

Comisión Interamericana del Atún Tropical
Inter-American Tropical Tuna Commission



Background on the fishery, stock assessment and management of skipjack tuna in the eastern Pacific Ocean

1st External Review of IATTC staff's stock assessment of skipjack tuna in the eastern Pacific Ocean
07-10 November 2022 – La Jolla CA, USA

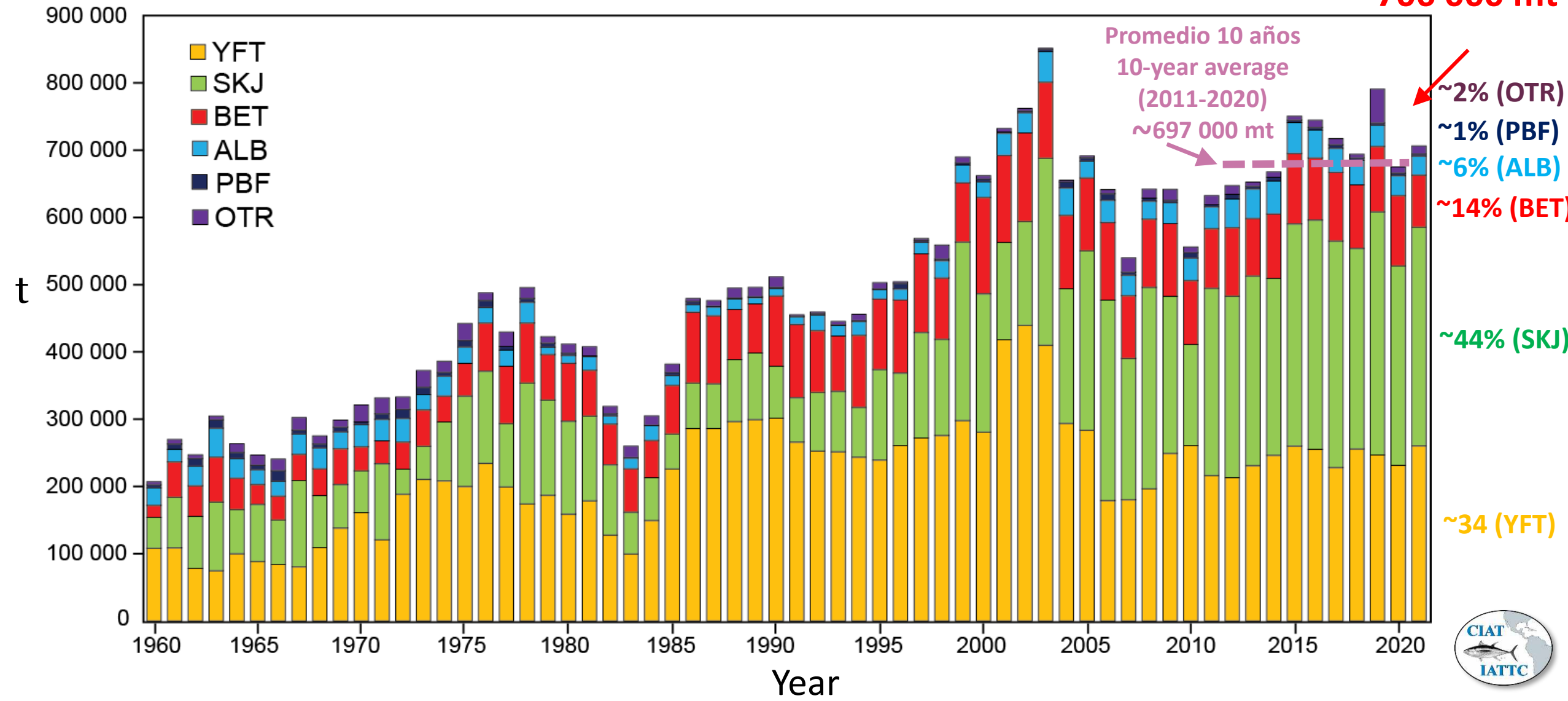


- Background on skipjack fishery in the EPO
- Stock assessment: Different tools used for assessing skipjack in the EPO (2001-2022)
- Management aspects

OPO captura retenida – todos los artes

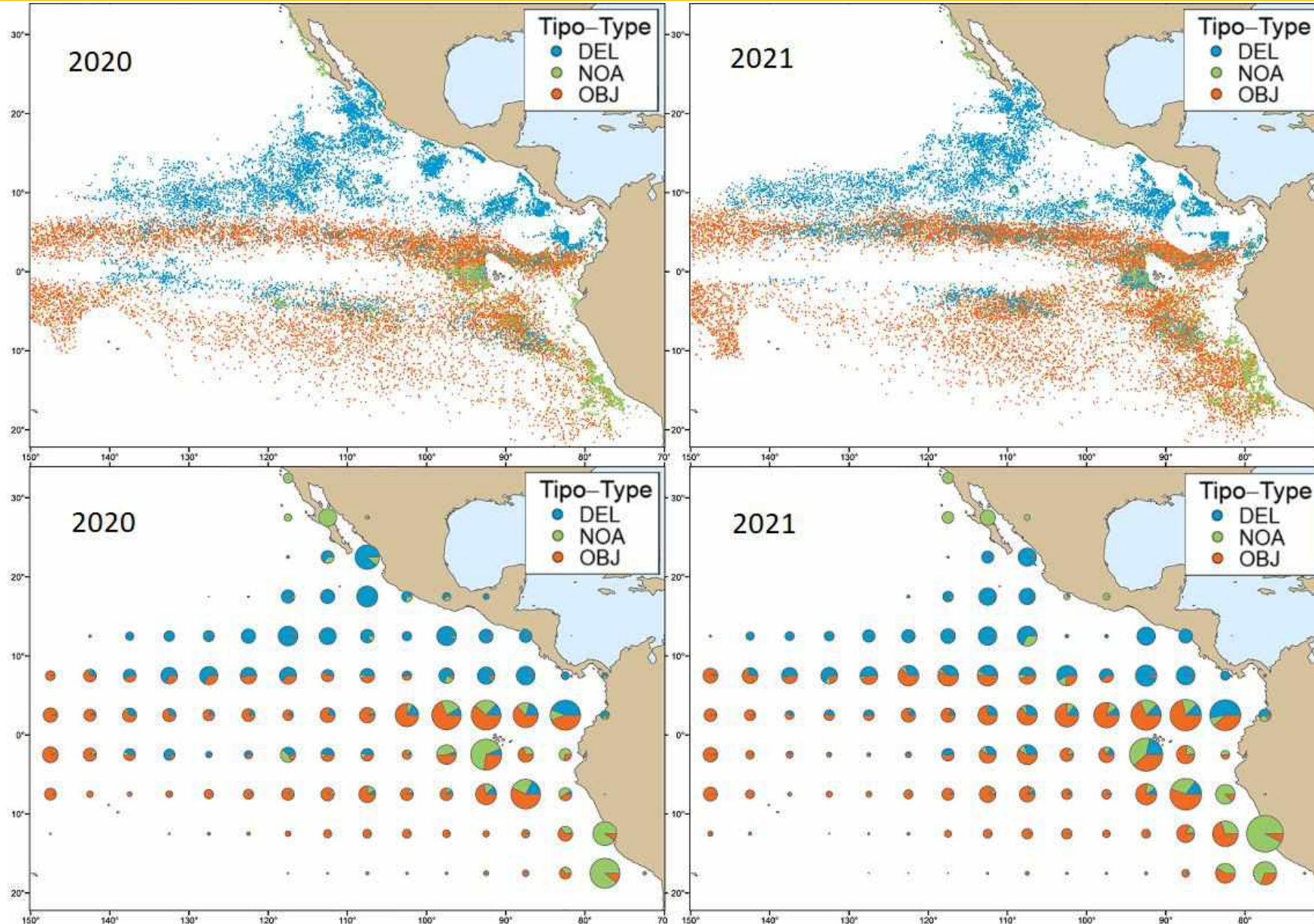
EPO retained catch – all gears

2021:
706 000 mt



Distribución de lances cerqueros, por tipo

Distribution of purse seine sets, by type



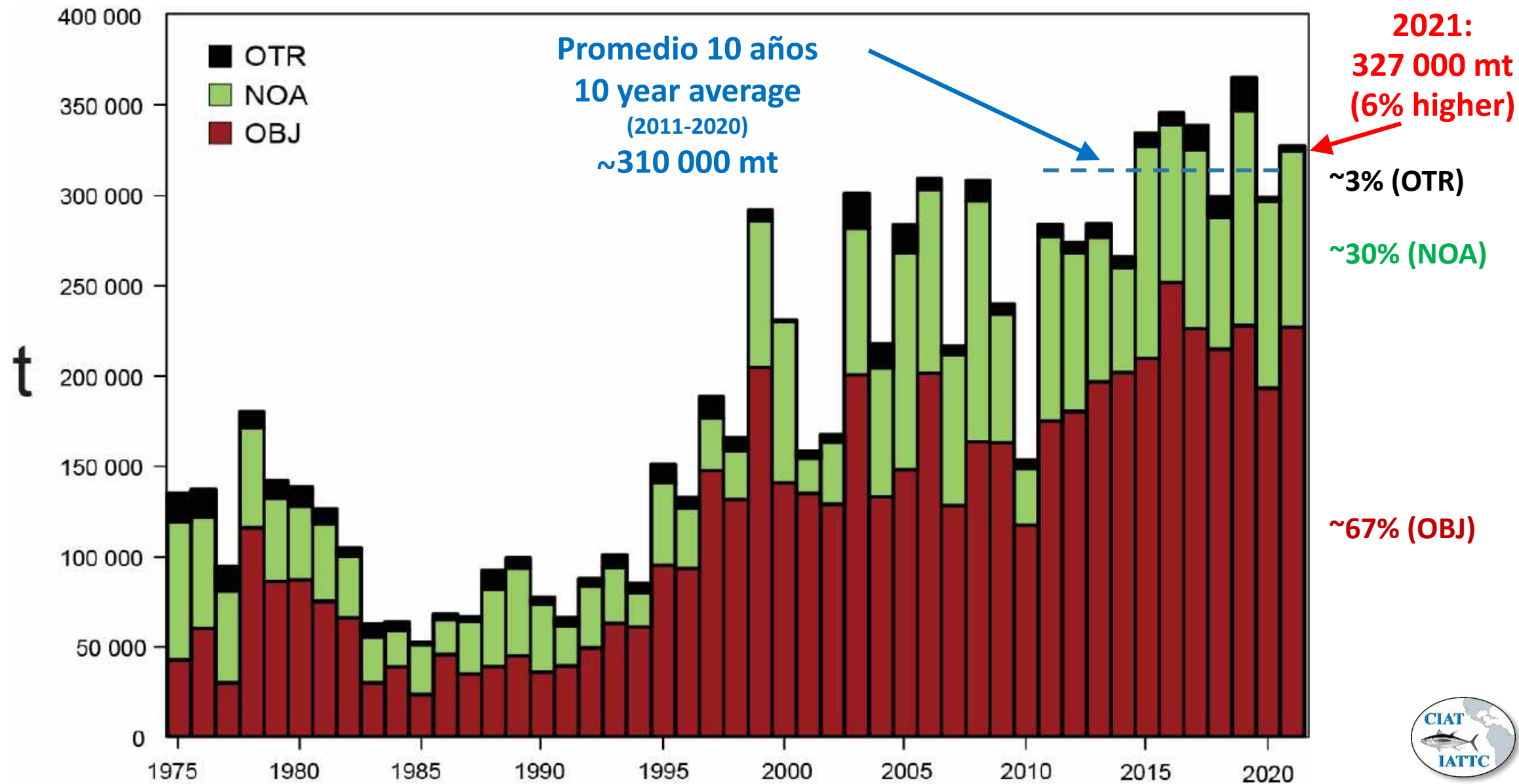
No. Lances - Sets

	<u>2020</u>	<u>2021</u>
DEL	9,773	9,892
NOA	6,458	6,476
OBJ	12,151	15,139
	<u>28,382</u>	<u>31,507</u>

