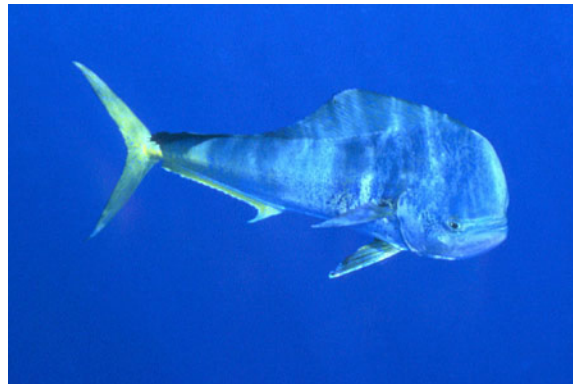


# Preliminary results from IATTC collaborative research activities on dorado in the EPO and future research plan (Document SAC-05-11b)

Alexandre Aires-da-Silva, Cleridy E. Lennert-Cody<sup>1</sup>, Mark N. Maunder<sup>1</sup>, Marlon Román-Verdesoto<sup>1</sup>, Carolina Minte-Vera<sup>1</sup>, Nickolas W. Vogel<sup>1</sup>, Jimmy Martínez-Ortiz, José M. Carvajal, Pablo X. Guerrero, and Fred Sondheimer<sup>4</sup>



Comisión Interamericana del Atún tropical  
Inter-American Tropical Tuna Commission (IATTC)

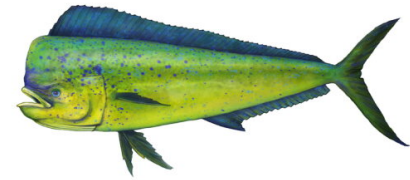
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5<sup>th</sup> Meeting of the IATTC Scientific Advisory Meeting  
La Jolla, California (USA), 12-16 May 2014



# Outline

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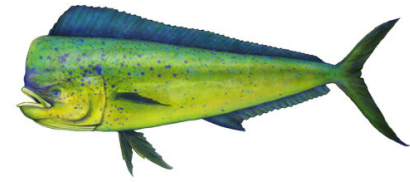


- Fishery statistics
  - Development of sampling programs
  - Seasonal trends (Ecuador and Costa Rica)
  - Identification of fishery units
- Stock status indicators
  - Indices based on catch-rate data: observer data and Ecuadorian artisanal fisheries
  - Indices based on composition data: observer data (size-classes) and Ecuadorian artisanal fisheries (length-composition)
- Research plan for low information stocks and bycatch species



# Development of sampling programs

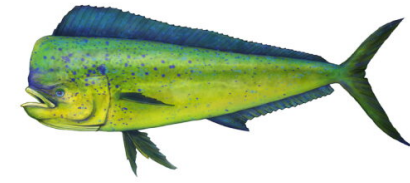
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- Assistance in development of data collection forms (Central America)
- Assistance in development of databases resources (Central America and Ecuador)



# Biological sampling and landings inspections - OSPESCA



## Biological sampling form for unloadings

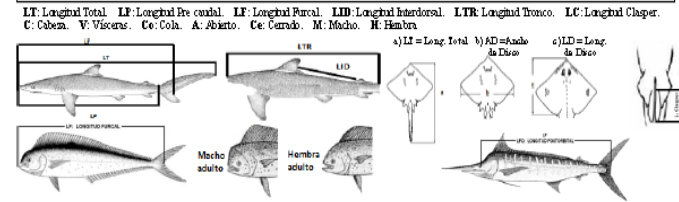
FORMULARIO DE MUESTREOS BIOLÓGICO PESQUERO EN DESEMBARQUES										
Principal Arte de Pesca: _____					Hoja: Biológica _____ Desembarque _____					
Nombre de la embarcación	Fecha de muestreo	Muestreador	País Pabellón	Matrícula	Esloro (m)	Lugar desembarque	Fecha de zape	Fecha de arribo		
Lugar de pesca, coordenadas ó rumbo		Distancia recorrida	# de cuadrantes	# de pescadores	Hp. motor	Combustible	Peso total de captura	Peso total tib. y rayas		
<b>PALANGRE</b>										
No. de lances	Largo [ ]	Anzuelos Cantidad: [ ] Tipo: J ( ) C ( ) Tamaño: [ ] Código de Anz: [ ] Anillo: Si ( ) No ( )	Longitud: Ornque [ ] Reinal superior [ ] Reinal Intermedio [ ] Reinal inferior [ ] Entre anzuelos [ ]	# Banderas: [ ] # Anzuelos entre flotadores: [ ] # Flotadores entre banderas: [ ]	Profundidad de pesca del arte [ ]	Carnada 1. [ ] ( ) ( ) ( ) 2. [ ] ( ) ( ) ( ) 3. [ ] ( ) ( ) ( )	% Vivo Fresco Cong ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( )	Reinal inferior de acero Si ( ) No ( )	Pesca objetivo	
<b>RED AGALLERA</b>										
No. de lances	Largo [ ]	Alto del arte de pesca [ ]	Luz de malla [ ] Superior [ ] Medio [ ] Inferior [ ]	Ubicación del arte de pesca: Superficie ( ) Media agua ( ) Fondo ( )	Profundidad del arte de pesca [ ]	Horario (h) Día ( ) Noche ( )	Pesca objetivo			
<b>LINEA DE MANO</b>										
Material de la línea	Largo [ ]	Anzuelos Cantidad: [ ] Tipo: J ( ) C ( ) Tamaño: [ ] Código de Anz: [ ]	Anillo: [ ] Si ( ) No ( )	Ubicación del arte de pesca: Superficie ( ) Media agua ( ) Fondo ( )	Profundidad de pesca del arte [ ]	Reinal inferior de acero Si ( ) No ( )	Carnada 1. [ ] ( ) ( ) ( ) 2. [ ] ( ) ( ) ( ) 3. [ ] ( ) ( ) ( )	% Vivo Fresco Cong ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( )	Horario (h) Día ( ) Noche ( )	Pesca objetivo
<b>RED DE ARRABASTRE</b>										
No. de lances	Luz de malla cuerpo de la red [ ]	Luz de malla del copo de la red [ ]	Abertura de la red [ ]	Tiempo promedio de arrastre por lance (hrs)	Numero de redes	Profundidad del arte de pesca [ ]	Horario (h) Día ( ) Noche ( )	Pesca objetivo		
<b>TOTAL DE LA DESCARGA</b>										
Especie	No. individuos misma especie o grupo de esp.	Peso total [ ]								
			<b>Observaciones</b> _____ _____ _____ _____ _____							



