

# Recent purse-seine FAD fishing strategies in the eastern Pacific Ocean: What is the appropriate number of FADs at sea?

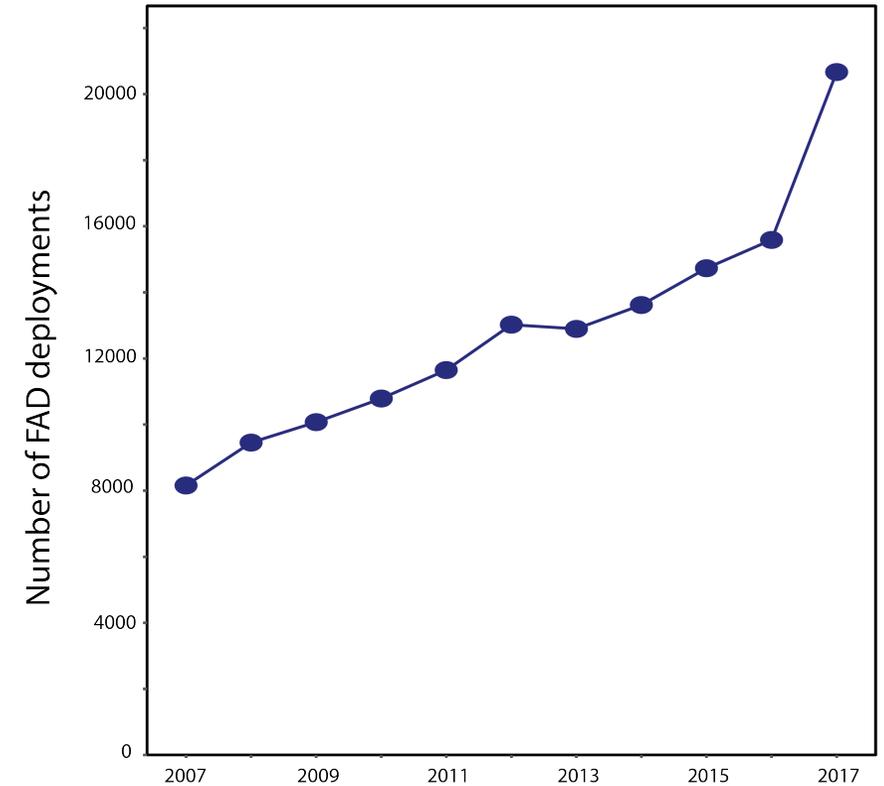
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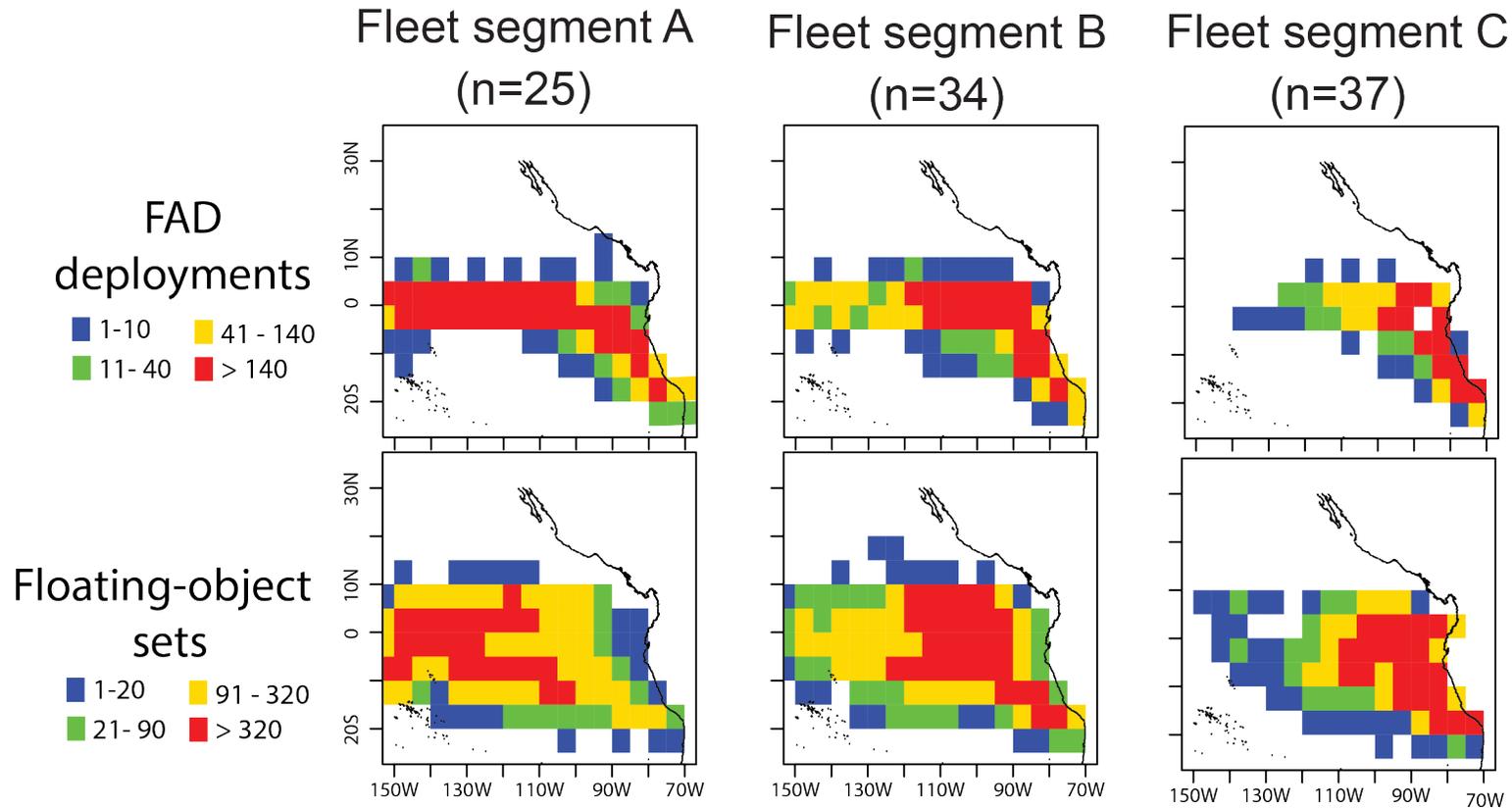
- Why do we care about the number of FADs at sea?
  - FAD use increasing worldwide, including in the eastern Pacific (EPO).
  - Several potential impacts, including higher catches of juvenile bigeye tuna.
  - FAD limits have been established but further quantitative support is needed.
- In this presentation:
  - Results from analyses of onboard observer data provide insights into recent FAD fishing strategies\*;
  - Discussion of the next steps for obtaining quantitative support for FAD limits: improving data collection.



