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

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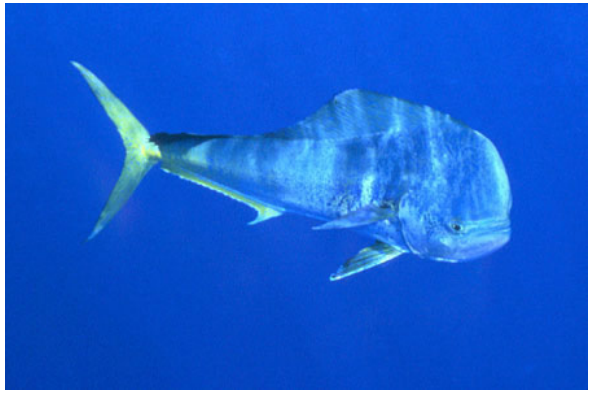
4th Meeting of the IATTC Scientific Advisory Meeting

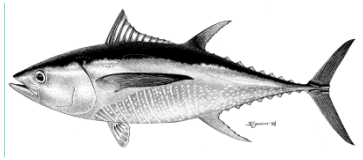
La Jolla, USA, 29 April – 3 May 2013



Outline

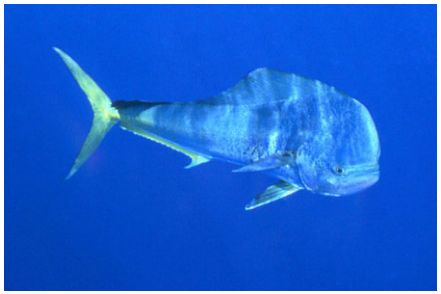
- Assessment framework plan for low information stocks and bycatch species in the EPO
- Available catch statistics for dorado in EPO
- Preliminary IATTC fishery indicators (purse seine CPUE) for dorado
- Ongoing collaborative activities with member countries
  - Ecuador and Central America
- IATTC future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



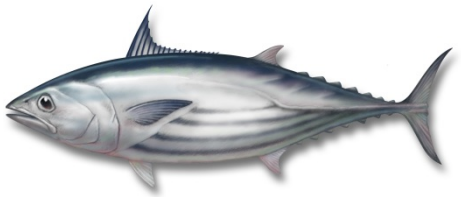
Need for alternative assessment methodologies…

- High-productivity species
  - Fishery-dependent data is sufficient
  - But species life-history complicate conventional stock assessment methods (shot-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

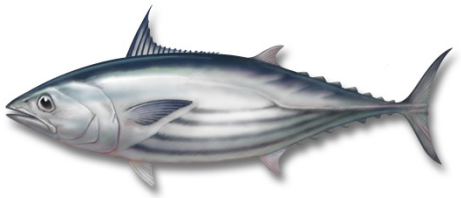
- Task 1: Develop methods to define stock structure
- Task 2: Conduct “semi-quantitative” analyses
  - Productivity-susceptability analyses (PSA)
  - Ecological risk assessment (ESA) tools
- Task 3: Extensive literature review on **fishery indicators**, decision rules and management strategy evaluation (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

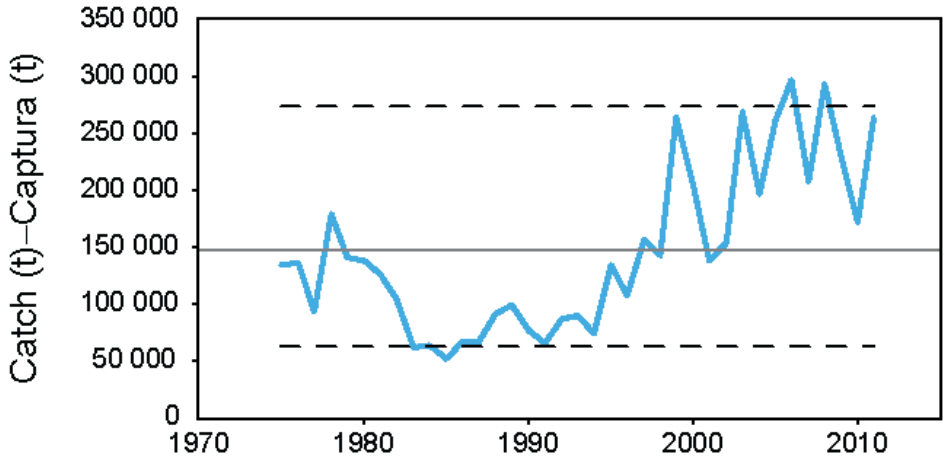
Fishery indicators

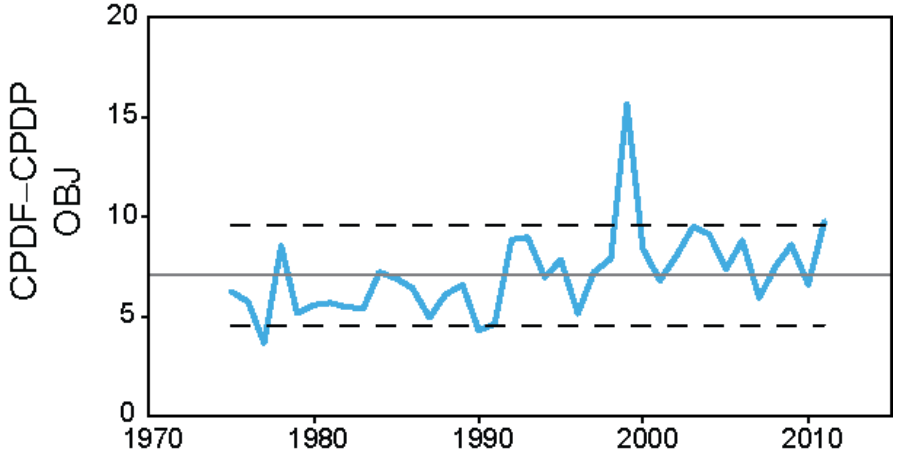


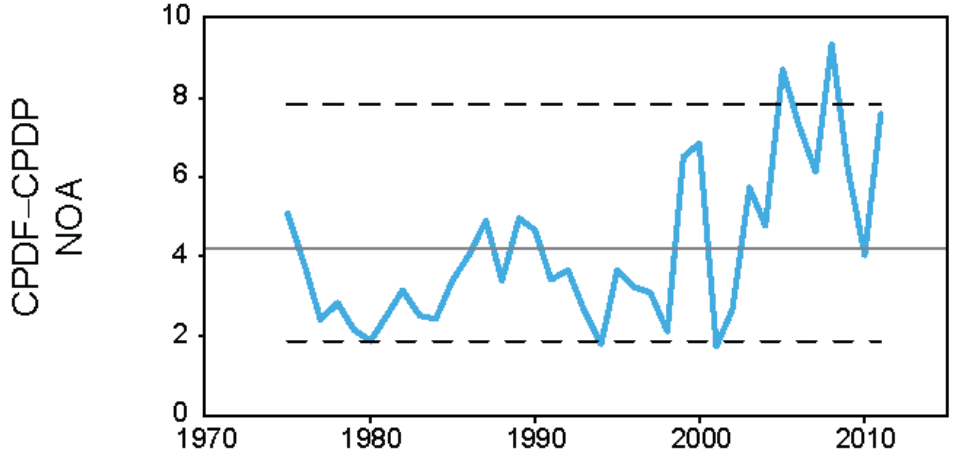
- Based on data (catch, effort, CPUE and mean weight)
- Based on simple population dynamics models (biomass, recruitment or exploitation rate)
- Reference levels
  - Selected by managers
  - Examples: 5th and 95th percentiles, ATHL for northern albacore (ISC)