FMB/PD-v2013-04

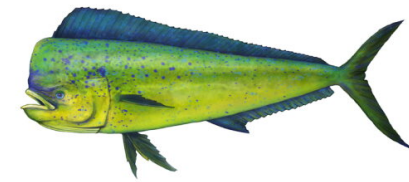
## Biological monitoring form

Especie	MONITOREO BIOLÓGICO																					
	Sexo	AD	LD	LT	LP	LF	LID	LTR	LC	Peso	El animal tiene		No. de crías		Clase oper. en el caso	Clase oper. en el examen						
		(cm)	(cm)	(cm)	(cm)	(cm)	(cm)	(cm)	(cm)	(kg)	C	V	Co	A	Ca	M	H	SI	No	SI	No	
1																						
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36																						
37																						
38																						
39																						
40																						
<b>Observaciones</b>																						
_____																						
_____																						





# Database work



## BASE DE DATOS FORMULARIO DE MUESTREOS BIOLÓGICO PESQUERO EN DESEMBARQUES

OSPESCA Herramientas de presentación de formulario

Inicio Crear Datos externos Herramientas de base de datos Formato Organizar

Ver Tahoma Fuente Formato Líneas de división Líneas de división Logotipo Fecha y hora Agregar campos existentes Autoformato

Ver Tahoma Fuente Formato Líneas de división Líneas de división Logotipo Fecha y hora Agregar campos existentes Autoformato

Todos los objetos d... <<

tblRango  
tblSede  
tblSexo  
tblSI\_No  
tblUnidad  
tblZImportLog

Consultas >>

Formularios >>

frmHerramientas  
frmMAgallera  
frmMArrastre  
frmMBiologico  
frmMDescarga  
frmMLineaMano  
frmMLineaManoCar...  
frmMPalangre  
frmMPalangreCarn...  
RegistroMuestreo  
SF00\_Vacio  
SF01\_Sede  
SF02\_Errores  
SF03\_ActualizarCam...  
SF05\_AddNewEmba...  
SF05\_Embarcacion

RegistroMuestreo

Sede Sede Sede Form. Muestreos Hoja: Biológico Desembarque  
Emb Prin. Arte Calidad 0 Herramientas

Embarcación	Fecha	Muestreador	Pais	Matricula	Eslora	Lugar Des.	Salida	Llegada		
Lugar de Pesca	Dist Rec.	Cuadrante	Pesc	Motor HP	Combust	U	Tot Cap	U	Tot Tib	U

Palangre Aqallera Línea mano Arrastre Descarga Biologico

Lance	Largo	Anzuelos	Longitud	U	Band	Anz	Prof	Carnada	Pcr	R. Acero	Pesca
		Cantidad	Orinq							Sí No	
	U	Tipo J-C	R Sup		Unidades						
		Tamano	R Med		1=cm	5=kg					
		Cat #	R Inf		2=m	6=lb					
		Anillo: Sí Nc	EnAnz		3=brz	7=gal					
					4=milla naut	8=L					
Observ:					Flot	Boya	Días				

Registro: 1 de 1

Ubicación arte: Super Media Fondo

Horario: Día Noche

Pesos: Sí No

Observaciones

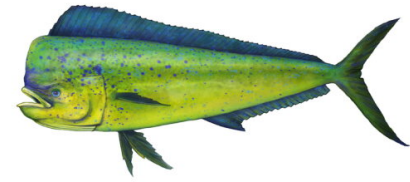
Latitud: Longitud:

Registro: 1 de 1 Sin filtro Buscar

Vista Presentación Bloq Num

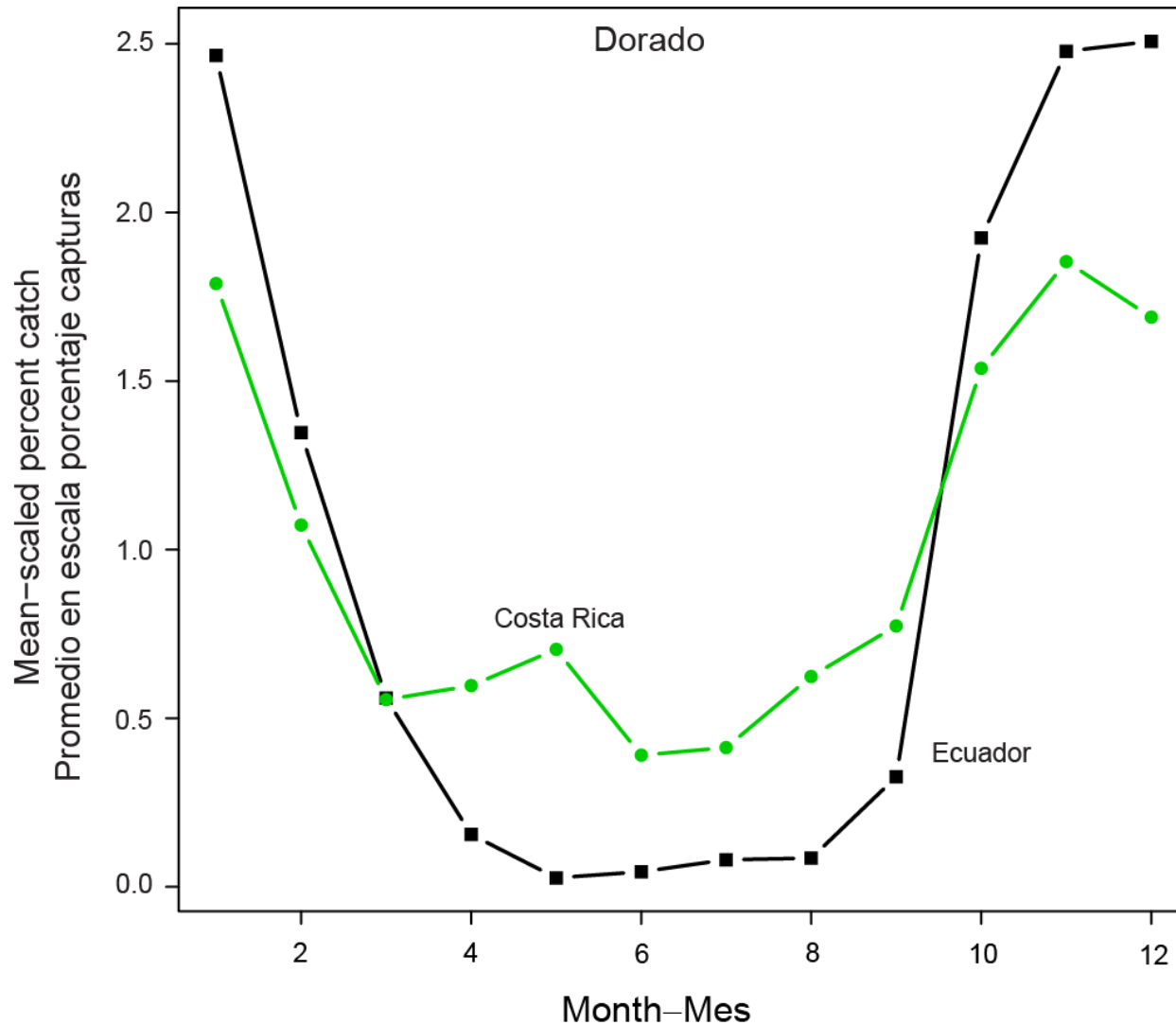
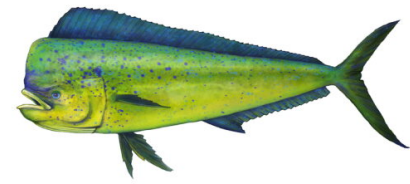
# Development of sampling programs

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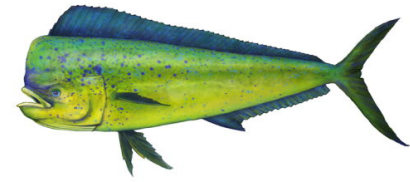
- Assistance with sampling design for data collection (Ecuador)

