Comisión Interamericana del Atún Tropical
Inter-American Tropical Tuna Commission

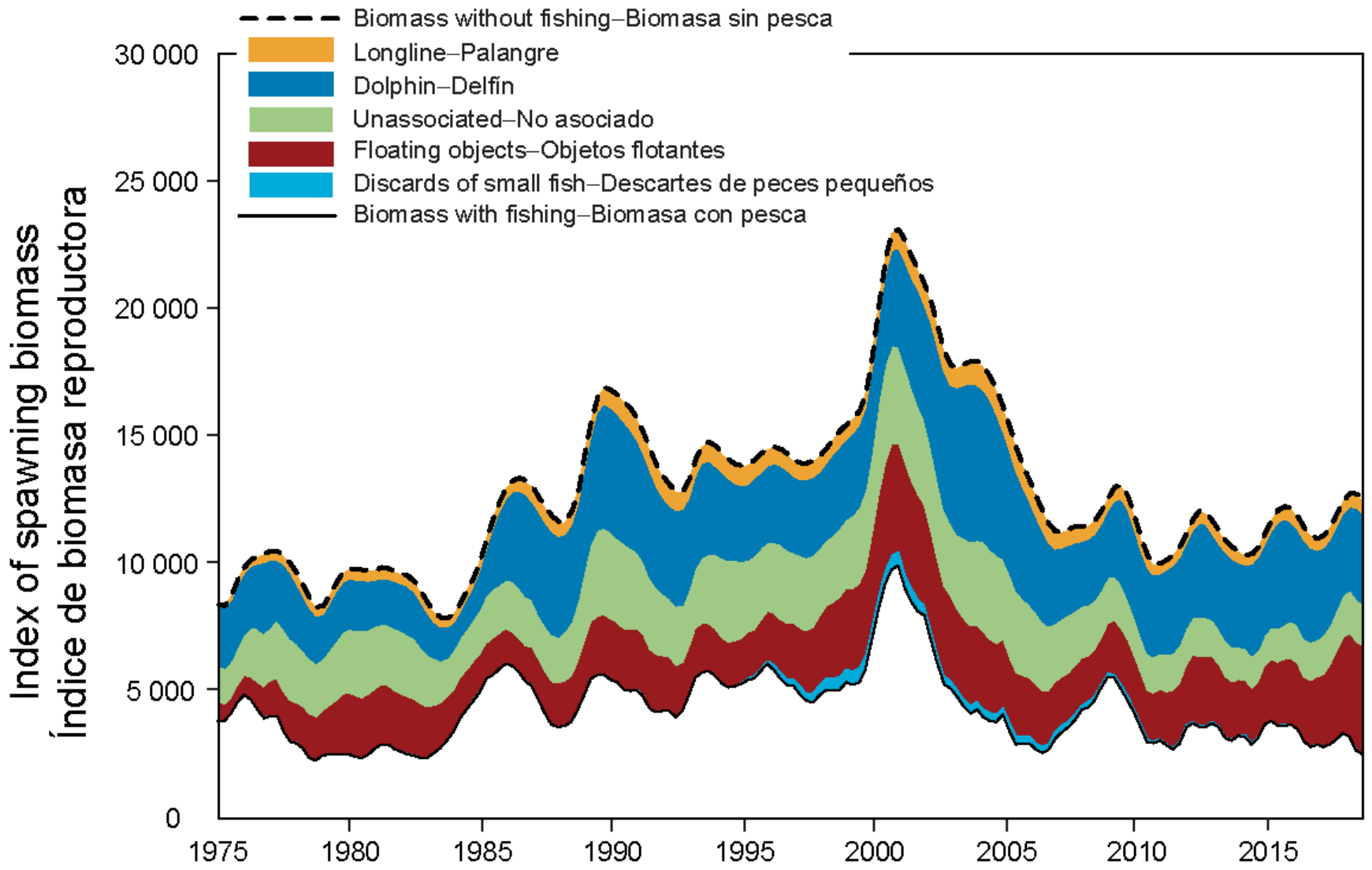
CIAT
IATTC

RESPONSES TO REQUESTS

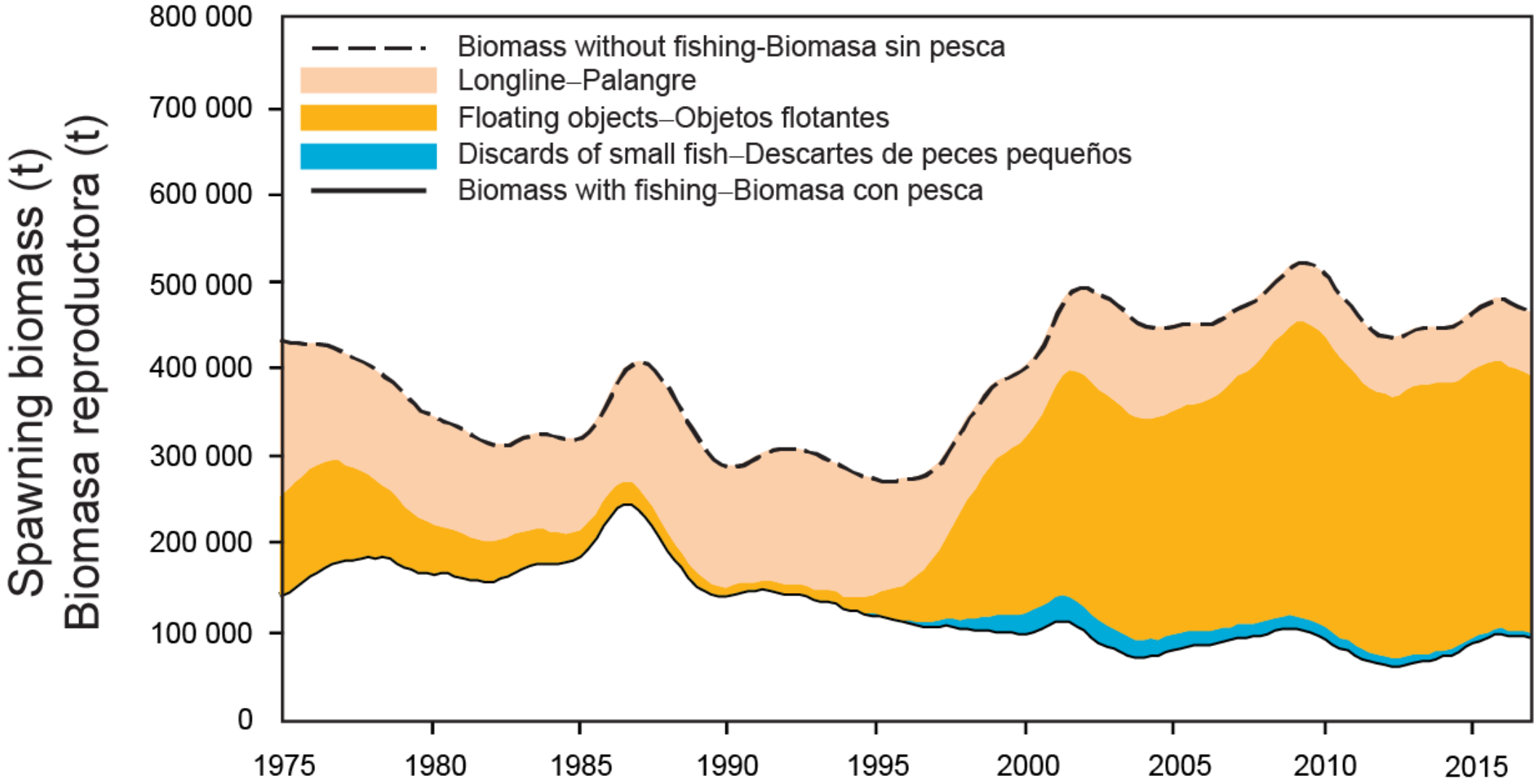
94ª Reunión de la CIAT–94th Meeting of the IATTC
22-26 julio-July 2019 - Bilbao, España–Spain