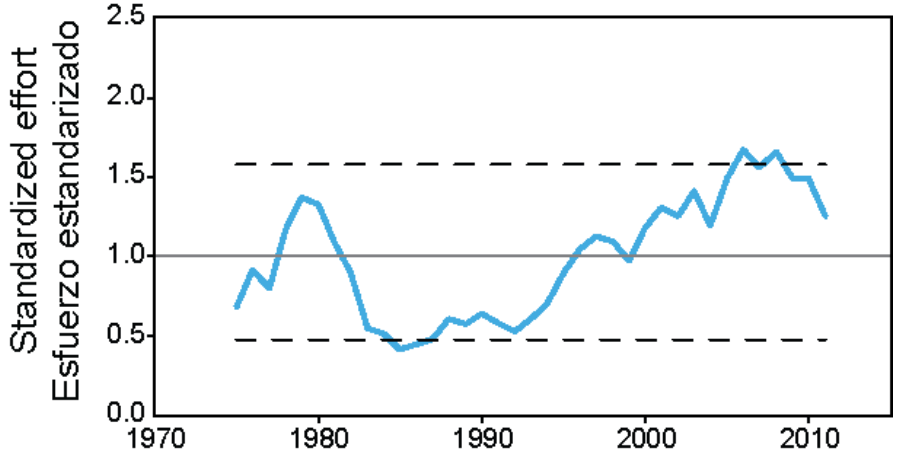
Indicators – skipjack example



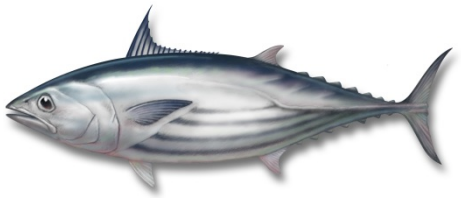


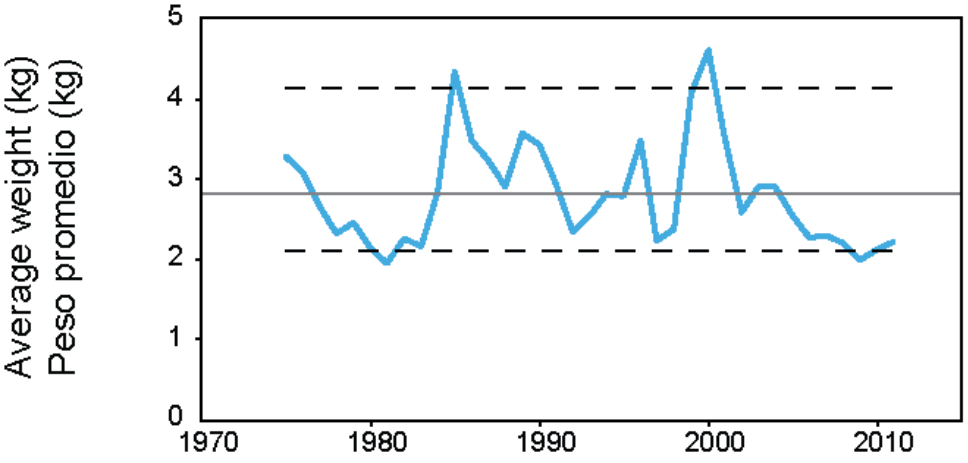


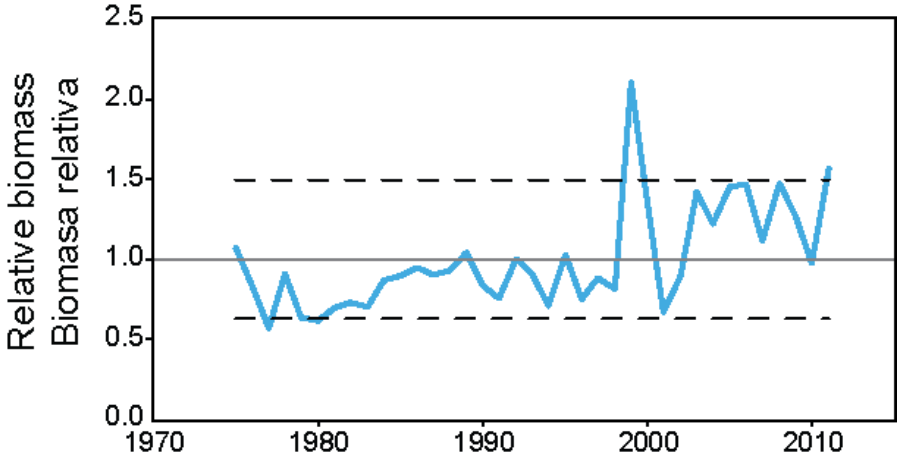