# Seasonal trends

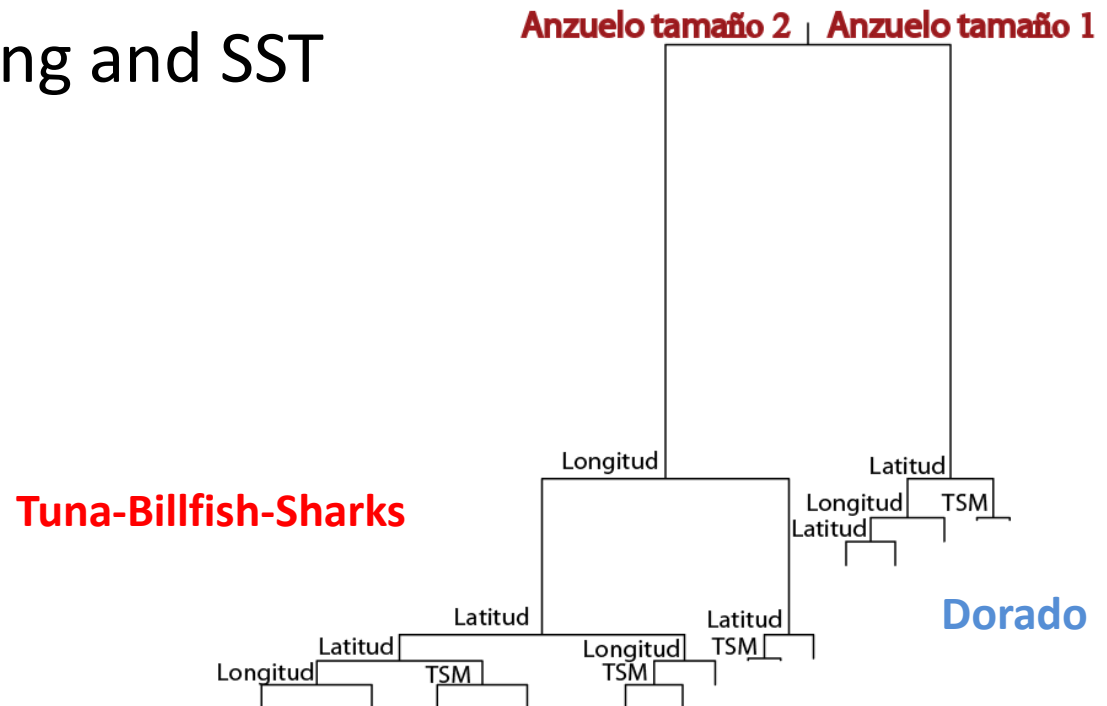




# Identification of fishery units

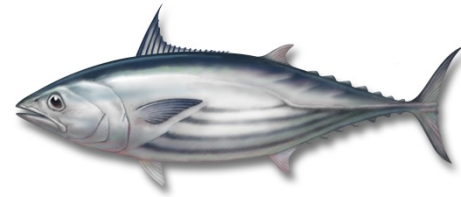


- Analysis of catch composition suggests two “nodriza” fisheries:
  - Hook type 1 with dorado as a dominant proportion of the catch
  - Hook type 2 with a more varied species composition
- Catch composition for both fisheries changes with location of fishing and SST



