

Preliminary results from *mahi mahi* (dorado) collaborative research with IATTC member countries

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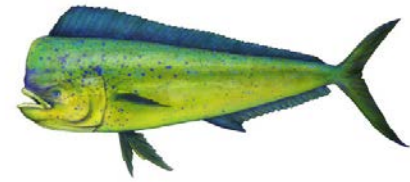
³Organización del Sector Pesquero y Acuicola del Istmo Centroamericano (OSPESCA)

4th Meeting of the IATTC Scientific Advisory Meeting

La Jolla, USA, 29 April – 3 May 2013



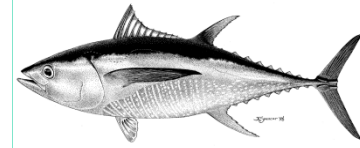
Outline



- Assessment framework plan for low information stocks and bycatch species in the EPO
- Available catch statistics for dorado in EPO
- Preliminary IATTC fishery indicators (purse seine CPUE) for dorado
- Ongoing collaborative activities with member countries
 - Ecuador and Central America
- IATTC future research plans for dorado



Need for alternative assessment methodologies...



- Low information species

- Fishery-dependent data (e.g., catch and effort) is not available or quality varies among fisheries
- Sharks species



- Bycatch species

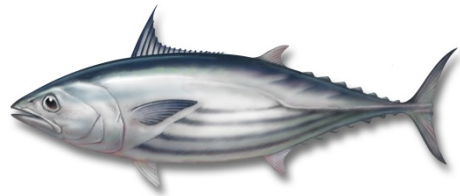
- Need to be monitored
- Insufficient recourses (staff) for full assessments



Need for alternative assessment methodologies...



- High-productivity species
 - Fishery-dependent data is sufficient
 - But species life-history complicate conventional stock assessment methods (short-lived, rapid-growth, high fecundities, high recruitment variability)
 - Very difficult to separate exploitation and environmental signals in conventional stock assessment models



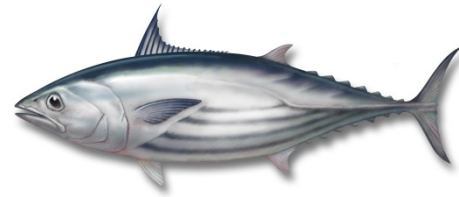
IATTC assessment workplan for low information and bycatch species



- Task 1: Develop methods to define stock structure
- Task 2: Conduct “semi-quantitative” analyses
 - Productivity-susceptability analyses (PSA)
 - Ecological risk assessment (ESA) tools
- Task 3: Extensive literature review on **fishery indicators**, decision rules and management strategy evaluation (MSE)
 - FAO, Australia, California, others
- Task 4: Select candidate fishery indicators and decision rules based on literature review, life-history and data available
- Task 5: Management strategy evaluation work (MSE)
- Task 6: Apply indicators



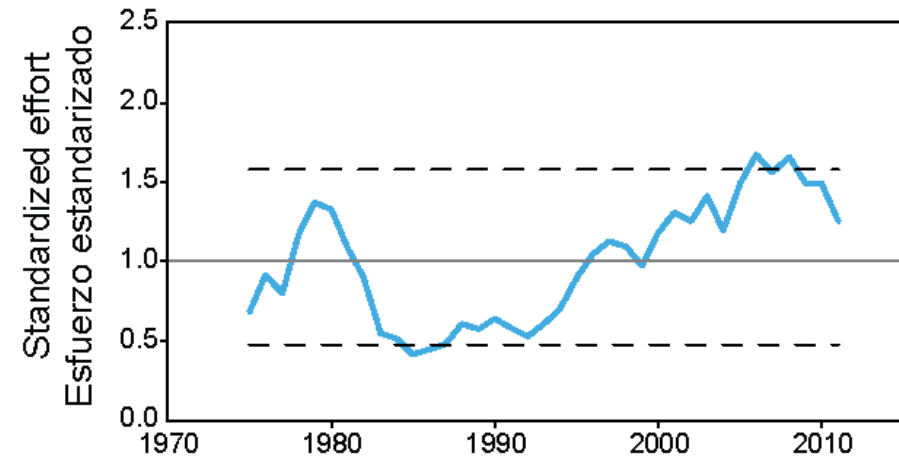
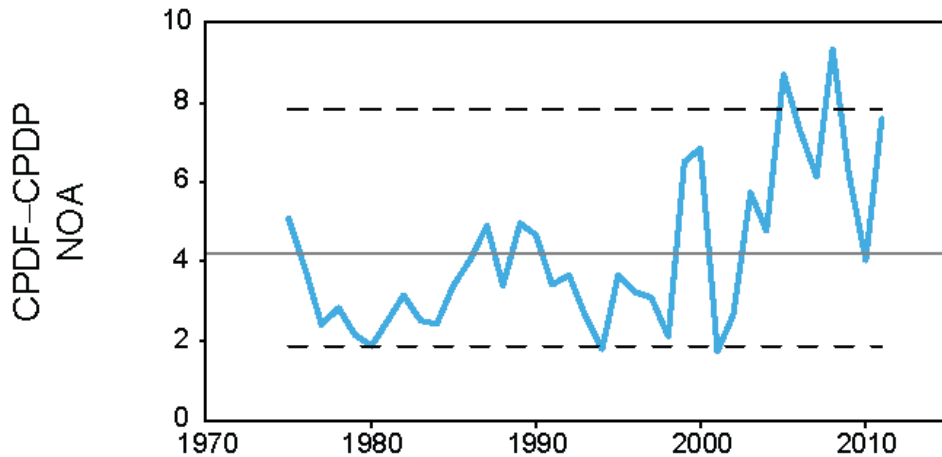
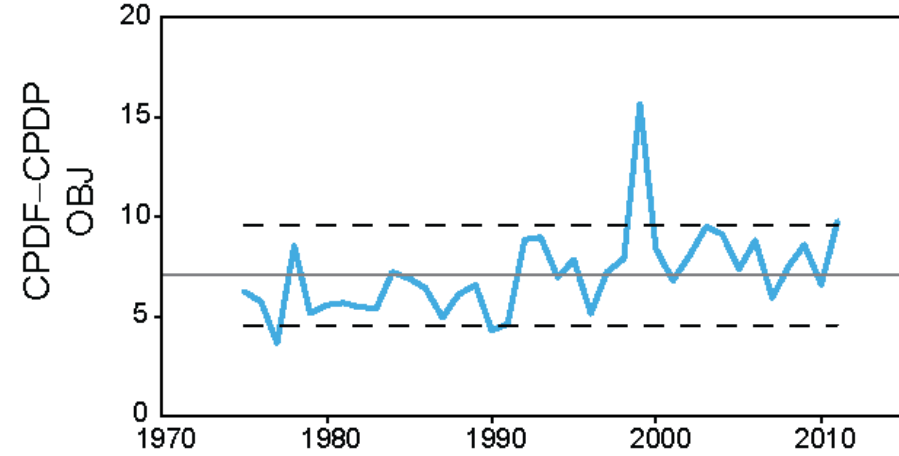
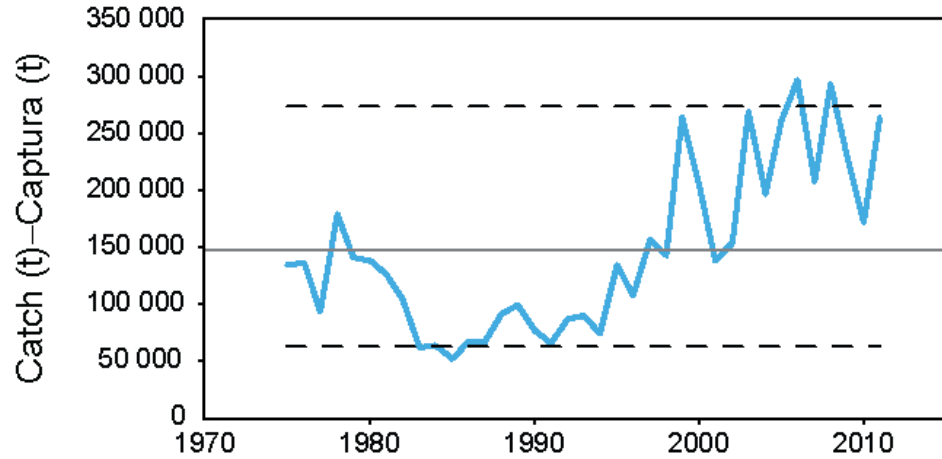
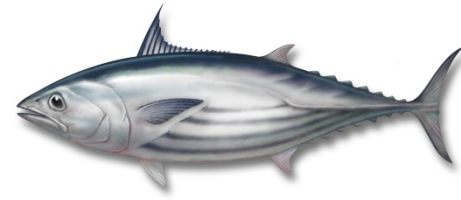
Fishery indicators