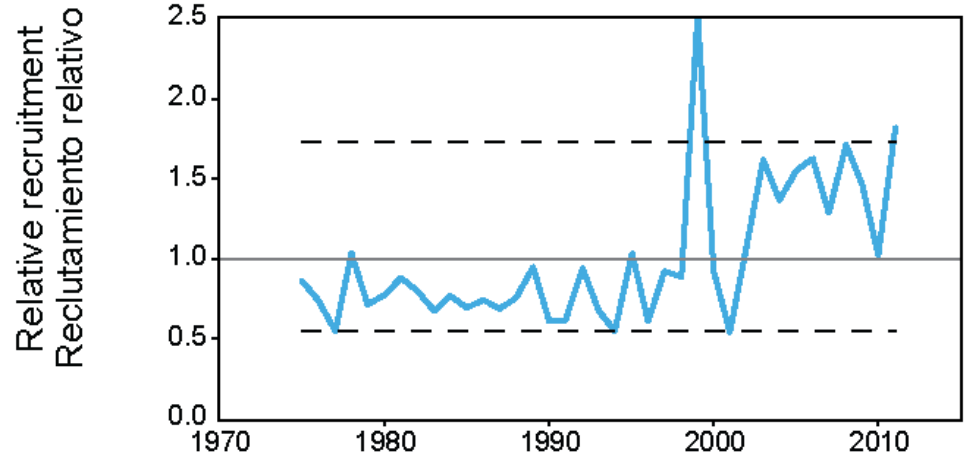


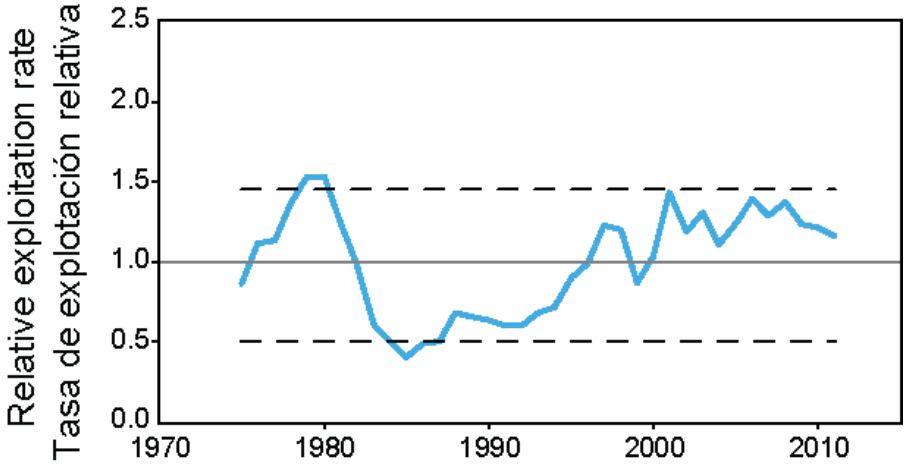
Indicators – skipjack example



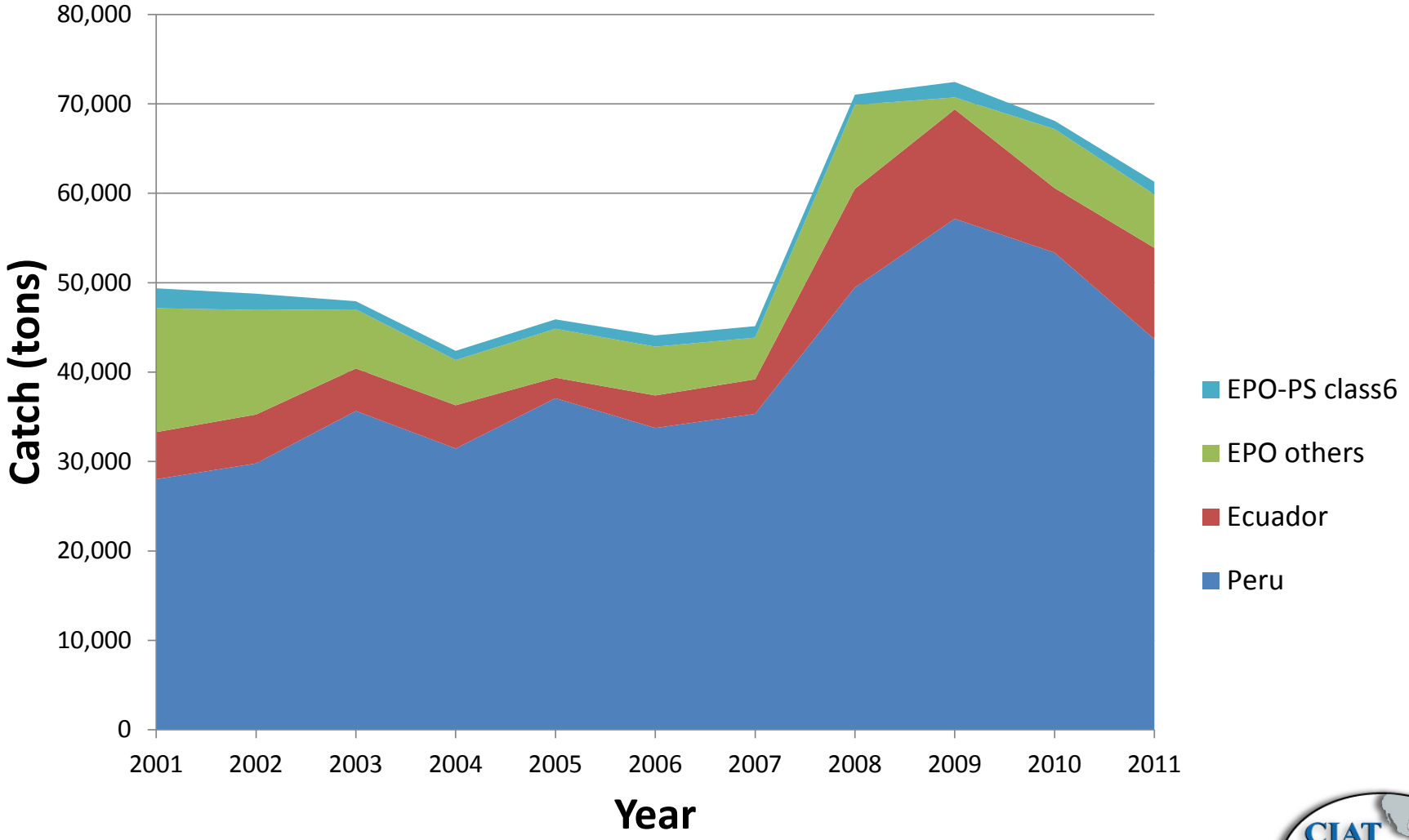






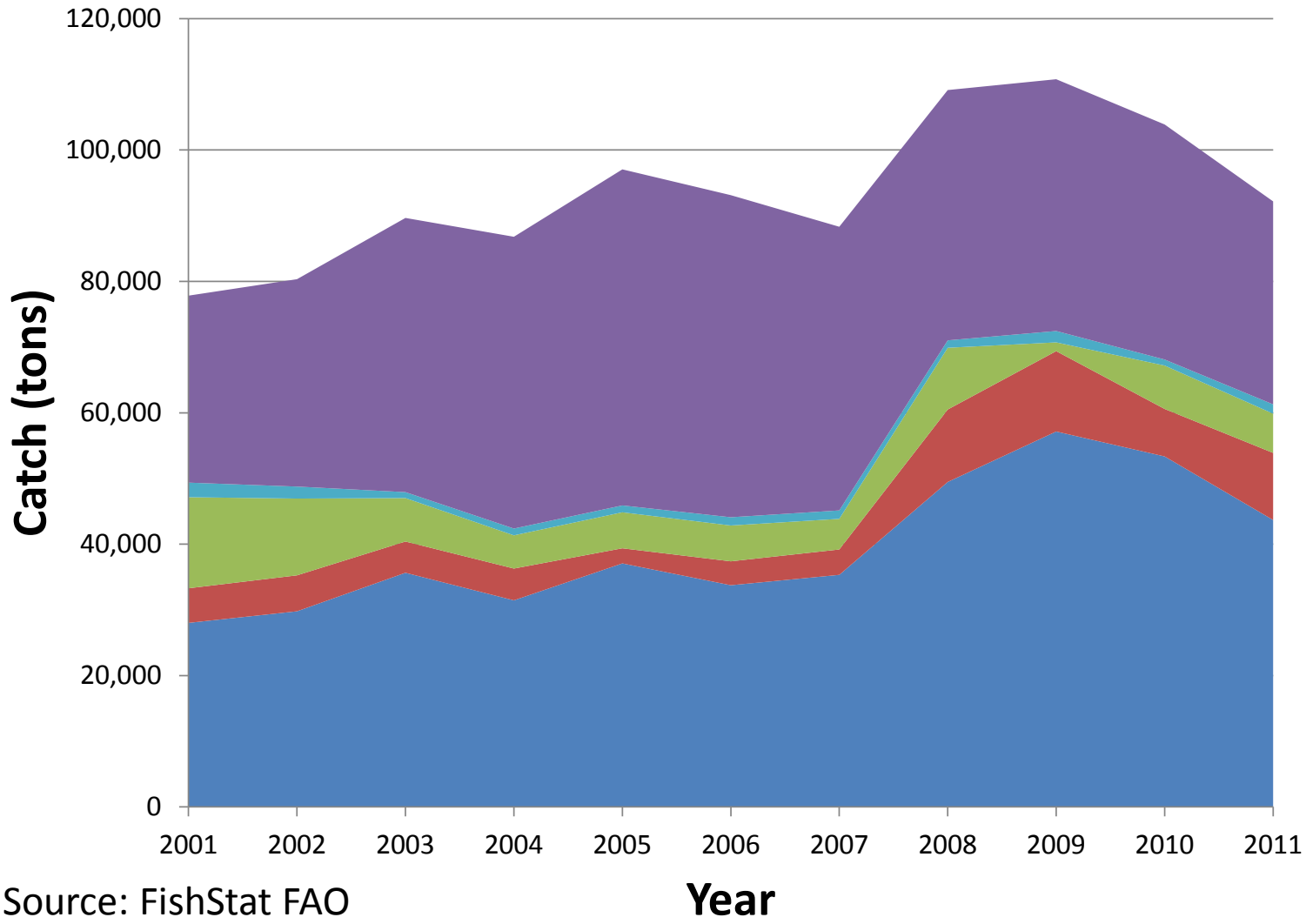


Dorado landings in EPO