% por tipo – by set type

	<u>DEL</u>	<u>NOA</u>	<u>OBJ</u>
2018	29.9	18.6	51.5
2019	29.2	24.2	46.7
2020	34.4	22.8	42.8
2021	31.4	20.6	48.0

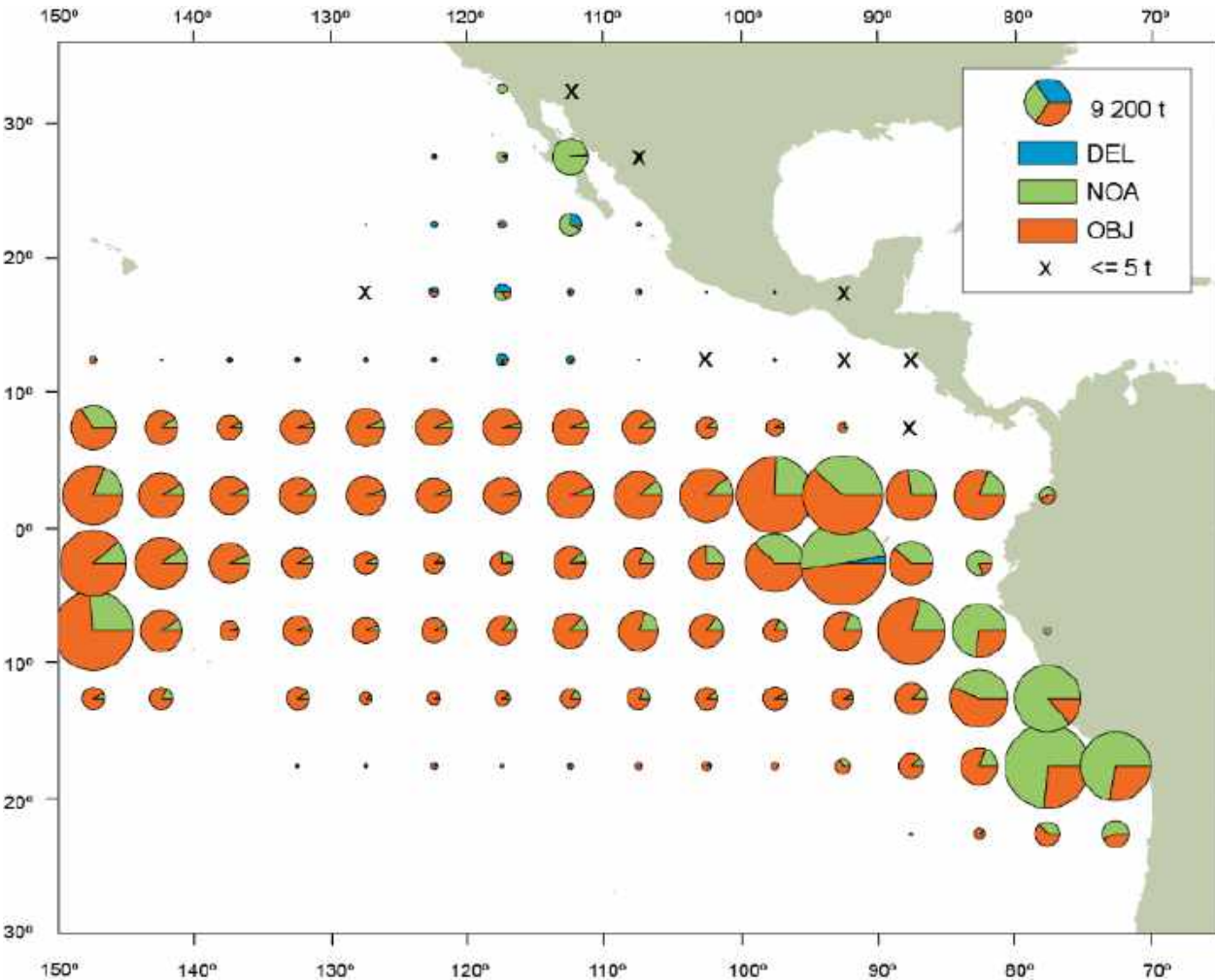
SKJ - Captura por arte de pesca—Catch by gear type



SKJ - Distribución de las capturas de cerqueros

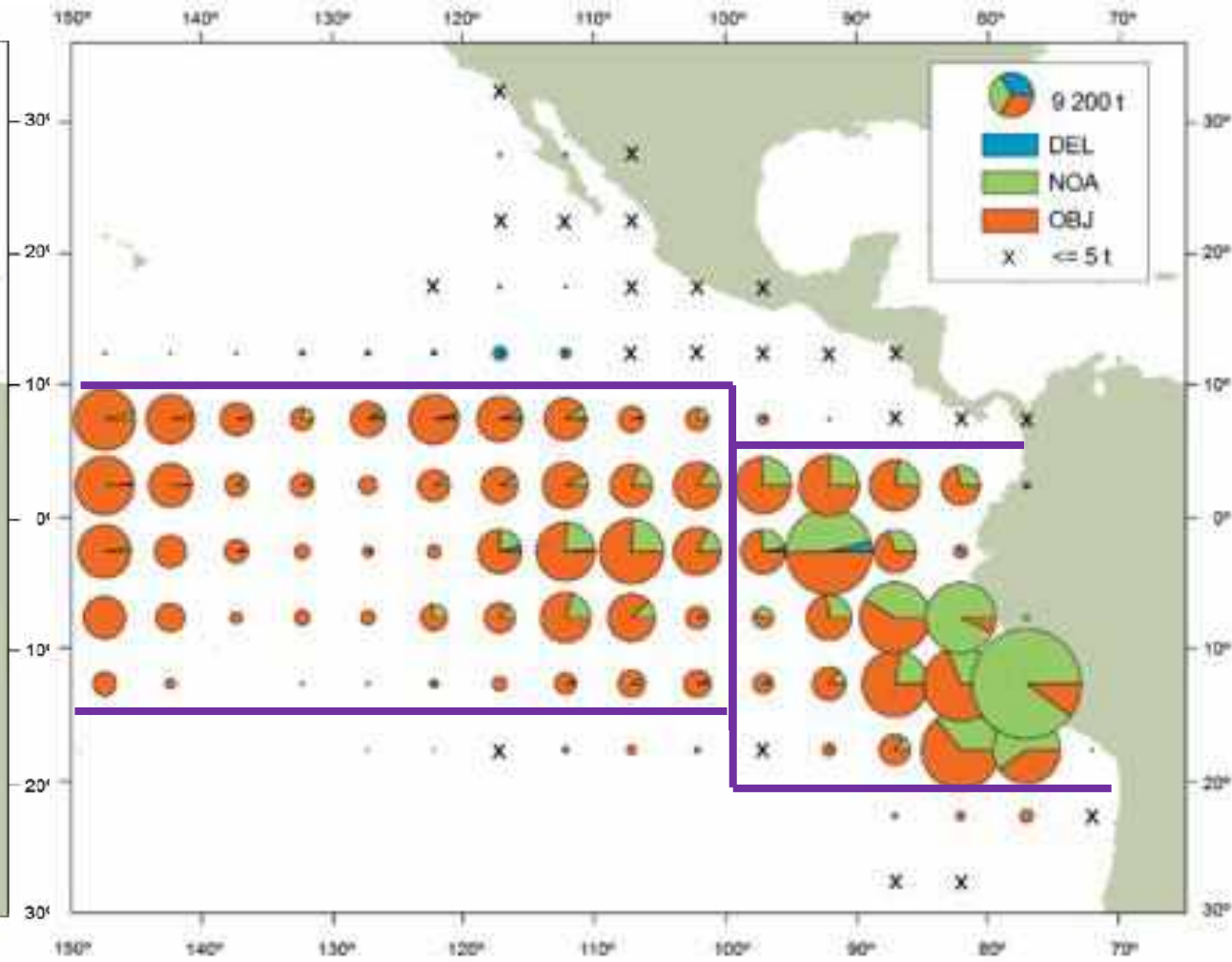
SKJ - Distribution of purse-seine catches

Promedio - Average 2016-2020



319 000 mt (289 000 - 347 000)