\* (Lennert-Cody et al. 2018. Recent purse-seine FAD fishing strategies in the eastern Pacific Ocean: what is the appropriate number of FADs at sea? <https://academic.oup.com/icesjms/advance-article/doi/10.1093/icesjms/fsy046/4976455> )

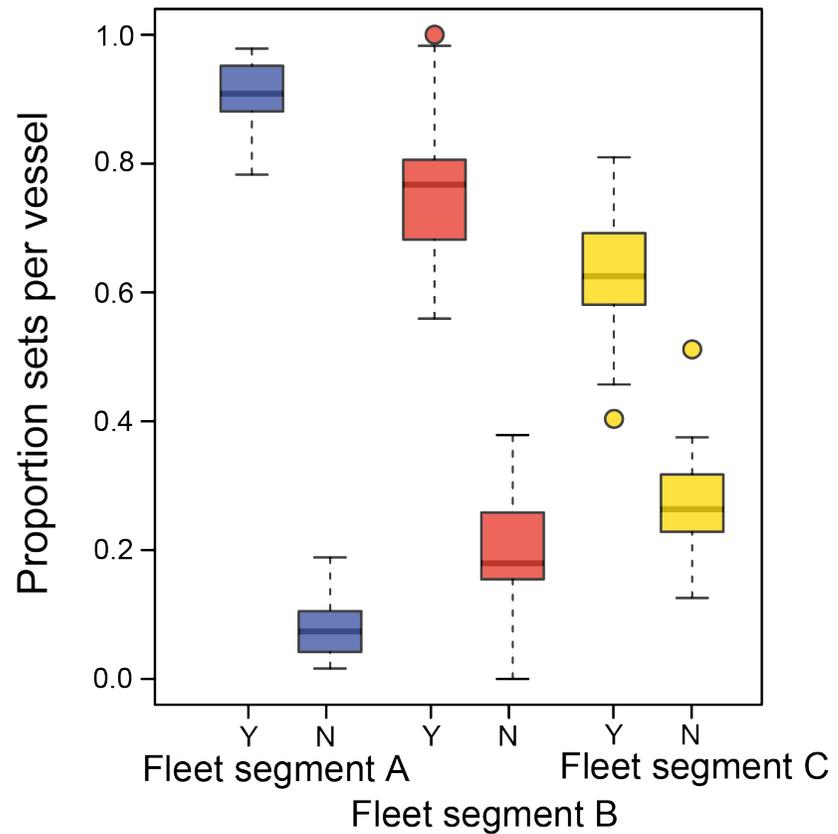


## Floating-object related activity



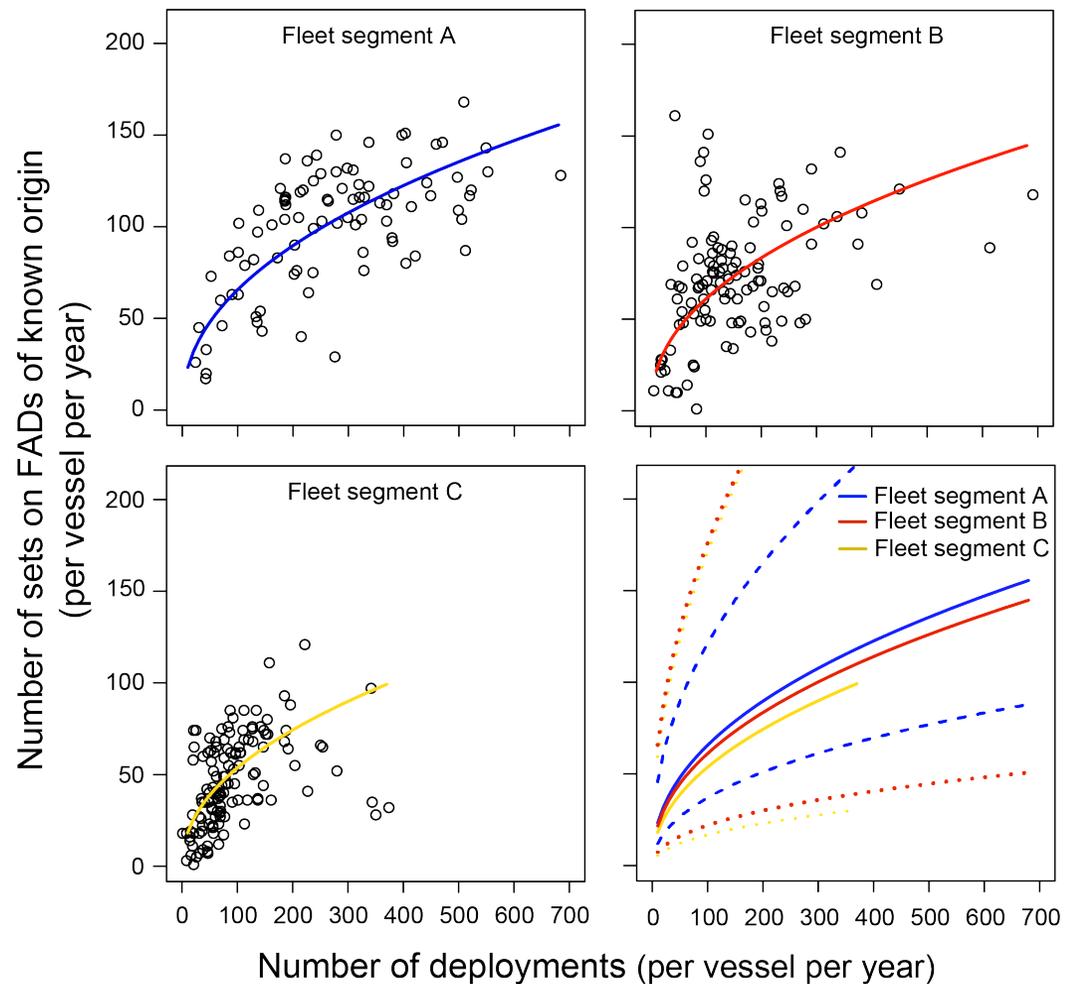
Analysis of 2012-2015 observer data identified 3 fleet segments among FAD-fishing vessels:

- Fleet segment A: operations furthest offshore;
- Fleet segment C: coastal operations, more unassociated sets;
- Fleet segment B: intermediate between Fleet segments A and C.

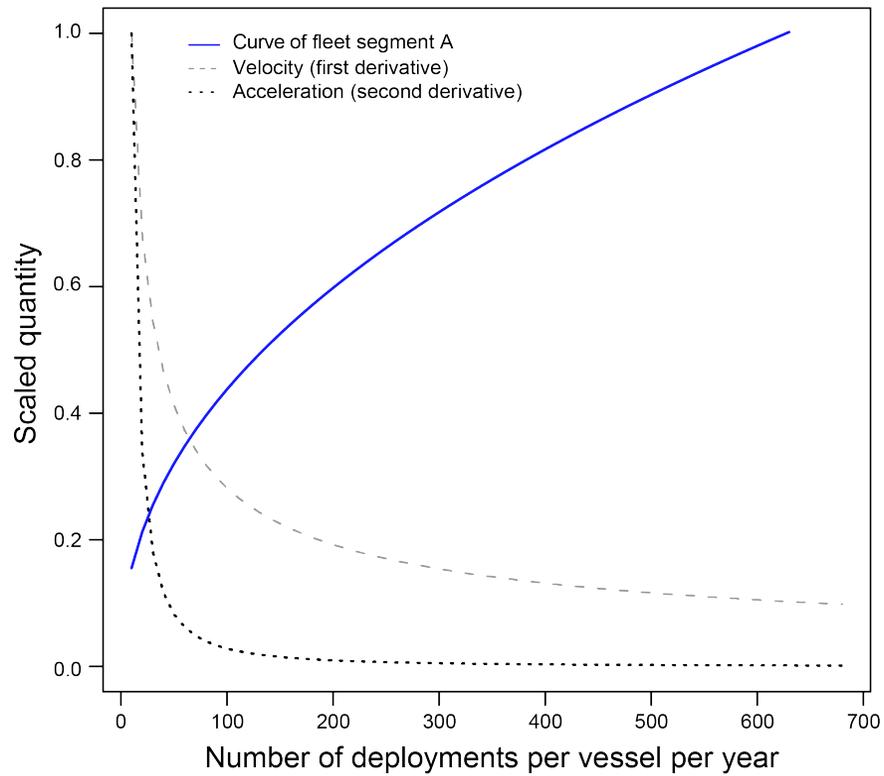


Y: Vessel's own FADs or other known origin  
 N: FADs encountered by chance

- Fleet segment A: sets almost exclusively on their own FADs, more FAD deployments;
- Fleet segment C: more sets on FADs encountered by chance, fewer FAD deployments;
- Fleet segment B: intermediate between Fleet segments A and C.



- What is the relationship between numbers of FADs at-sea and sets?
- At present, we do not know FADs at-sea, but we can say something about FAD *deployments*:
  - Relationship between deployments and sets is nonlinear;
  - Fleet segment A is the most homogeneous.



- Several views of deployments *versus* sets for fleet segment A:
  - estimated curve;
  - rate of change in FADs sets per deployment (“velocity”);
  - rate of change of “velocity” (“acceleration”).
- Greatest benefit occurred below 200 *deployments* per vessel per year.
- Current limits in all oceans are on numbers of *active* FADs (per vessel per day):
  - EPO: 300 (Class-6 < 1,200 m<sup>3</sup>), 450 (Class-6 ≥ 1,200 m<sup>3</sup>); IO, WCPO: 350; AO: 500 – all well above 200.
- Are the limits too high?