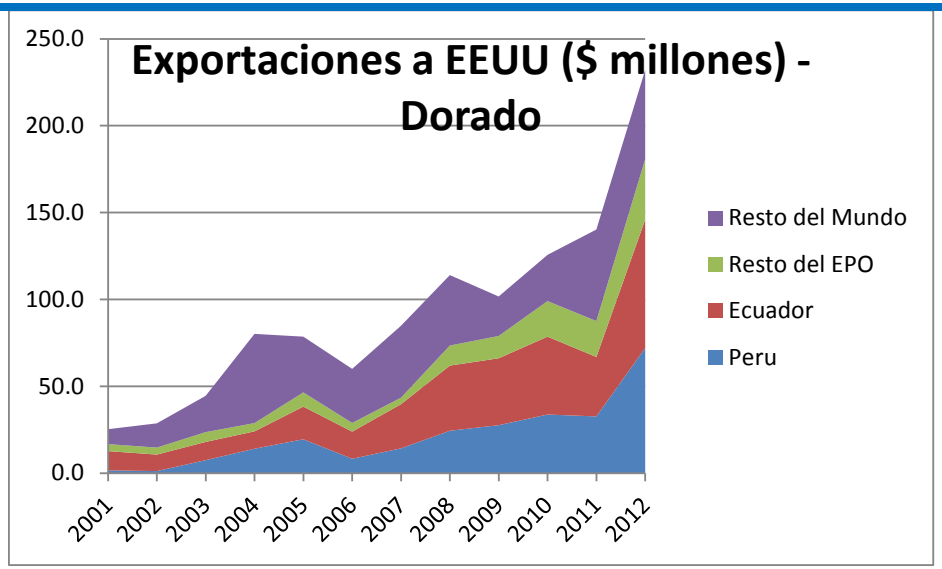
Source: FishStat FAO

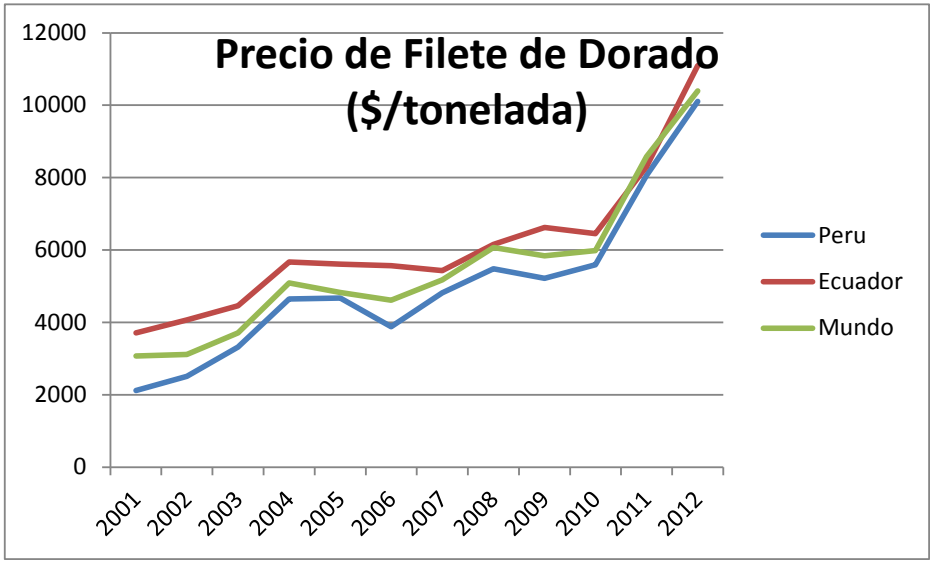
World's perspective



Source: FishStat FAO

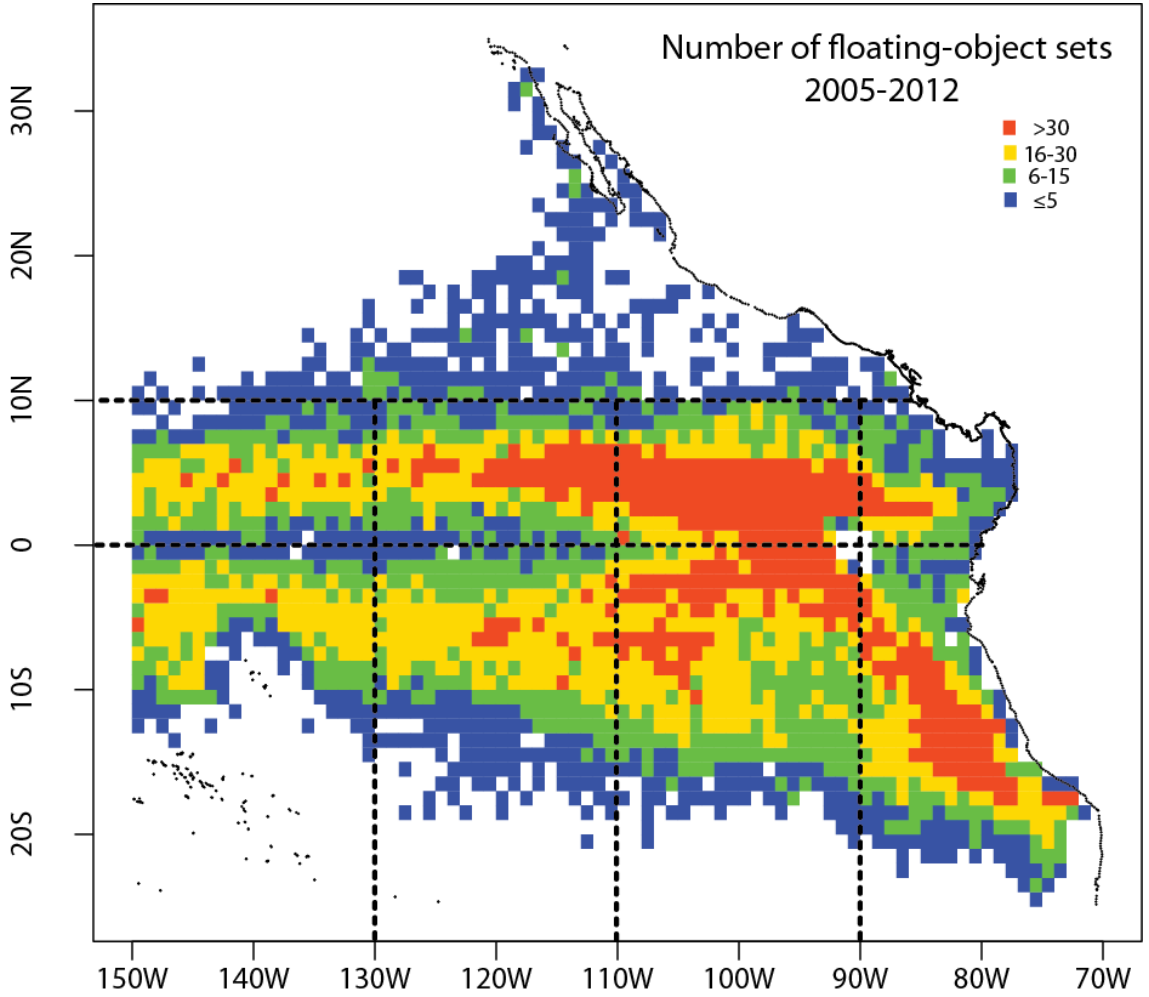
Dorado exports to US