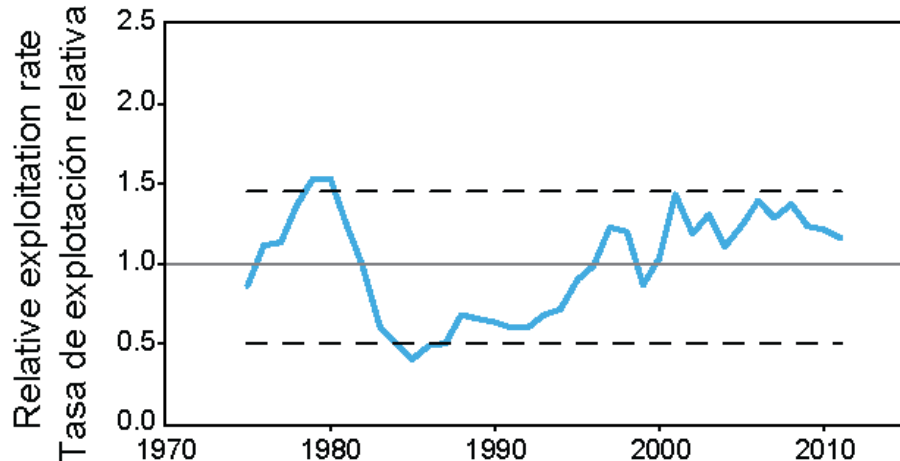
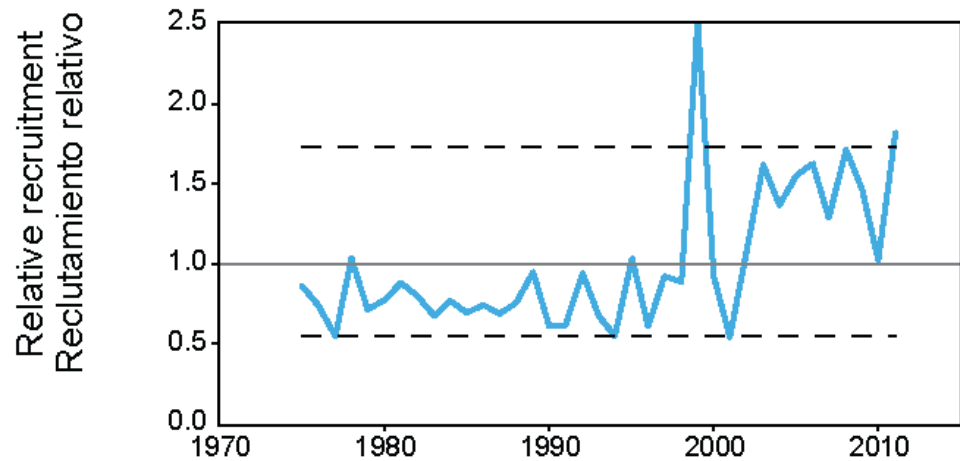
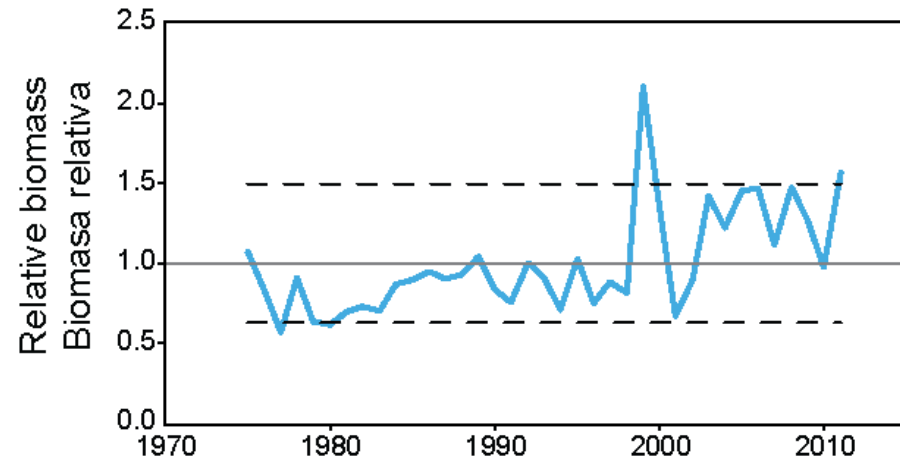
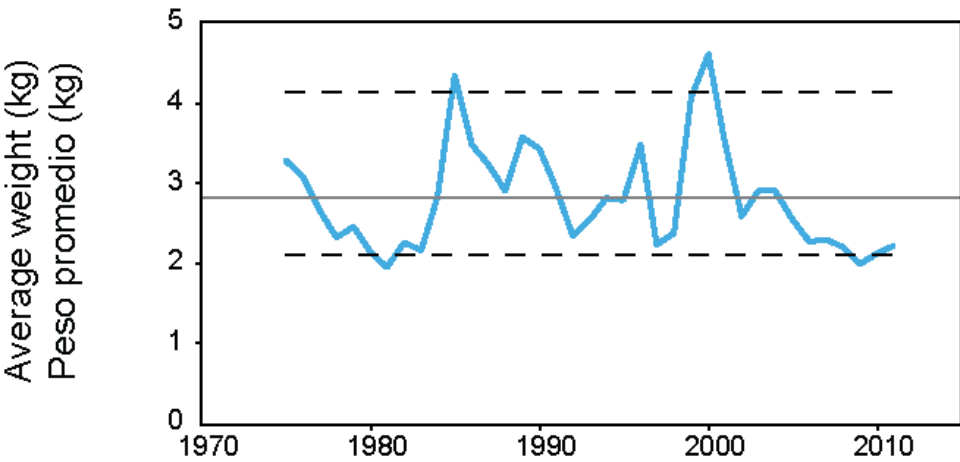
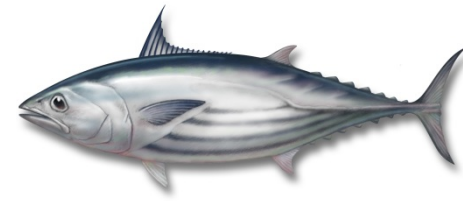
- Based on data (catch, effort, CPUE and mean weight)
- Based on simple population dynamics models (biomass, recruitment or exploitation rate)
- Reference levels
 - Selected by managers
 - Examples: 5th and 95th percentiles, ATHL for northern albacore (ISC)