DAY 1 – MONDAY 22

Fishery impact plots: YFT



Fishery impact plots: BET

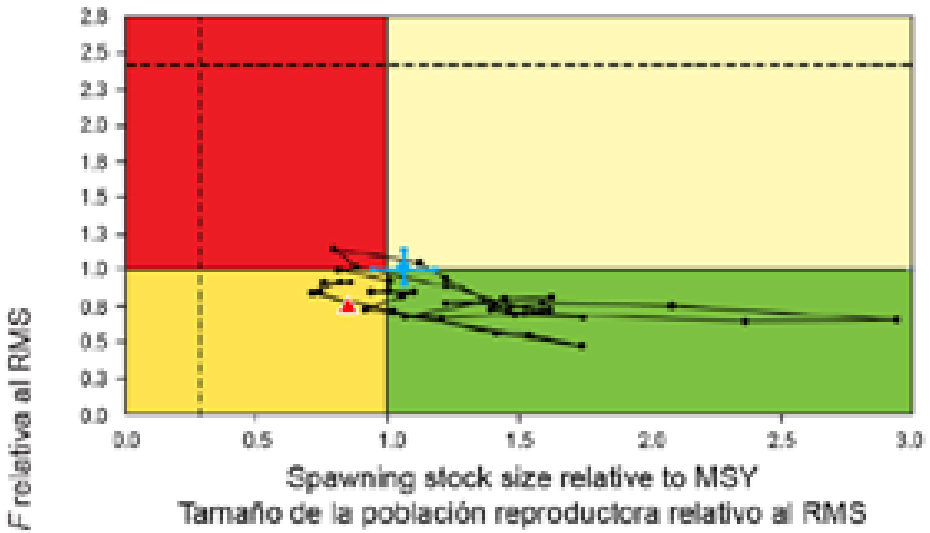


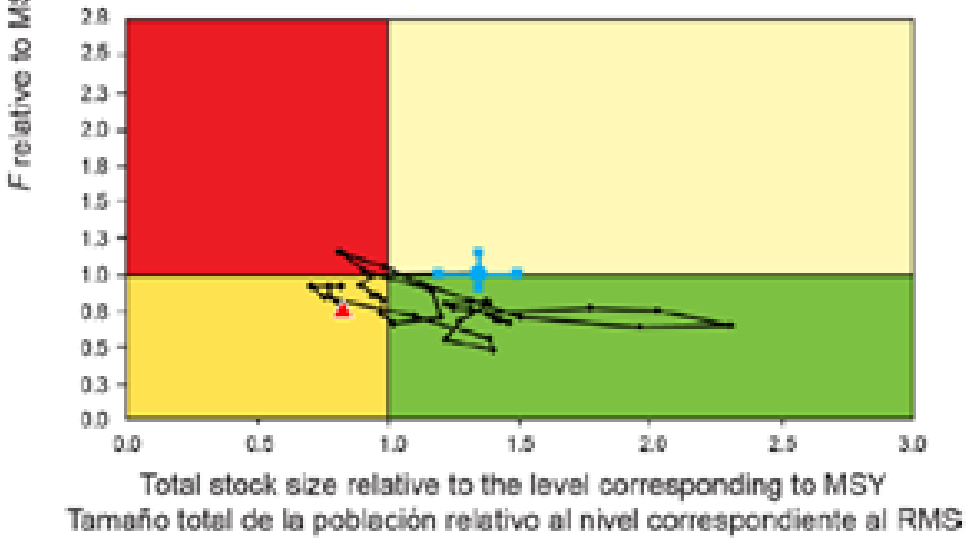
DAY 2 – TUESDAY 23

Request

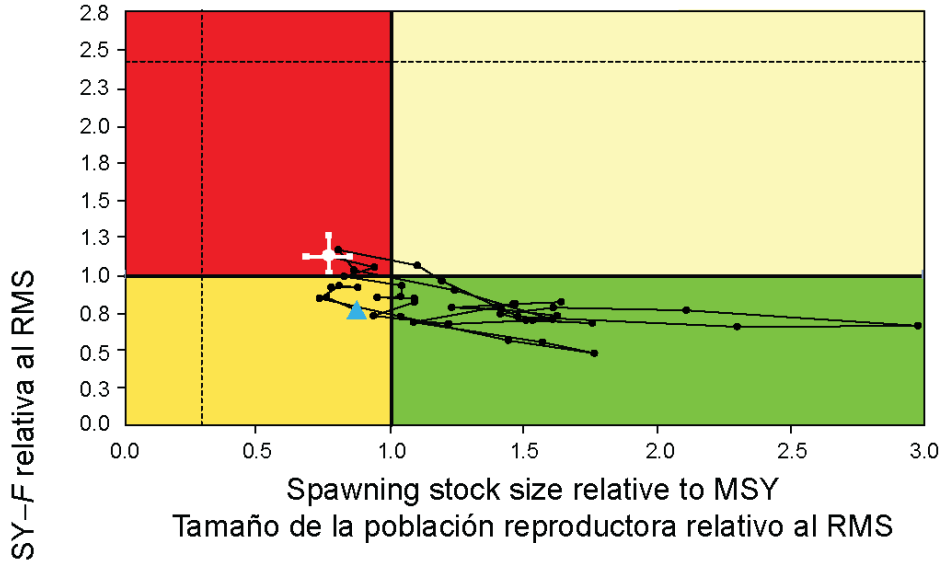
KOR: species KOBE plots

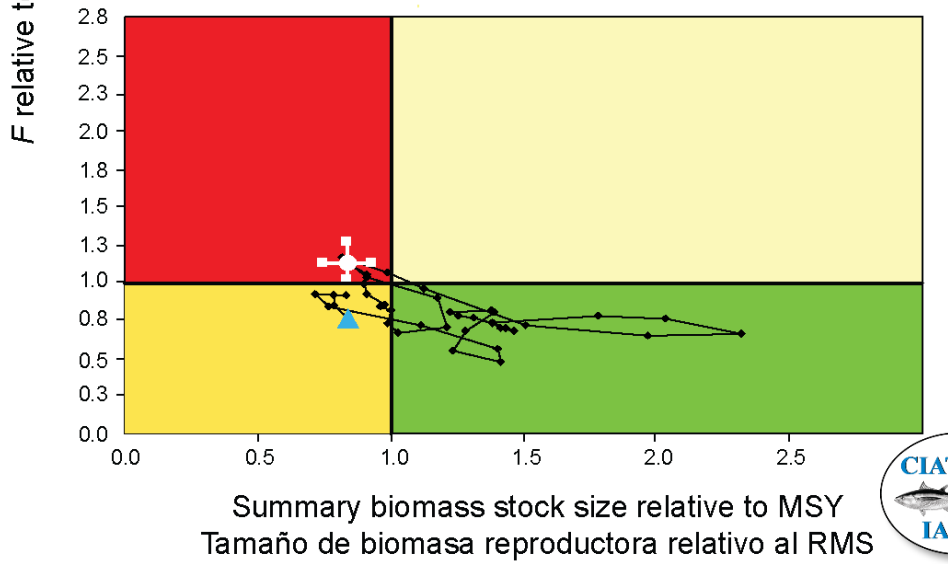
YFT 2018



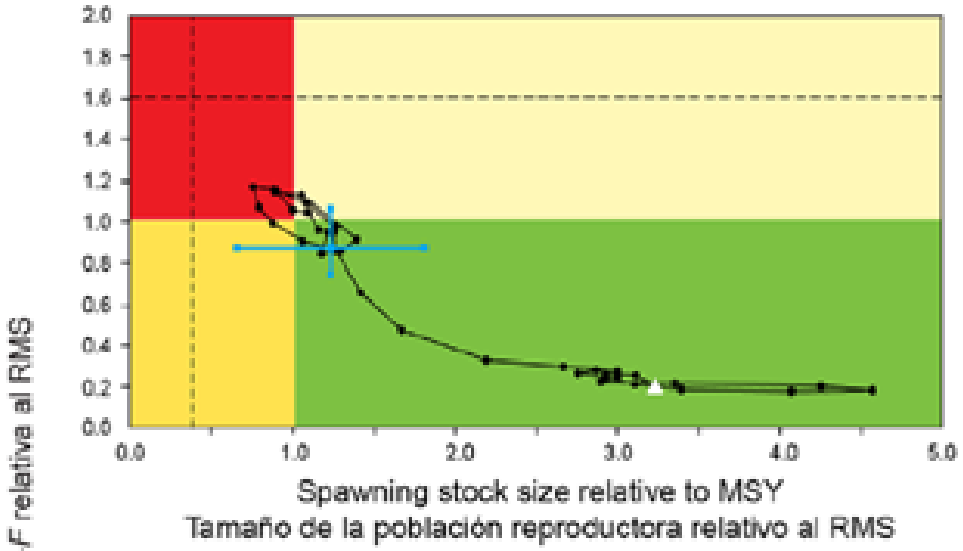


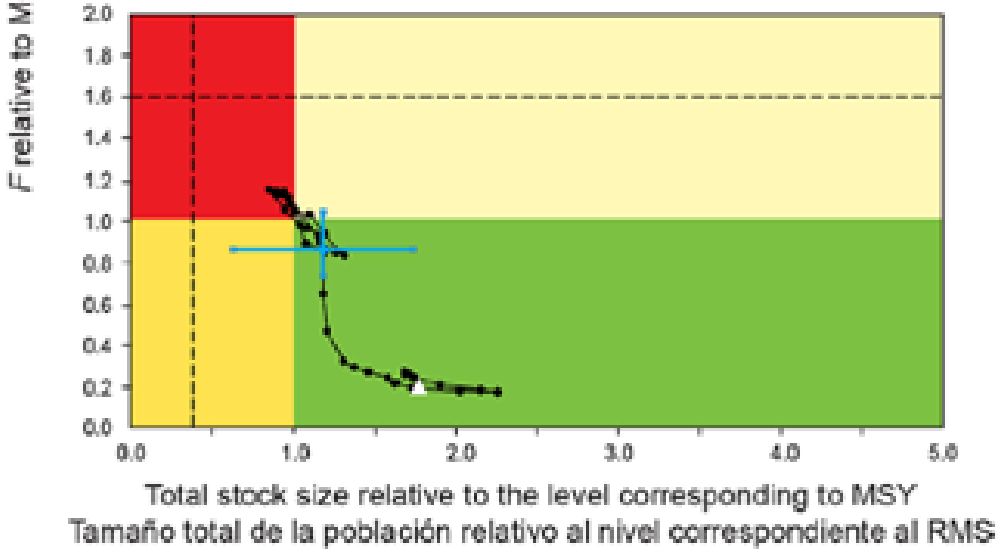
YFT 2019



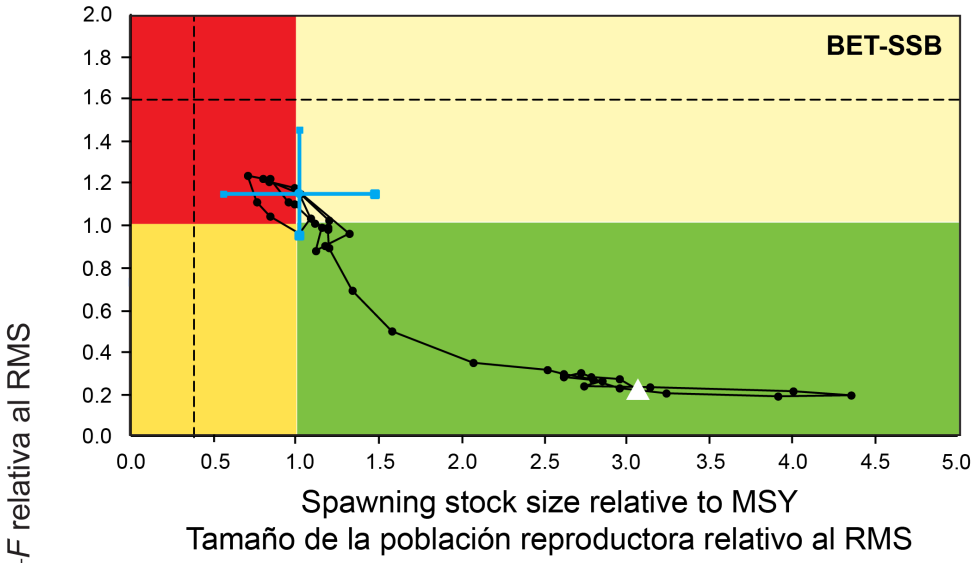


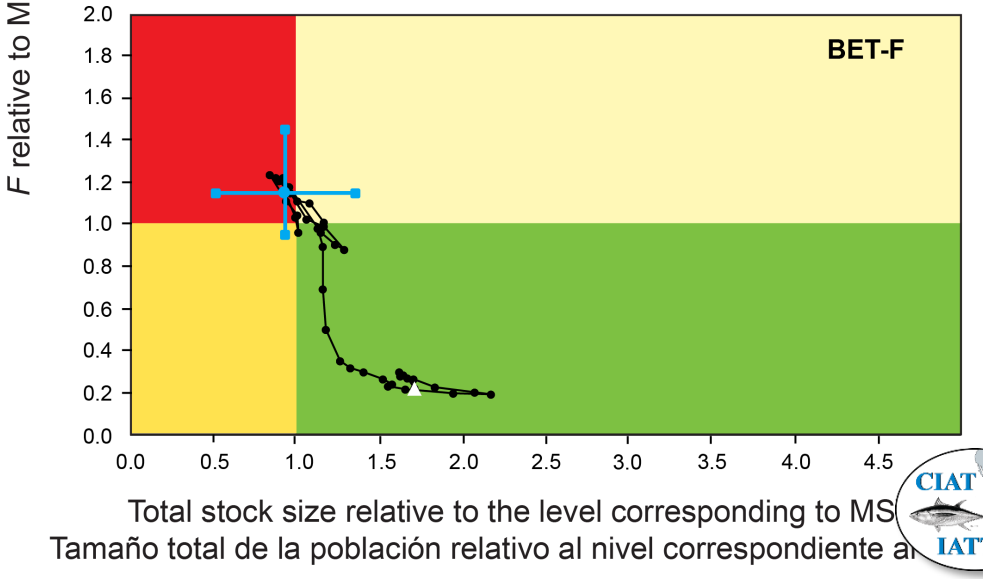
BET 2017





BET 2018

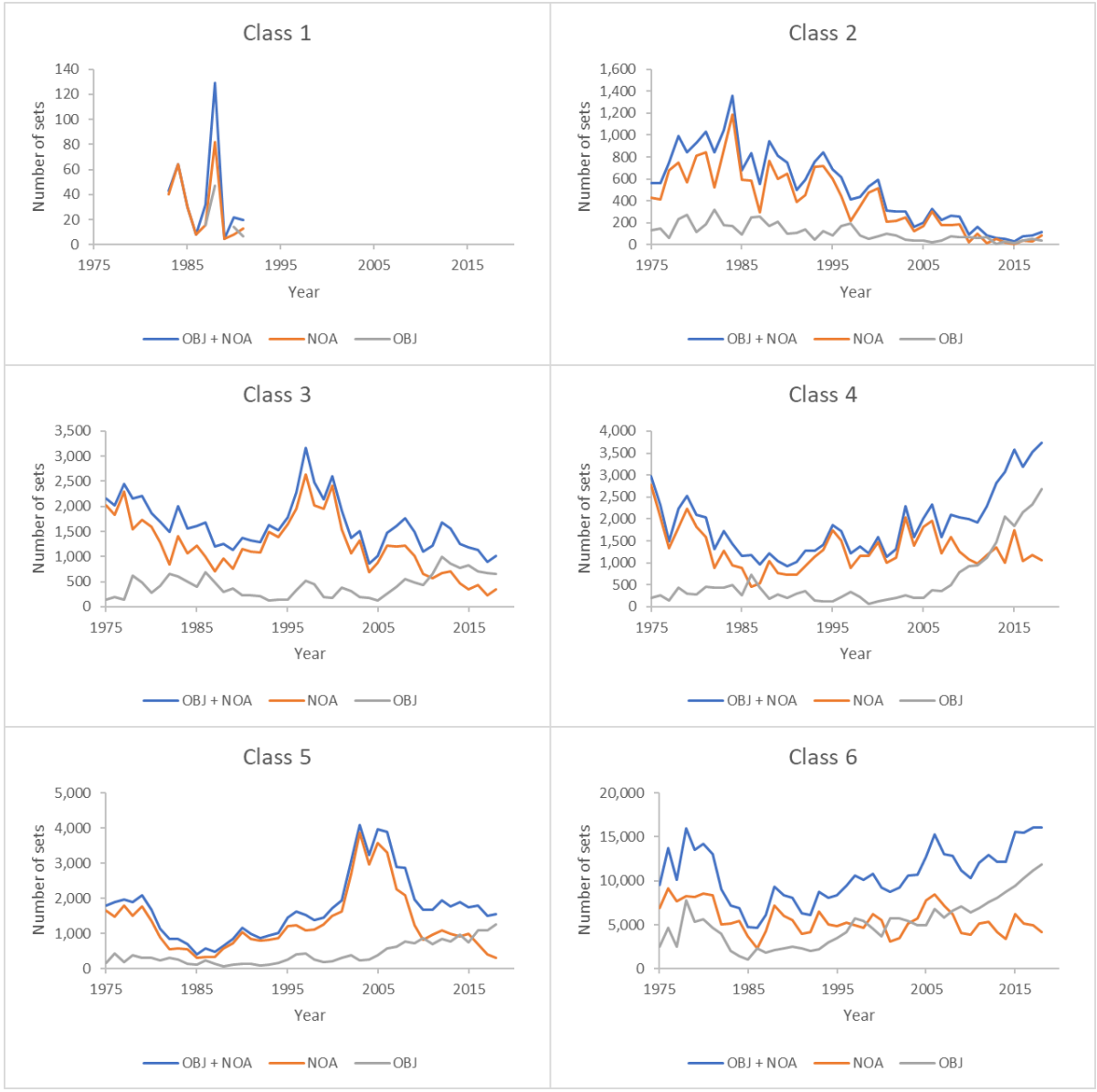




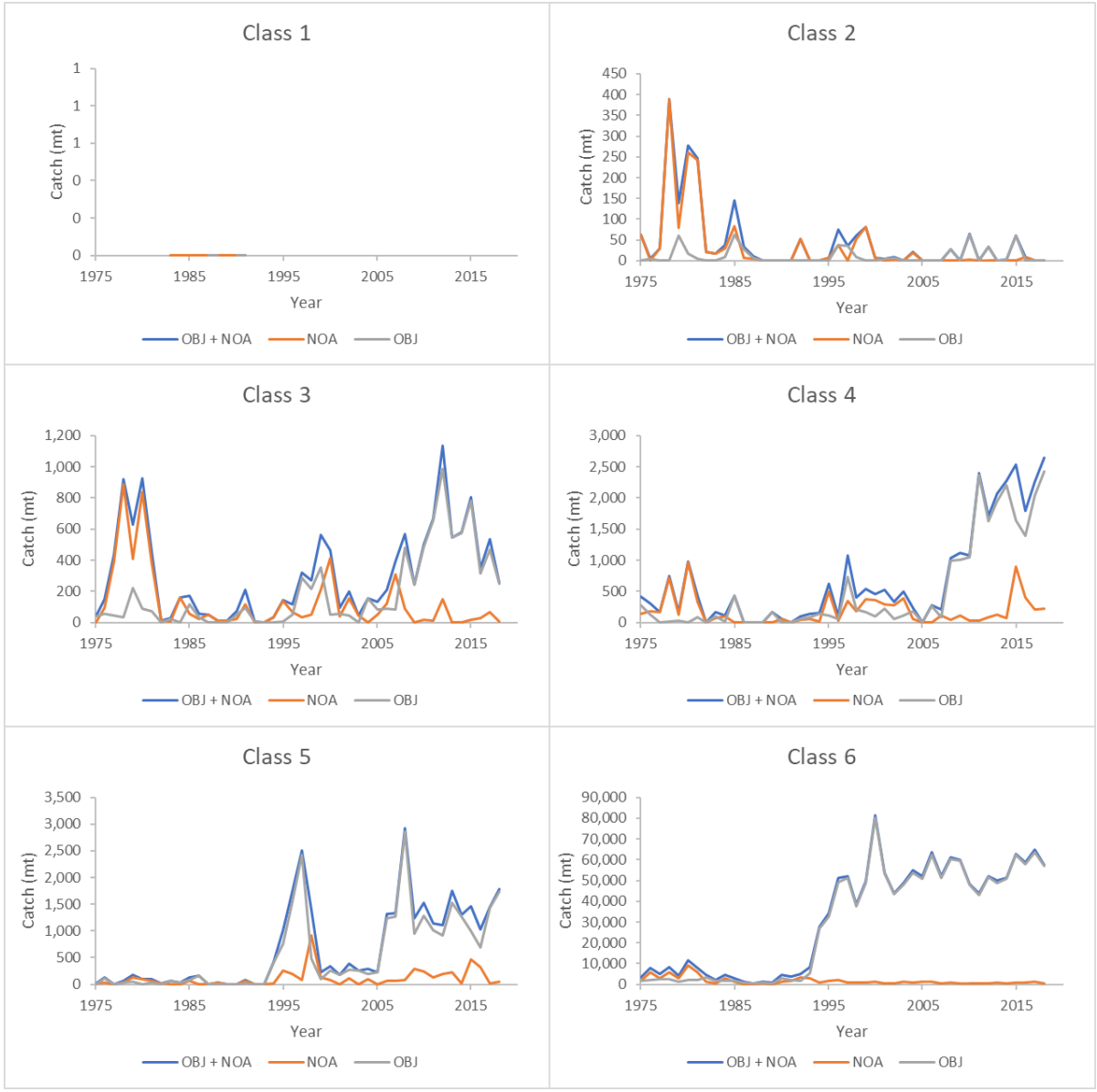
Request

CHI: catches-effort for the class 1-5 vessels on BET/YFT.