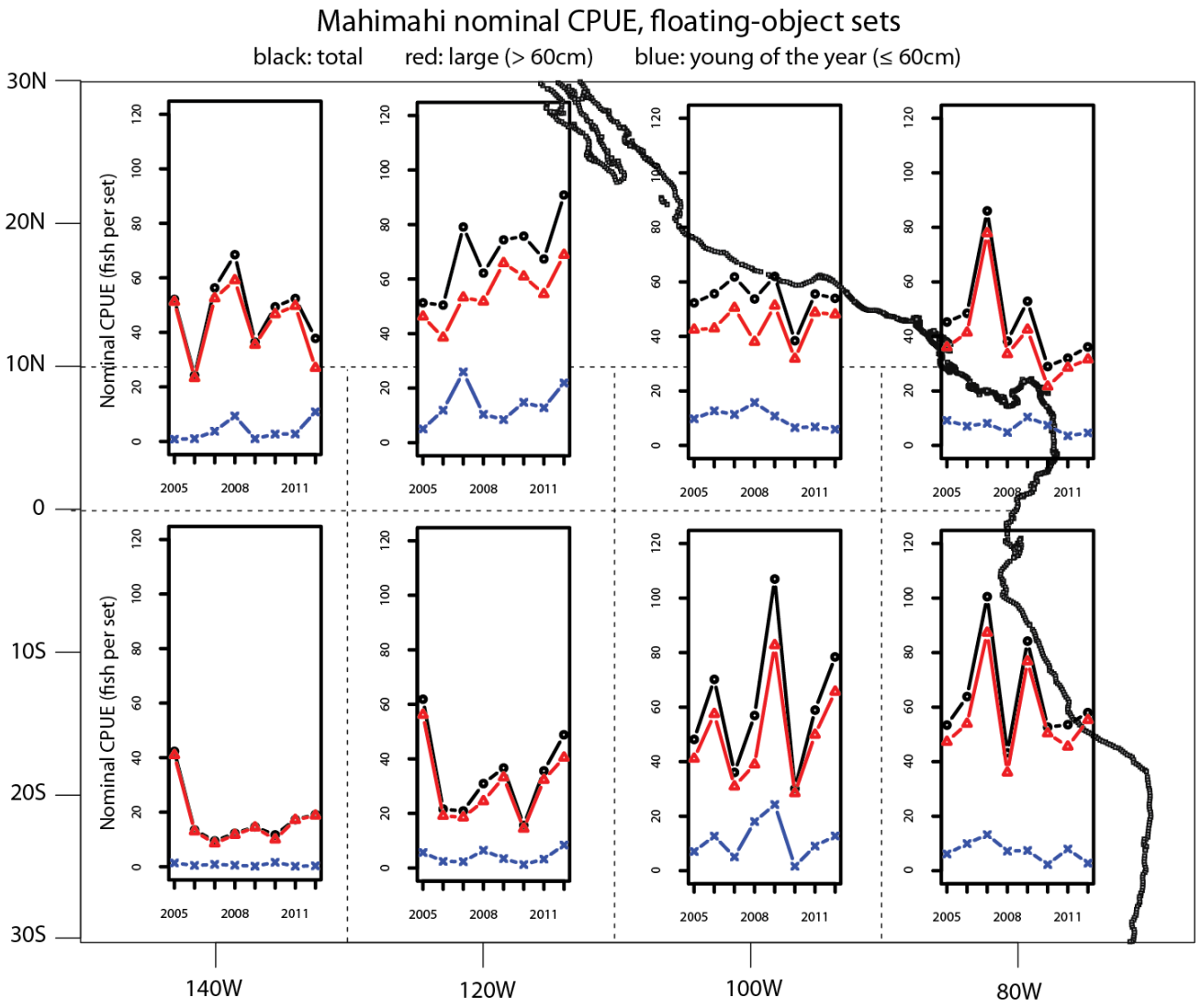


CIAT
IATTC

OBJ purse seine effort



Dorado purse seine CPUE

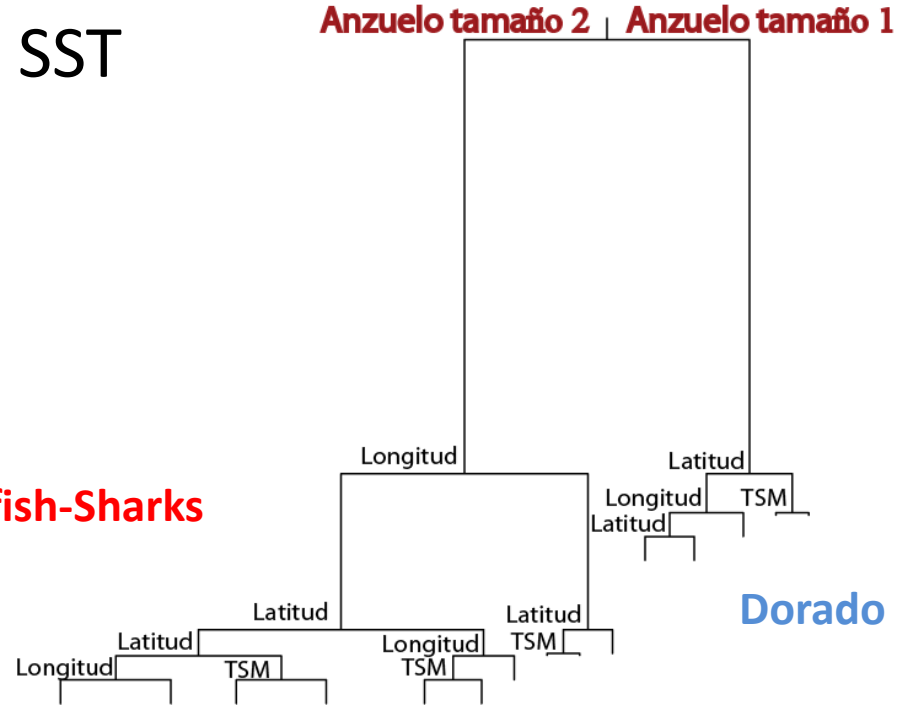


Collaborative work with Ecuador

- 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)