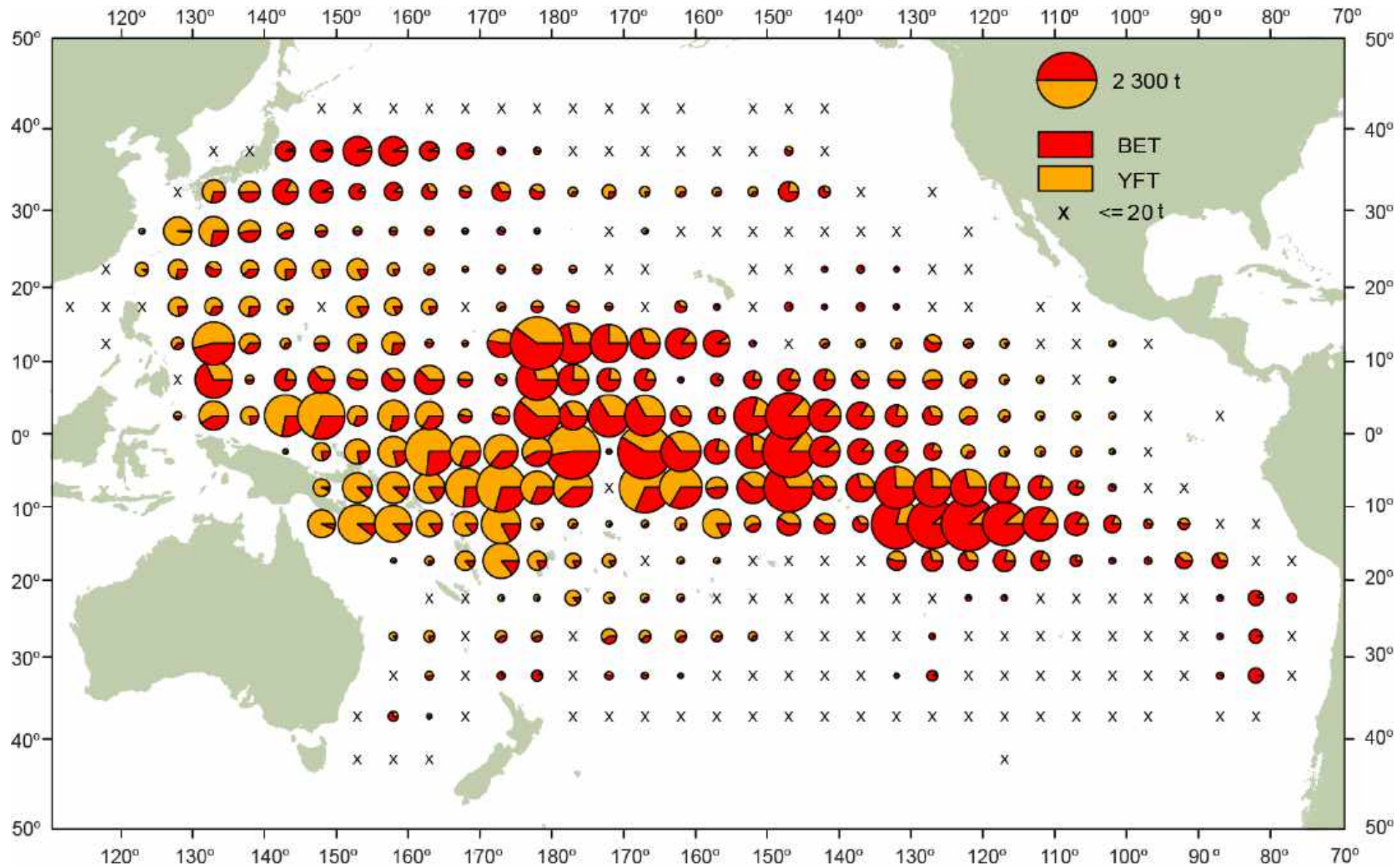
2021



325 000 mt 2% Mayor-Higher

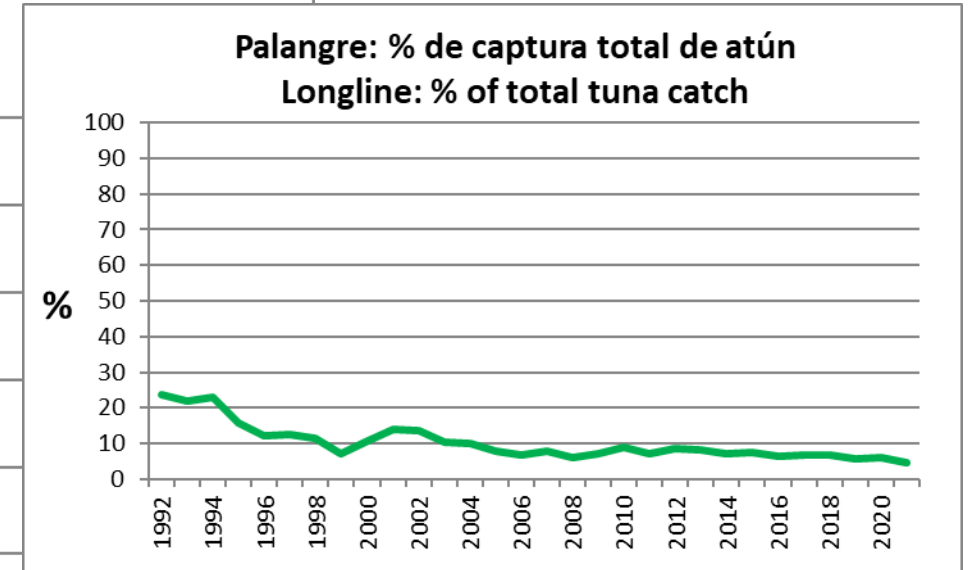
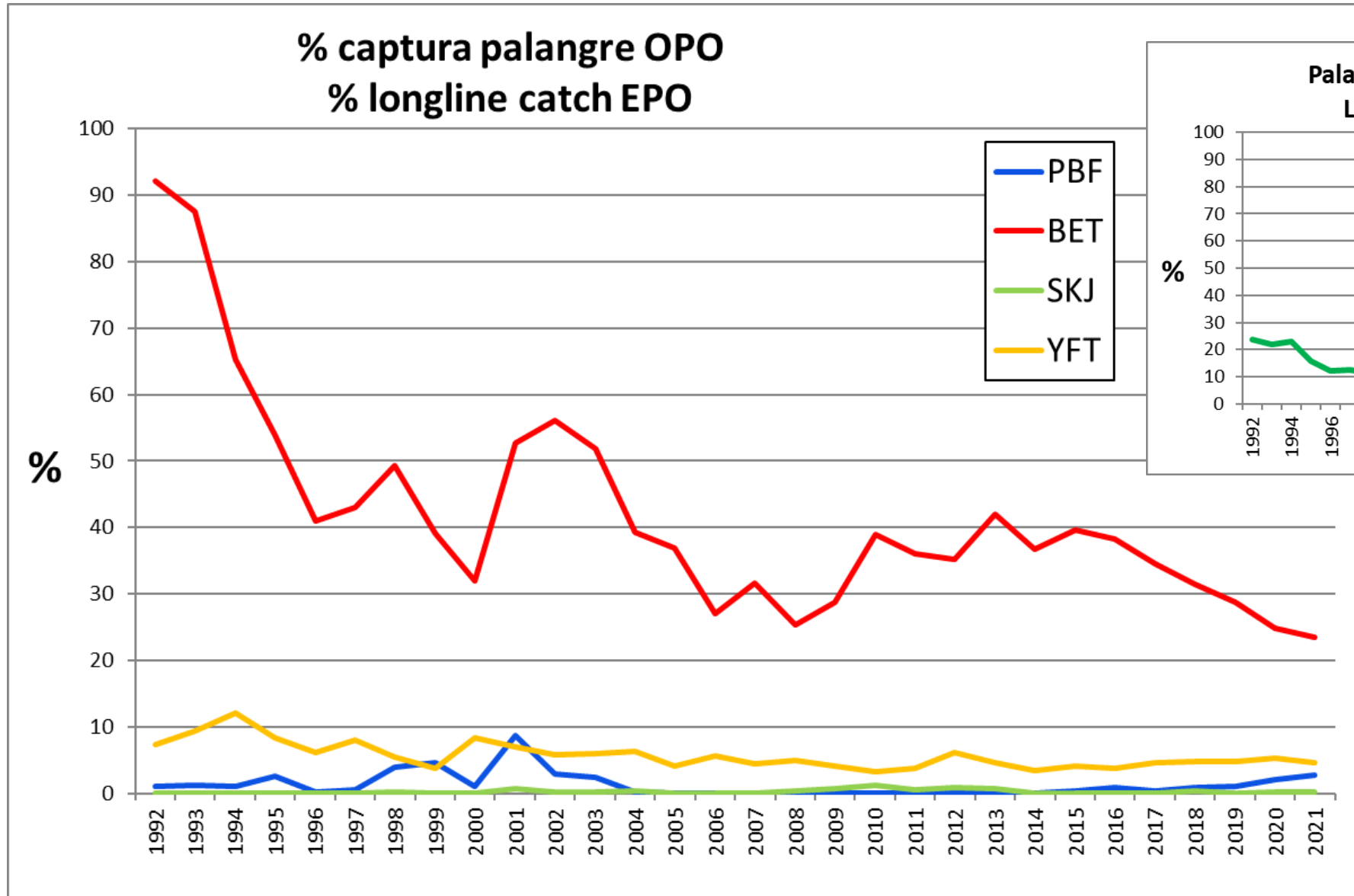
Distribución de LL 2016-2020

LL distribution 2016-2020



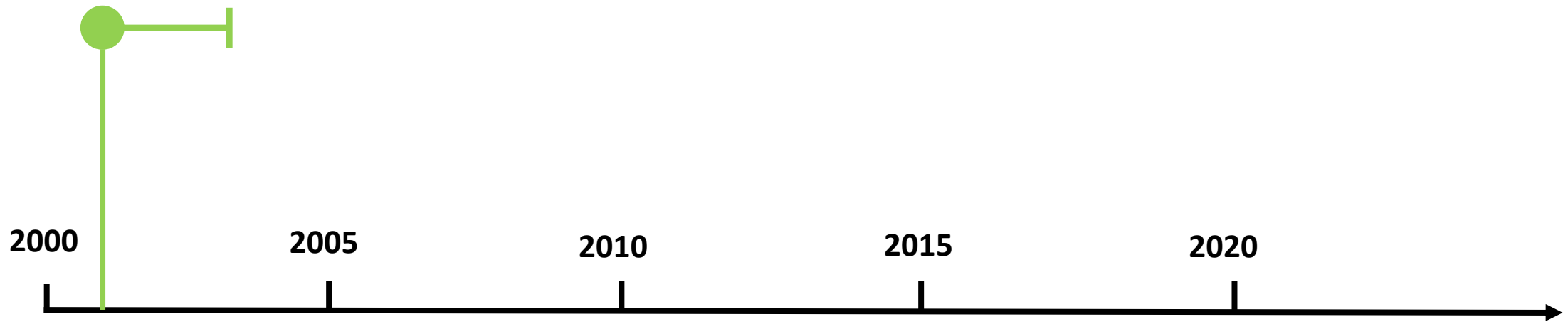
OPO captura retenida por arte/especie

EPO retained catch by gear/species



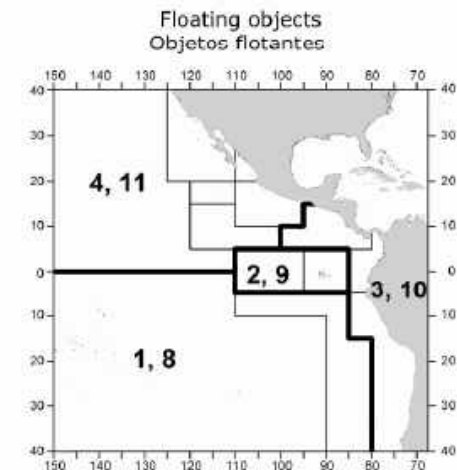
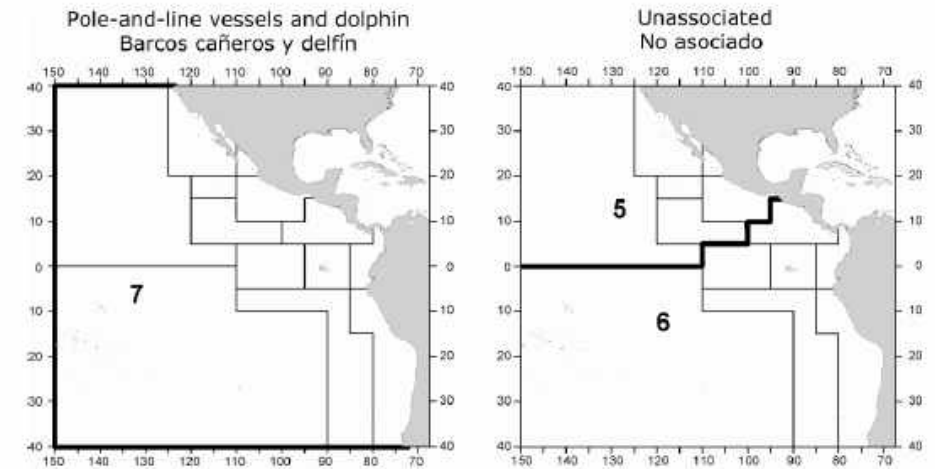
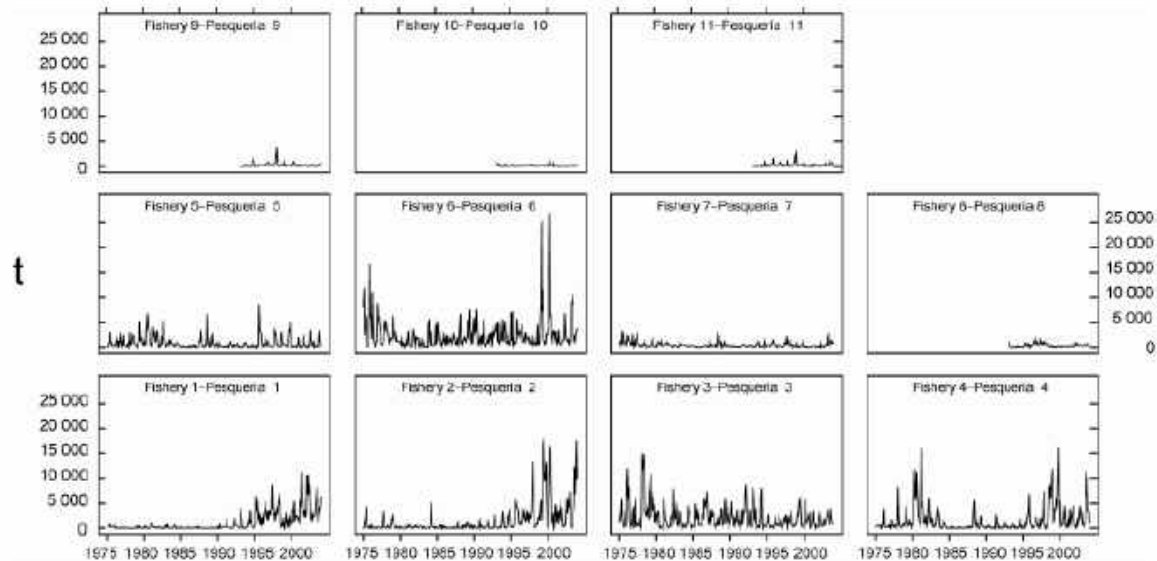
Chronology of stock assessment work