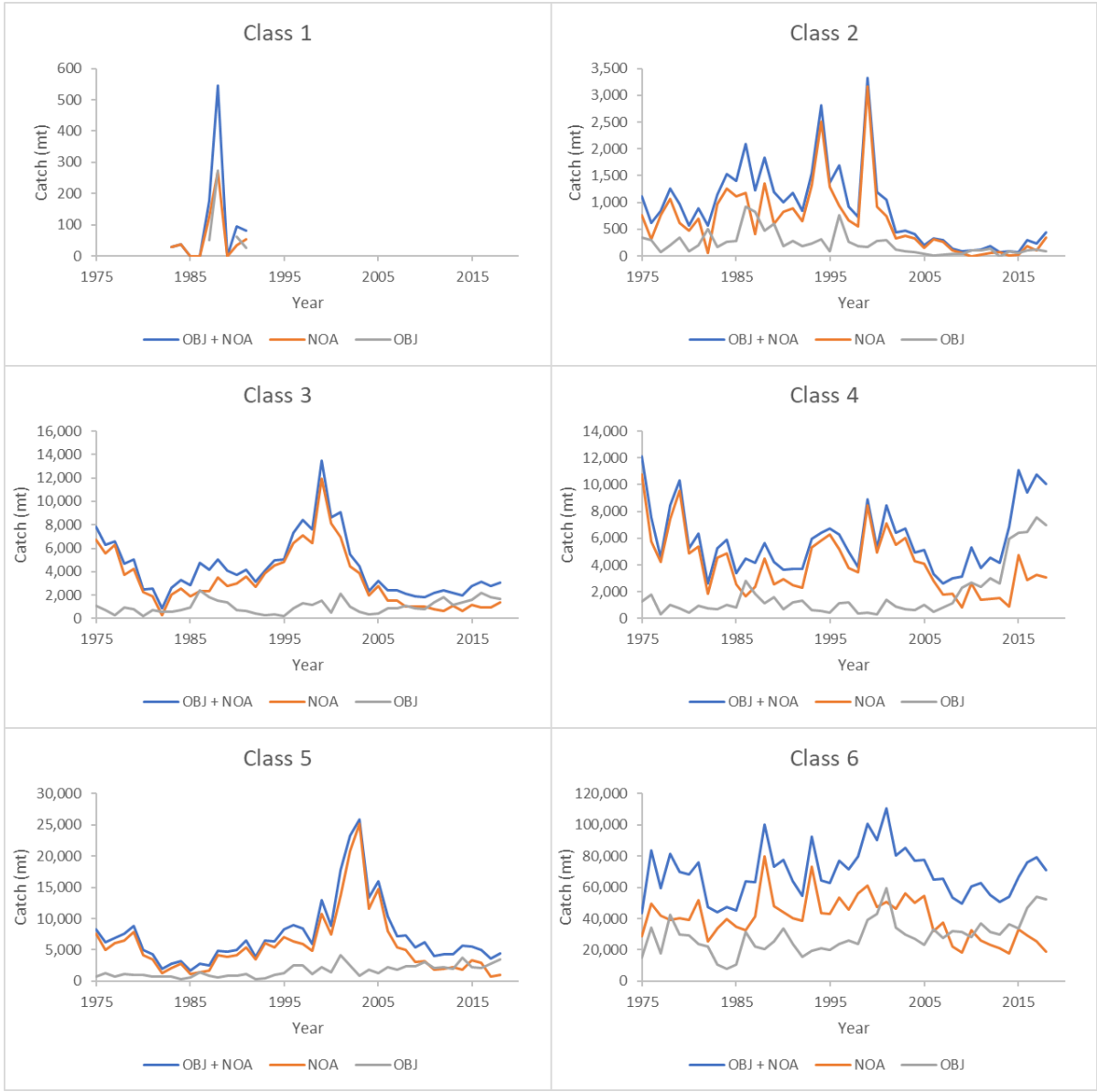
Number of sets by class



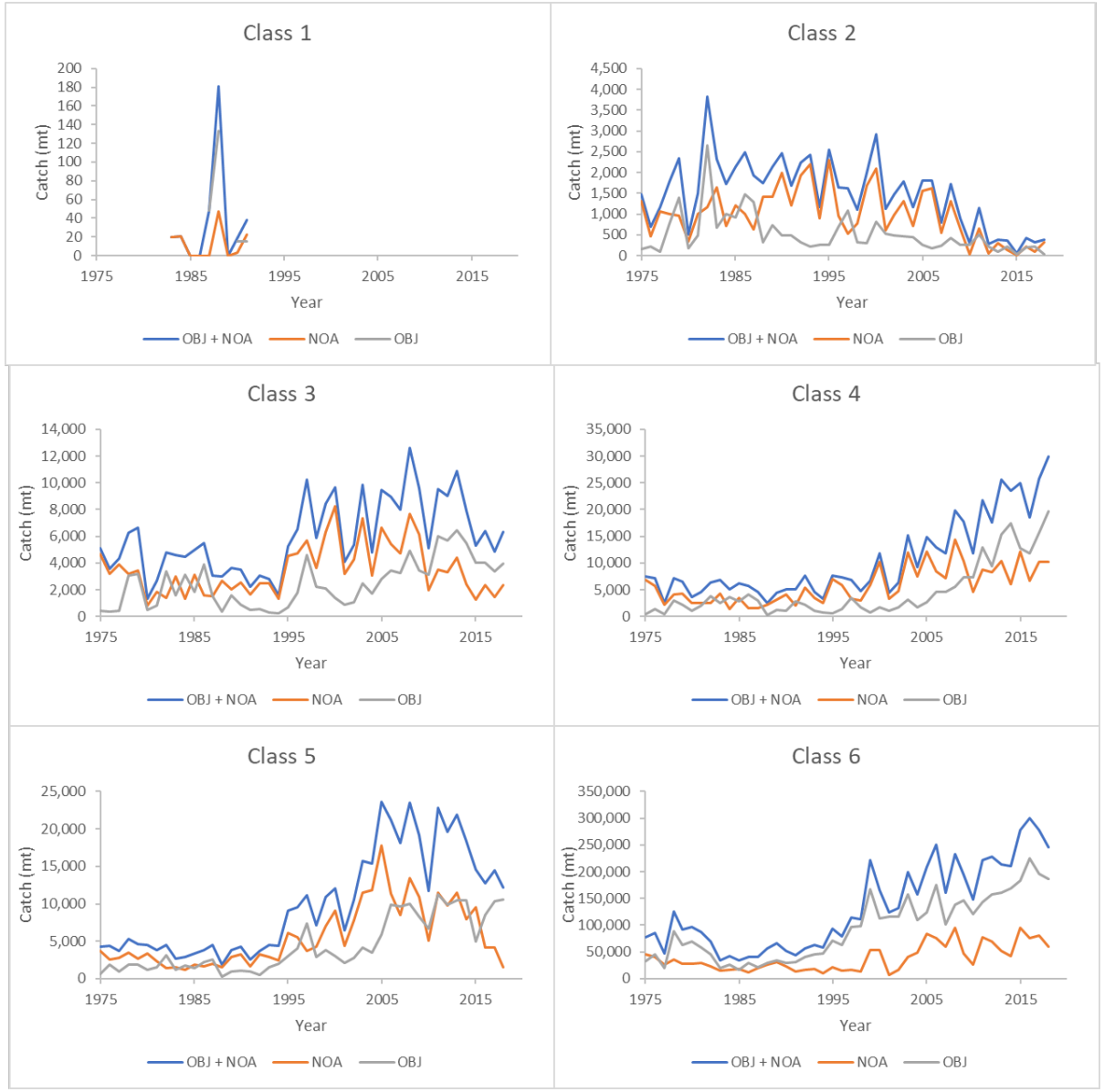
catches-effort for the class 1-5 vessels on BET



catches-effort for the class 1-5 vessels on YFT



catches-effort for the class 1-5 vessels on SKJ



Request

Request for IATTC staff to review and comment on IATTC-94 K-1: US Proposed Resolution to Mitigate the Impacts on Sea Turtles

Staff analysis of Proposal IATTC-94 K-1 (Sea Turtles)

- This proposed resolution is supported by IATTC scientific staff, and if adopted would represent a significant step forward in mitigating impacts to sea turtles.

- IATTC staff agree that most data suggests that hooking rates for sea turtles are decreased by use of some combination of either circle hooks or finfish bait, but also notes that the benefits for hard shell turtles are clearer than for leatherbacks, which are of a critical concern. That said, several species of hard shell sea turtles are also considered threatened or endangered, so staff consider the circle hook or fin fish bait requirements warranted.

- Entanglement in the gear rather than hooking is significant source of death and injury of leatherbacks in longline fisheries- specifically entanglement in the float lines running from floats to mainlines, which may be due to leatherback attraction to the floats.

Staff analysis of Proposal IATTC-94 K-1 (Sea Turtles)

- The IATTC staff agrees that additional measures that should be considered for critically endangered leatherbacks are those mentioned in paragraph 1(e) of the proposal- the seasonal closures of areas adjacent to nesting beaches or hot spots for foraging (e.g. inter-nesting areas).

- Some have suggested that a circle hook mandate could also be applied to deep set longlines as well, and it is likely the case that use of circle hooks would further reduce hooking rates in deep sets. However, because the hooking rates for deep sets is estimated to be very low (by some measures approximately 0.0004 per 1000 hooks), IATTC staff would not expect the exclusion of deep sets from the circle hook requirement to significantly diminish the effectiveness of what is proposed.

FAD requests

COL-2.1: Present the evolution of the total number of deployments and retrievals of FADs in the EPO.

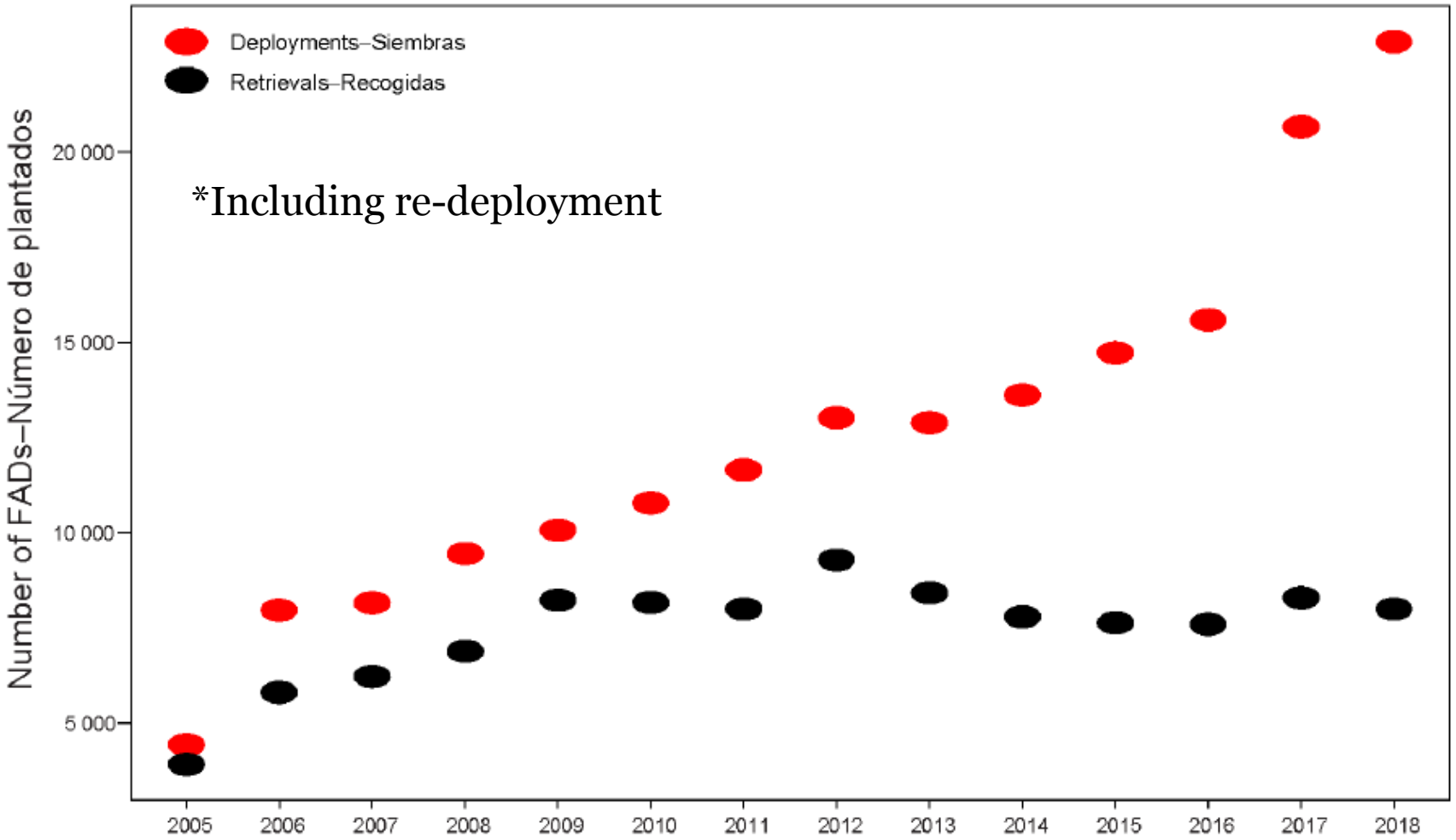
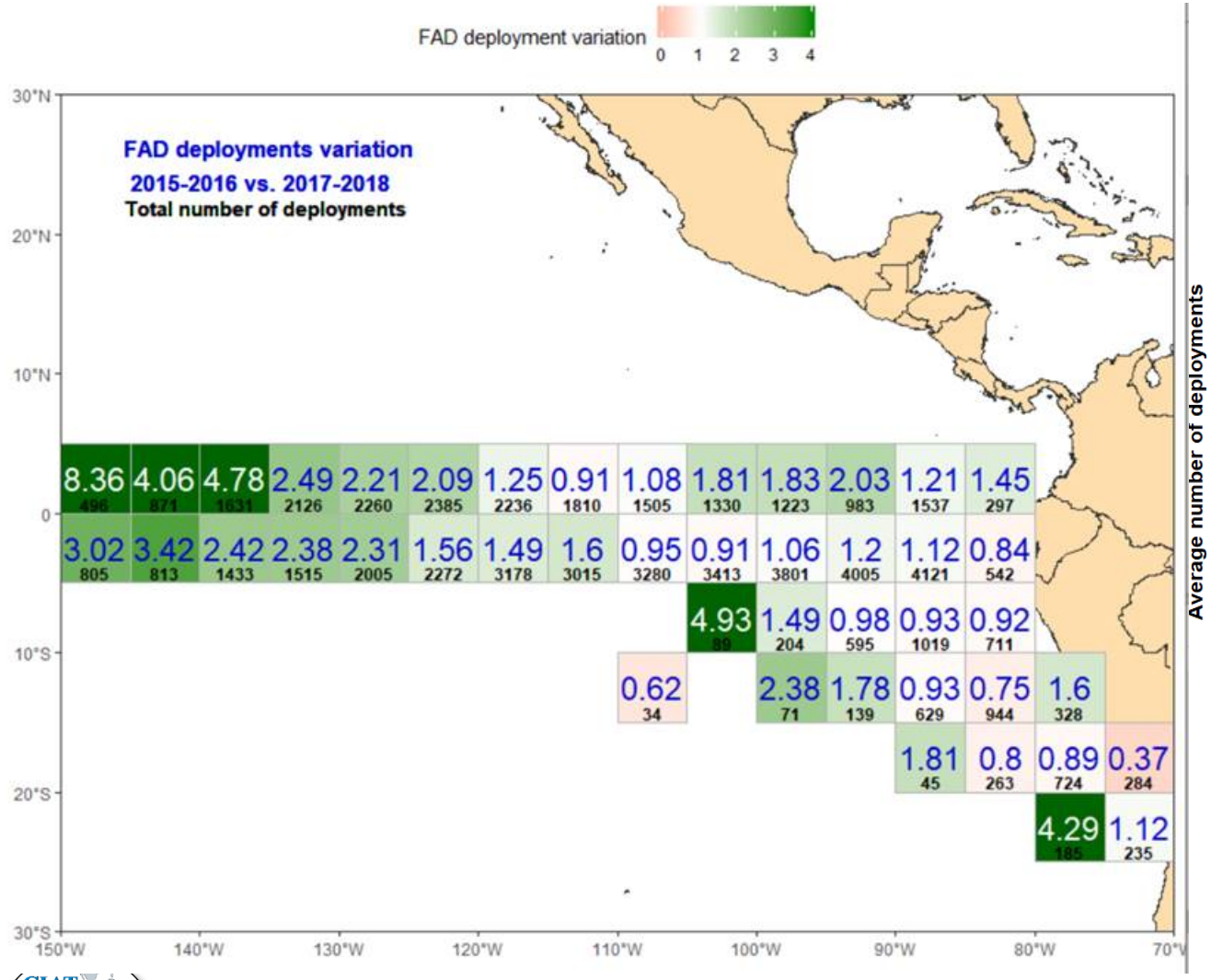
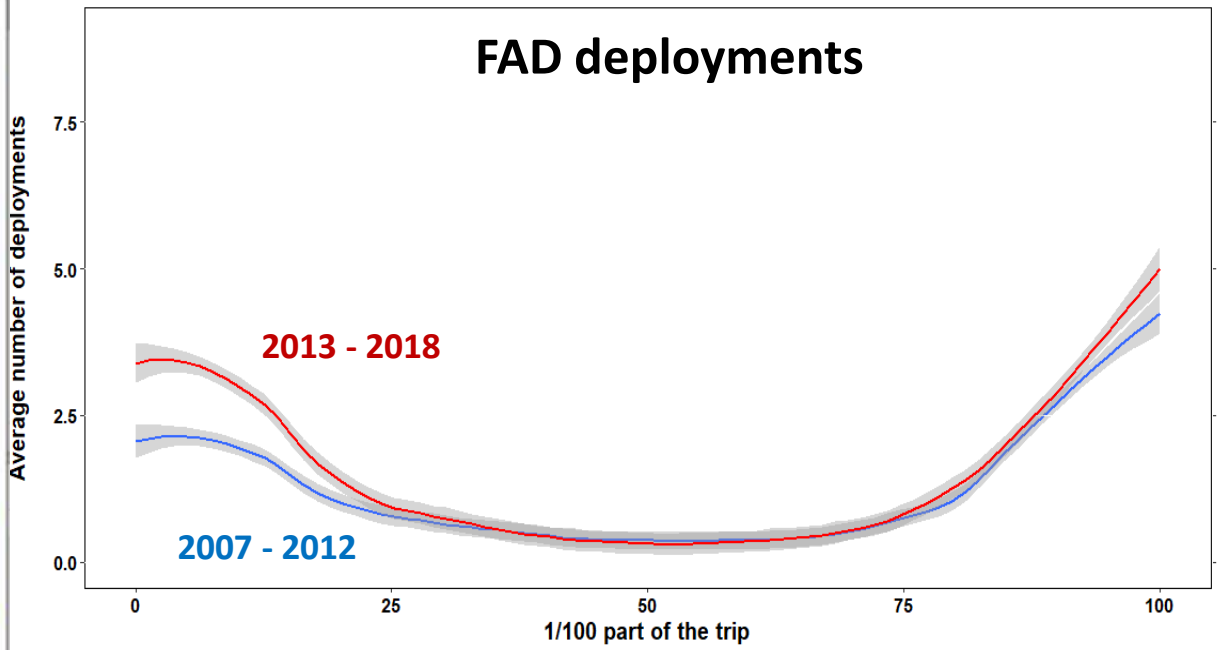