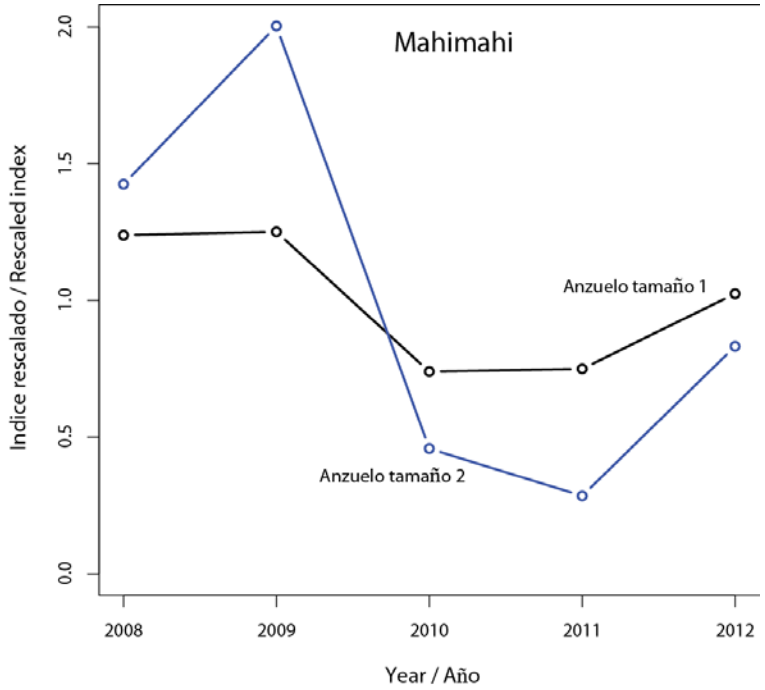
Identification of fishery units

- 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

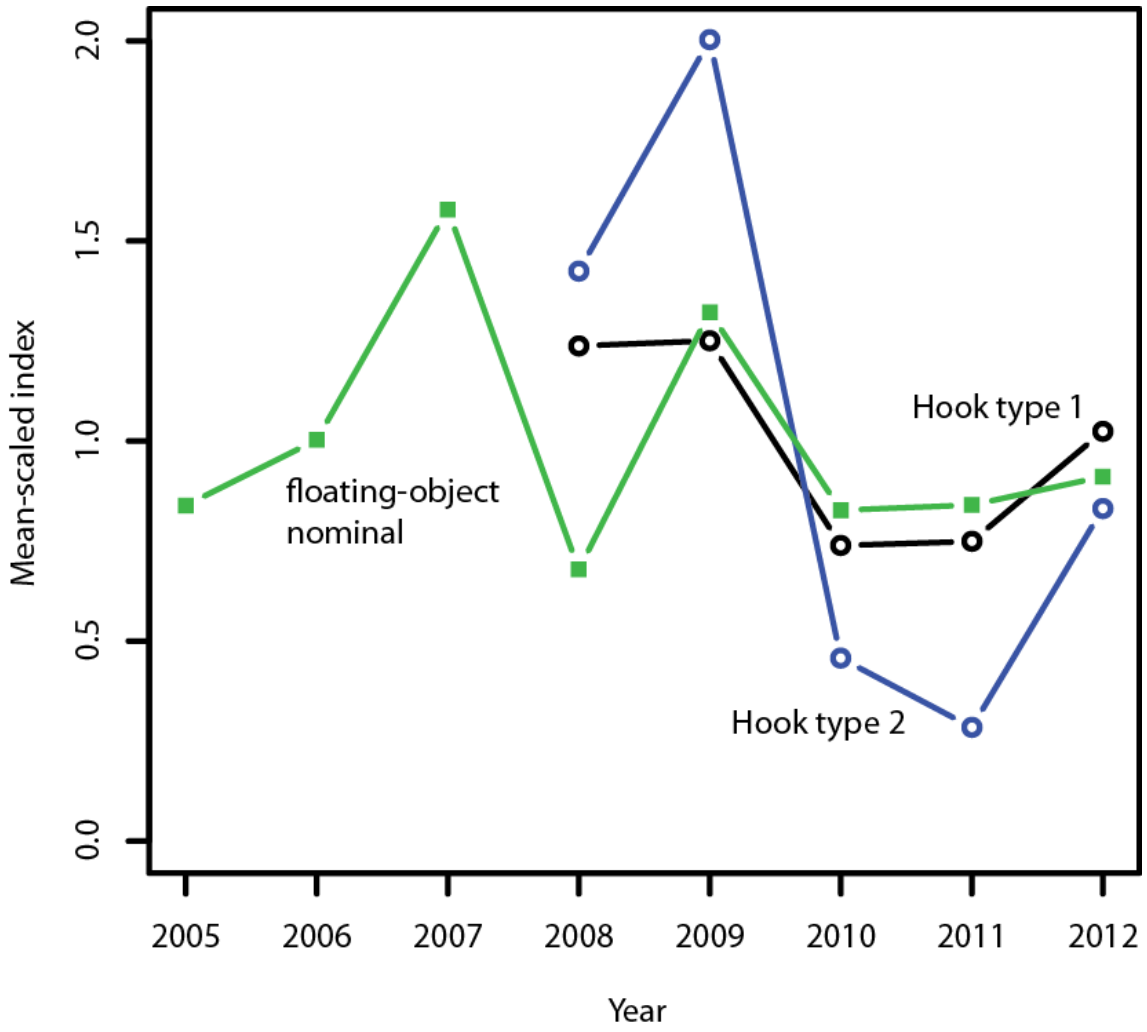


Development of indicators

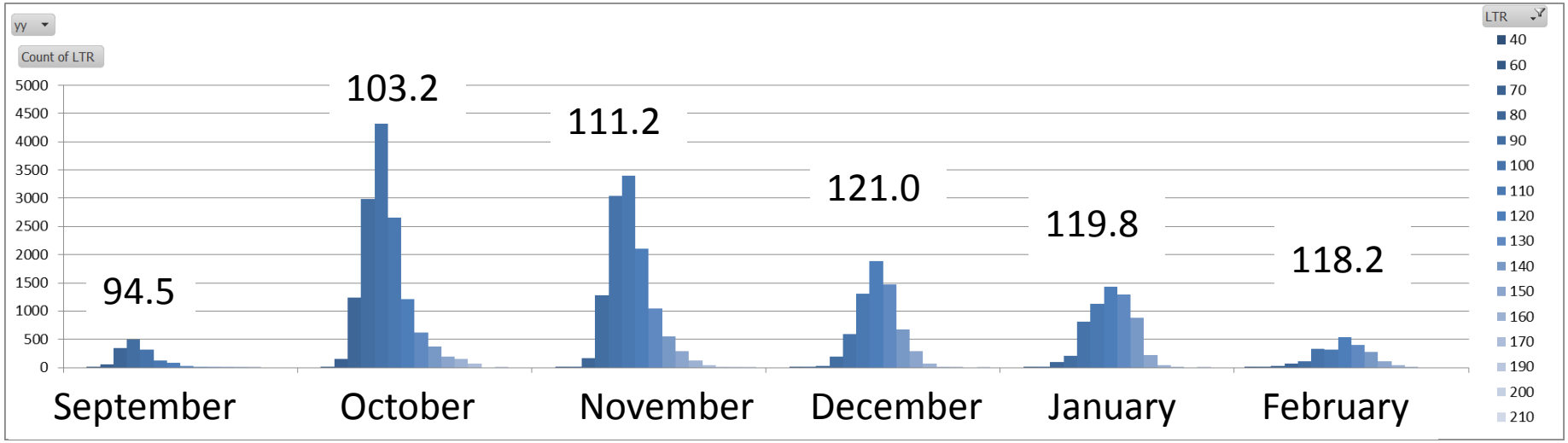
- By-trip catch and effort data used to compute relative indices for the “nodriza” fisheries catch species
- GAM standardized CPUE for dorado from the two “nodriza” fisheries show similar trends over last 5 years
- Precision measures are under development