A-SCALA (integrated analysis)
(2001-2003)



A-SCALA assessments (2001-2003)

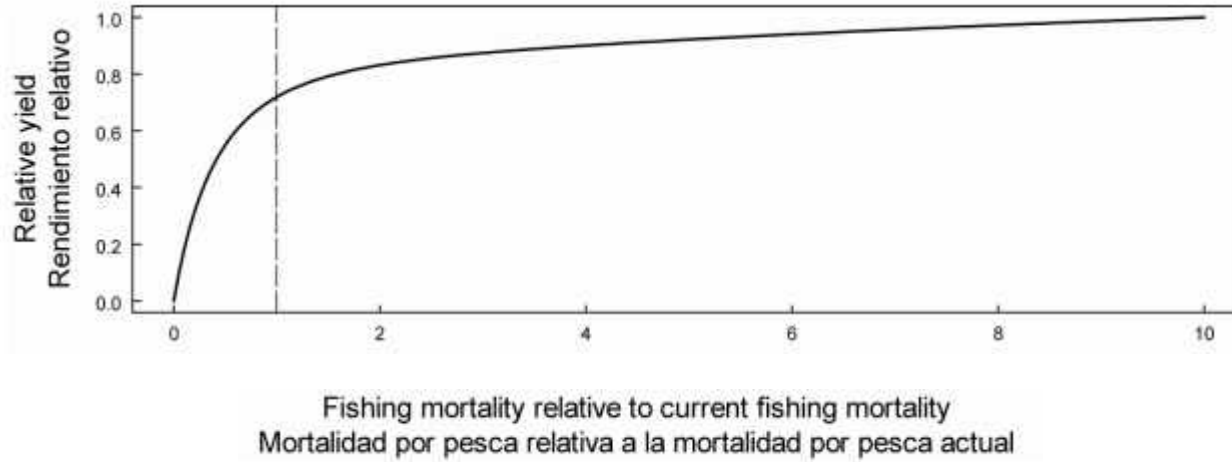
- Age-structured population dynamics model (Maunder and Watters, 2003)
- Data: retained catch, discards, fishing effort and size composition of the catches of several fisheries



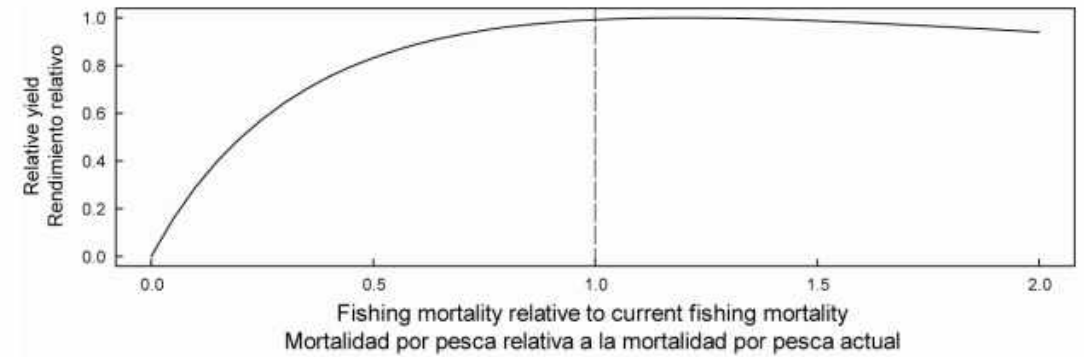
SAR 5 (2005)