# Stock status indicators

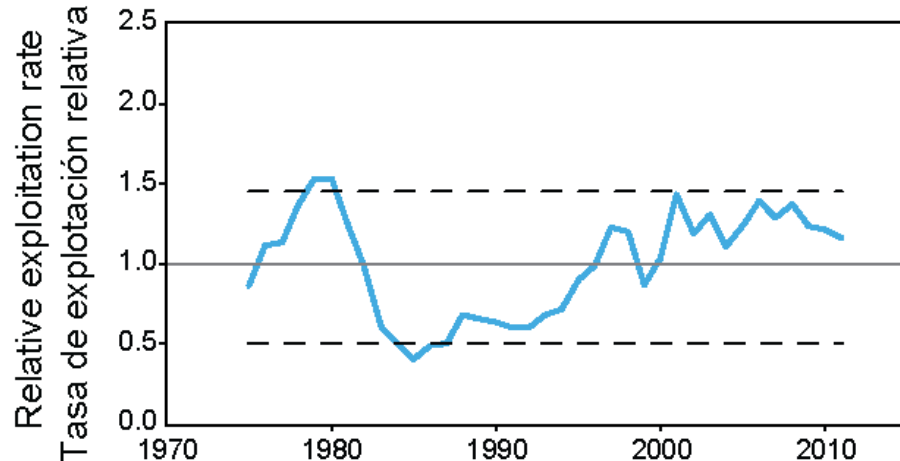
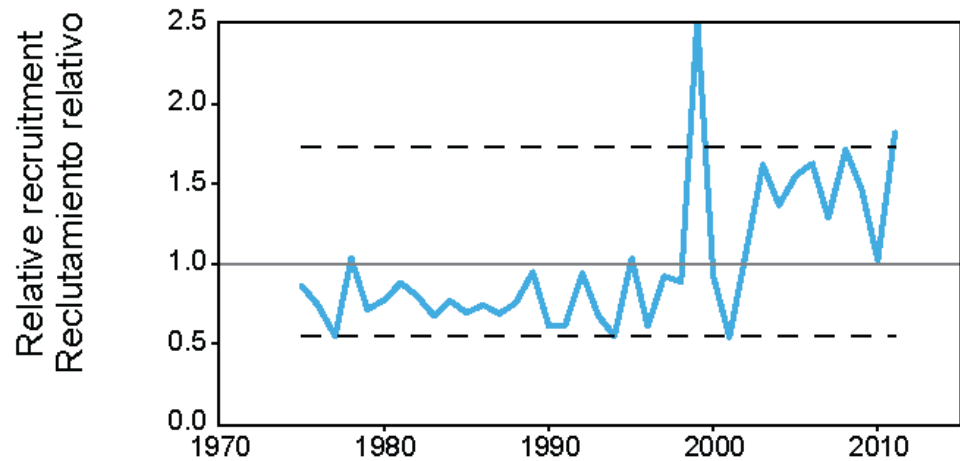
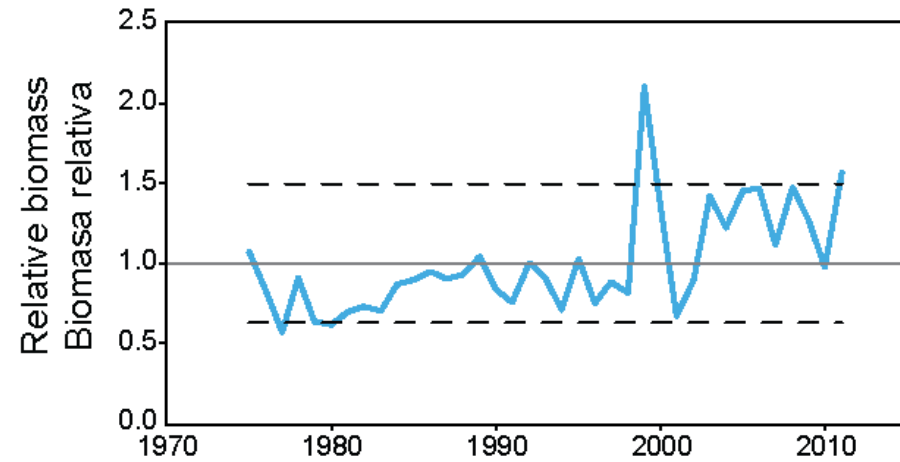
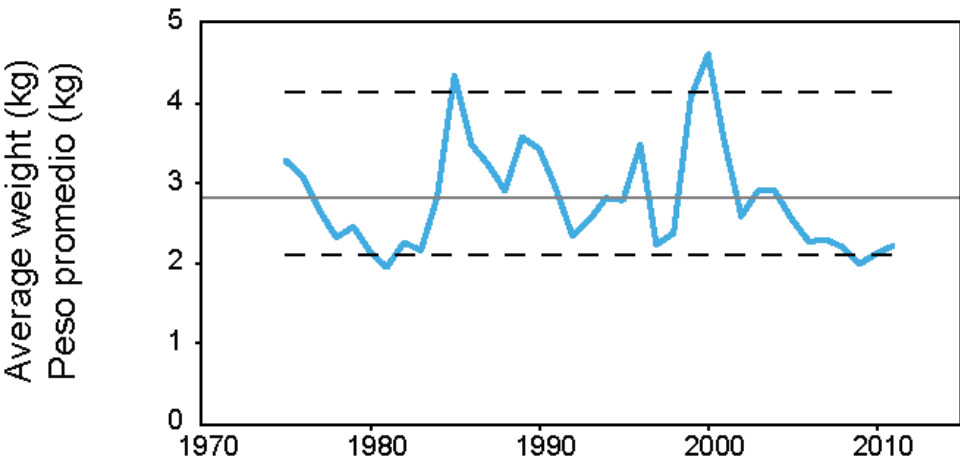
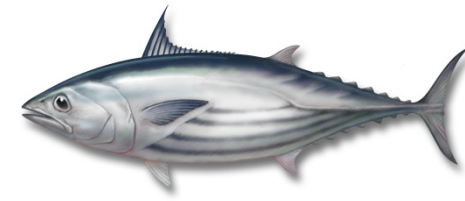
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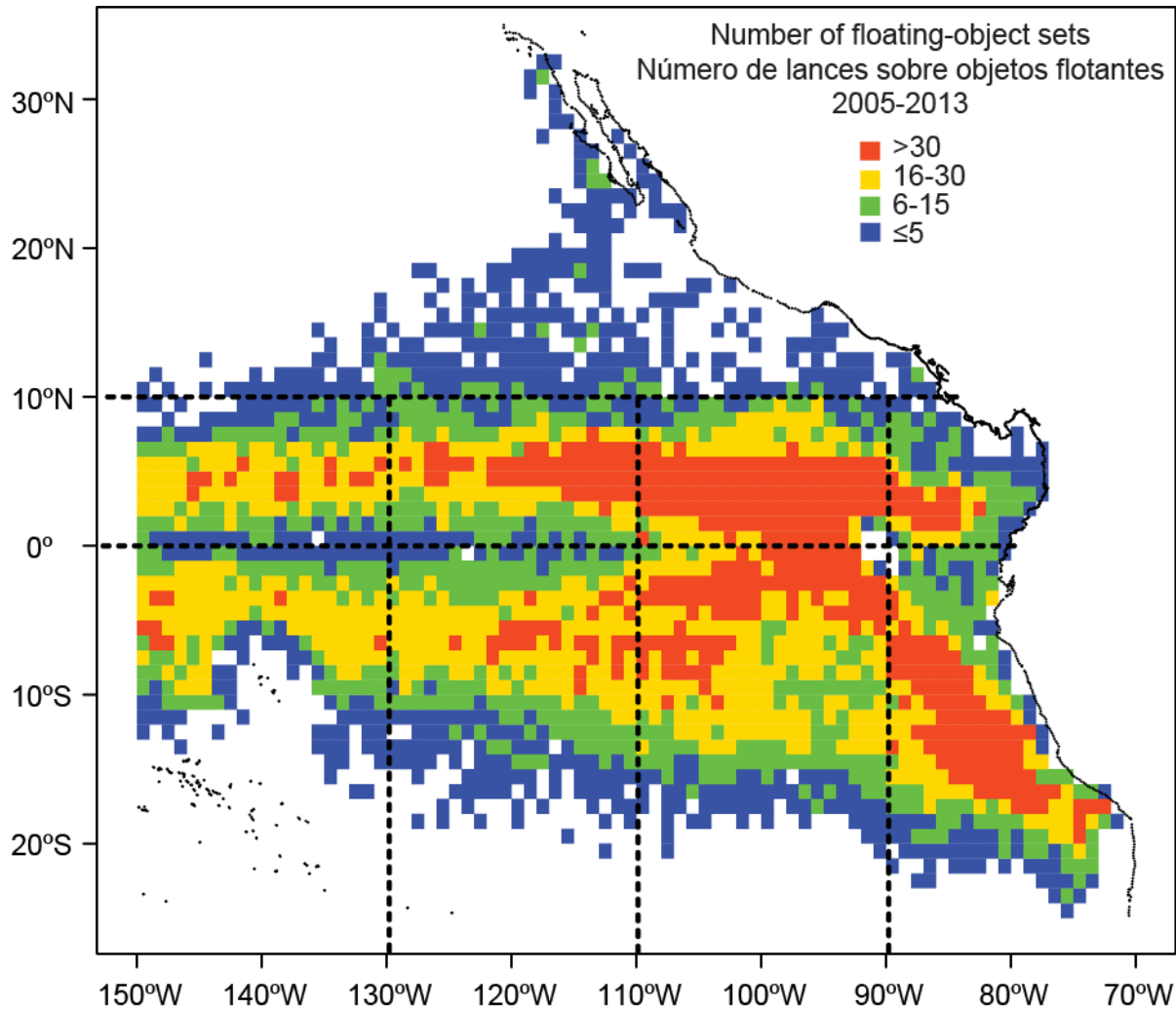
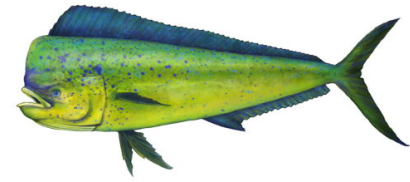
- Based on data (catch, effort, CPUE and mean weight)
- Based on simple population dynamics models (biomass, recruitment or exploitation rate)
- Reference levels
  - Selected by managers
  - Examples: 5<sup>th</sup> and 95<sup>th</sup> percentiles, ATHL for northern albacore (ISC)