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______

Artes de Pesca

LINEA DE MANO

Lugar de pesca, coordenadas ó rumbo	Distancia recorrida [ ]	# de cuadrantes	# de pescadores	Hp. motor	Combustible [ ]	Peso total de captura [ ]	Peso total tib. y rayas [ ]

PALANGRE

No. de lances	Largo [ ]	Anzuelos	Longitud:	# Banderas:	# Anzuelos entre flotadores:	Profundidad de pesca del arte [ ]	Carnada % Vivo Fresco Cong.	Reinal inferior de acero	Pesca objetivo
		Cantidad: ____	Orinque [ ] ____				1.____ ____ ( ) ( ) ( )	Si ( )	
		Tipo: J ( ) C ( )	Reinal superior [ ] ____				2.____ ____ ( ) ( ) ( )	No ( )	
		Tamaño: ____	Reinal intermedio [ ] ____	# Flotadores entre banderas:	# Radio boyes	Días efectivos de pesca:	3.____ ____ ( ) ( ) ( )	Horario ____ (h)	Pesos en el palangre
		Código de Anz. ____	Reinal inferior [ ] ____				Ubicación del arte de pesca: Superficie ( ) Media agua ( ) Fondo ( )	Día ( ) Noche ( )	Si ( ) No ( )
		Anillo: Si ( ) No ( )	Entre anzuelos [ ] ____						

RED AGALLERA

No. de lances	Largo [ ]	Alto del arte de pesca [ ]	Luz de malla [ ]	Ubicación del arte de pesca:	Profundidad del arte de pesca [ ]	Horario ____ (h)	Pesca objetivo
			Superior ____	Superficie ( )		Día ( )	
			Medio ____	Media agua ( )		Noche ( )	
			Inferior ____	Fondo ( )			

LINEA DE MANO

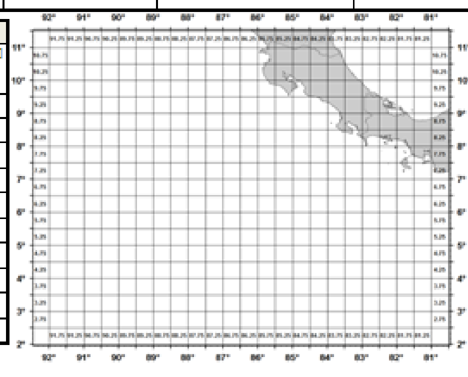
Material de la línea	Largo [ ]	Anzuelos	Ubicación del arte de pesca	Profundidad de pesca del arte [ ]	Reinal inferior de acero	Carnada % Vivo Fresco Cong.	Horario ____ (h)	Pesca objetivo
		Cantidad: ____	Superficie ( )		Si ( )	1.____ ____ ( ) ( ) ( )	Día ( )	
		Tipo: J( ) C( ) Anillo:	Media agua ( )		No ( )	2.____ ____ ( ) ( ) ( )	Noche ( )	
		Tamaño: ____ Si ( )	Fondo ( )			3.____ ____ ( ) ( ) ( )		
		Código de Anz. ____ No ( )						

RED DE ARRASTRE

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)	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 ______________________________

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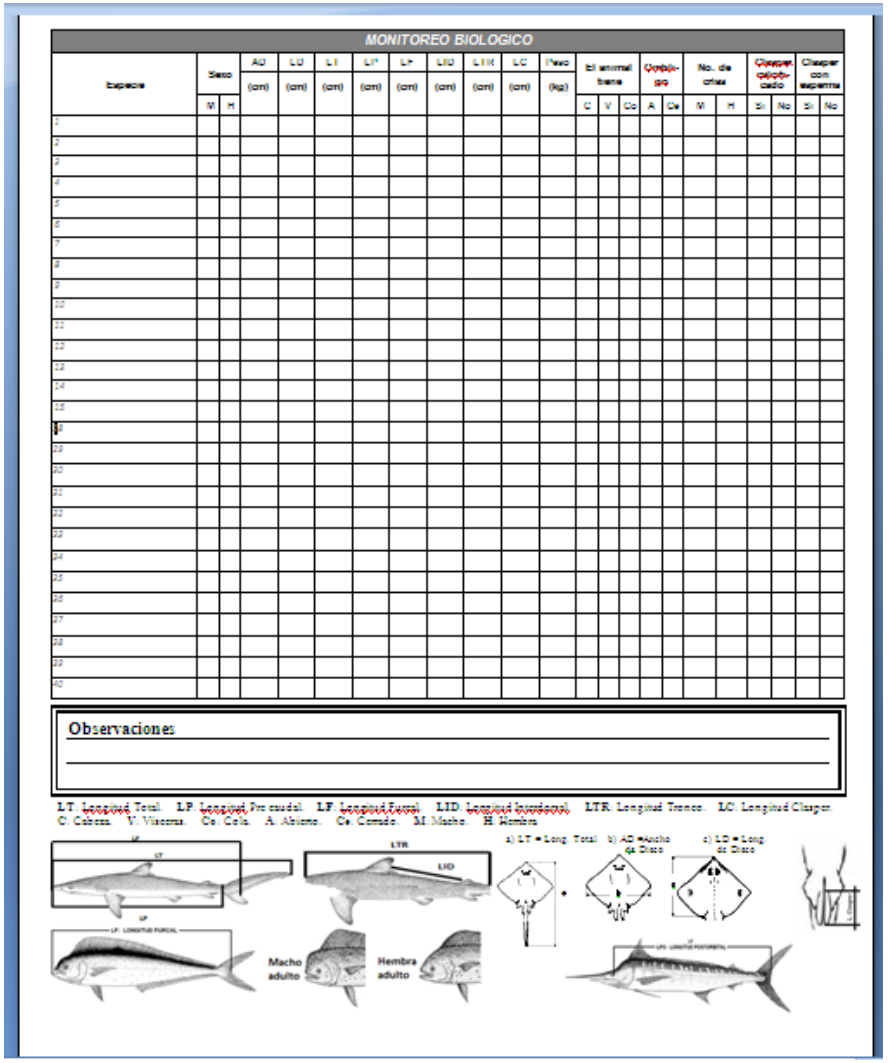
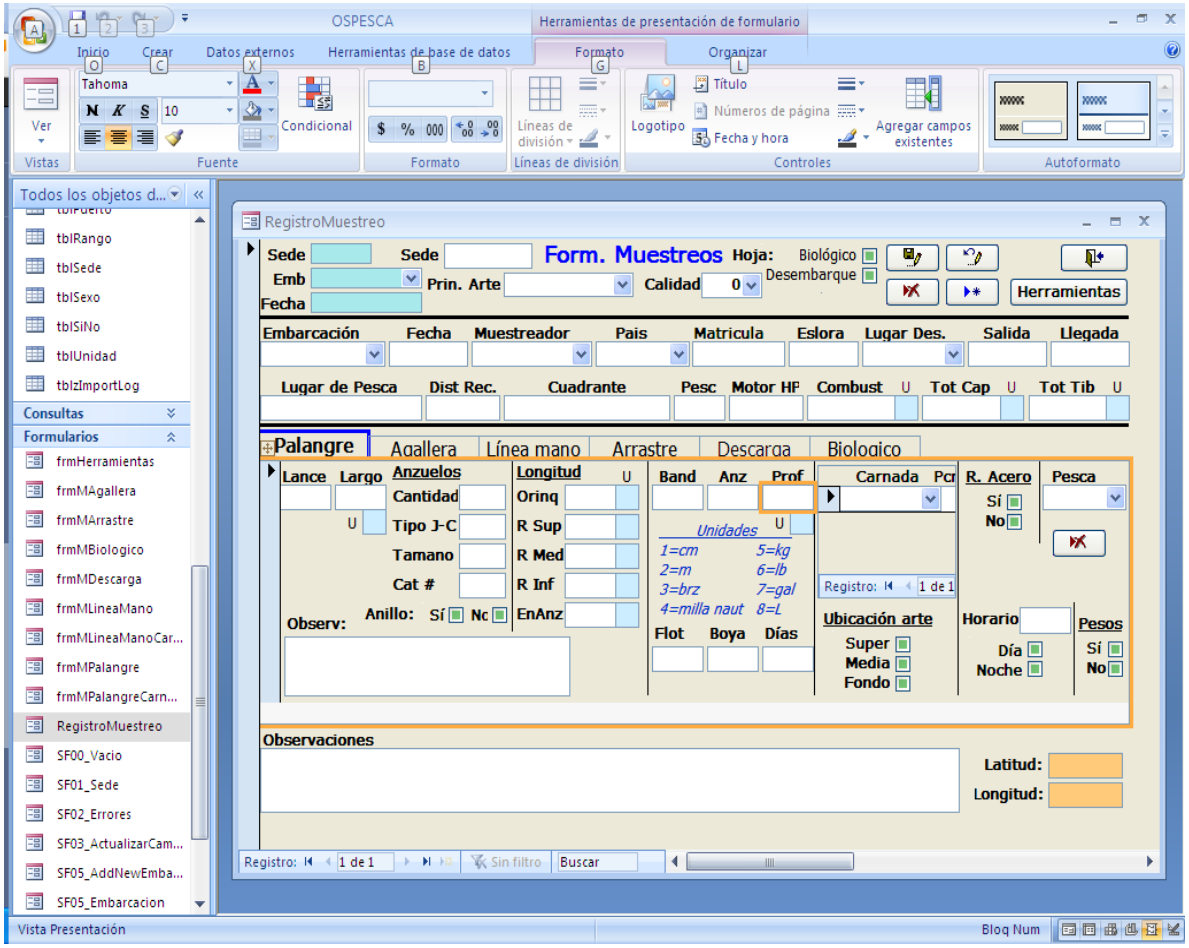
FORMULARIO DE MUESTREOS BIOLÓGICO PESQUERO EN DESEMBARQUES