A-SCALA: YPR

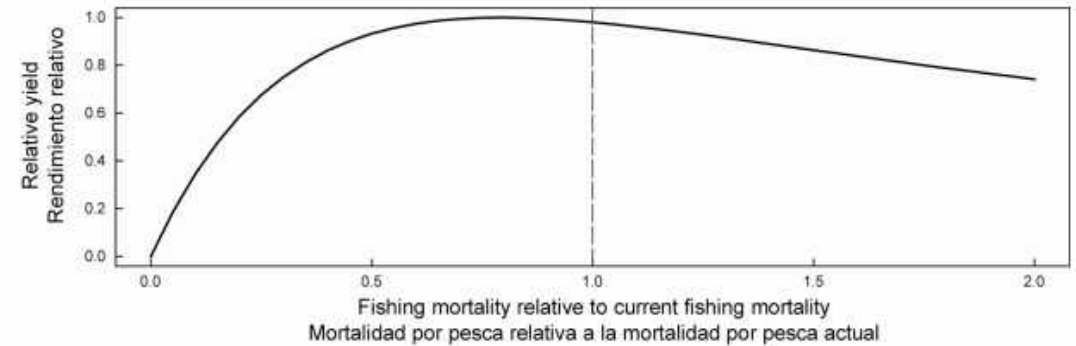
SKJ



YFT

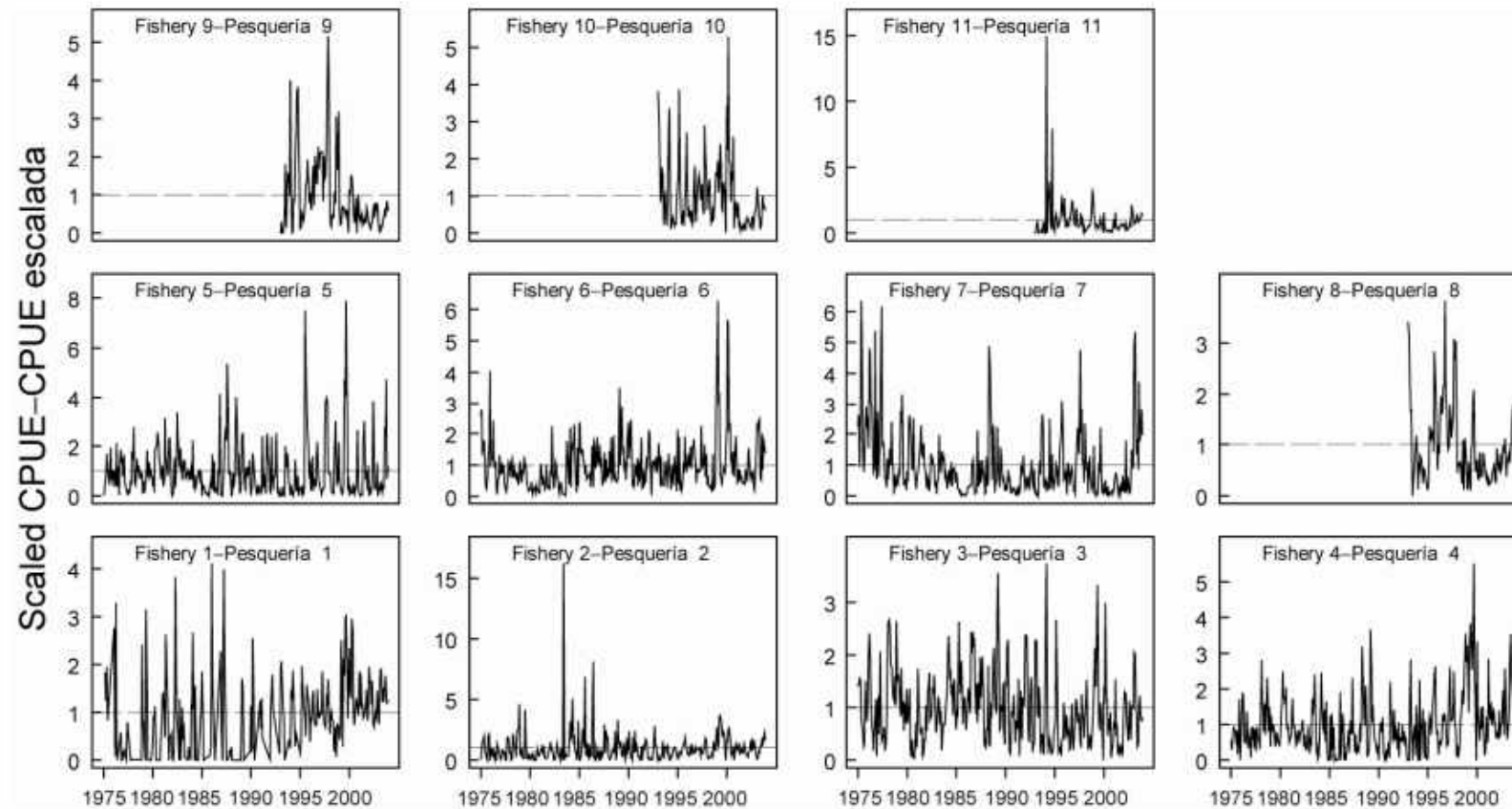


BET



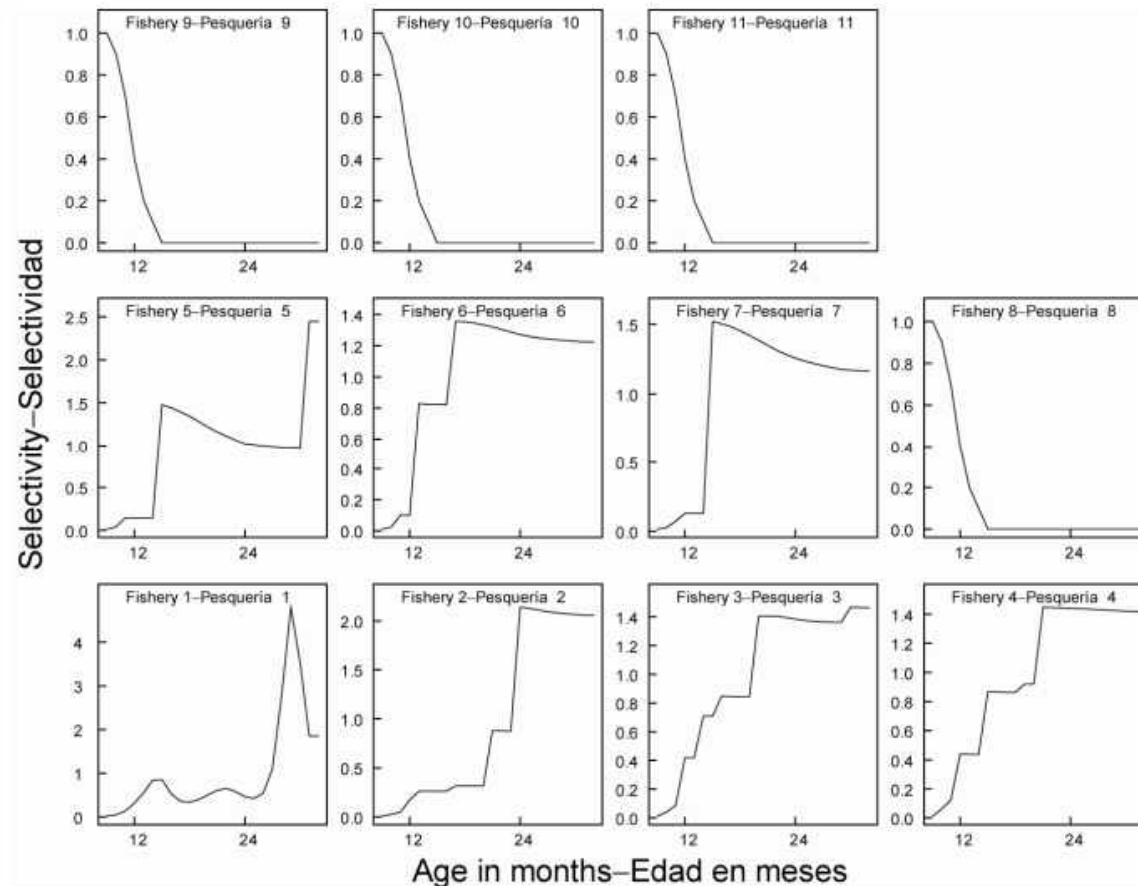
A-SCALA assessments considered not reliable for management advice

- It is unknown if CPUE for purse seine fisheries is proportional to abundance



A-SCALA assessments considered not reliable for management advice

- It is possible that there is a population of large skipjack that is invulnerable to the fisheries (no asymptotic selectivities)



A-SCALA assessments considered not reliable for management advice

- The structure of the EPO stock in relation to the western and central Pacific stocks is uncertain

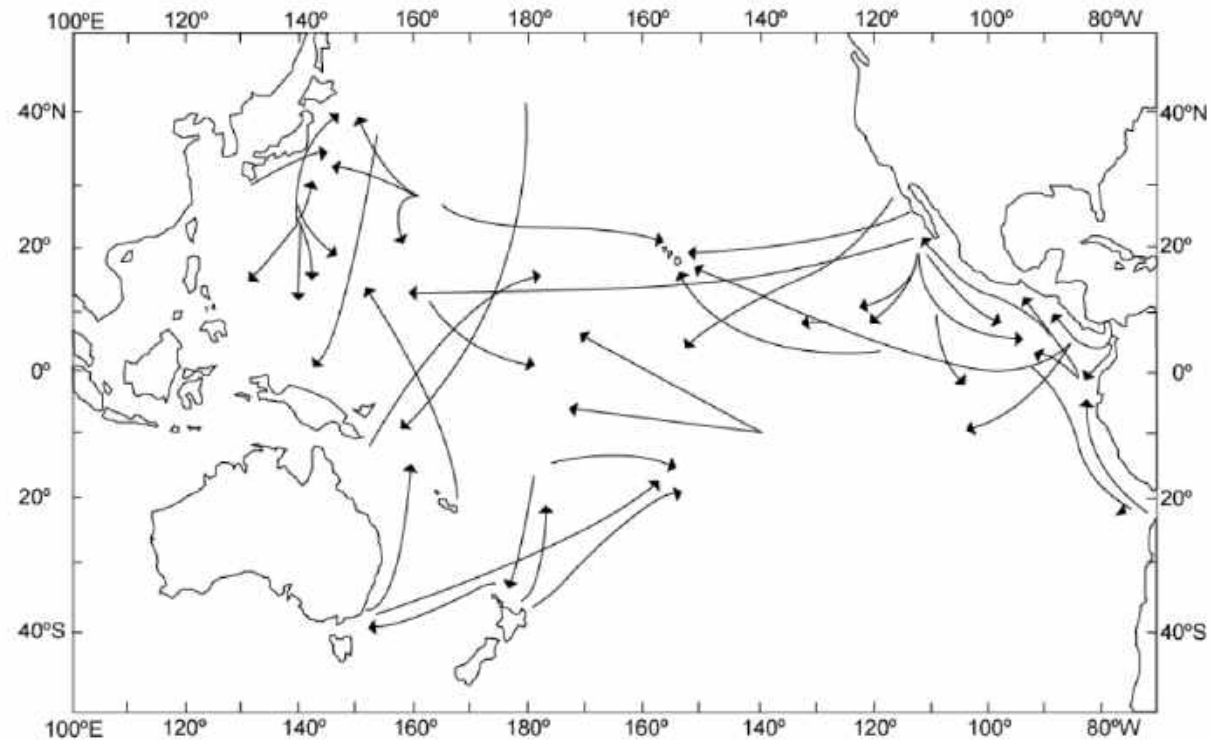
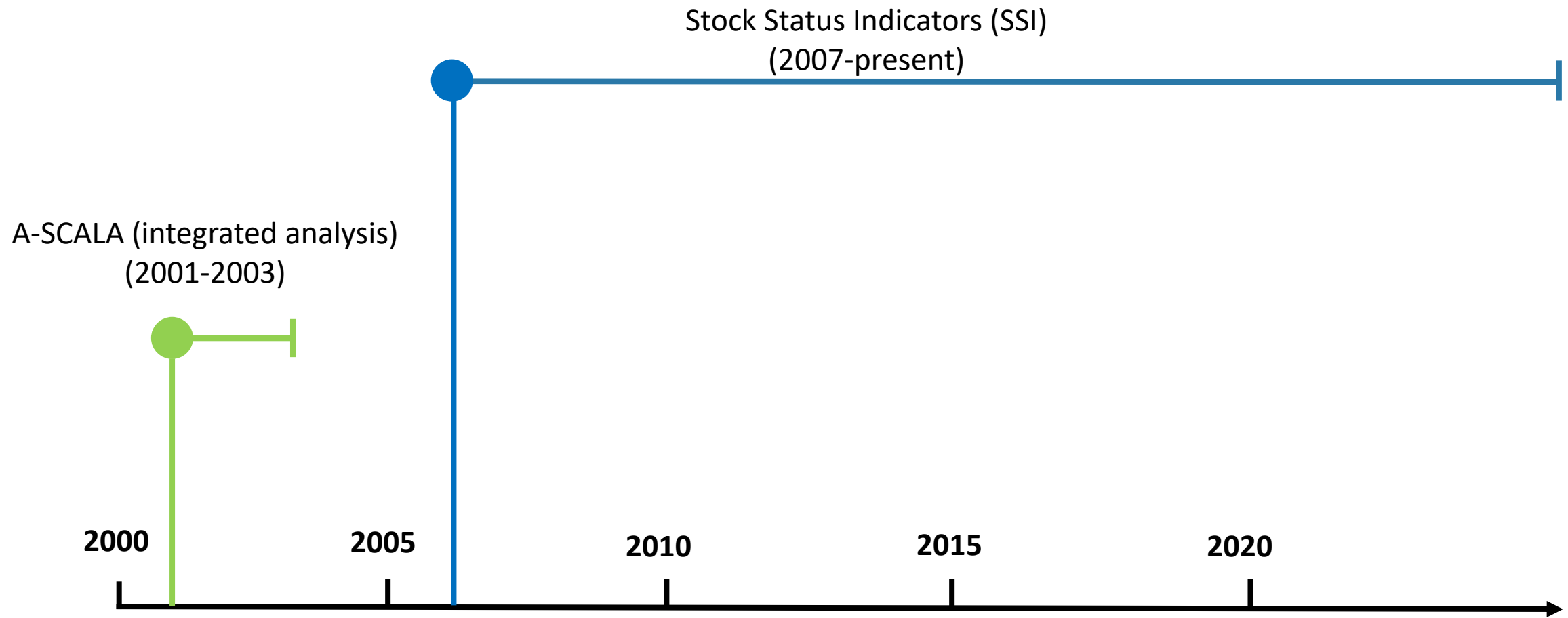


FIGURE 3.1.5. Some long-distance movements recorded for skipjack in the Pacific Ocean.
FIGURA 3.1.5. Desplazamientos a larga distancia registrados para barriletes en el Océano Pacífico.

SAR 1 (2001)

Chronology of stock assessment work



Stock status indicators

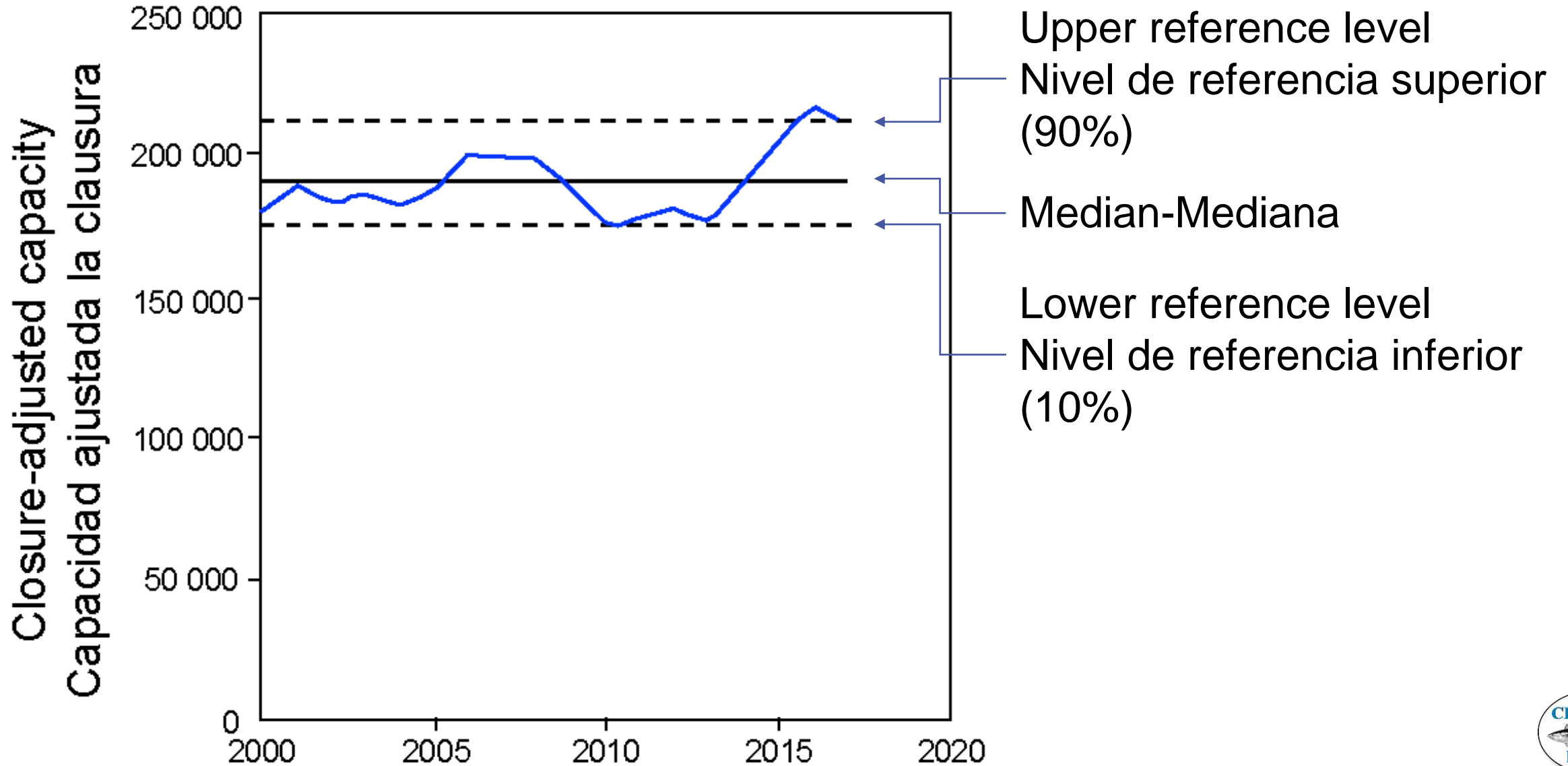
- Based on data (catch, effort, CPUE, and mean weight)
- Based on a simple population dynamics model (biomass, recruitment, and exploitation rate)
- Reference levels based on the 10th and 90th percentiles