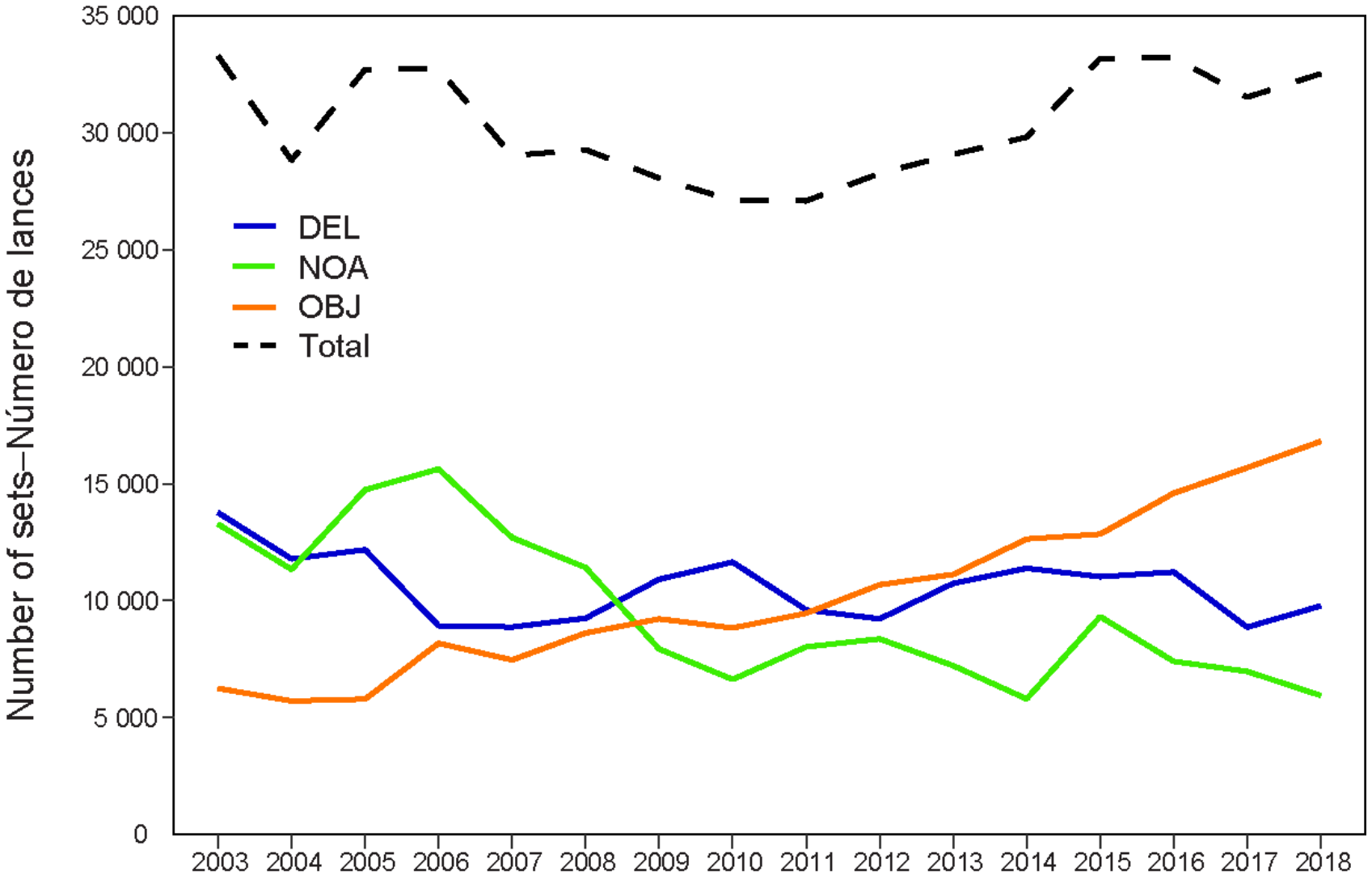
FIGURE COL-01. FAD deployments and retrievals by Class-6 vessels, 2005-2018.

Deployment strategies – Estrategias de plantado





COL-2.2: Present the evolution of the total number of sets on FADs in the EPO



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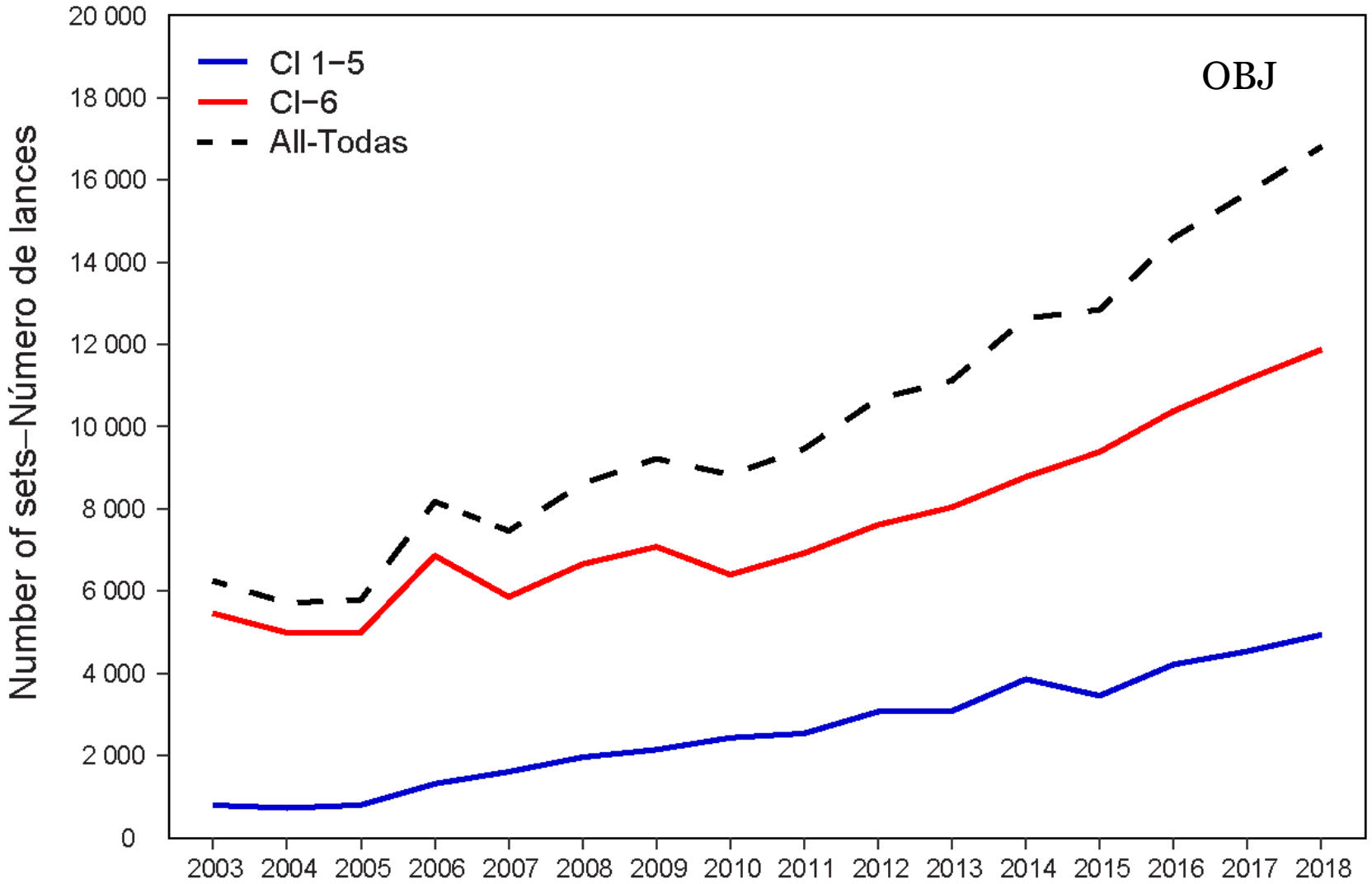
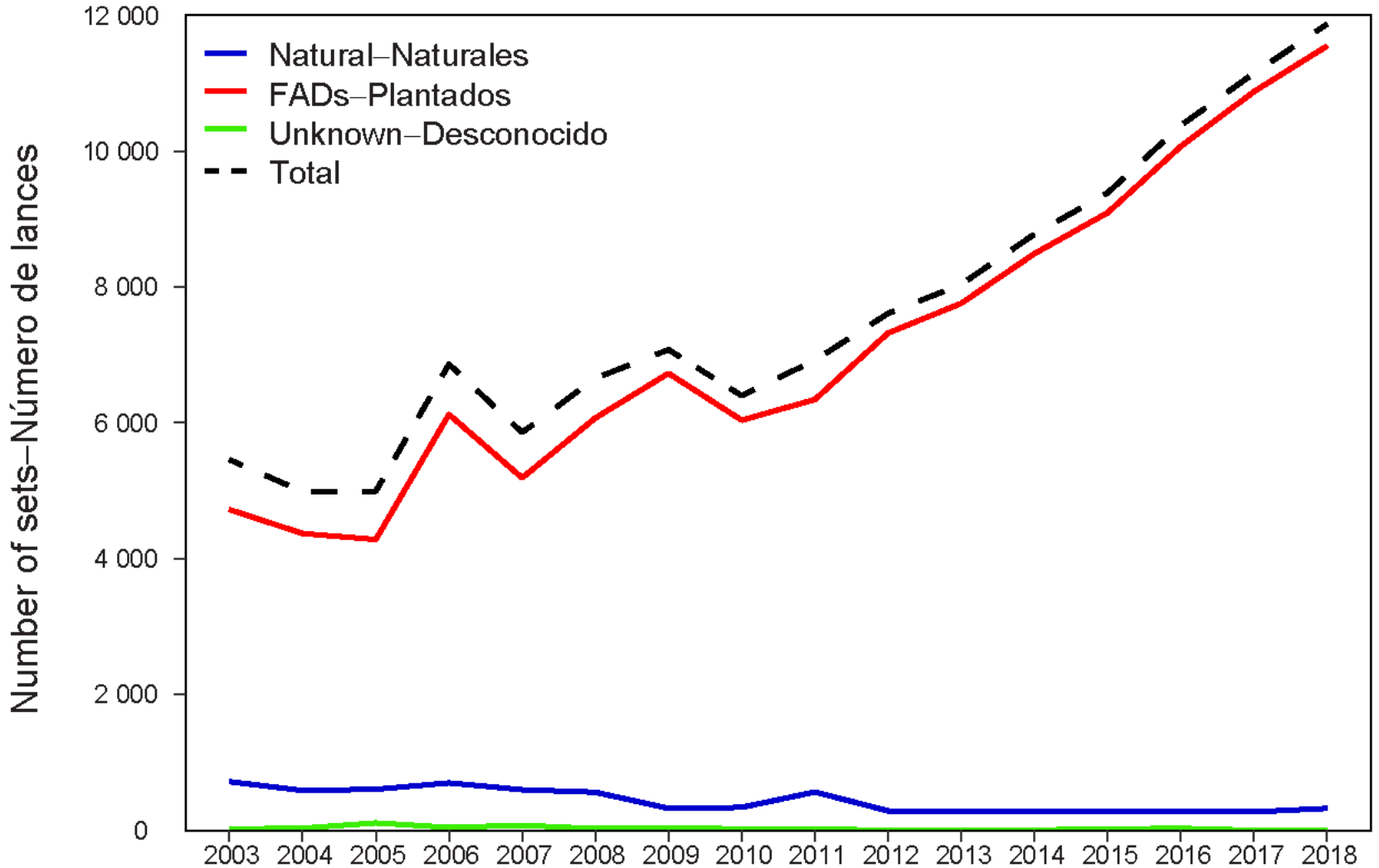
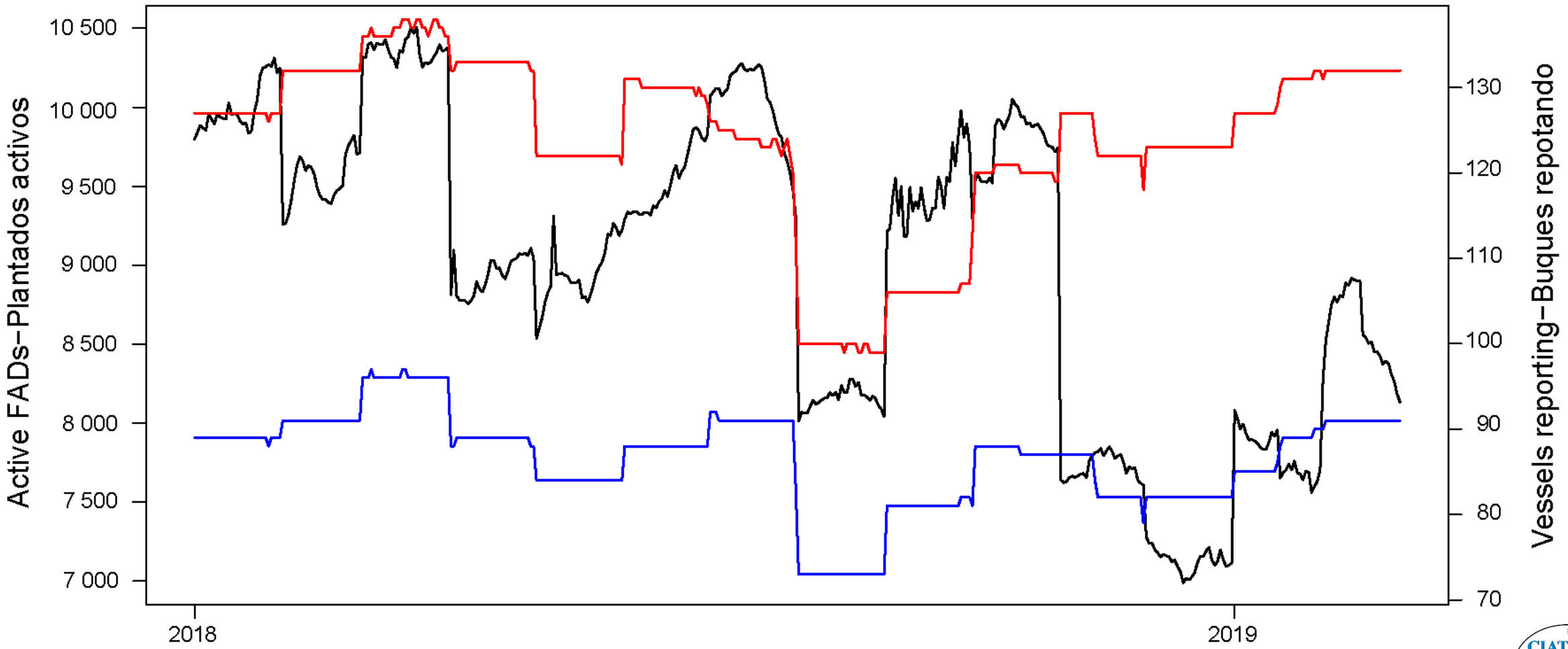


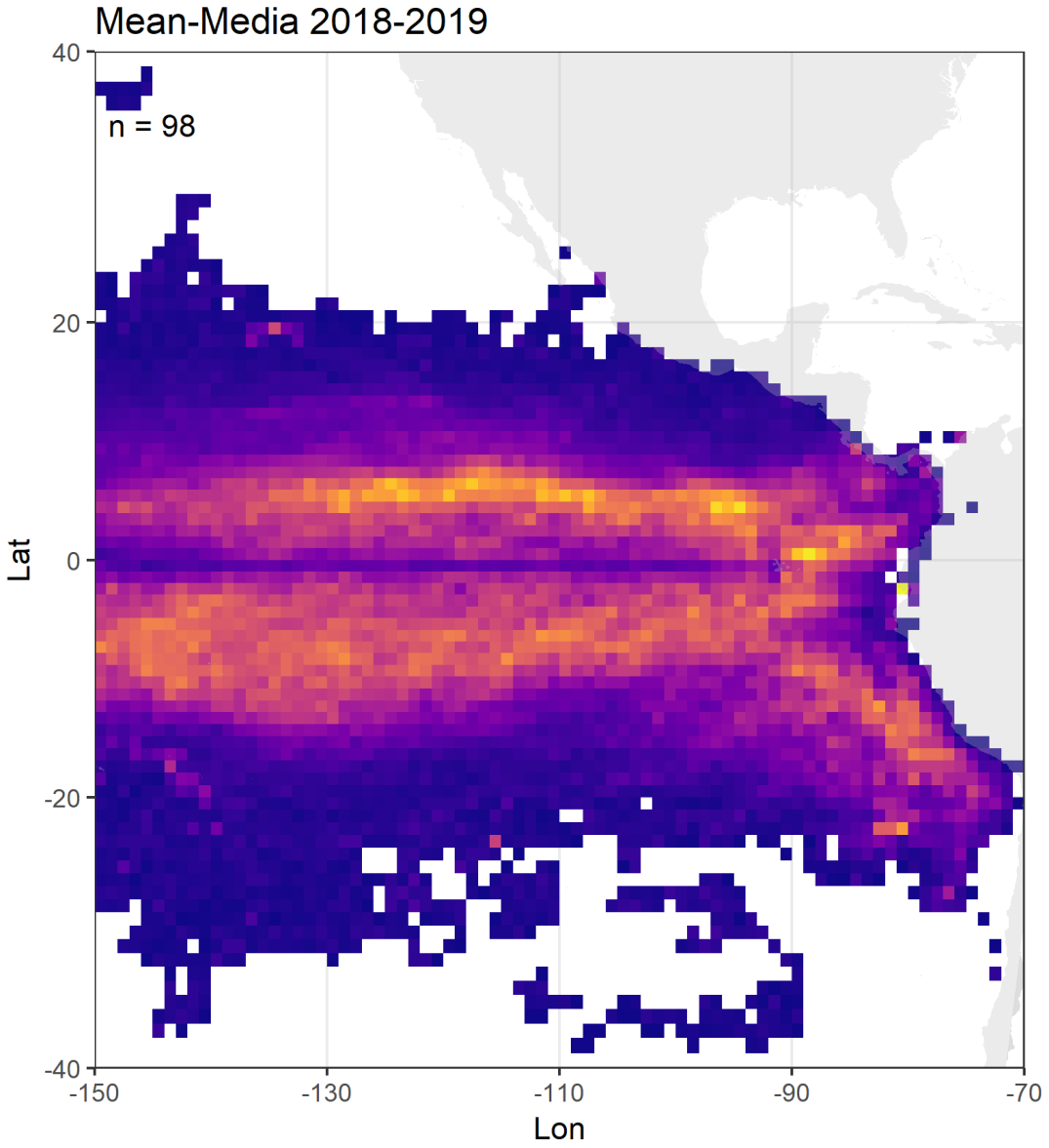
COL-2.2: Present the evolution of the total number of sets on FADs in the EPO