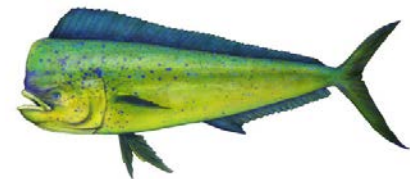
Indicators – skipjack example



Indicators – skipjack example



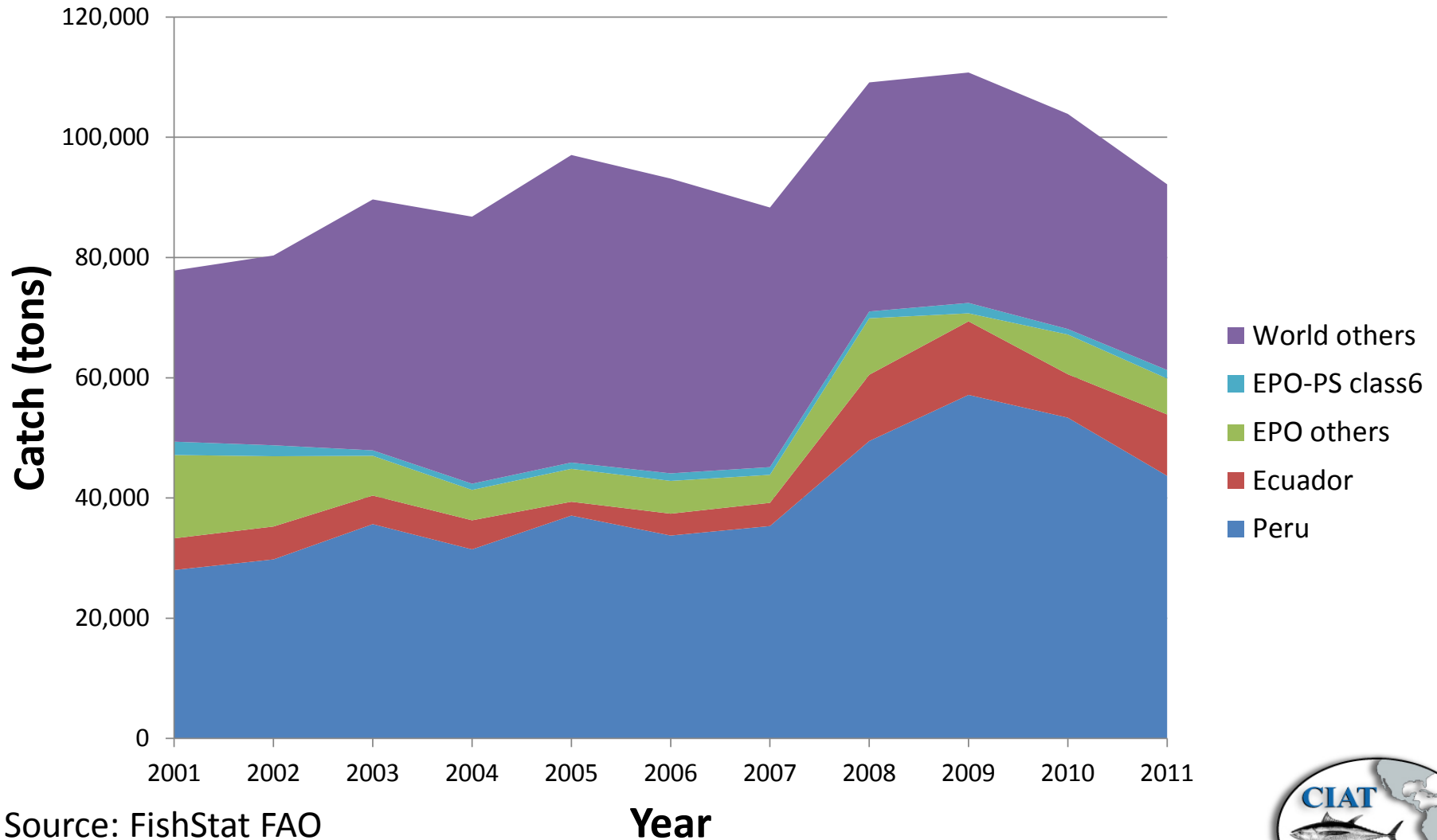
Dorado landings in EPO



Source: FishStat FAO