Maunder and Deriso (2007)



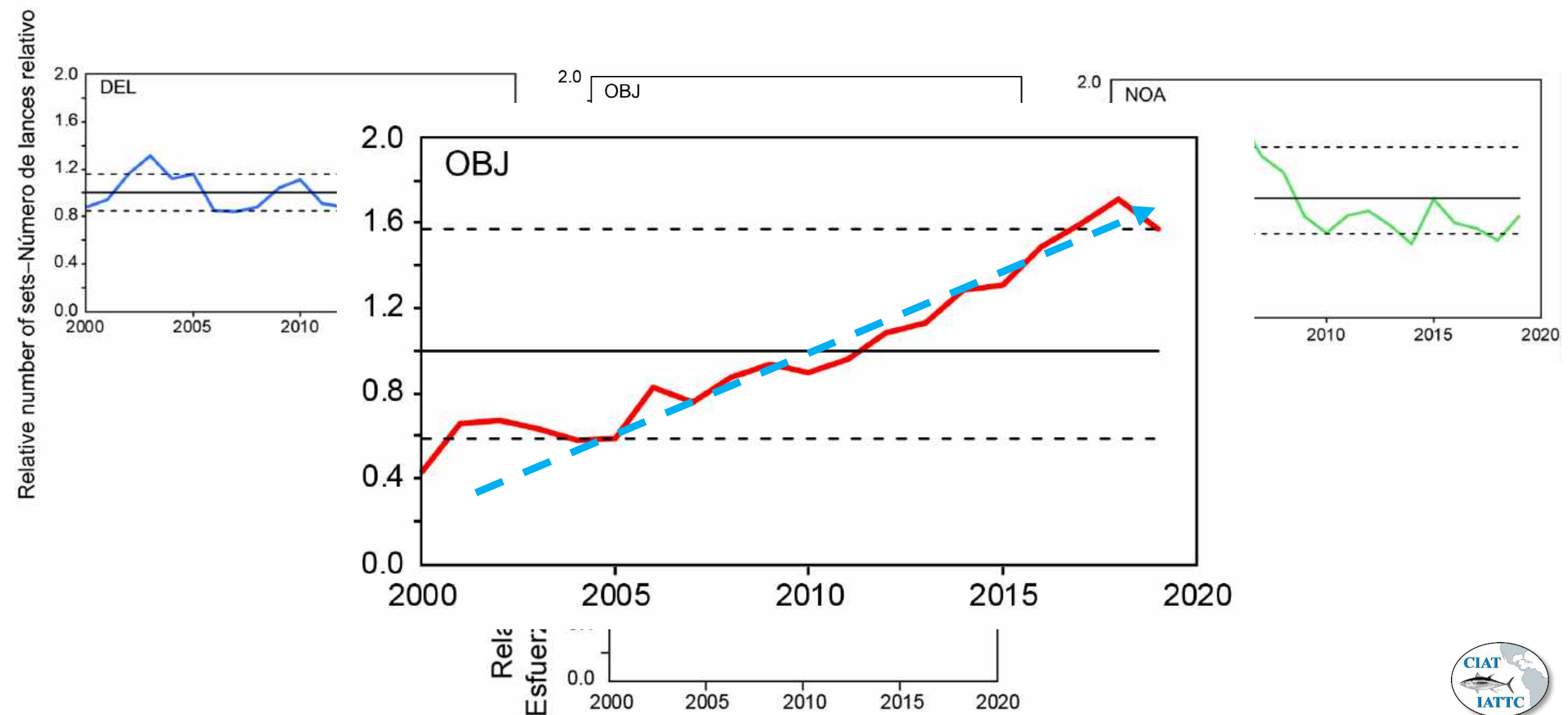
¿Qué son los indicadores de condición de población (SSI)?

What are Stock Status Indicators (SSI)?



Esfuerzo: Número de lances por arte y tipo de lance

Effort: Numbers of sets by gear and set type



Cerco: Captura en peso por especie y tipo de lance

Purse seine: Catch in weight by species and set type

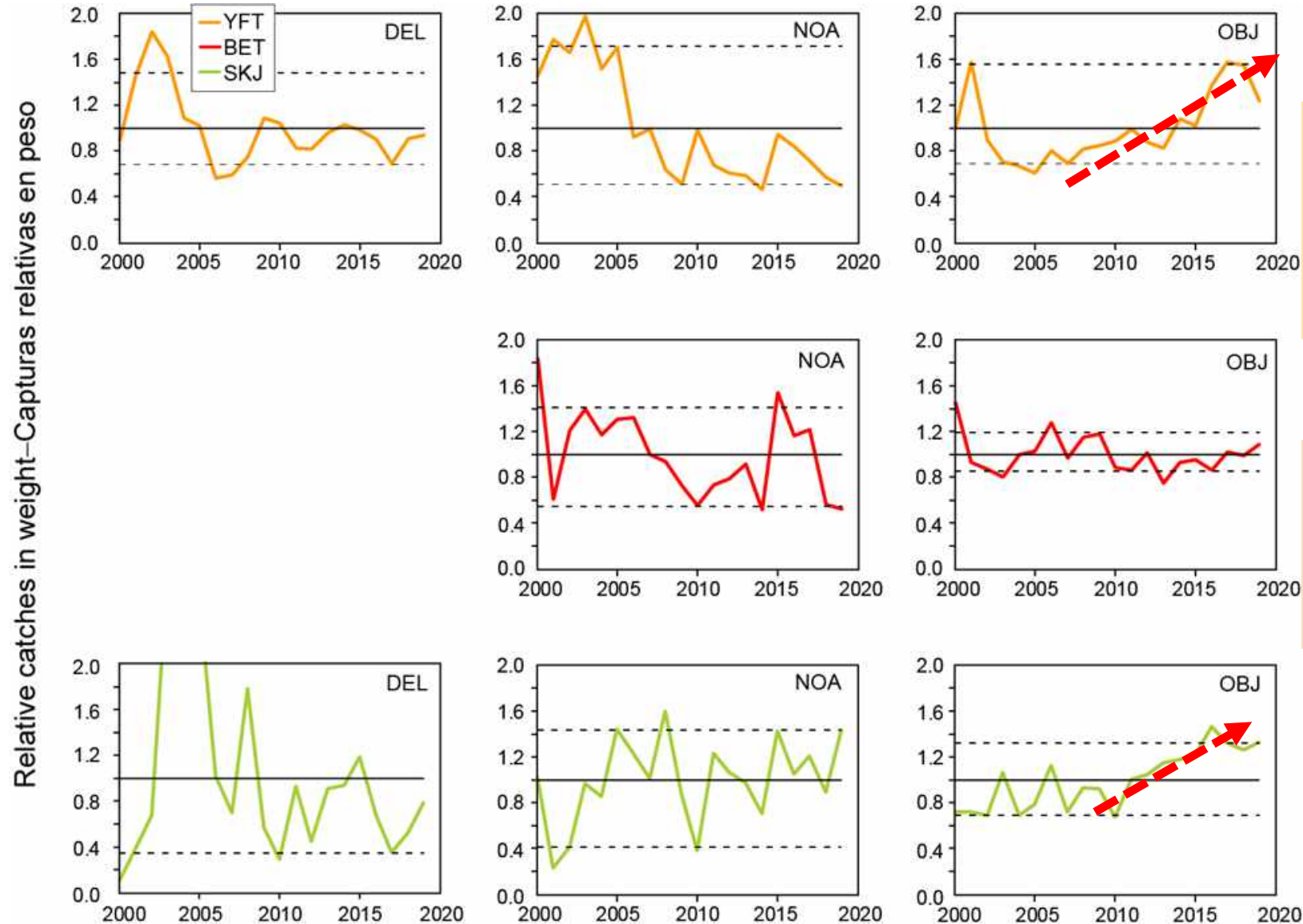
YFT



BET



SKJ



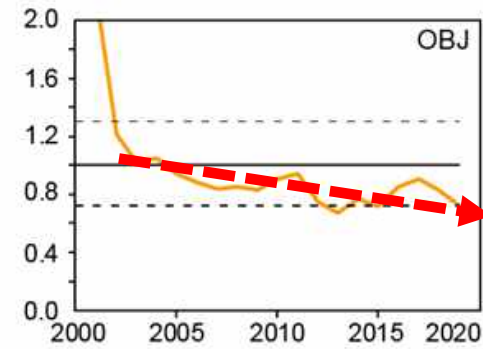
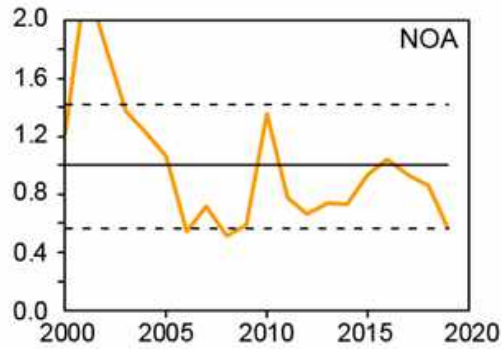
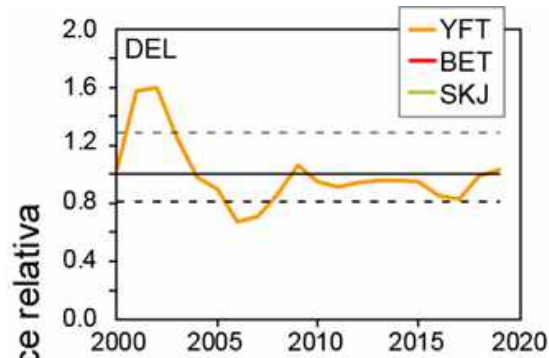
- Aumento de las capturas de YFT y SKJ en la pesquería sobre objetos flotantes