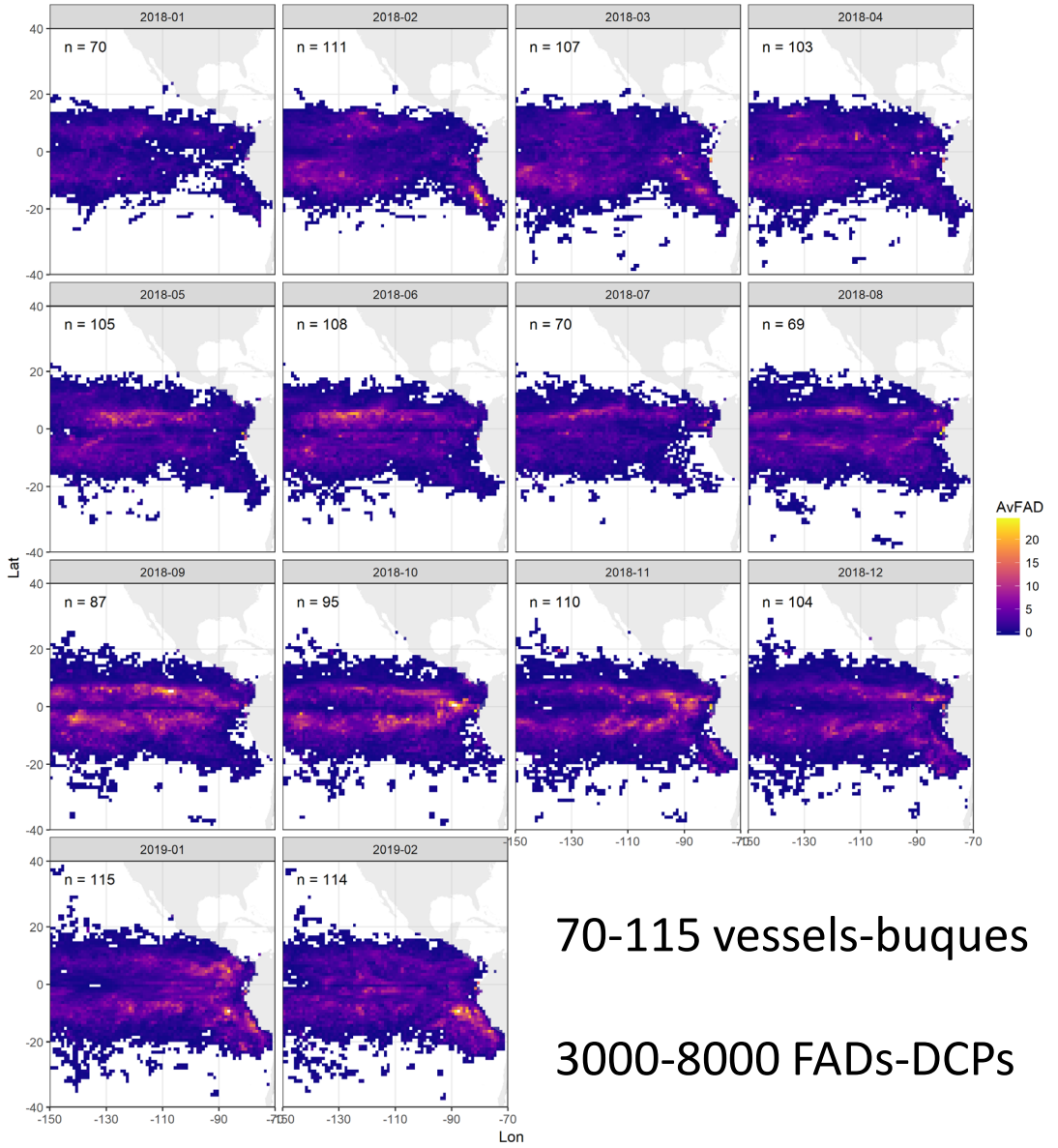


COL-2.3: Present monthly information on the total number of active FADs in the EPO, explaining the percentage of vessels that have submitted information and a possible extrapolation for estimating the total of active FADs in the EPO during 2018 and the first two months of 2019.



COL-2.4: Presentation of FADs (active buoys) by quadrant, month-to-month, in the EPO.

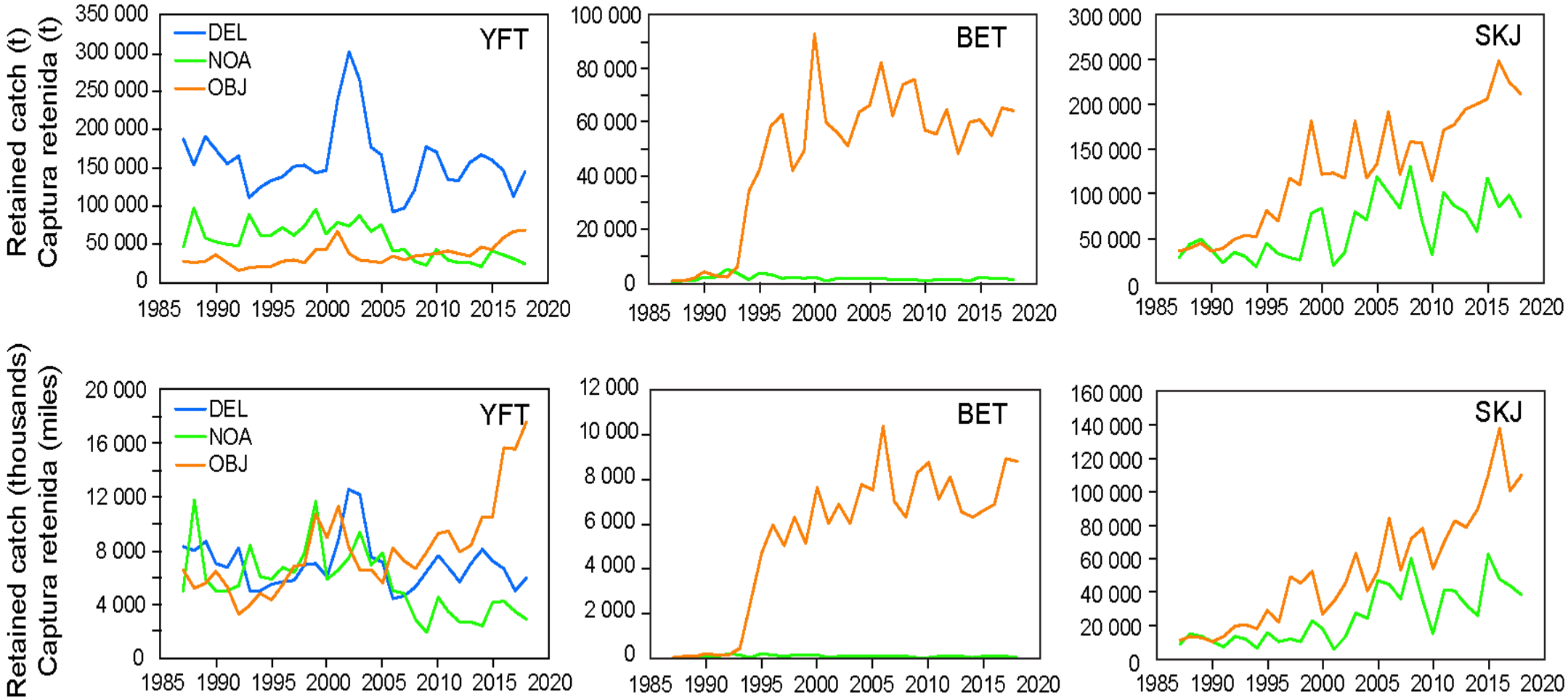




70-115 vessels-buques

3000-8000 FADs-DCPs

COL-2.5: Present the evolution of catches of tropical tunas by set type (quantities by species in tons and number of individuals).



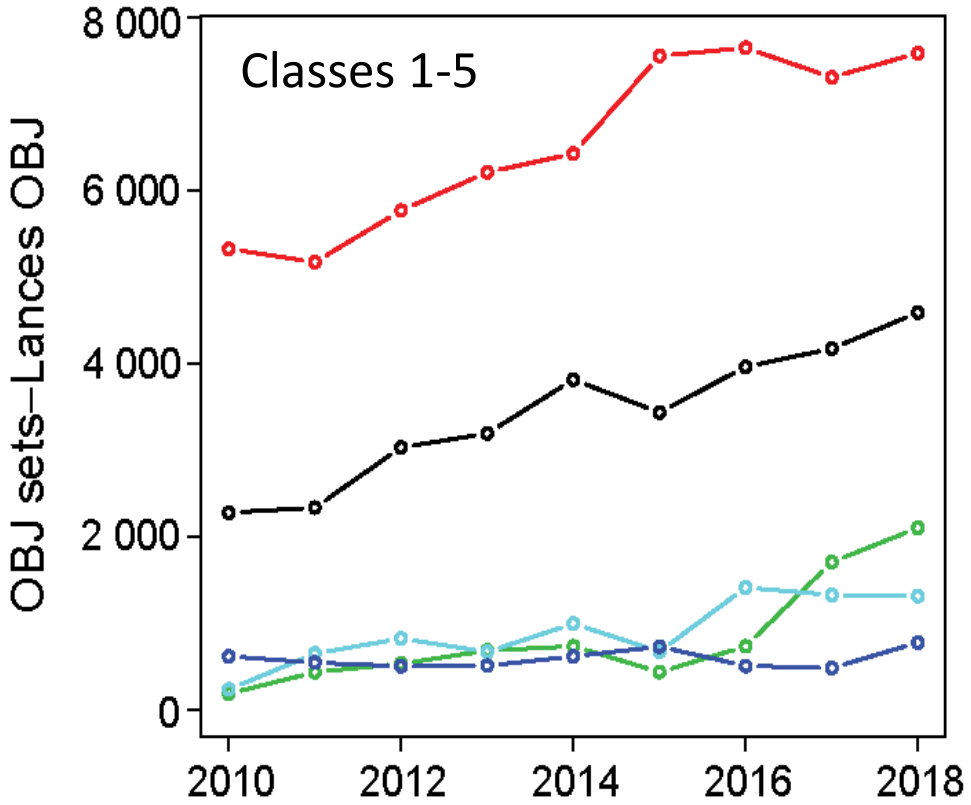
Request

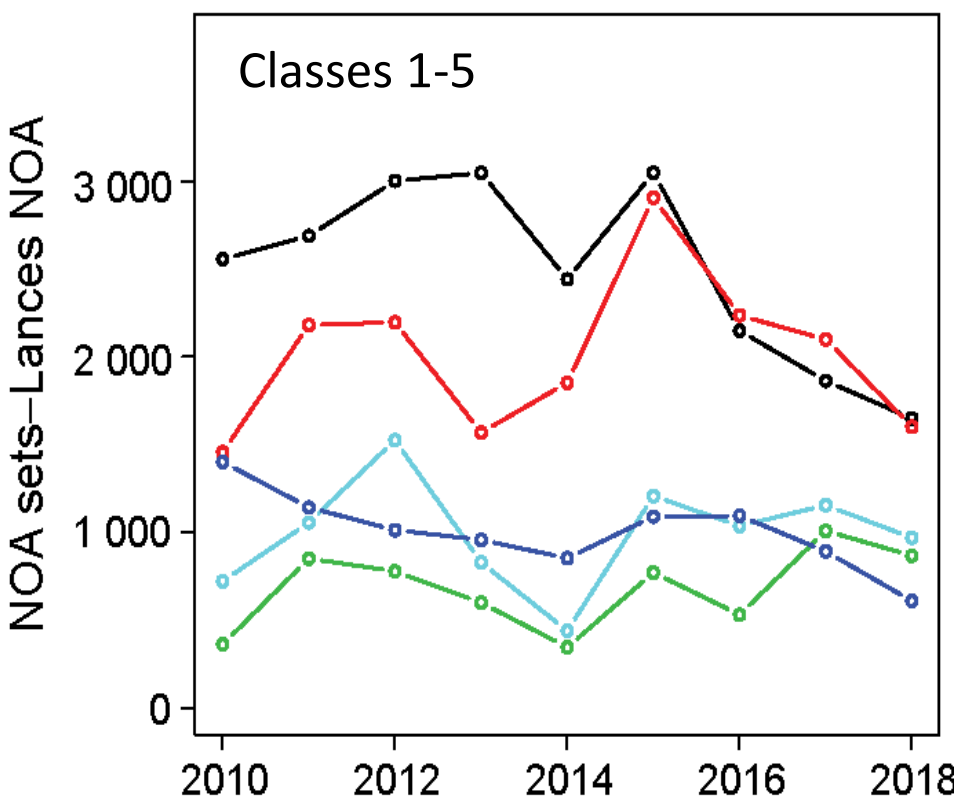
EU: why OBJ sets are increasing?

from Lopez et al. SAC-10-INK-K

Class 1-5 vessels

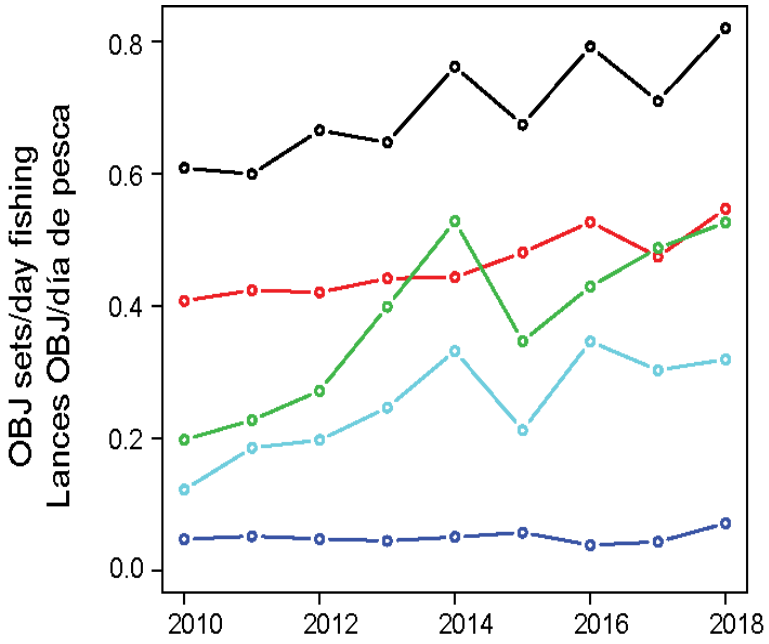
- the increase appears to be due to a **switch from NOA sets to OBJ sets**, not to an increase in number of trips or vessels making OBJ sets.

