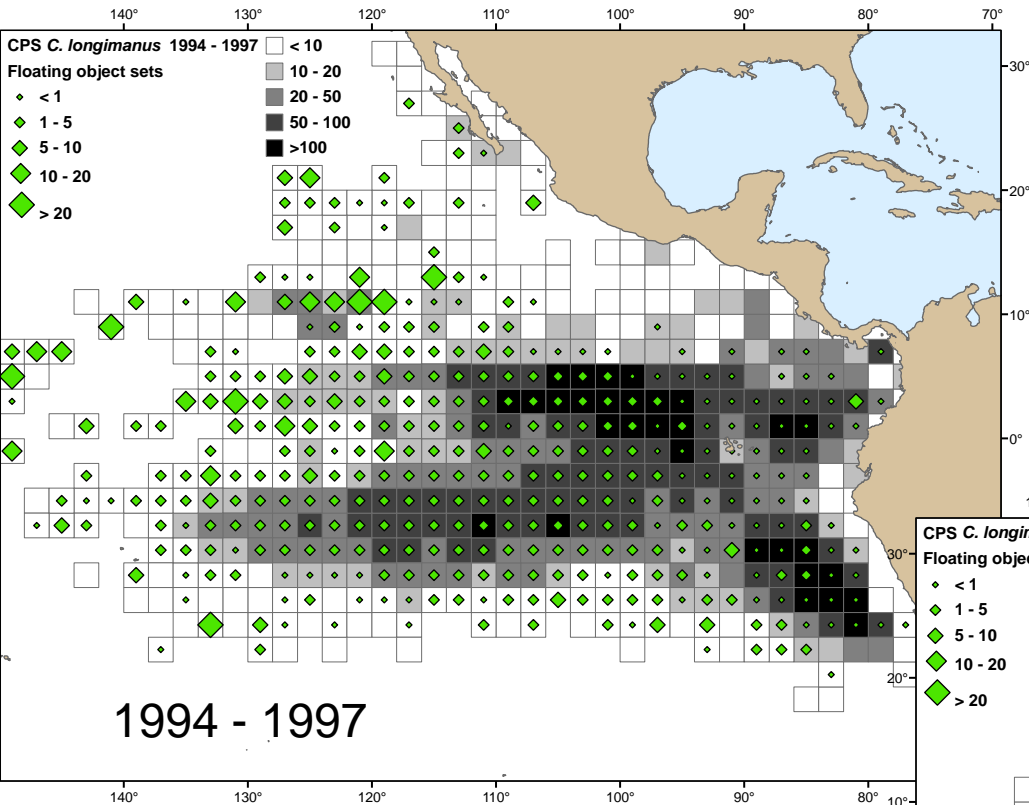
Fishing effort and CPS (num. individuals) – Oc. whitetip