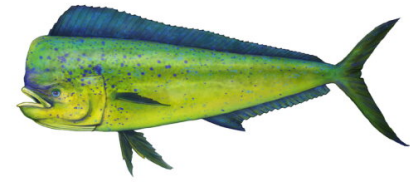
# Indicators – skipjack example



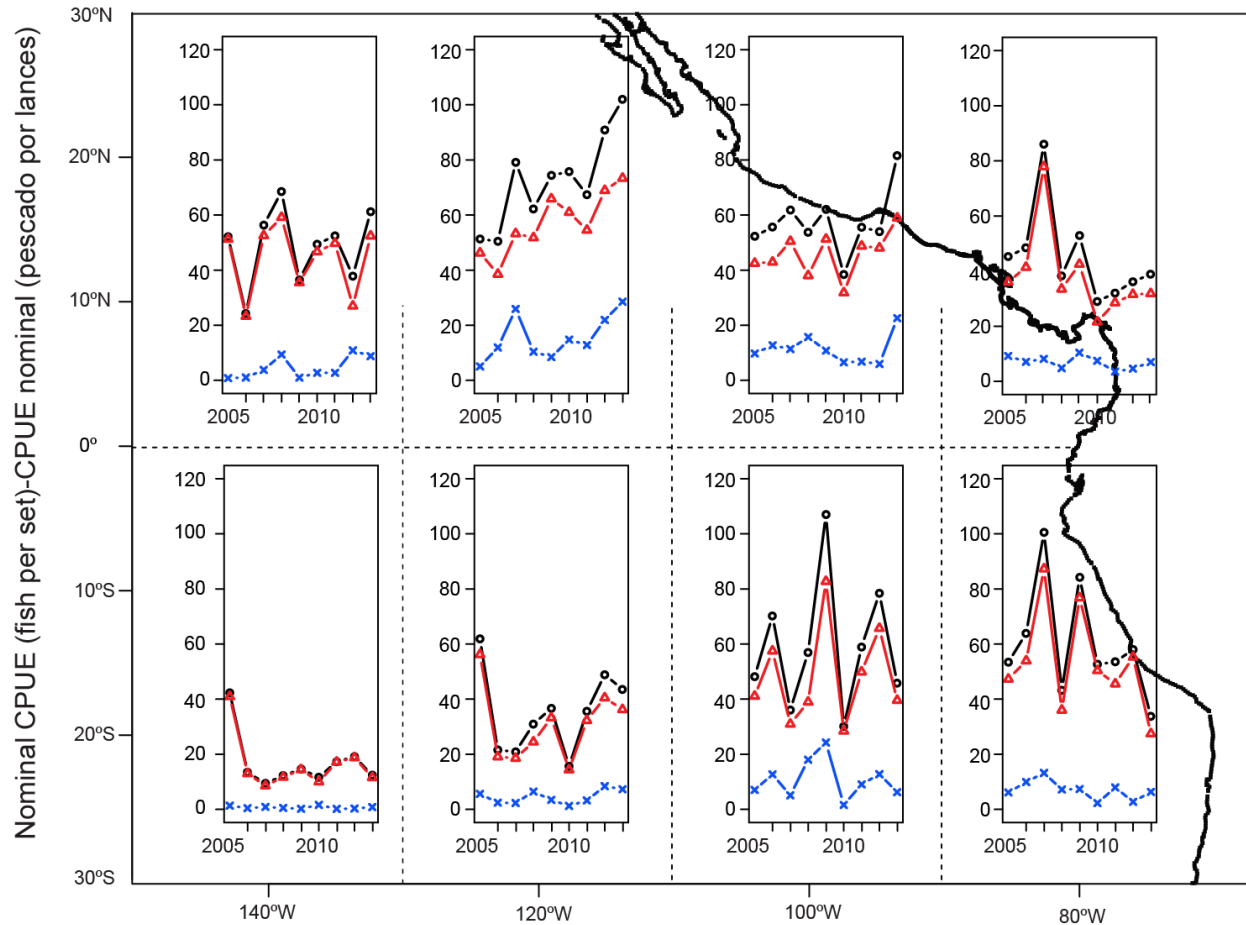
# OBJ purse seine sets



# Dorado purse seine CPUE



## Floating-object sets (OBJ)



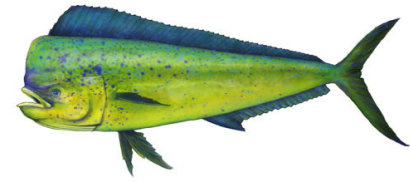
Black: all dorado

Red: large dorado (>60 cm)