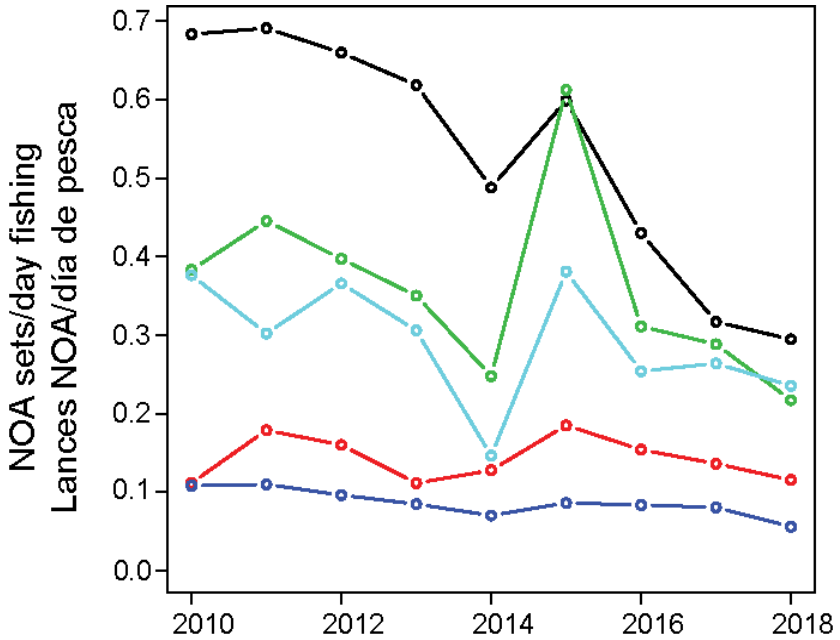


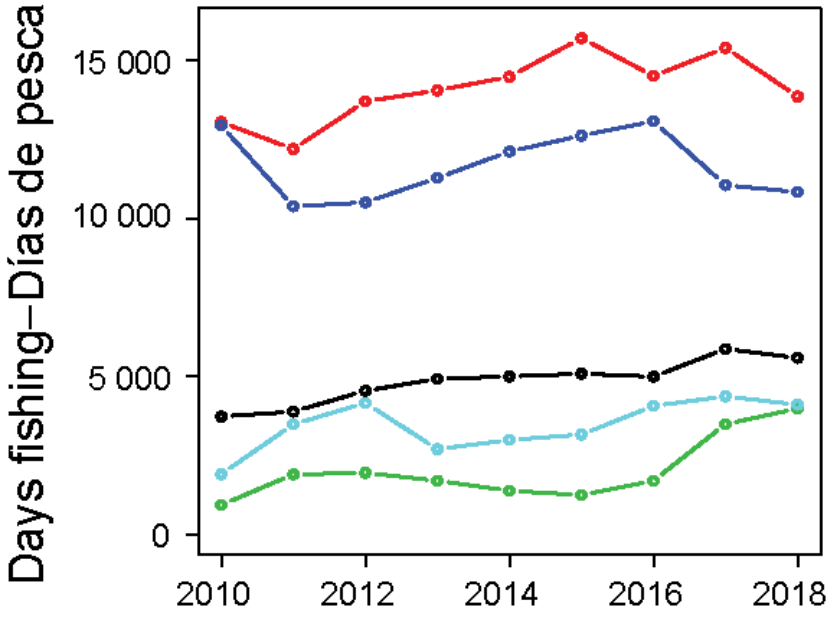


Class 1-6 vessels

- For trips by Class-6 vessels with a DML that were not focused on DEL fishing
  - the increase is partially due to **increased effort**, in terms of number of trips, vessels, days fishing, or number of sets per day fishing or per vessel.
  - Also, partially **switching from NOA sets to OBJ sets**.







Request

COL: active FAD limits
from Lopez et al FAD-04-01

ECU: relationship between F and operational characteristics
from Lopez et al FAD-04-01, SAC-10-10 (Project J2a), FAD-03-INF-A

Background

- The staff's **stock assessments** were found to be **extremely sensitive** to new data and to previously-identified issues in the assessment.

- Because of this, the results of the assessments, particularly the ***F* multiplier, could not be used** as a basis for management advice.

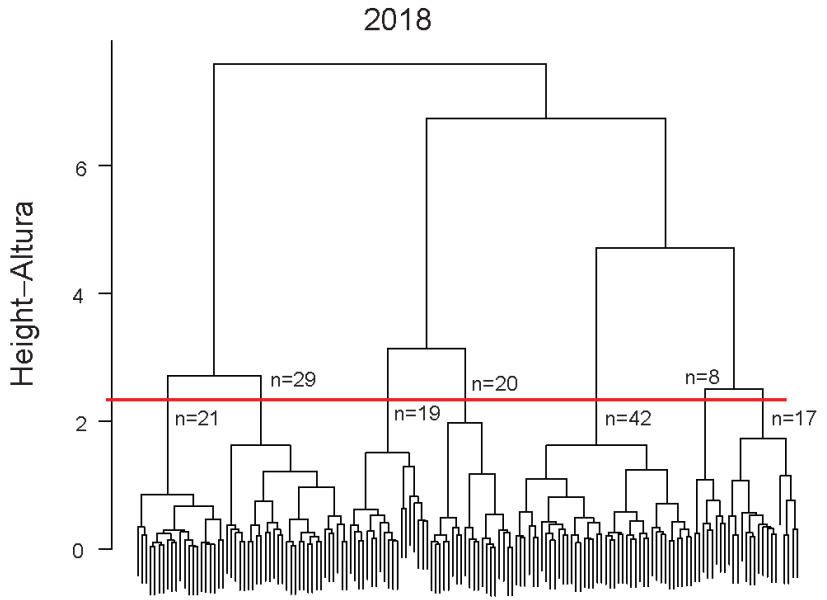
- However, the stock status indicators suggested that **fishing mortality is continuing to increase**, especially due to increases in the number of **floating-object sets**.

- In 2018 and 2019, the **staff recommended limiting the number of floating-object and unassociated sets combined**. However, this recommendation was **not supported** by the Scientific Advisory Committee.

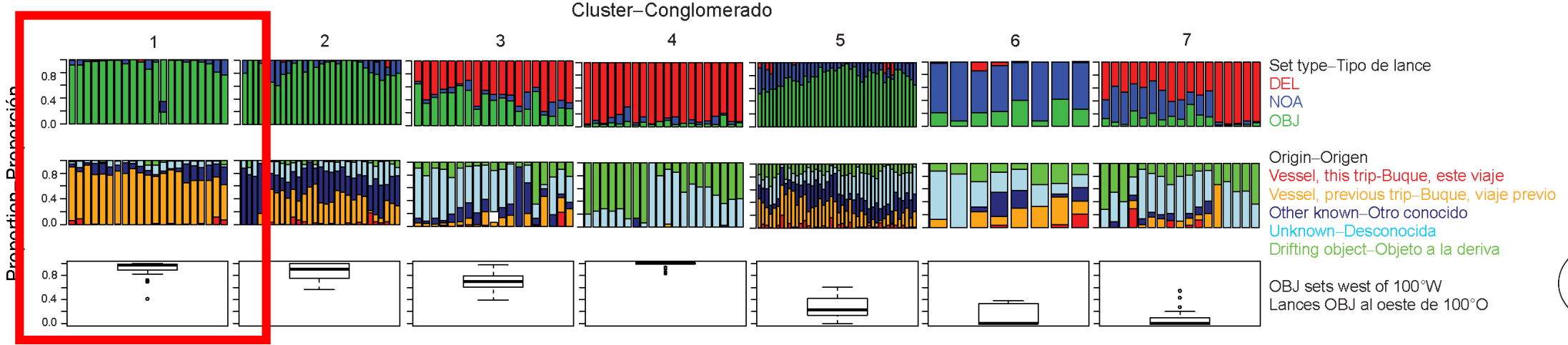
- In response to requests to investigate **alternative measures**, the staff has developed an approach that meets conservation and management needs by **adjusting the active fish-aggregating device (FAD) limits** currently in force under Resolution C-17-02.

Clustering

- Only vessels that conduct 5 OBJ sets considered (details on the methodology Lennert-Cody et al. 2018)



Fleet segment that fishes on its own FADs



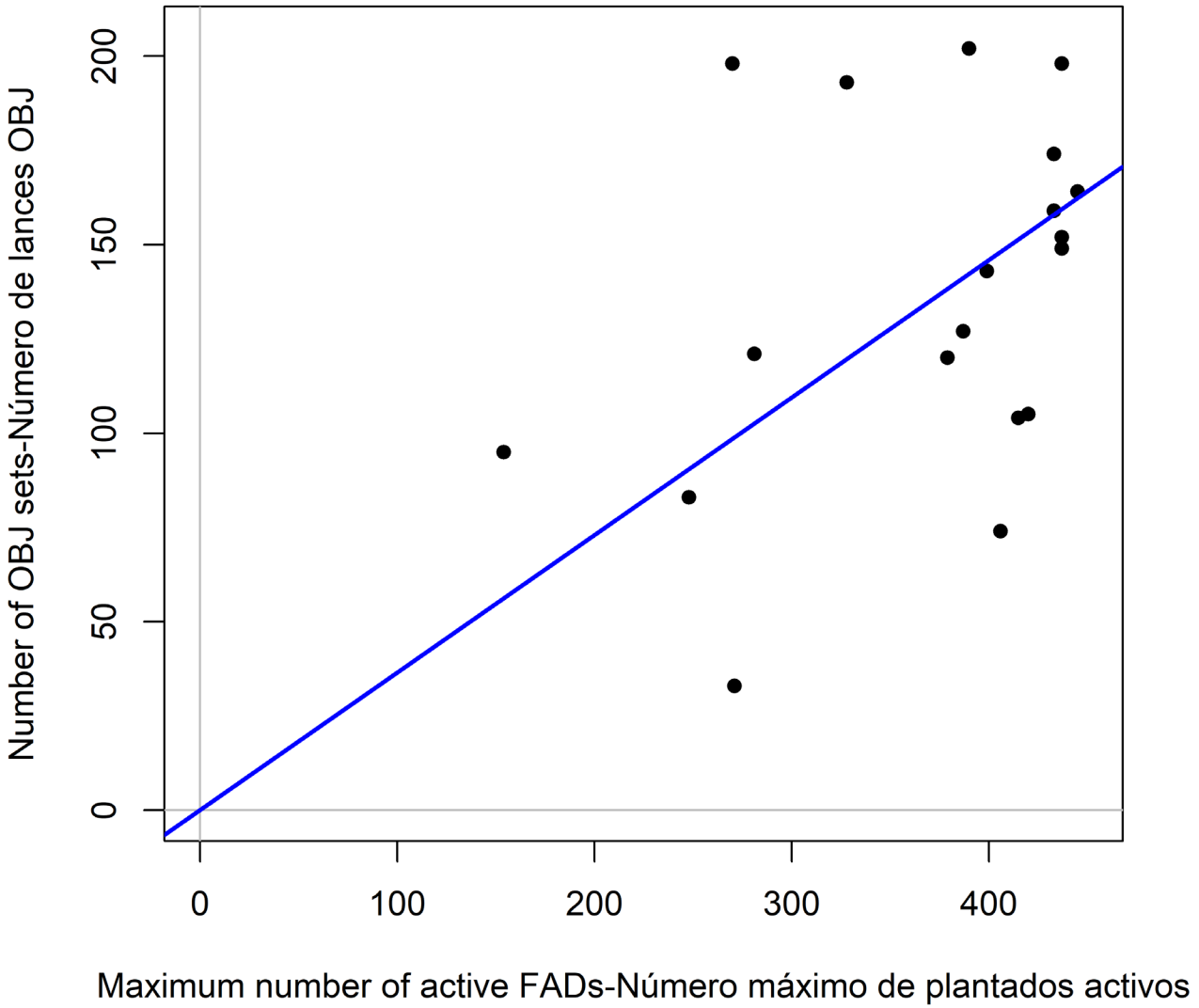
Relationship between active FADs and OBJ sets

(i) it is the metric **most directly related to F**;

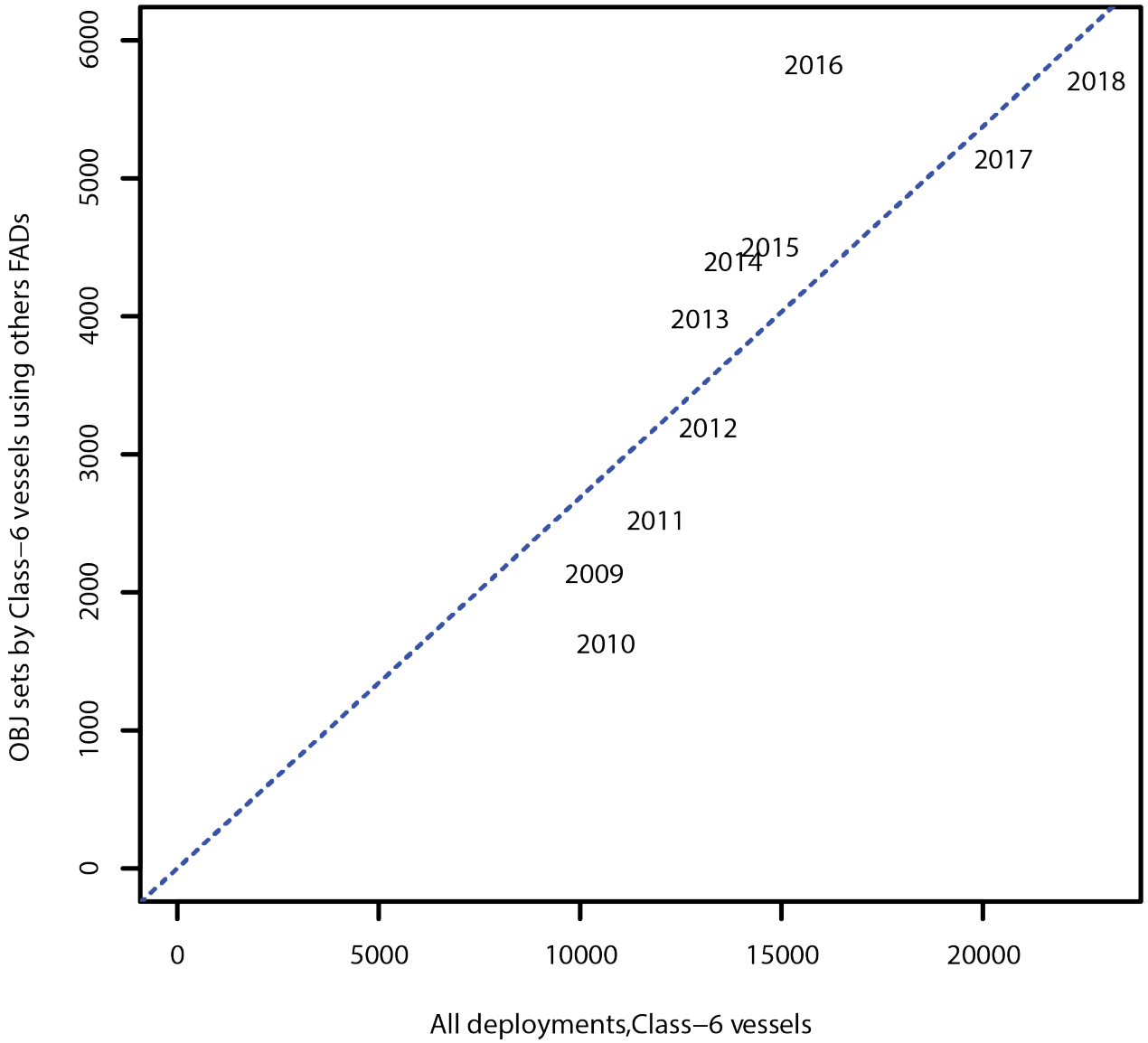
(ii) it is used by the staff to determine **target F levels under a precautionary approach**; and

(iii) there is **no clear evidence that links other metrics to F**, especially in an absence of appropriate measures of effort for the purse-seine fishery (Fonteneau et al. 2013) and data with which to estimate effort (Lopez et al. 2018), which can ultimately lead to **misleading results**.

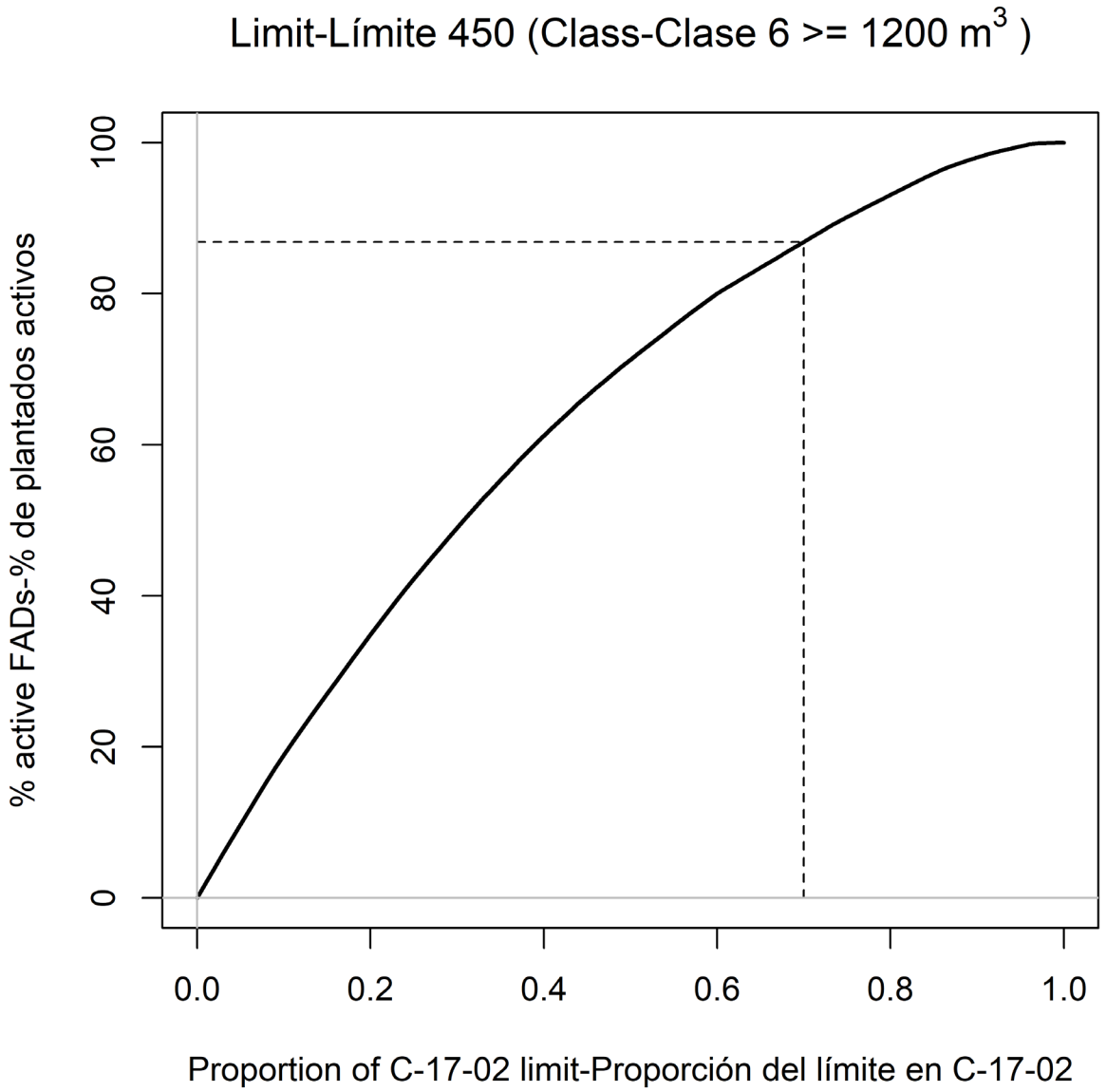
Relationship between active FADs and OBJ sets (2)