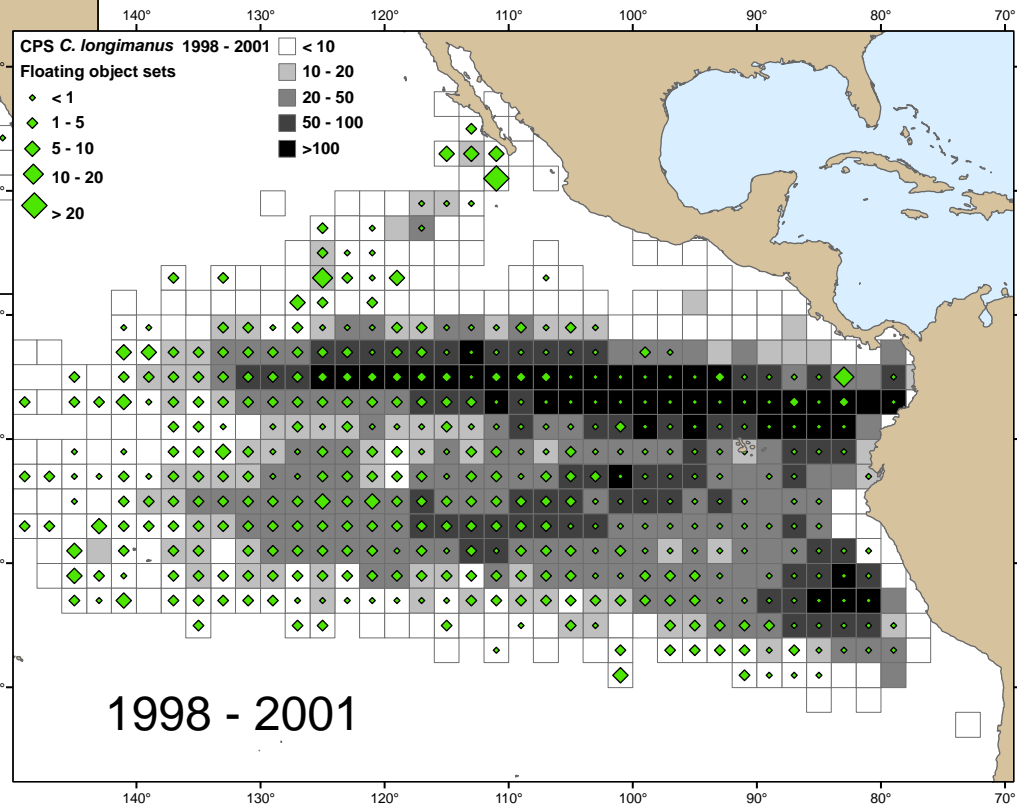
Dolphin and unassociated sets



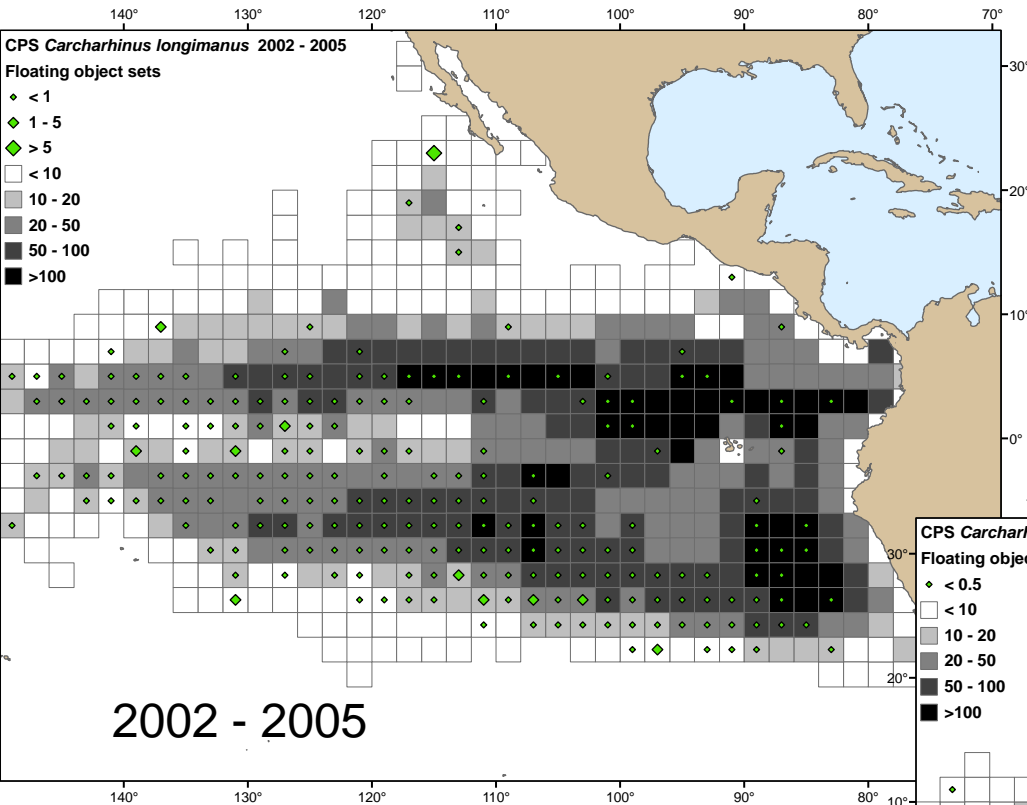
Fishing effort and CPS (num. individuals) – Oc. whitetip