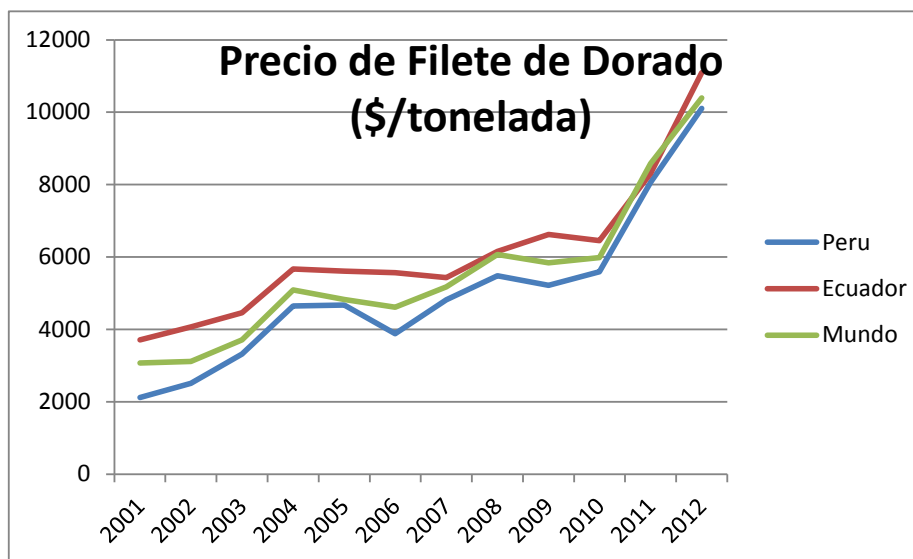
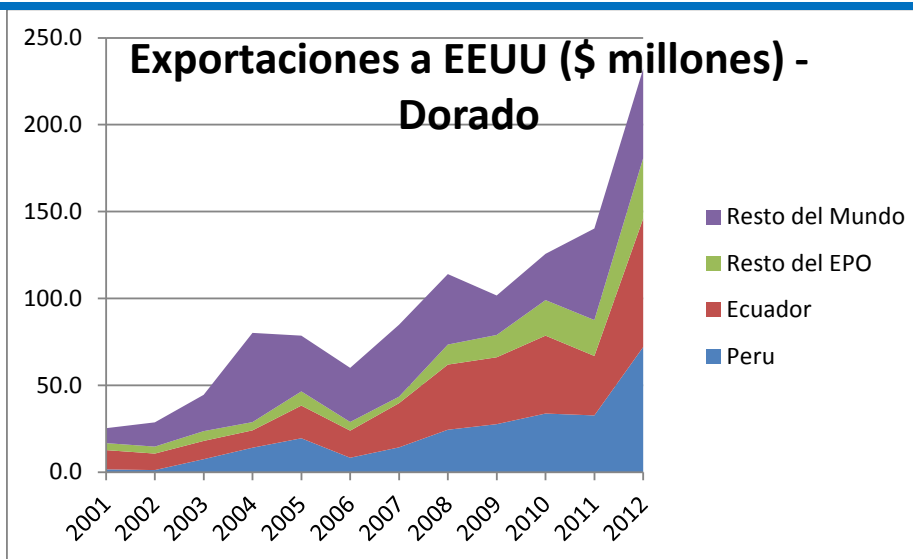
World's perspective



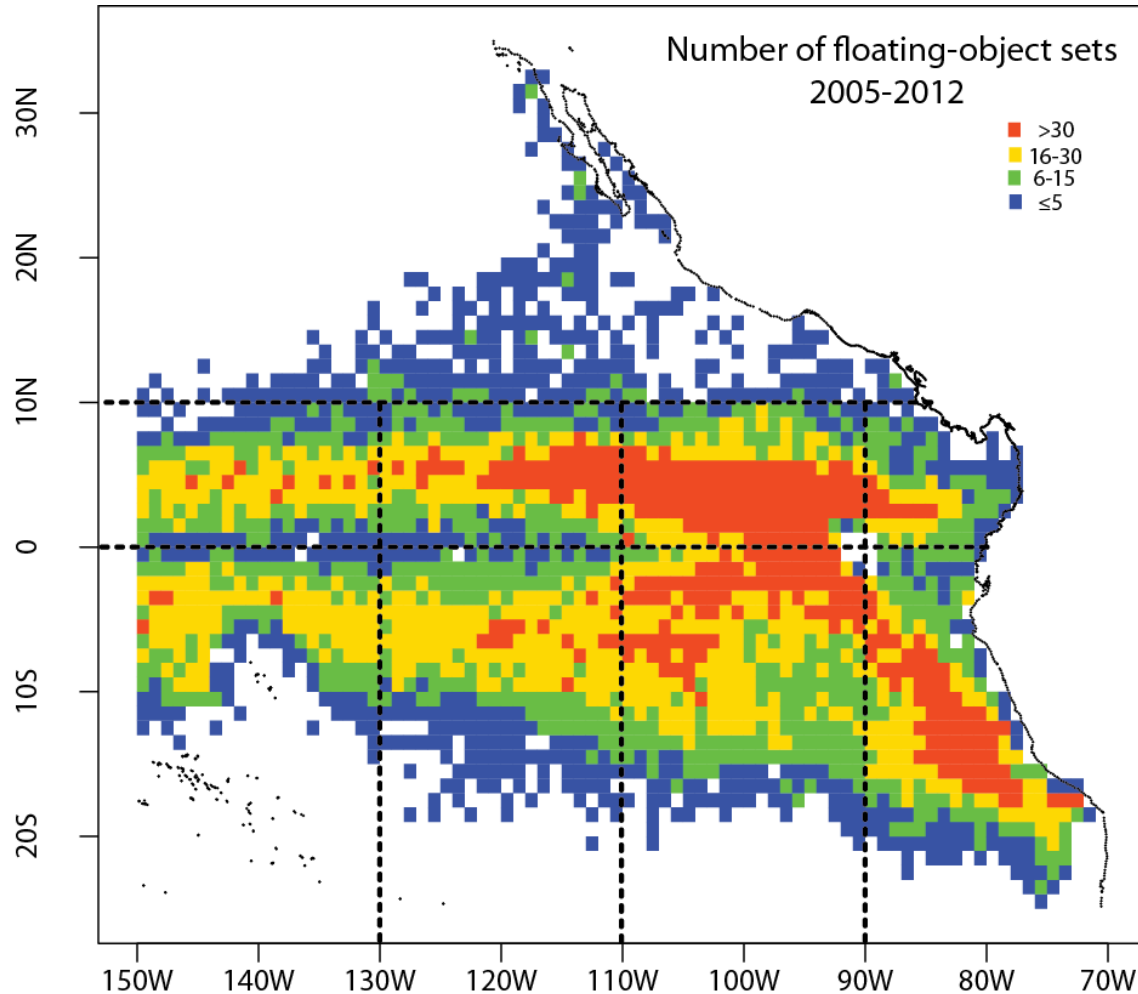
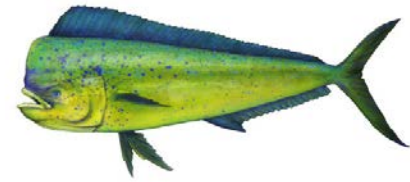
Source: FishStat FAO