- Increase in the catch of YFT and SKJ in the floating object fishery

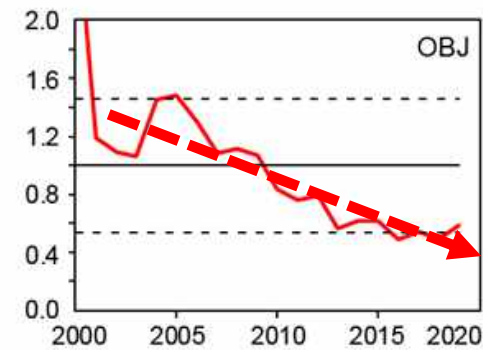
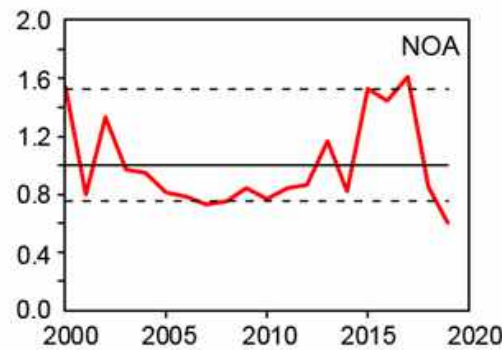
Cerco: Captura por lance por especie y tipo de lance

Purse seine: Catch per set by species and set type

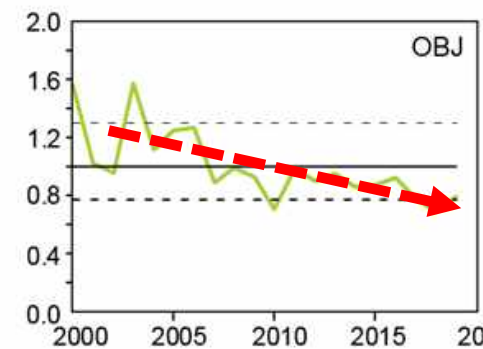
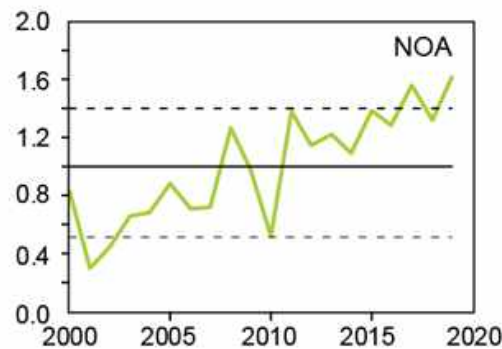
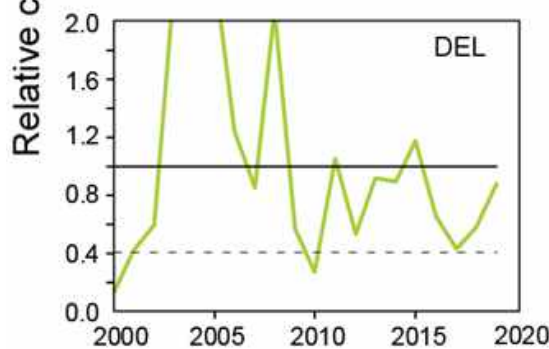
YFT



BET



SKJ



- Disminución de la captura por lance en la pesquería sobre objetos flotantes para las tres especies

- A decline in the floating object catch per set for all three species

Cerco: Talla promedio por especie y tipo de lance

Purse seine: Average length by species and set type

YFT



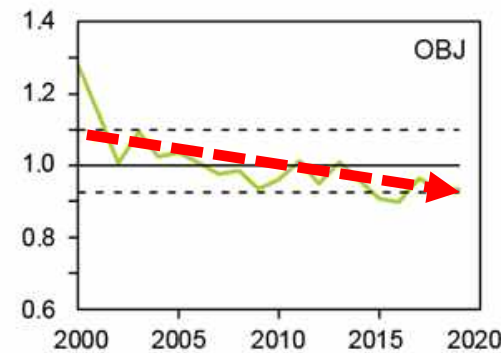
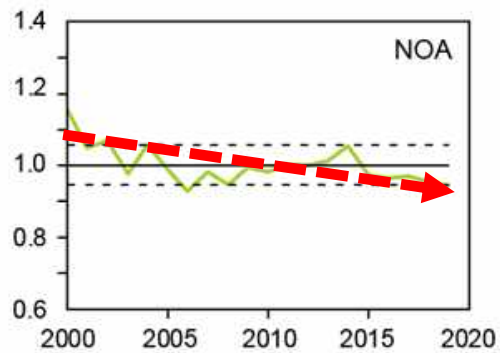
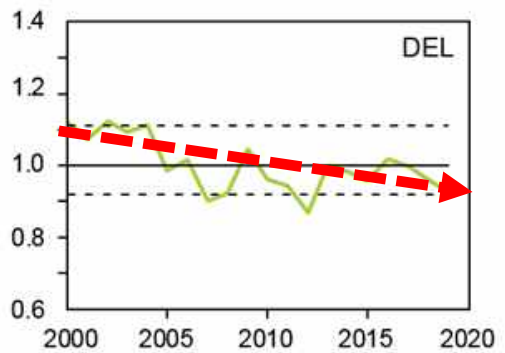
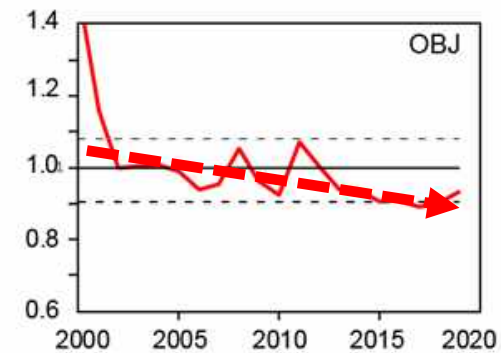
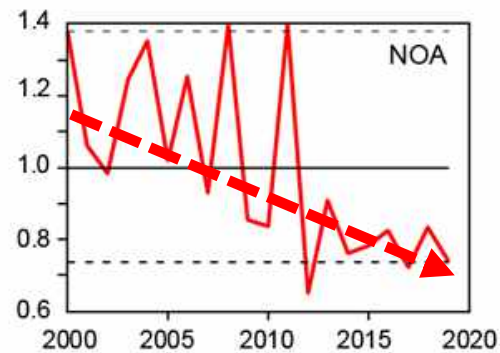
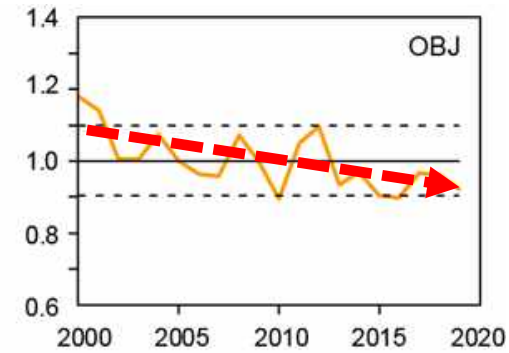
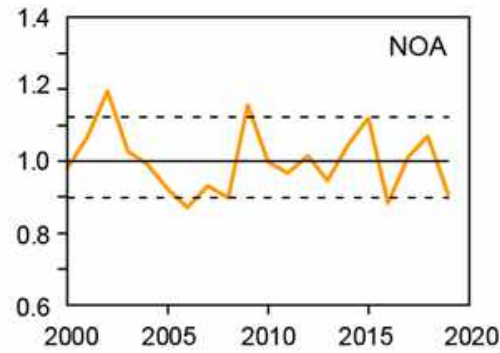
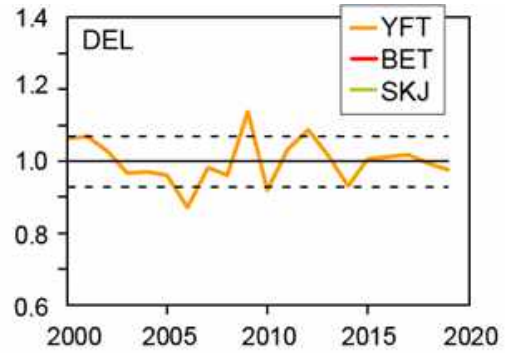
BET



SKJ



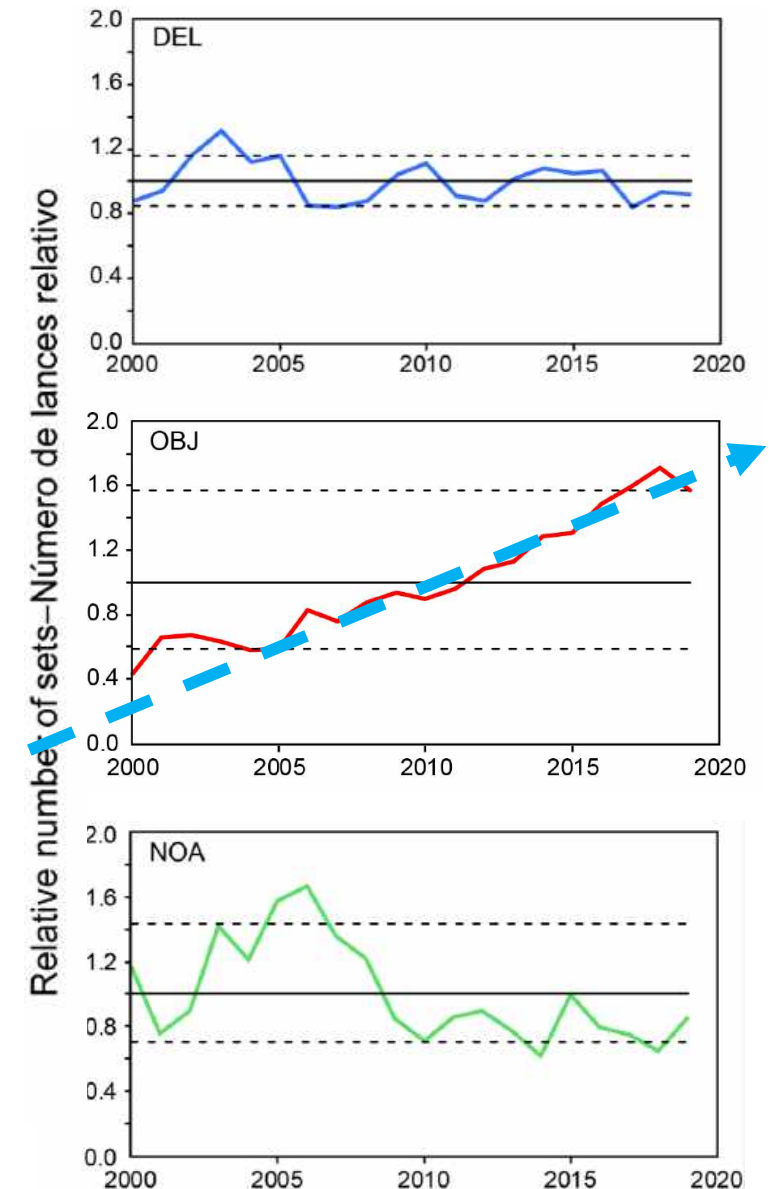
Relative average length—Talla promedio relativa