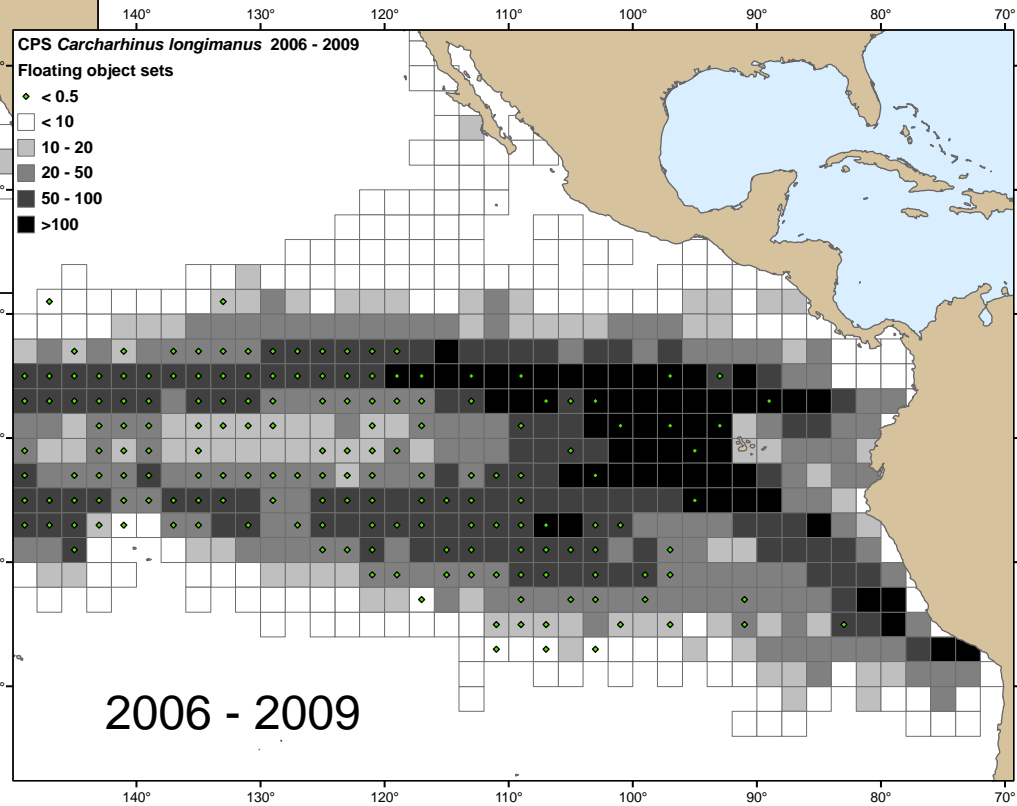
Floating object sets



Fishing effort and CPS (num. individuals) – Oc. whitetip



Floating object sets