Relationship between active FADs and OBJ sets (3)

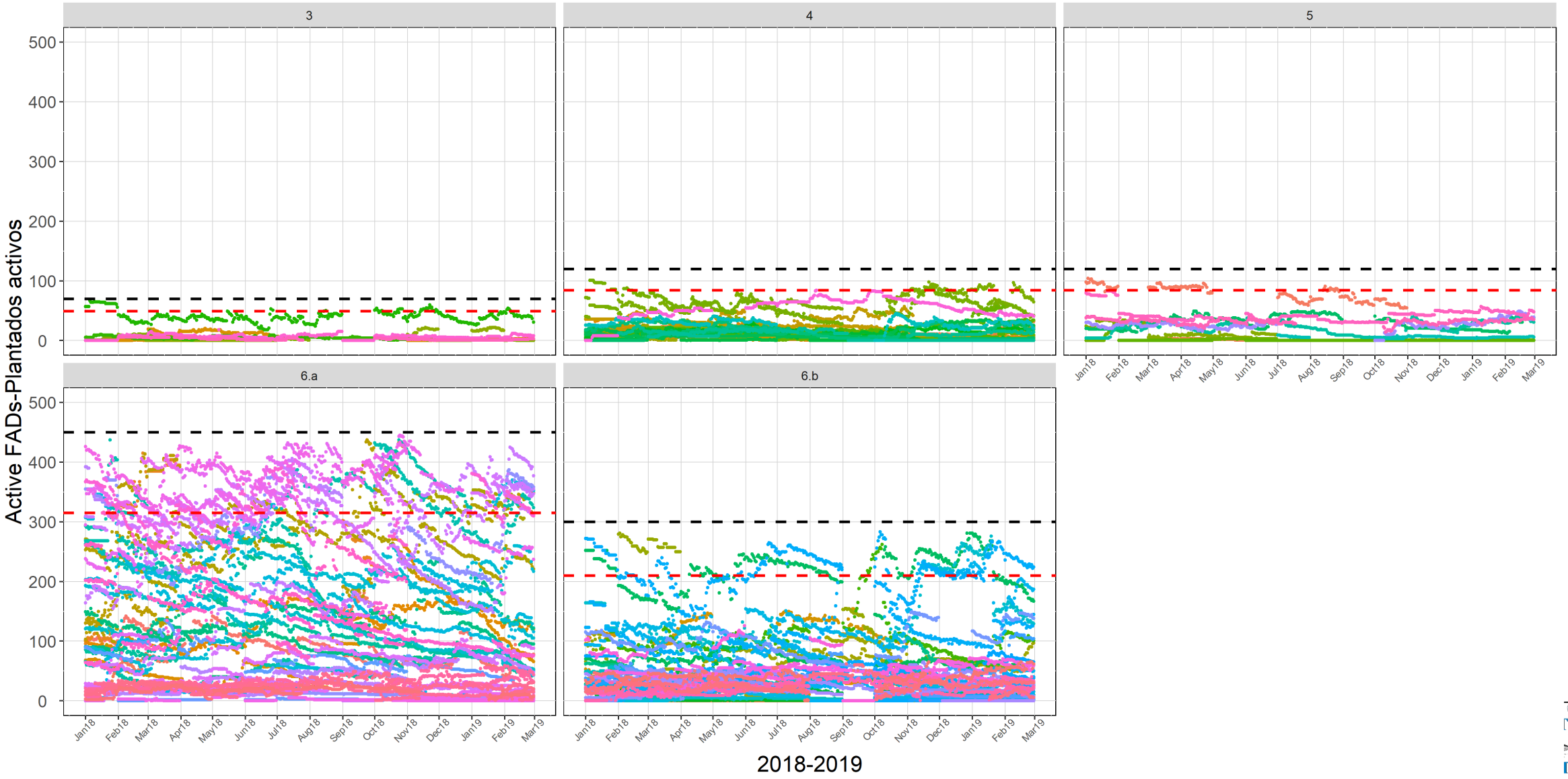


Estimating the new limits



	Current	New
Class 6 (≥ 1,200 m^3)	450	315
Class 6 (< 1,200 m^3)	300	210
Class 4-5	120	85
Class 1-3	70	50

Estimating the impact



Estimating the impact

Class	Number of vessels	Limit		Using maximum active FADs		Using average active FADs	
		C-17-02	New	Average FAD reduction (sd)	Affected vessels (%)	Average FAD reduction (sd)	Affected vessels (%)
3	7	70	50	17 (0)	1 (14.3)	0	0
4	28	120	85	14 (2.1)	2 (7.1)	0	0
5	11	120	85	19 (0)	1 (9.1)	0	0
6.a	50	300	210	58 (16.6)	7 (14)	0	0
6.b	56	450	315	91 (44.1)	19 (33.9)	23 (10.7)	4 (7.1)

Data needs

- Understanding the link between fishing mortality and alternative metrics for the purse-seine fishery is particularly difficult, since the data are not ideal.

- This approach provides a reasonable understanding of the **relationship between number of sets and monitored active FADs**, and can be used to improve scientific advice.

- Nonetheless, the relationship between **mortality and operational characteristics** needs to be better understood if **additional or improved conservation and management measures** are to be developed.

- Very few vessels are reporting daily positions for active FADs, and the **summarized data** reported by the vast majority of the fleet **are of limited use** for scientific studies.

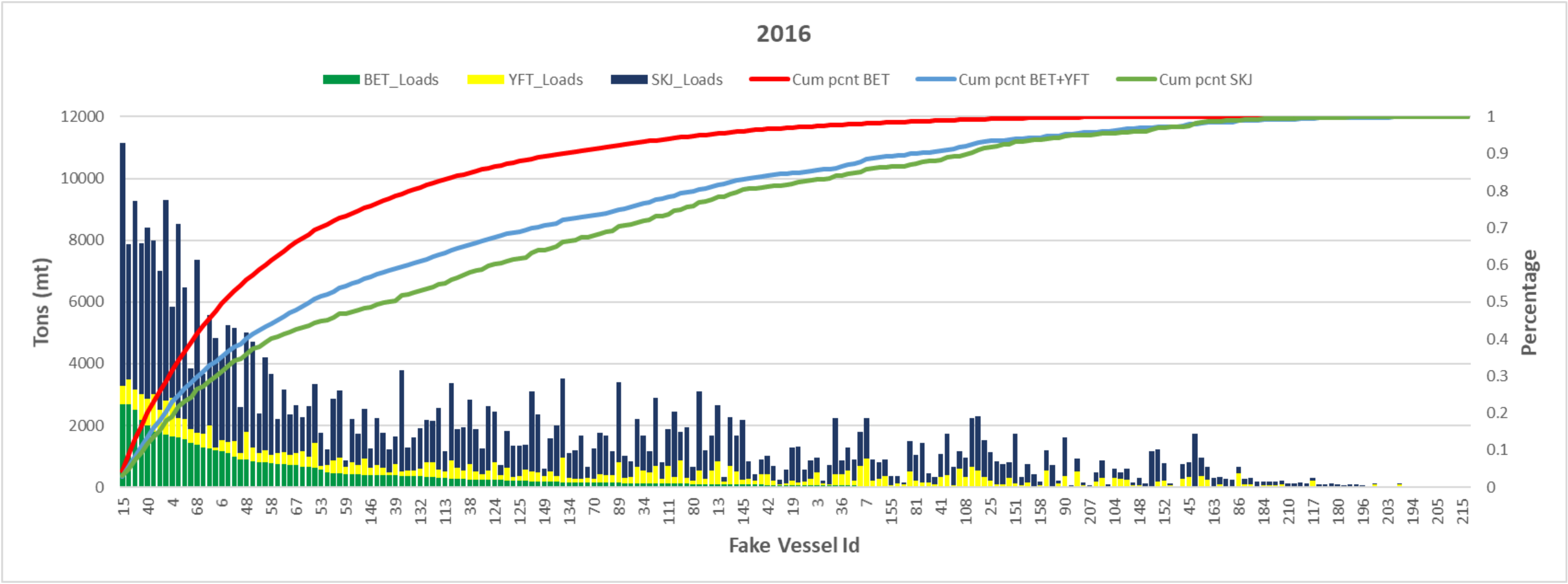
- Therefore, the staff reiterates the need for access to **high-resolution buoy data**.

Request

VEN/NIC: vessel contribution to BET/YFT mortality

from IATTC-94-01.

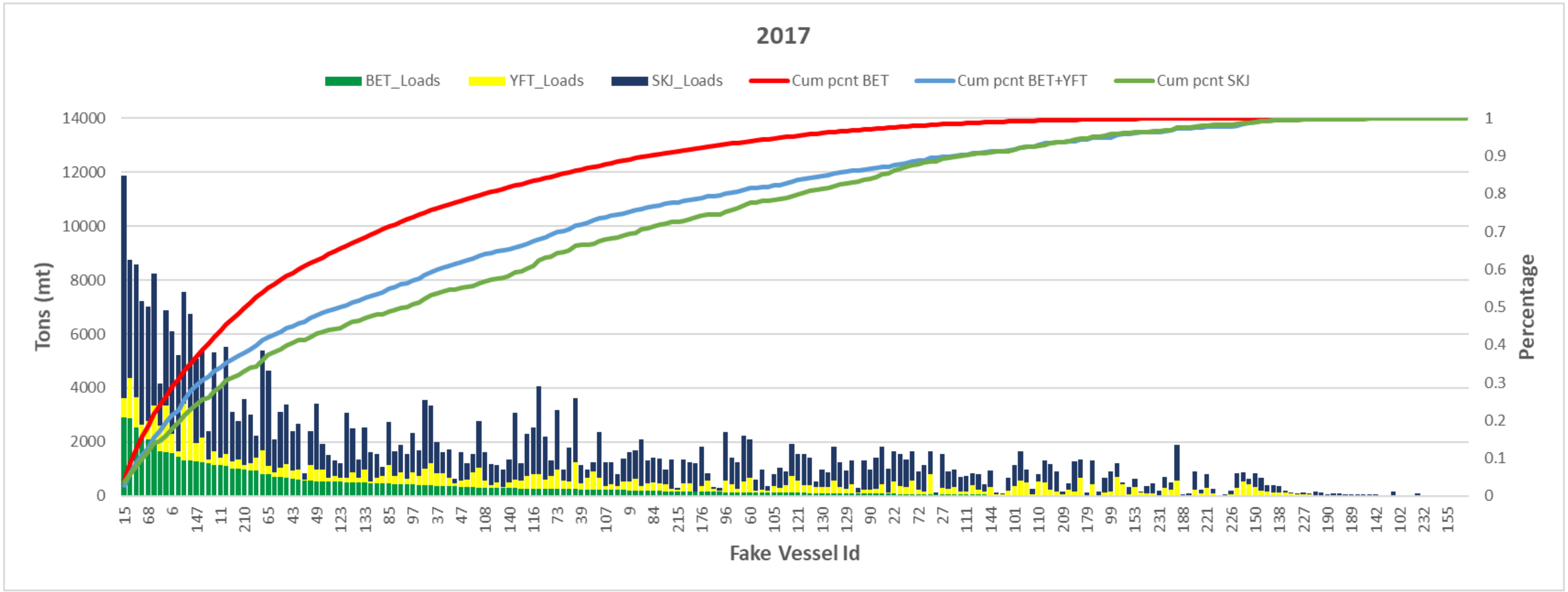
Individual vessel contribution to BET/YFT mortality



BET
25% → 7 vessels ; 50% → 17 vessels.

BET + YFT
25% → 10 vessels ; 50% → 31 vessels.

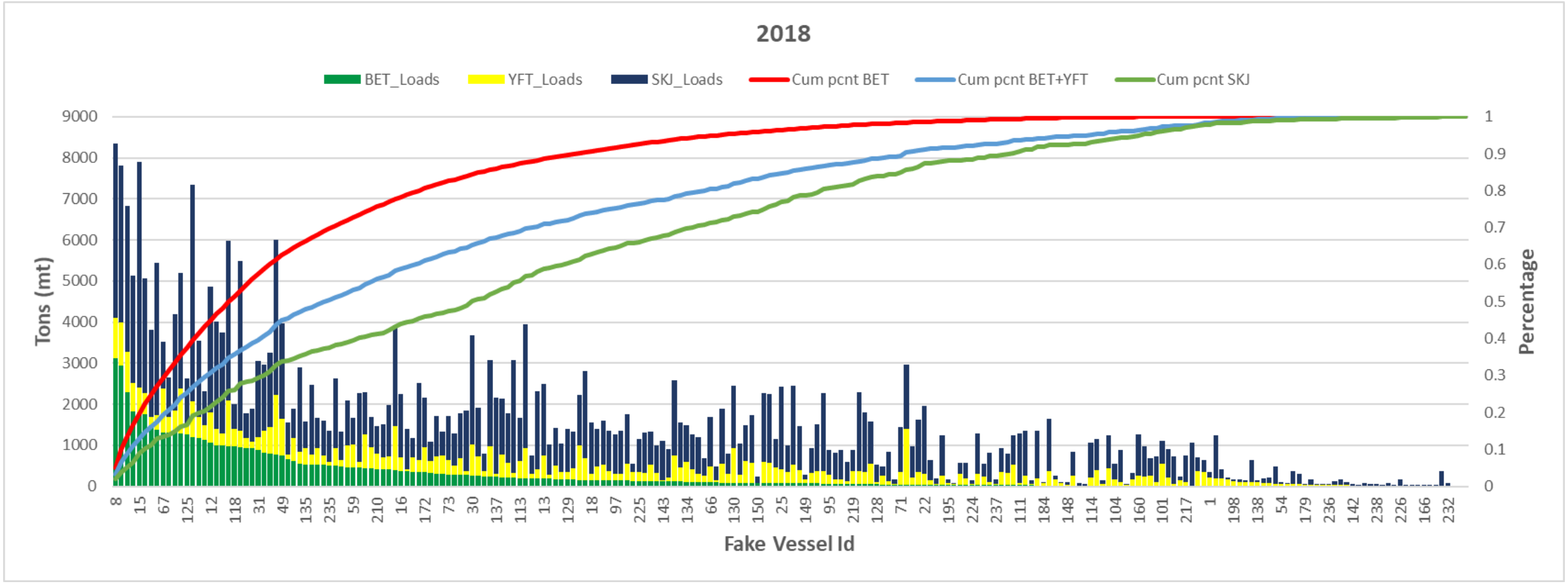
Individual vessel contribution to BET/YFT mortality



BET
25% → 7 vessels ; 50% → 21 vessels.

BET + YFT
25% → 11 vessels ; 50% → 36 vessels.

Individual vessel contribution to BET/YFT mortality



BET
25% → 7 vessels ; 50% → 20 vessels.

BET + YFT
25% → 12 vessels ; 50% → 36 vessels.