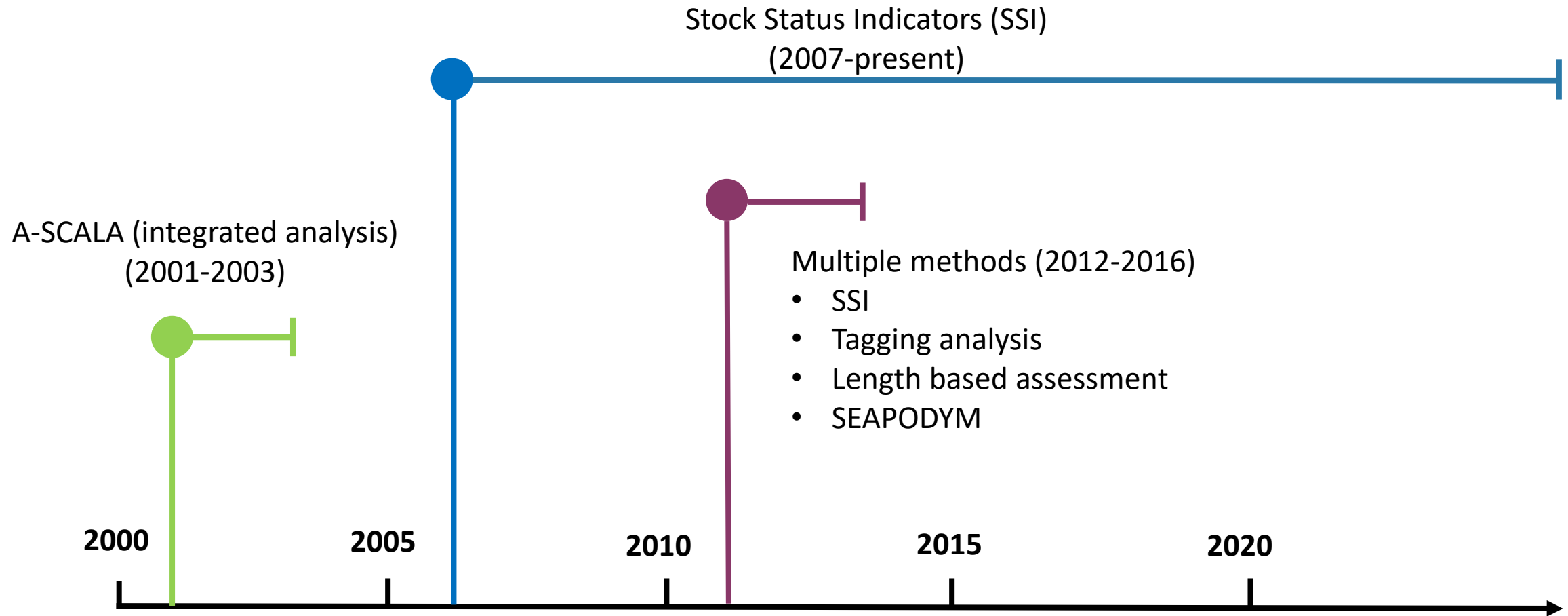
- Disminución de la talla promedio en la pesquería sobre objetos flotantes para las tres especies
- Disminución de la talla promedio de BET y SKJ en los otros tipos de lances

- A decline in the floating object average length for all three species
- A decline in average length for BET and SKJ in the other set types

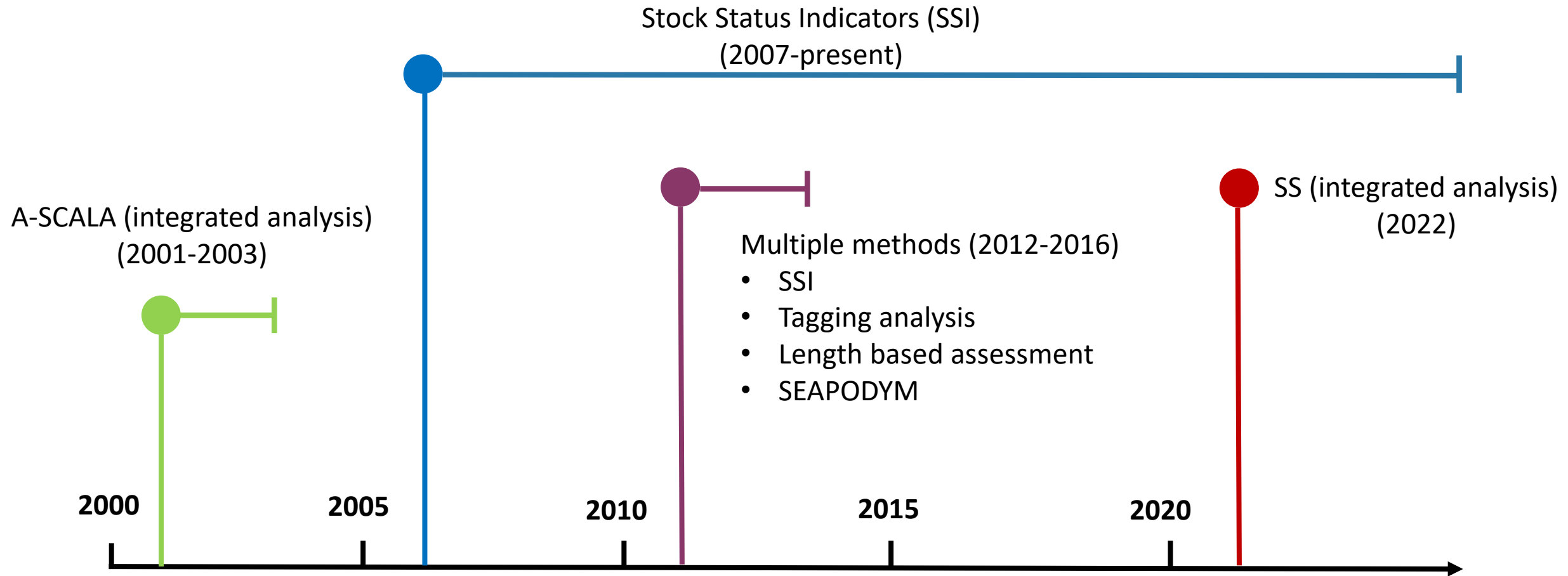
- La mayoría de los SSI basados en la pesquería sobre objetos flotantes sugieren que la **mortalidad por pesca de las tres especies ha aumentado**
 - Principalmente debido al **aumento del número de lances sobre objetos flotantes**
-
- Most SSIs based on the floating-object fishery suggest that the **fishing mortality of all three species has increased**
 - Mainly due to the **increase in the number of floating-object sets**



Chronology of stock assessment work



Chronology of stock assessment work



SKJ: Condición de las poblaciones – Stock status

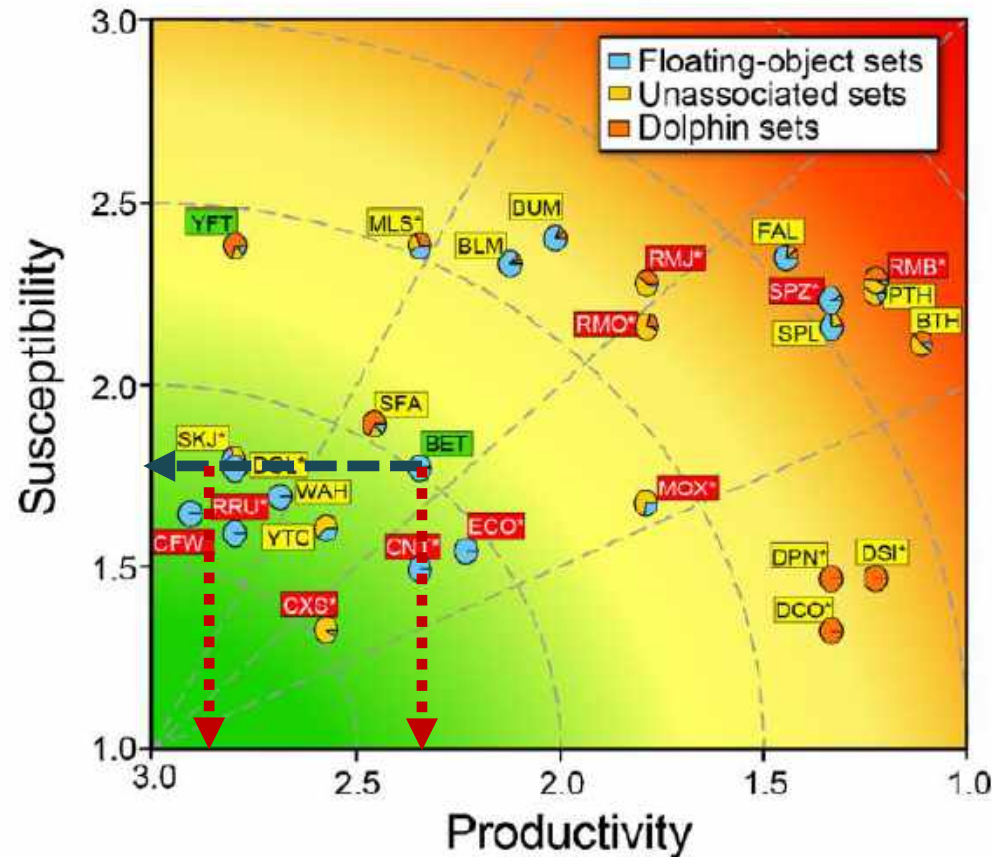


- Justificación del APS

- **Susceptibilidad:** SKJ \approx BET
- **Productividad:** SKJ $>$ BET



- La condición del SKJ debería ser más optimista que la del BET
- La probabilidad de rebasar los PR del SKJ debería ser menor que para el BET
- Medidas de ordenación adecuadas para el BET deberían proteger al SKJ



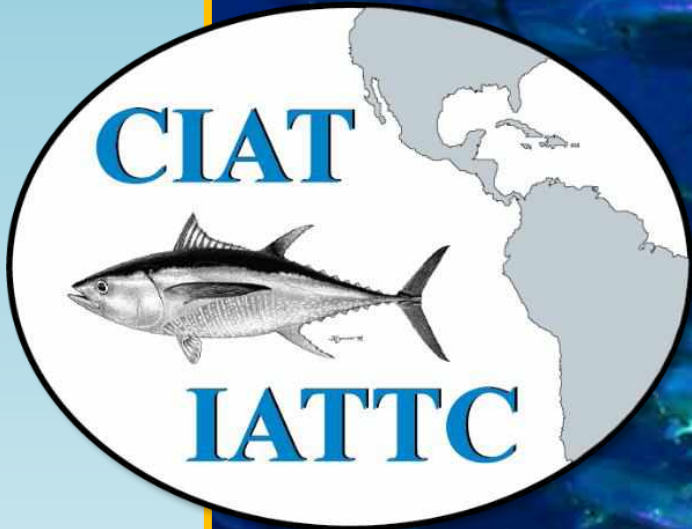
Duffy et al. 2019

- PSA rationale

- **Susceptibility:** SKJ \approx BET
- **Productivity:** SKJ $>$ BET



- SKJ status should be more optimistic than BET
- Probability of exceeding RP for SKJ should be lower than for BET
- Adequate management measures for BET should protect SKJ



Questions