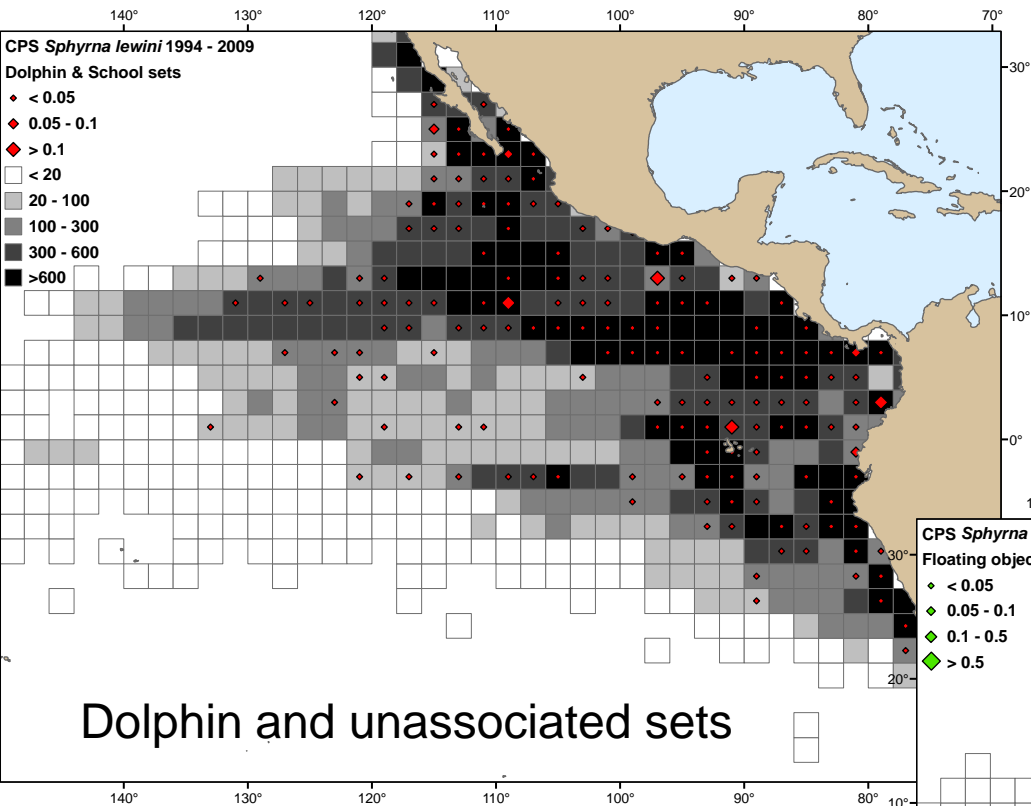


Hammerheads

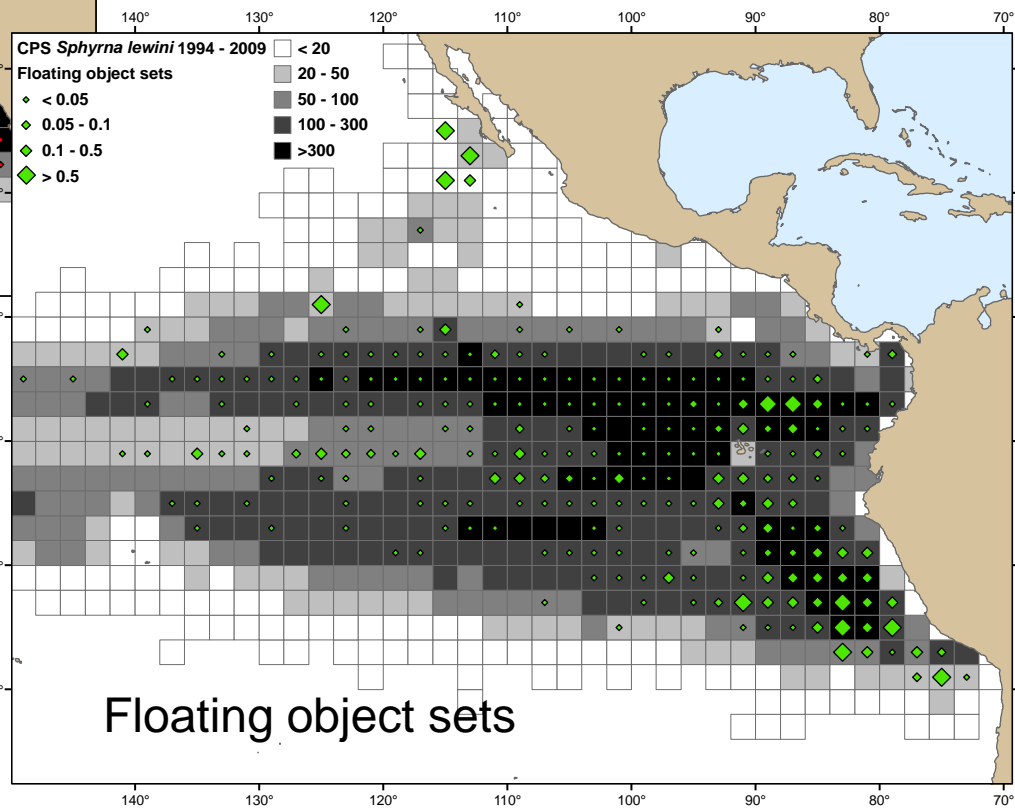
Sphyrna spp – *S. zygaena* – *S. lewini*