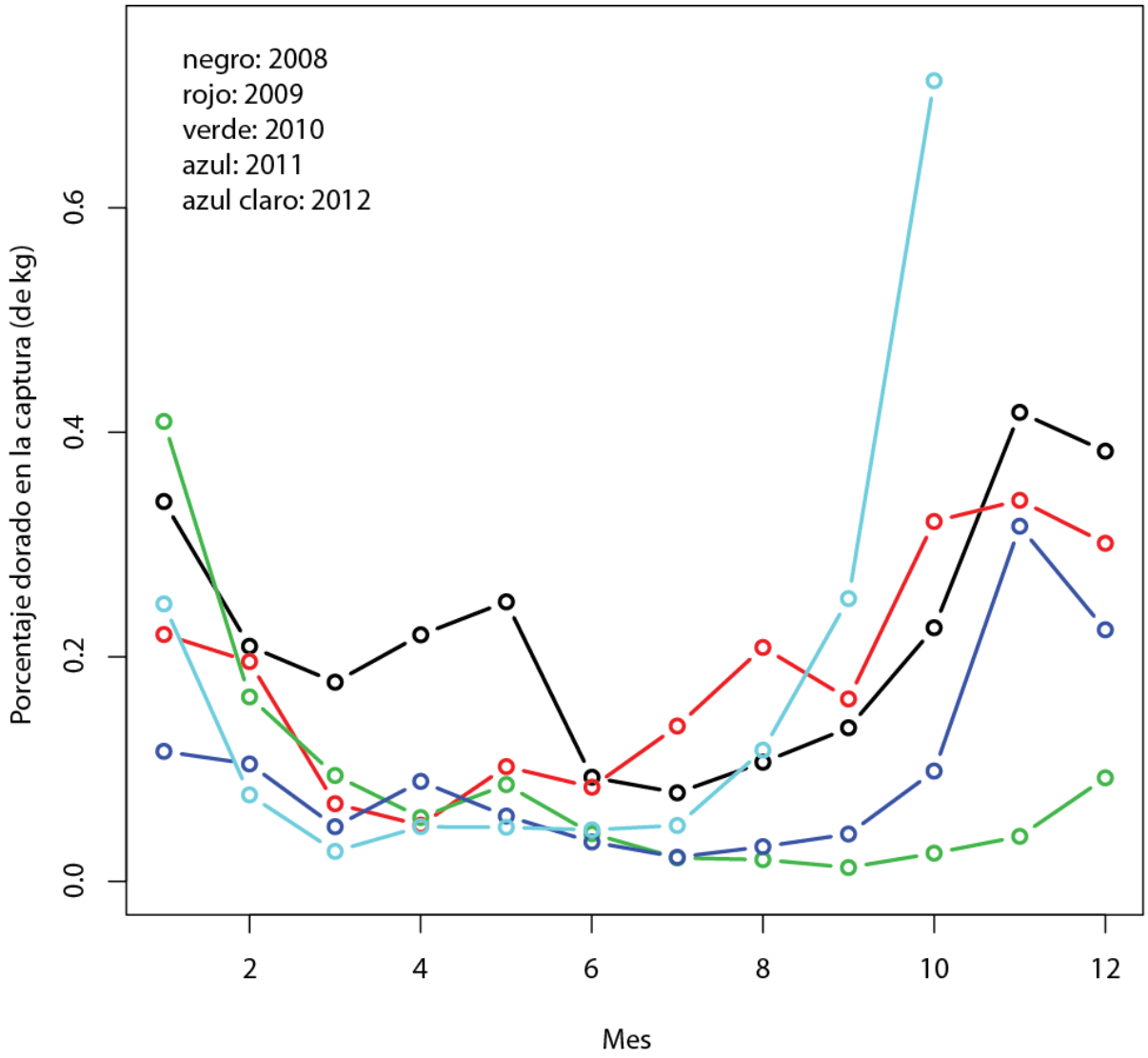
- ✓Manual para llenado de los formularios
- ✓Manual para el uso de la base de datos
- ✓Base de datos para todos los países



BASE DE DATOS FORMULARIO DE MUESTREOS BIOLÓGICO PESQUERO EN DESEMBARQUES

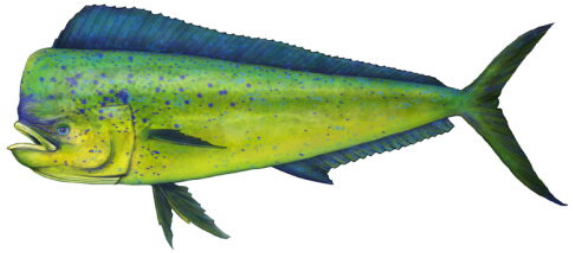


Collaborative work with Costa Rica



Future work

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



QUESTIONS?