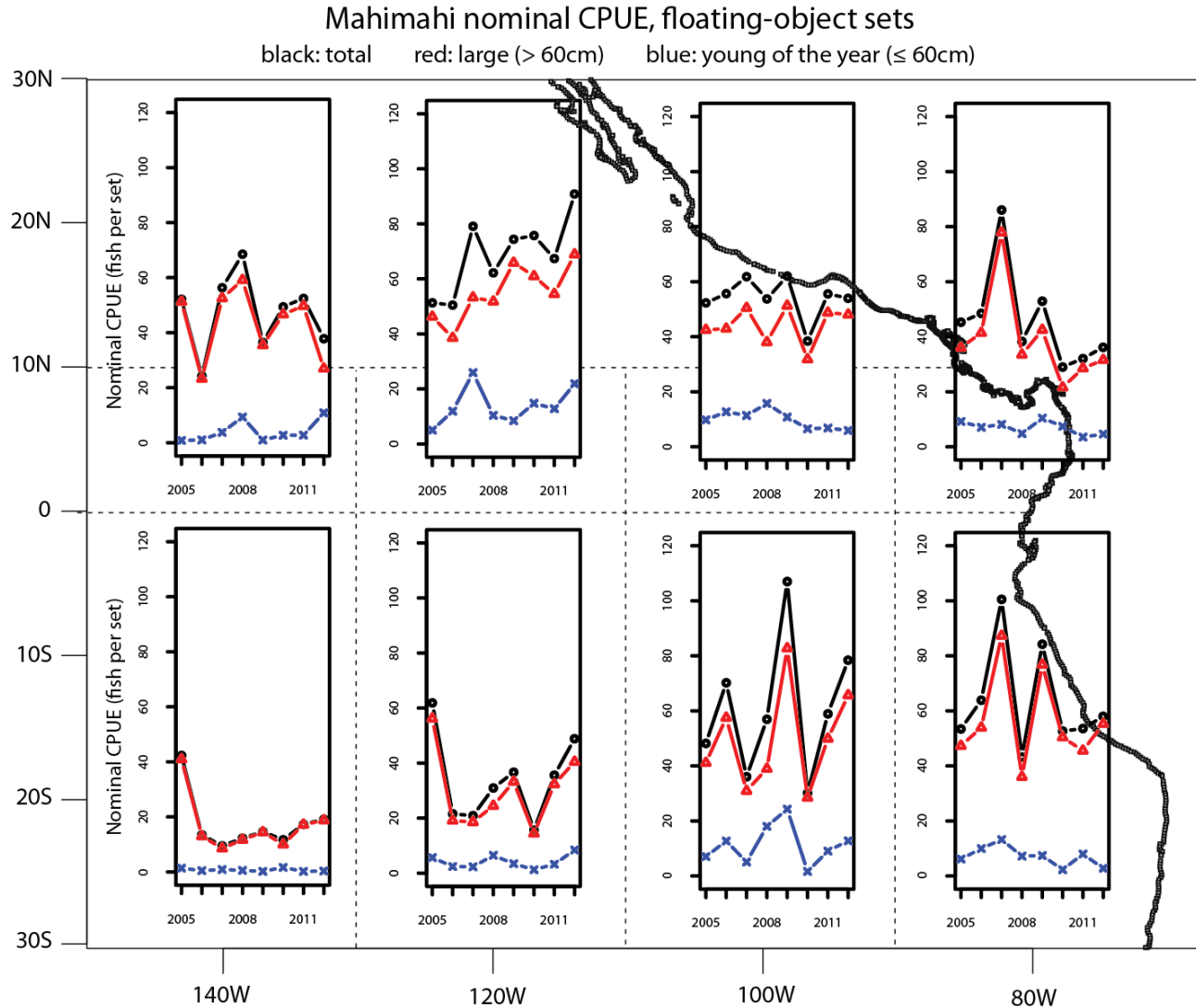
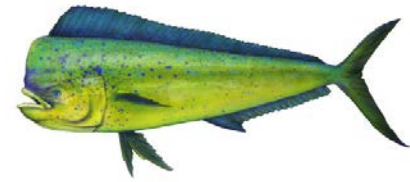
Dorado exports to US



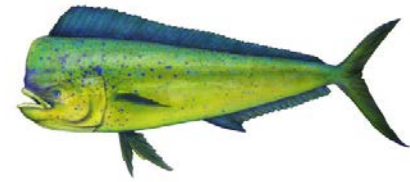
OBJ purse seine effort



Dorado purse seine CPUE



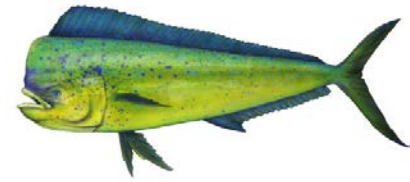
Collaborative work with Ecuador



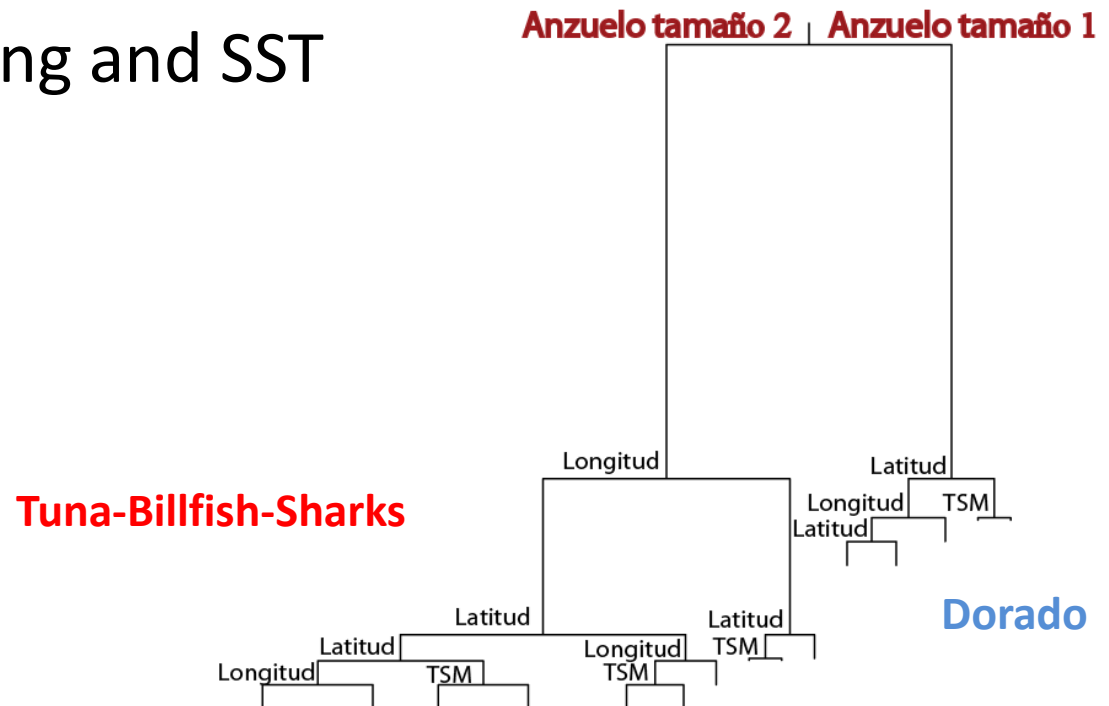
- Identification of fishery units
- Development of fishery indicators
- Publications in preparation
 - Spatial analyses of the pelagic catch community (submit to journal)
 - Description of pelagic community data collection accomplishments (IATTC bulletin)