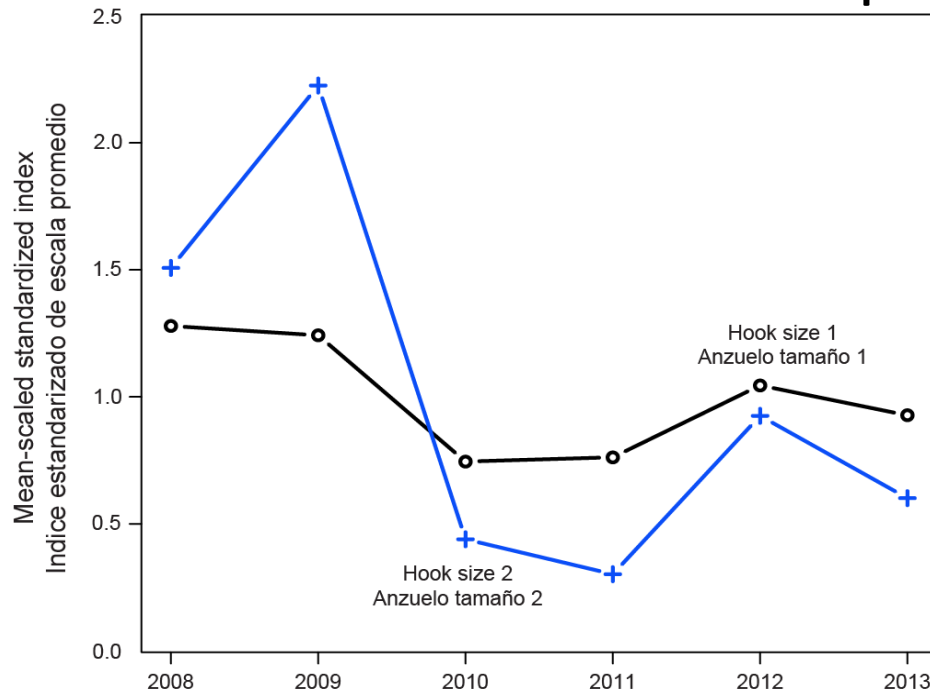
Blue: young-of-the-year (≤ 60 cm)



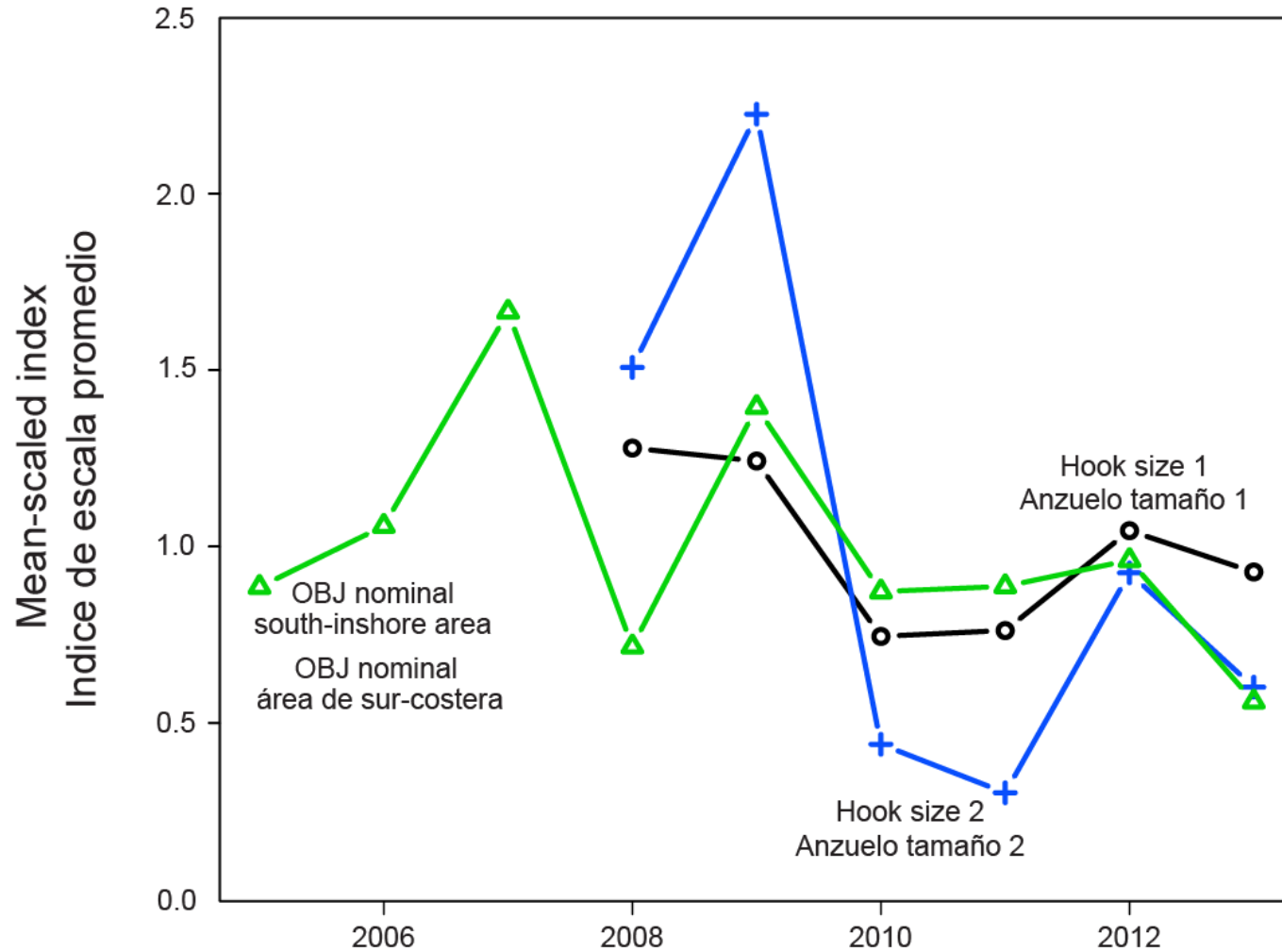
# Ecuador artisanal fisheries



- By-trip catch and effort data used to compute relative indices for the “nodriza” fisheries catch species
- GAM standardized CPUE for dorado from the two “nodriza” fisheries show similar trends over last 6 years
- Precision measures are under development