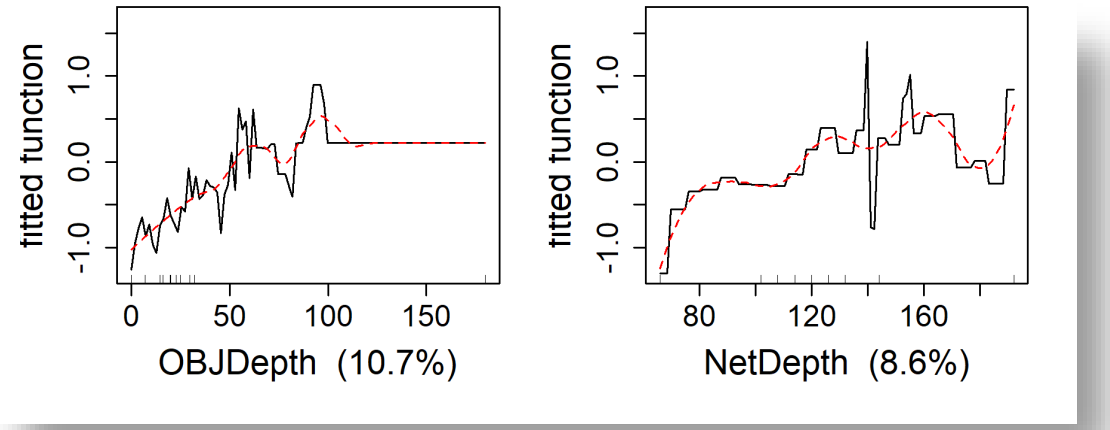
Request

VEN: How to reduce BET catches:

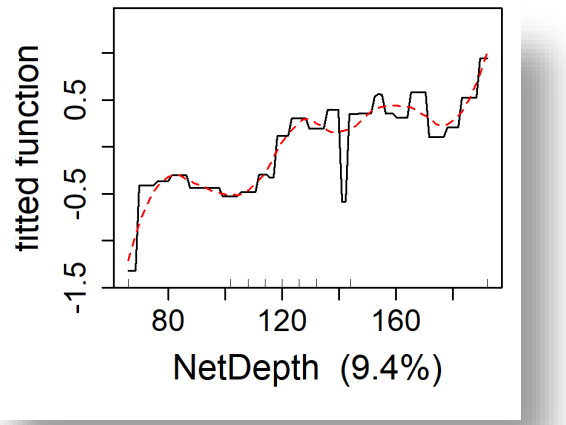
from Lopez et al. SAC-10-INF-D

Results – Partial dependence plots

1) BET Small

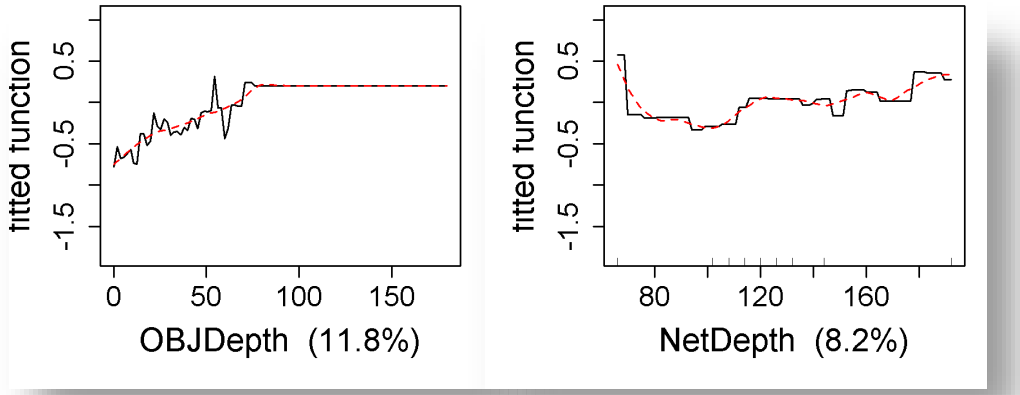


2) BET Small + Medium (Juveniles)

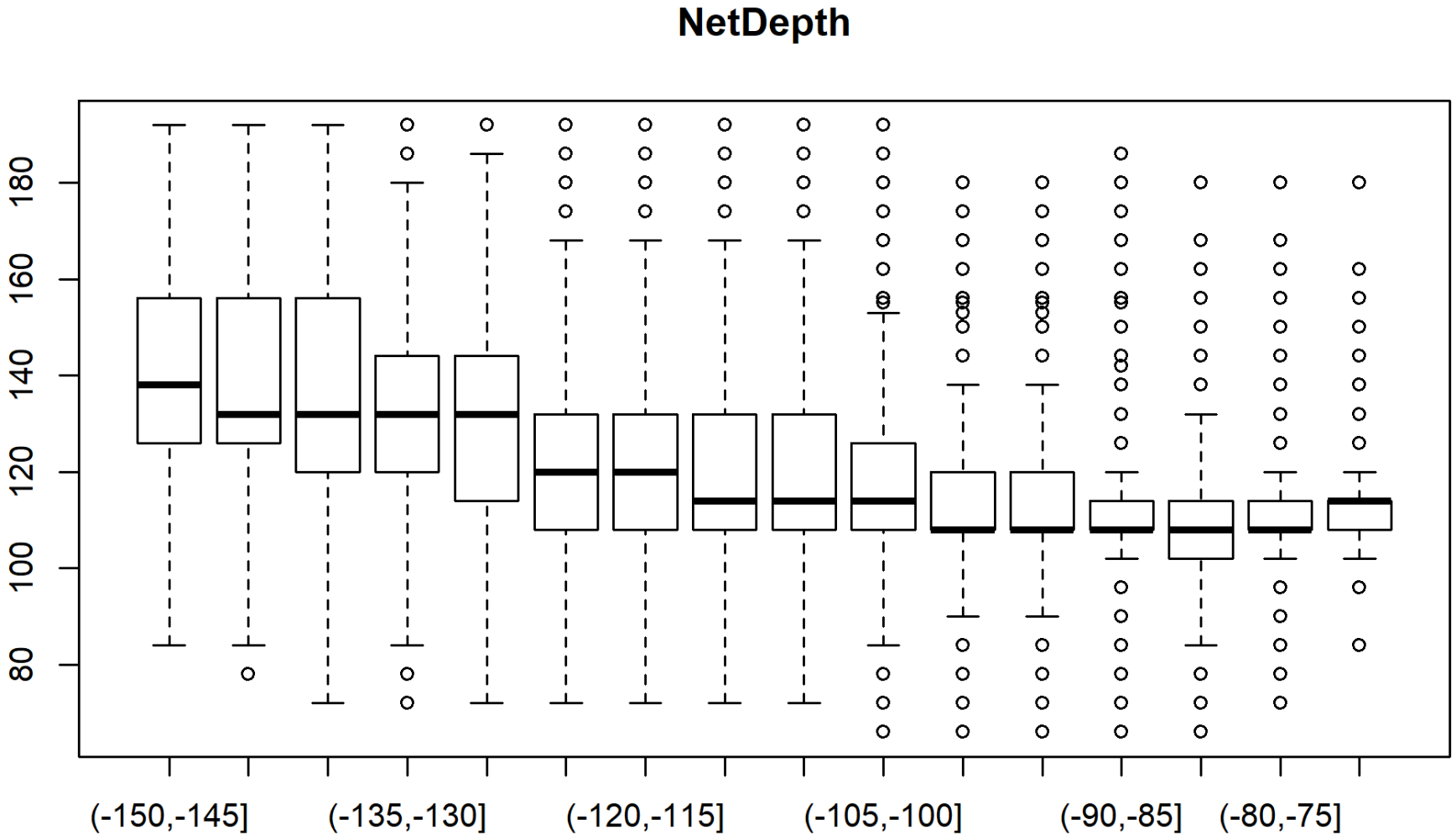


3) Large BET not significantly affected by operational characteristics

4) YFT Small + Medium (Juveniles)



Operational vs Longitude



Request

JPN: Determination of FAD sets.

Determination of FAD set

Observers make an initial identification of the type of sets divided in three categories:

- Marine mammal
- Non-associated
- Floating object

Observers also record all floating objects interactions during the trip, determining:

- Components
- Methods used to locate the object
- Information determining if the vessel placed the object in the water to attract fish

If a set is made, observers record identification of

- Catch by target species and estimated weigh by size
- Estimate weight and/or number of associated fauna.

Occasionally, the floating object may not be encircled by the vessel

Determination of FAD set

Whenever possible field office staff take samples for determination of catch by species and size

In recent years observers have reported that FADs were not always visible at the time of the set, and that operators may conduct activities with FADs prior to the set, either with a speed boat or a helicopter, that may prevent the observer from making an accurate determination of set type.

Using all data sources available to it (observer data, logbook data, port-sampling data), the IATTC staff have developed statistical methods to evaluate the set type.
These analyses cannot be conducted in real time, however, because they require multiple data sources that are only all available some weeks after a trip has been completed.

Request

Why the staff needs high-resolution buoy data?

Formato de datos

Res. C-17-02

RAW

Date	Hora	code	Latitud	Longitud	Velocidad
1/1/2018	0.32	T7+01016	4.109	-102.694	0
1/1/2018	9.22	Z0704512	4.585	-82.553	0
1/1/2018	10.5	T7+01417	6.759	-82.814	0
1/1/2018	11.29	T7+01016	4.1922	-102.618	0.62
1/1/2018	21.5	T7+01417	6.713	-82.764	0.37
1/1/2018	22.29	T7+01016	4.251	-102.497	0.73
1/2/2018	8.5	T7+01417	6.662	-82.731	0.33
1/2/2018	9.29	T7+01016	4.275	-102.356	0.78
1/2/2018	19.5	T7+01417	6.611	-82.645	0.54
1/2/2018	20.29	T7+01016	4.258	-102.192	0.9

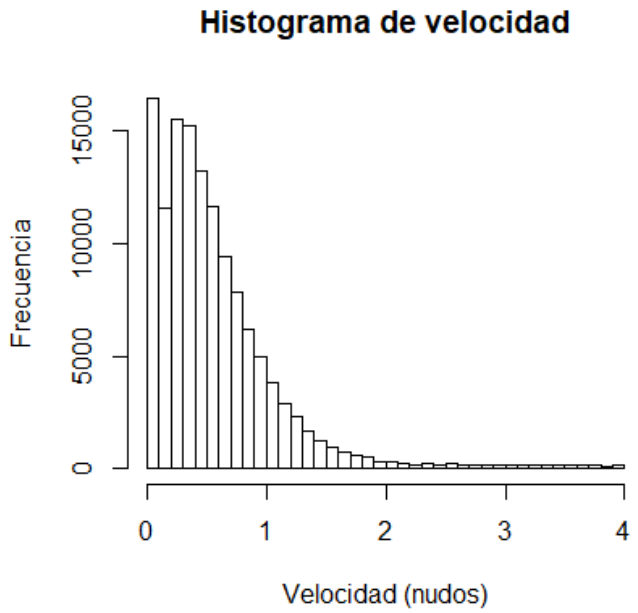
INF1

Date	Vessel	No. active
2018/04/01	9003421	345
2018/04/02	9003421	342
2018/04/03	9003421	340
...	...	...

INF2

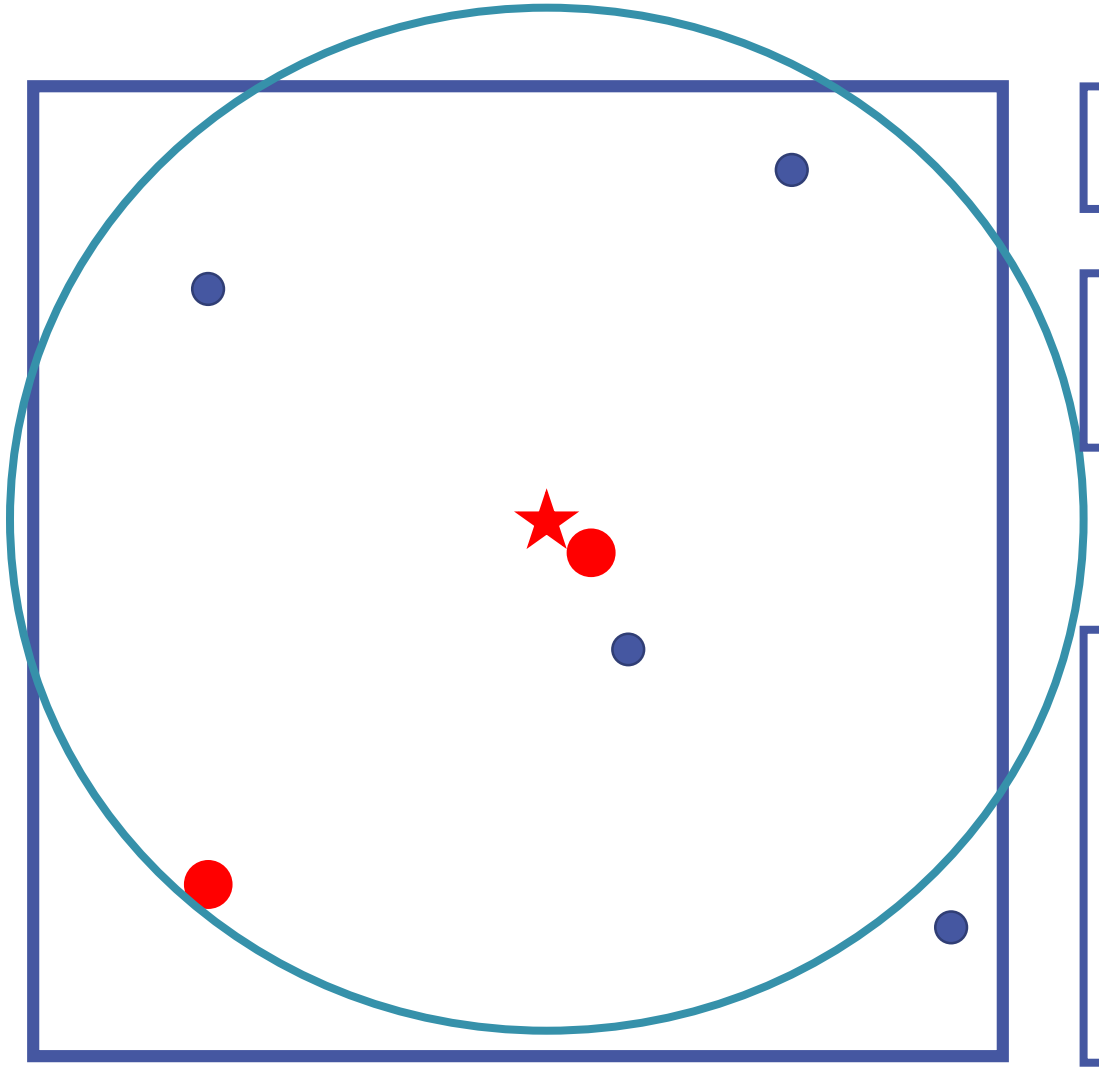
Year	Month	CPC	Vessels	Lat	Lon	Average no. active FADs
2018	1	xxx	6	10.5	-132.5	1.93
2018	1	xxx	6	9.5	-132.5	0.84
2018	1	xxx	6	8.5	-132.5	2.32
...	...	...	...	...	...	...

Problemas identificados con una sola posicion al dia



Velocidad media = 1.25 nudos
(~30 millas en 24h)

LINK ESPACIO-TEMPORAL



LO QUE REALMENTE SUCEDE

LO QUE VEMOS CON UNA POSICION AL DIA

ESTO ES SOLO UN EJEMPLO CON UN LANCE PERO IDEALMENTE DEBERIAMOS DE CONSIDERAR LAS DEMAS ACTIVIDADES SOBRE PLANTADOS

Cuestiones científicas fundamentales

- ✓ Cuál es el efecto de los plantados en la mortalidad de juveniles y tasas de captura?
- ✓ Desarrollar mejores índices de abundancia y CPUE de cerco
- ✓ Son los plantados capaces de modificar el comportamiento de los atunes?
- ✓ **PARA RESPONDER A ESTAS PREGUNTAS, NECESITAMOS CRUZAR BASES DE DATOS:**
  - ✓ OBSERVADORES
  - ✓ FORMULARIO DE DCPs
  - ✓ DATOS DE POSICIONES DE BOYAS

- Tiempo en remojo
- Historial del objeto:
  - Ambiental
  - Actividades

Qué ciencia podemos llevar a cabo con INF1?

- Medidas **pobres** de captura y esfuerzo sobre DCPs.

- Porqué decimos que son **pobres**?
  - **No** todos los DCPs son **iguales**.
  - Cada uno tiene valores específicos de **tiempo de remojo, historia ambiental y de actividades** sobre el mismo.
  - Estas características particulares **afectan tanto el esfuerzo como las tasas de captura** de los buques.
  - En general, la mayoría de los estudios científicos muestras que las **medidas agregadas de esfuerzo e índices de abundancia están sesgadas** y por lo tanto, estamos dejando atrás el uso de estos datos en ciencia.

- Cómo podemos **mejorar** esta situación?
  - Reportando **datos de alta resolución** que nos permitan **relacionar bases de datos** de observadores, formularios de DCPs y datos de boyas.

Qué ciencia podemos llevar a cabo con INF2?

- Medidas **inciertas** de densidades de DCPs activos en una escala de tiempo **inapropiada**.

- Porqué son **inciertas**?
  - No conocemos como estas **variables** son **estimadas** por las compañías de boyas.

- Porqué es **inapropiada** la escala de tiempo?
  - Los análisis de CPUE más robustos solo pueden ser llevados a cabo con **datos operacionales y parámetros de densidades locales** de DCPs que se ajusten a su resolución temporal, en este caso, **diaria**.

- Cómo podemos **mejorar** esta situación?
  - Reportando datos de **alta resolución** que nos permitan **relacionar bases de datos** de observadores, formularios de DCPs y datos de boyas.