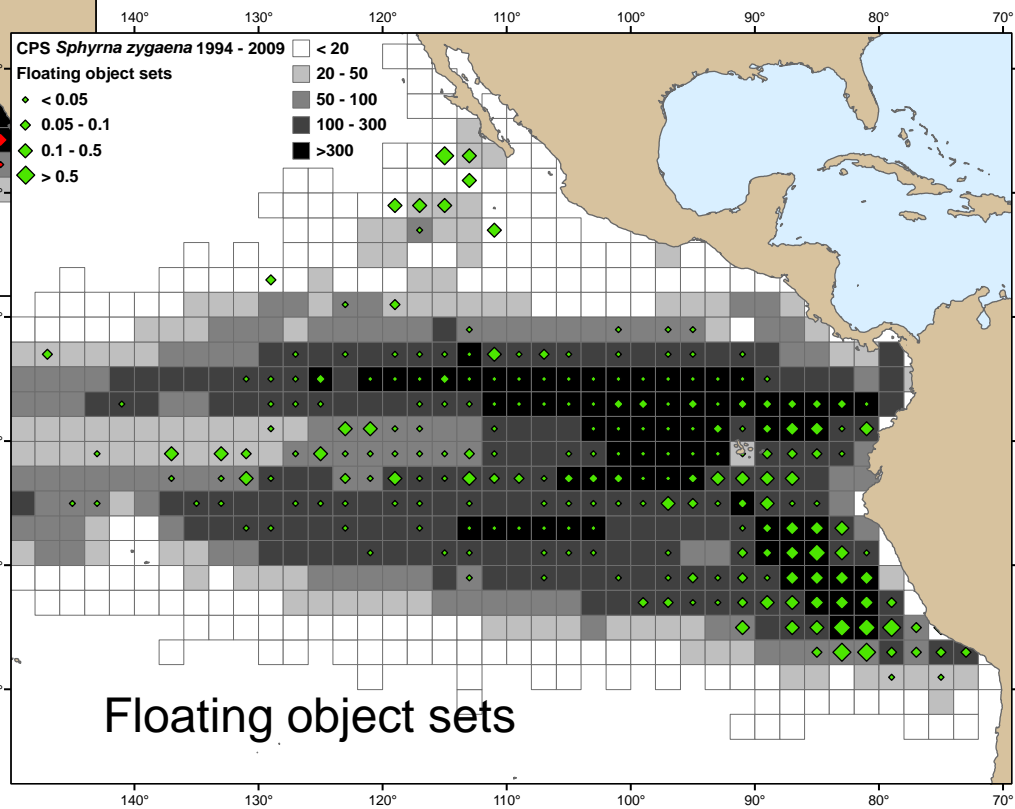
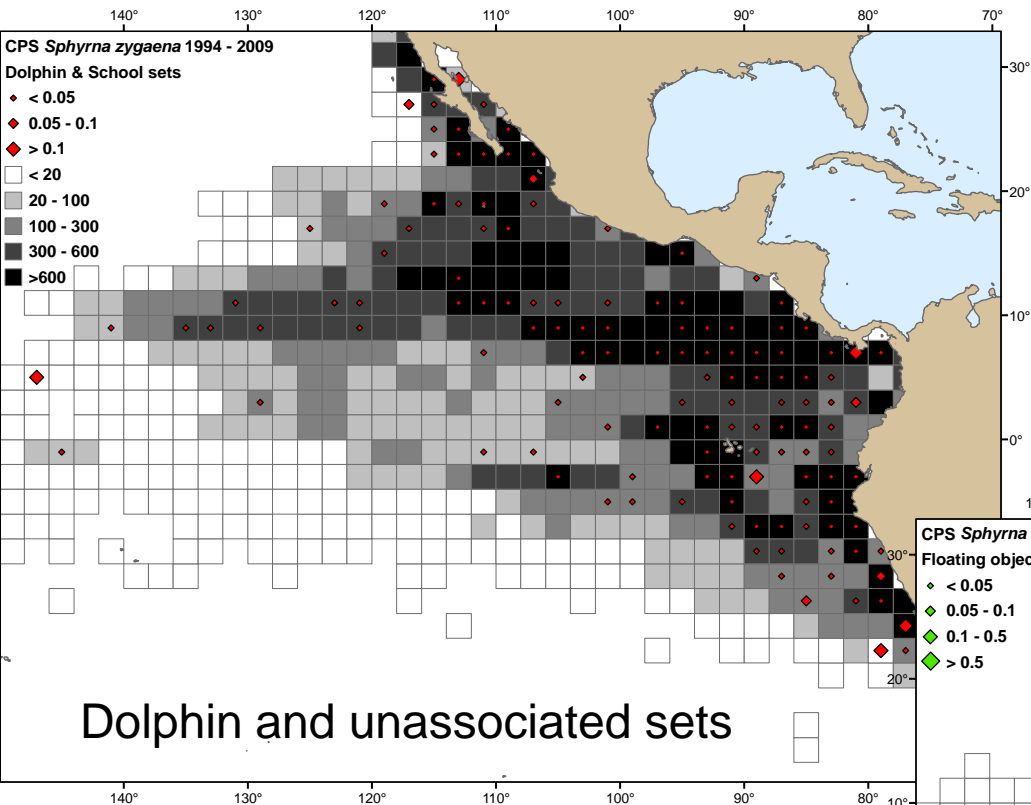
Fishing effort and CPS (num. individuals) – *Sphyrna lewini*