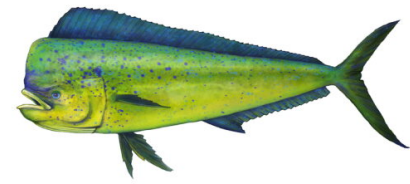


# CPUE indicator comparisons



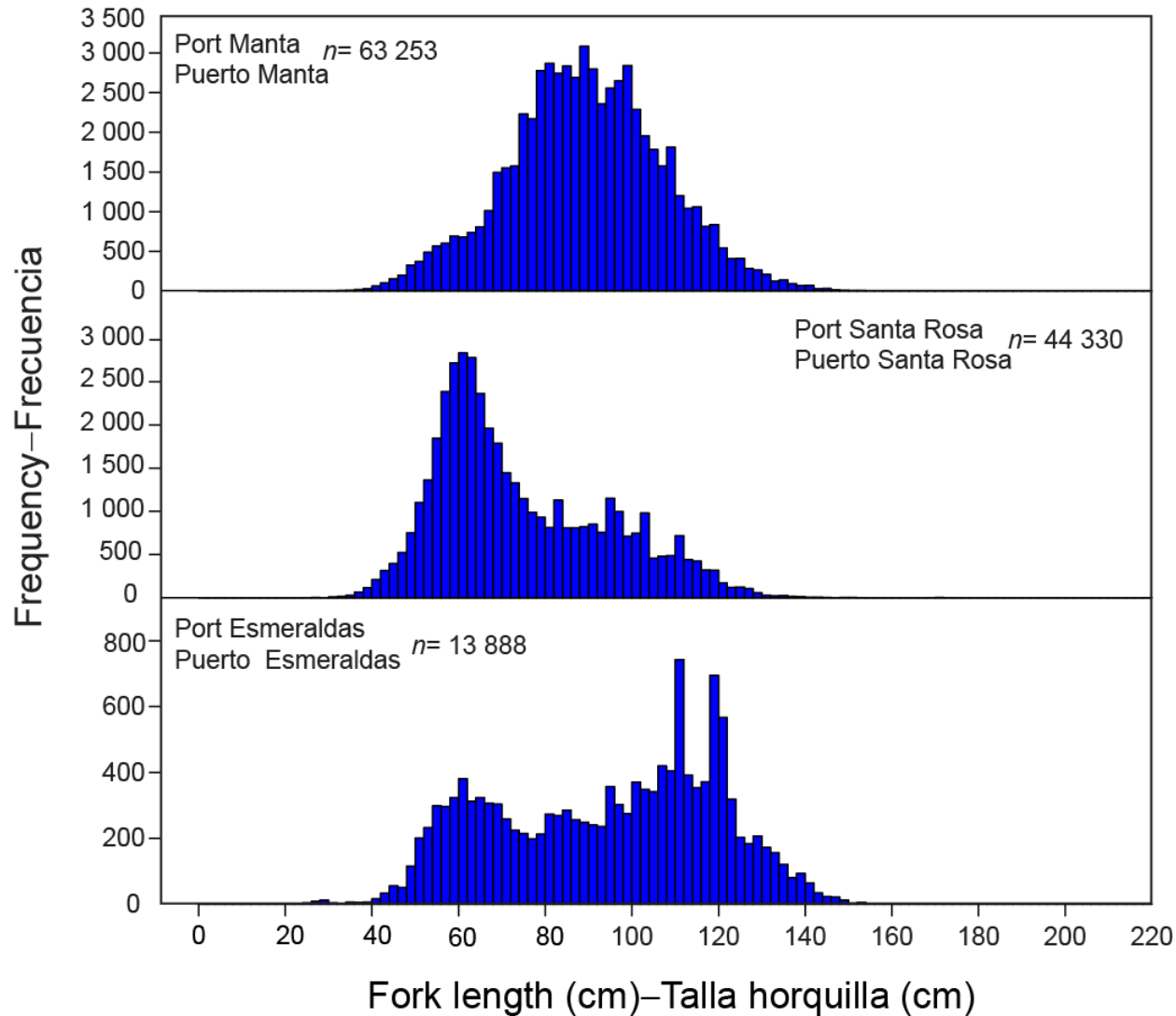
# Purse seine OBJ size-class data

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# Length-composition data - Ecuador



# IATTC assessment workplan for low information and bycatch species



- Task 1: Develop methods to define stock structure
- Task 2: Conduct “semi-quantitative” analyses
  - Productivity- susceptibility analyses (PSA)
  - Ecological risk assessment (ESA) tools
- Task 3: Extensive literature review on **fishery indicators**, decision rules and management strategy evaluation (MSE)
  - See SAC-05-11c
- Task 4: Select candidate fishery indicators, reference points, and decision rules based on literature review, life-history and data available
- Task 5: Management strategy evaluation work (MSE)
- Task 6: Routinely produce indicators for advice





QUESTIONS?