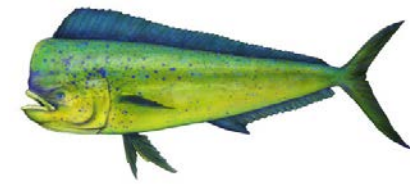
Identification of fishery units



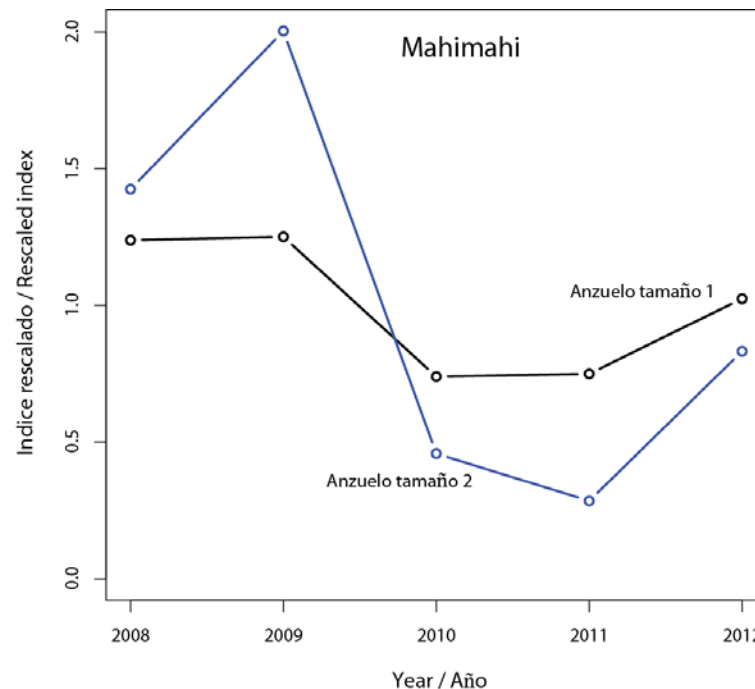
- Analysis of catch composition suggests two “nodriza” fisheries:
 - Hook type 1 with dorado as a dominant proportion of the catch
 - Hook type 2 with a more varied species composition
- Catch composition for both fisheries changes with location of fishing and SST



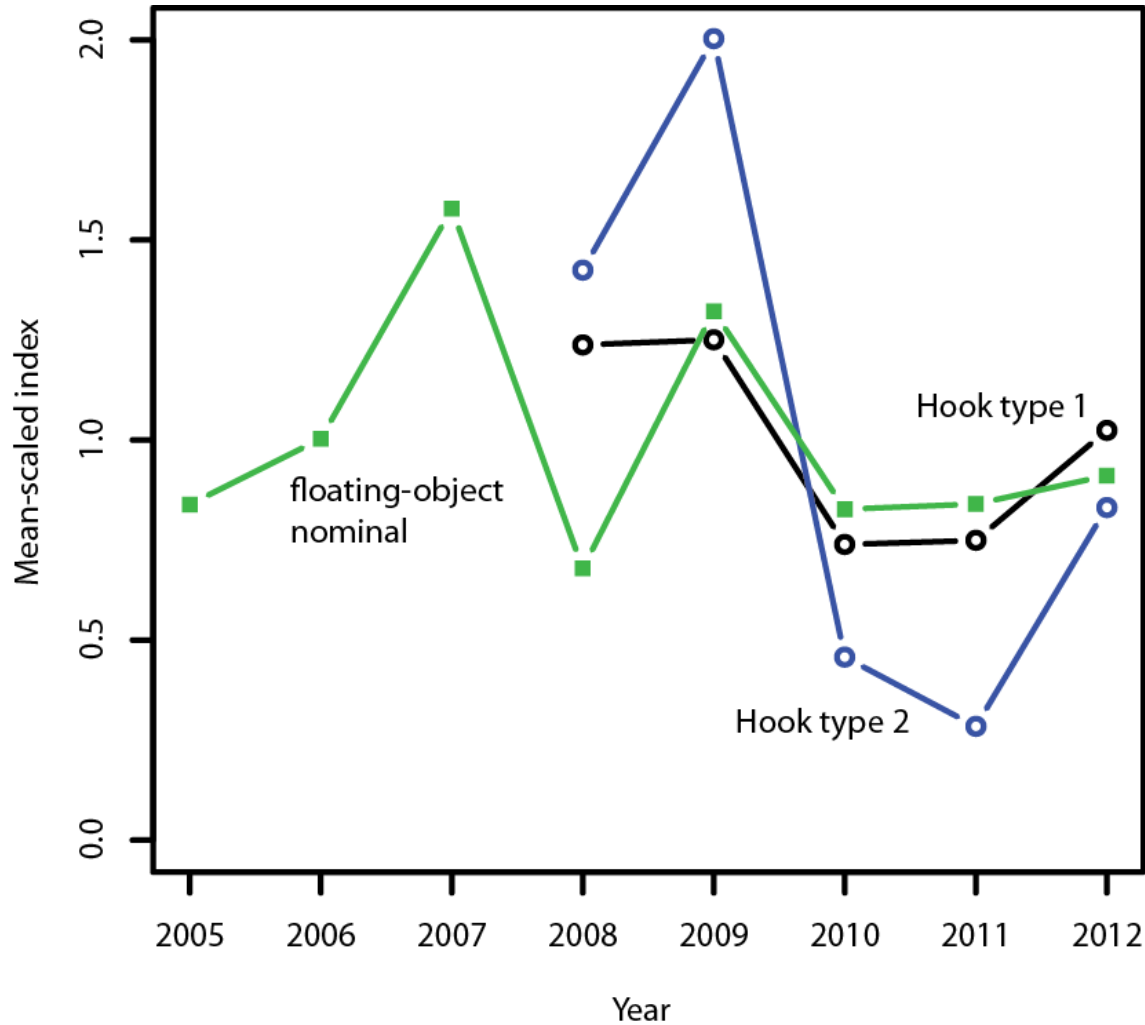
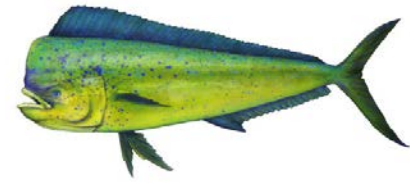
Development of indicators