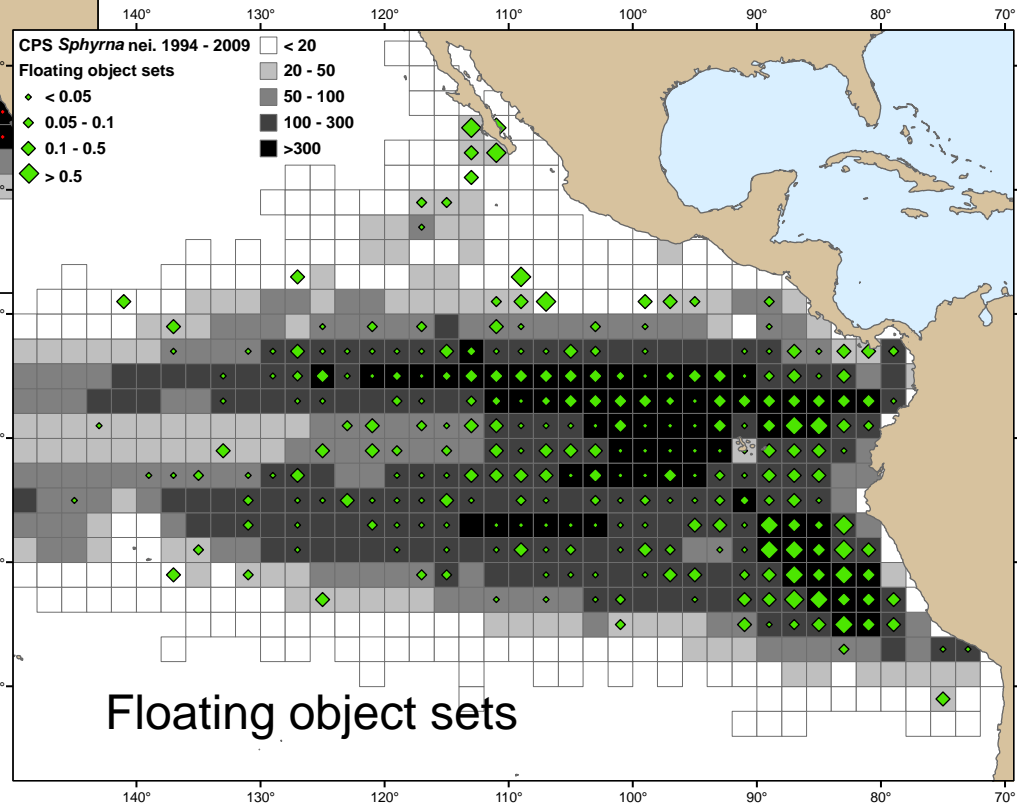
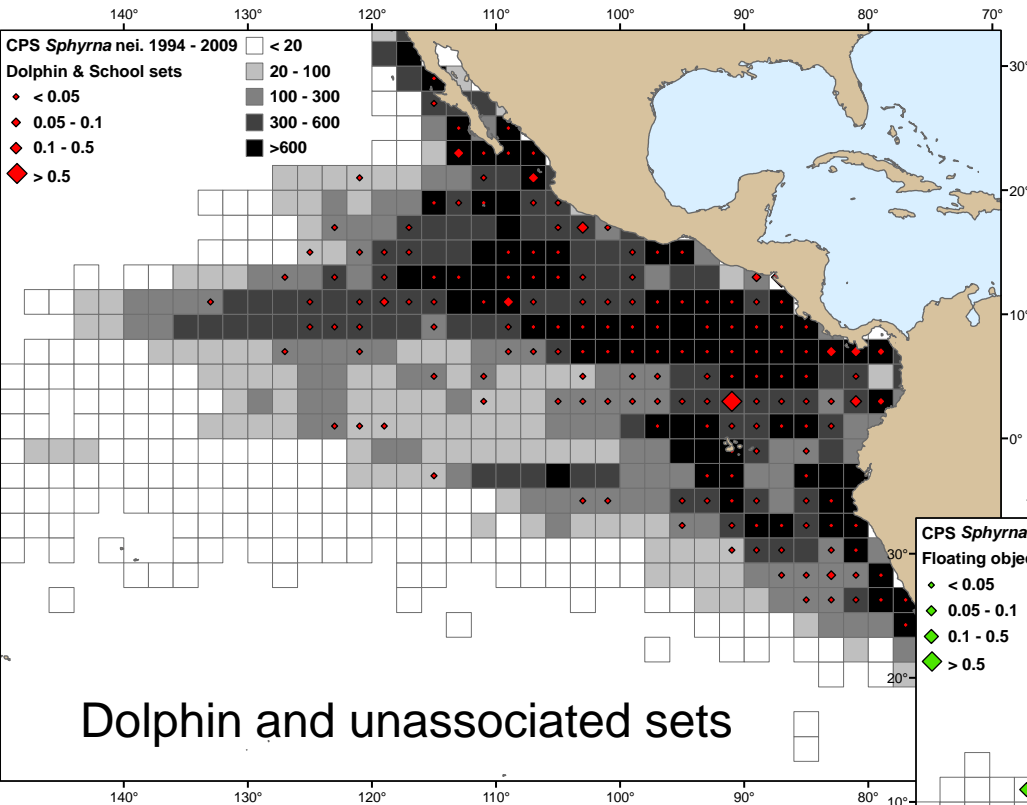
1994 - 2009



Fishing effort and CPS (num. individuals) – *Sphyrna zygaena*

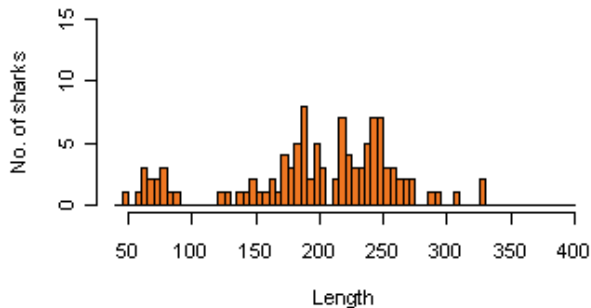


Fishing effort and CPS (num. individuals) – *Sphyrna* spp

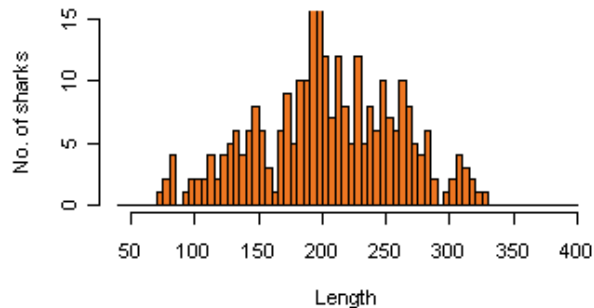


Length frequency distribution (cm) for common (*Sphyrna lewini*), smooth (*S. zygaena*) and unidentified *Sphyrna* caught by set type on sets made from 2005 to 2009.