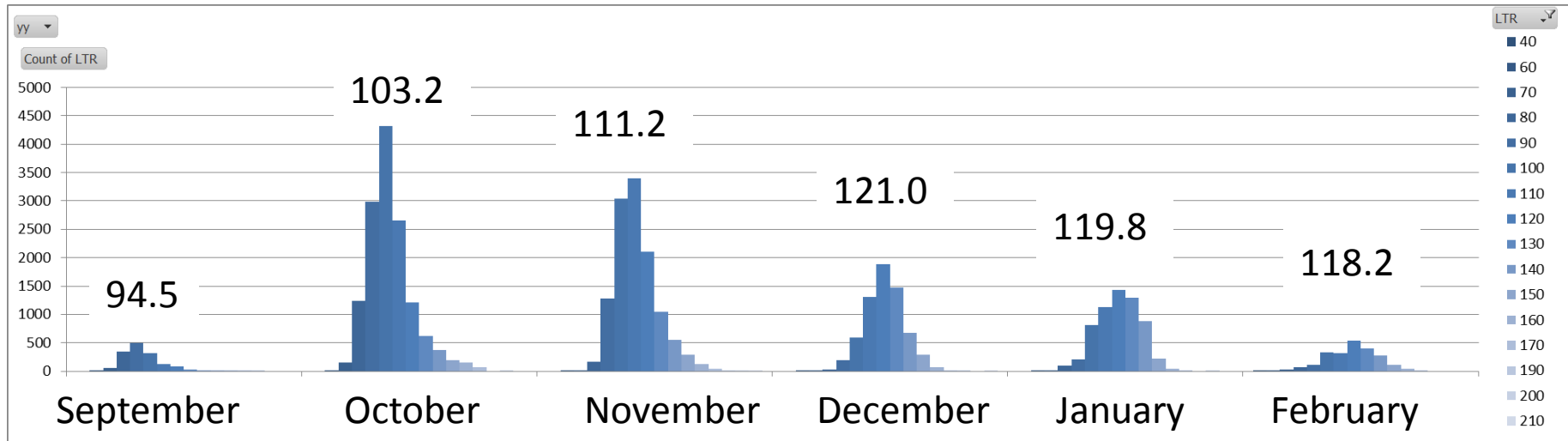
- By-trip catch and effort data used to compute relative indices for the “nodriza” fisheries catch species
- GAM standardized CPUE for dorado from the two “nodriza” fisheries show similar trends over last 5 years
- Precision measures are under development



Development of indicators



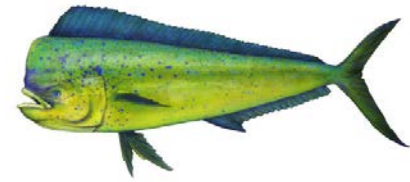
Dorado length frequency by month (2008-2011)



Numbers on top are average total length

Source: SRP Ecuador

Collaborative work with Central America



- Assistance in developing data collection forms
- Development with databases resources
- Assistance with sampling design for data collection

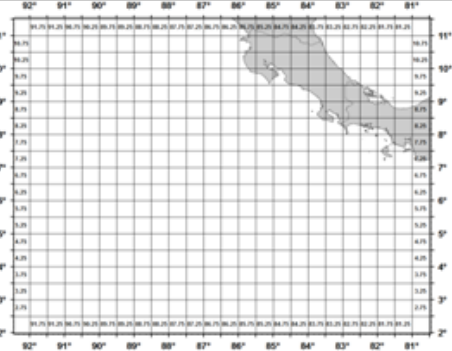


FORMULARIO DE MUESTREOS BIOLÓGICO PESQUERO EN DESEMBARQUES

Principal Arte de Pesca: _____ **FORMULARIO DE MUESTREOS BIOLÓGICO PESQUERO EN DESEMBARQUES** Hoja: Biológica ____ Desembarque ____

LINEA DE MANO										
Lugar de pesca, coordenadas o rumbo	Distancia recorrida []		# de cuadrantes	# de pescadores	Hp. motor	Combustible []	Peso total de captura []	Peso total lib. y rayas []		
PALANGRE										
No. de lances	Largo []	Anzuelos Cantidad: _____ Tipo: J () C () Tamaño: _____ Código de Anz. _____ Anillo: SI () No ()	Loncheras Orínque [] Reinal superior [] Reinal Intermedio [] Reinal inferior [] Entre anzuelos []	# Banderas:	# Anzuelos entre flotadores:	Profundidad de pesca del arte []	Sacada 1 _____ () () () 2 _____ () () () 3 _____ () () ()	% Vivo Fresco 0000	Reinal inferior de acero SI () No ()	Pesca objetivo
			# Flotadores entre banderas:	# Radio boyas	Días efectivos de pesca:	Ubicación del arte de pesca: Superficie () Medio agua () Fondo ()		Horario ____ (h) Día () Noche ()	Pesos en el palangre SI () No ()	
RED AGALLERA										
No. de lances	Largo []	Alto del arte de pesca []	Luz de malla [] Superior _____ Medio _____ Inferior _____	Ubicación del arte de pesca: Superficie () Medio agua () Fondo ()			Profundidad del arte de pesca []		Horario ____ (h) Día () Noche ()	Pesca objetivo
LINEA DE MANO										
Material de la línea	Largo []	Anzuelos Cantidad: _____ Tipo: J () C () Tamaño: _____ Código de Anz. _____ Anillo: SI () No ()	Ubicación del arte de pesca: Superficie () Medio agua () Fondo ()		Profundidad de pesca del arte []	Reinal inferior de acero SI () No ()	Sacada 1 _____ () () () 2 _____ () () () 3 _____ () () ()	% Vivo Fresco 0000	Horario ____ (h) Día () Noche ()	Pesca objetivo
RED DE ARRASTRE										
No. de lances	Luz de malla cuerpo de la red []	Luz de malla del capo de la red []	Abertura de la red []	Tiempo promedio de arrastre por lance (hrs)		Número de redes	Profundidad del arte de pesca []		Horario ____ (h) Día () Noche ()	Pesca objetivo

TOTAL DE LA DESCARGA		
Especie	No. Individuos misma especie o grupo de esp.	Peso total []



Observaciones



FORMULARIO DE MUESTREOS BIOLÓGICO PESQUERO EN DESEMBARQUES

- ✓ Manual para llenado de los formularios
- ✓ Manual para el uso de la base de datos
- ✓ Base de datos para todos los países