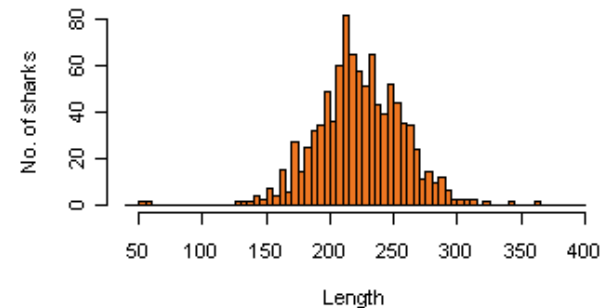
SPL - Dolphin sets



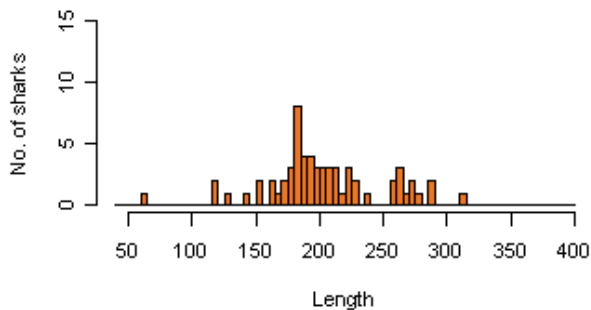
SPL - Unassociated sets



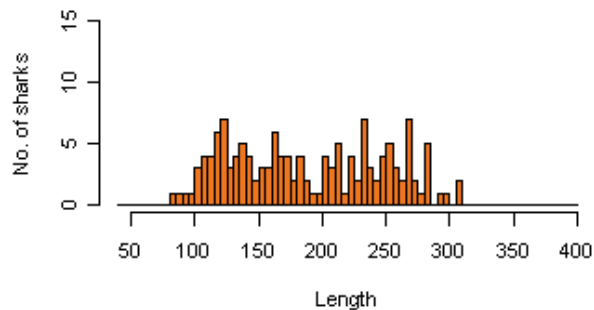
SPL - Floating object sets



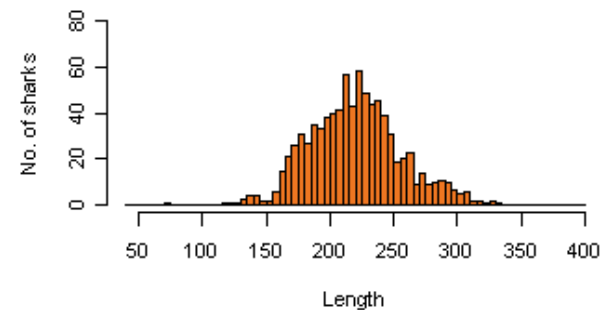
SPZ - Dolphin sets



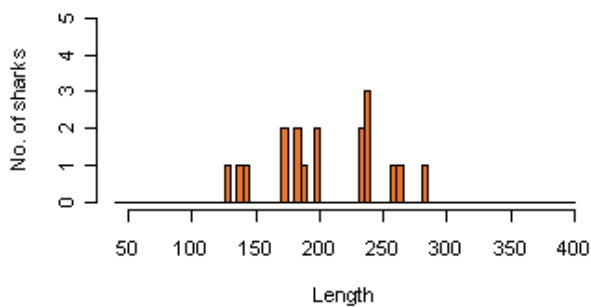
SPZ - Unassociated sets



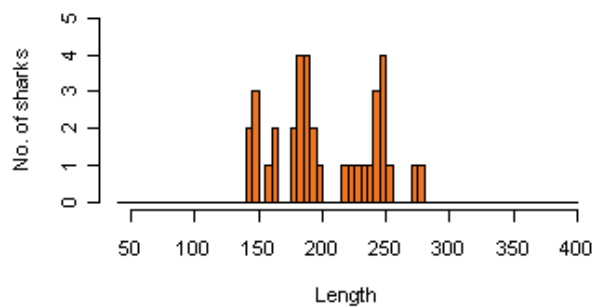
SPZ - Floating object sets



SPN - Dolphin sets



SPN - Unassociated sets



SPN - Floating object sets