MONITOREO BIOLÓGICO																							
Especie	Sexo		AD	LU	LI	LI*	LP	LFD	LTR	LC	Peso	Diagnóstico			No. de crías		Chequeo						
	M	H	(cm)	(cm)	(cm)	(cm)	(cm)	(cm)	(cm)	(cm)	(kg)	C	V	Co	A	Cw	M	H	Si	No	Si	No	
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Observaciones:

LT: Longitud Total LP: Longitud Precaudal LF: Longitud Frenal LID: Longitud Interdorsal LTR: Longitud Tronco LC: Longitud Caudal
 C: Cabeza V: Ventrals Co: Cola A: Abdomen Ce: Caudal M: Macho H: Hembra
 a) LT = Long. Total b) AD = Macho de Disco c) LD = Long. de Disco

BASE DE DATOS FORMULARIO DE MUESTREOS BIOLÓGICO PESQUERO EN DESEMBARQUES

OSPECA Herramientas de presentación de formulario

Inicio Crear Datos externos Herramientas de base de datos Formato Organizar

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

Todos los objetos d... <<

tblRango
tblSede
tblSexo
tblSiNo
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 Form. Muestreos Hoja: Biológico Desembarque

Emb Prin. Arte Calidad 0

Fecha

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

Palangre

Lance	Largo	Anzuelos	Longitud	U	Band	Anz	Prof	Carnada	Pcr	R. Acero	Pesca
		Cantidad	Orinq							Si <input type="checkbox"/>	
		Tipo J-C	R Sup							No <input type="checkbox"/>	
		Tamano	R Med								
		Cat #	R Inf								
		Anillo: Si <input type="checkbox"/> No <input type="checkbox"/>	EnAnz								
		Observ:									

Unidades

1=cm 5=kg
2=m 6=lb
3=brz 7=gal
4=milla naut 8=L

Flot Boya Días

Ubicación arte

Super
Media
Fondo

Horario

Día
Noche

Pesos

Si
No

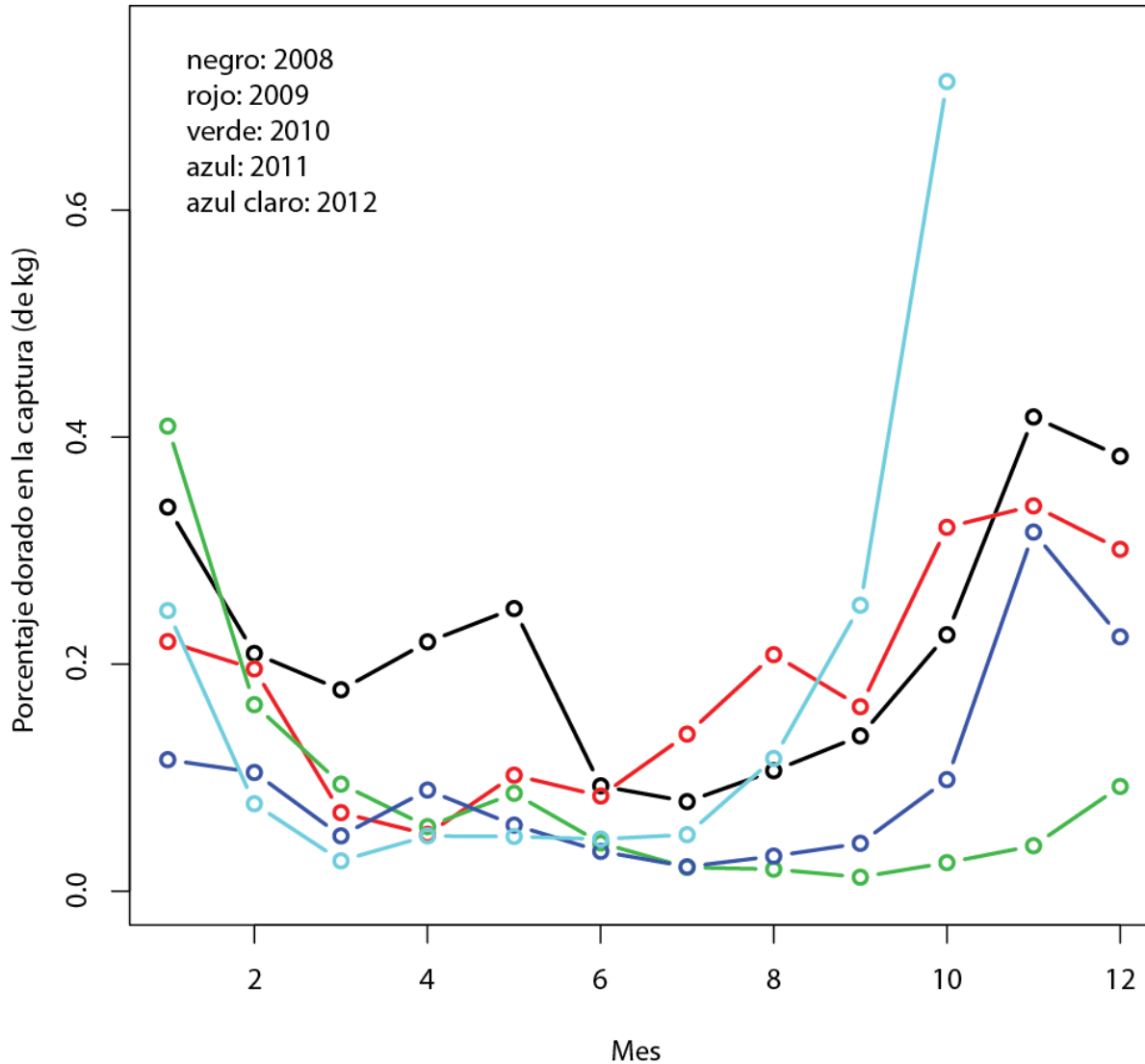
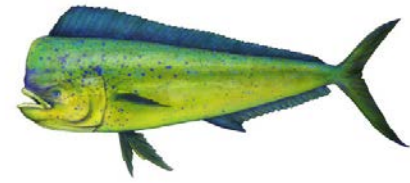
Observaciones

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Longitud:

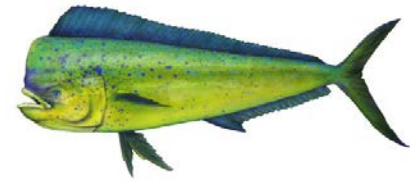
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Vista Presentación Bloq Num

Collaborative work with Costa Rica



Future work



- Stock structure (regression tree analyses)
- Develop fishery indicators
- Management strategy evaluation (MSE)
- Sampling design for data collection



QUESTIONS?