- Problem: the conversion from deployments to monitored FADs is not known.
- FADs are lost due to sinking, beaching events, drifting out of fishing ground, appropriation by other vessels.
- An additional caveat: number of deployments may be biased low.
- For a better understanding of FAD-use dynamics, additional data are needed on:
  - Any night-time deployments (IATTC Class-6 vessels);
  - Changes in FAD ownership over a FAD's lifetime;
  - FAD-use strategies of small (IATTC Class 1-5) vessels\*;
  - Buoy-use strategies of all vessel size classes.

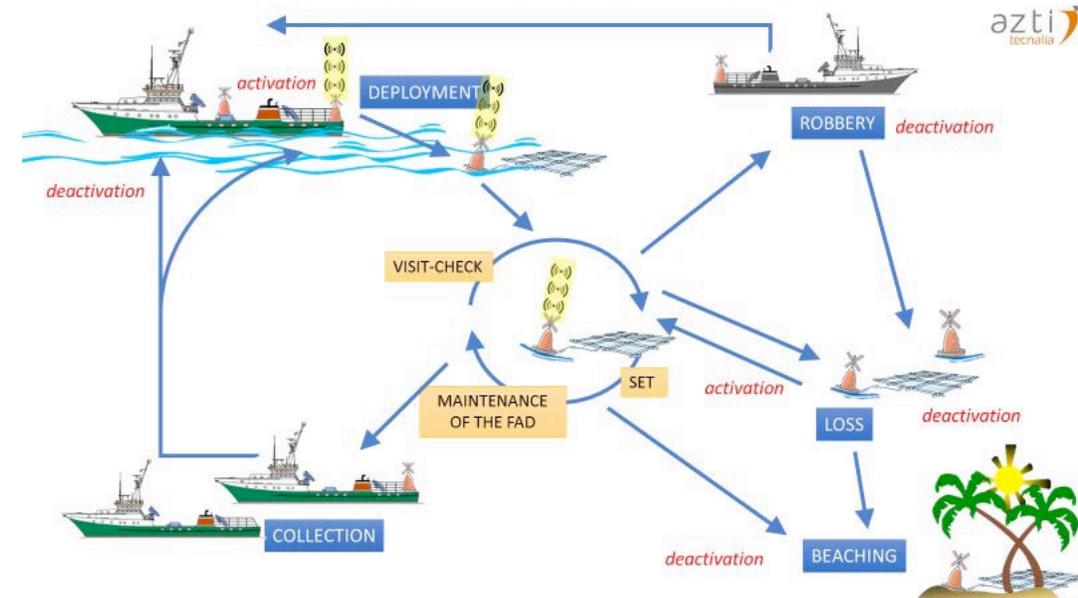


Image courtesy of Josu Santiago

\* Román et al. 2018. [http://www.iattc.org/Meetings/Meetings2018/SAC-09/PDFs/PRES/English/SAC-09-PRES\\_Electronic-Monitoring-\(EM\)-of-Purse-Seine-Vessel-Activities-and-Catches.pdf](http://www.iattc.org/Meetings/Meetings2018/SAC-09/PDFs/PRES/English/SAC-09-PRES_Electronic-Monitoring-(EM)-of-Purse-Seine-Vessel-Activities-and-Catches.pdf)

## Improving data collection

- Additional FAD data will be provided under Resolutions C-16-01 and C-17-02.
  - Suggestions for improving the scientific value of these data recently proposed <sup>a</sup>.
  - These suggestions include, among others:
    - Multiple buoy identifiers be recorded on Form 9/2016;
    - Buoy data, at the resolution received by vessels, be provided to IATTC staff;
    - A reliable FAD marking scheme be developed.
  - These data will make possible <sup>b</sup>:
    - Studying FAD-use and buoy-use strategies, and their relationship to fishing mortality;
    - Obtaining FAD drift time and trajectories, and from these environmental histories and soak time, to improve CPUE analyses and studies of fishing mortality and effort.
- A FAD marking project proposal has been prepared <sup>c</sup>; FAD marking may provide a better understanding of FAD use over the lifetime of a FAD and the impacts on fleet strategies.

<sup>a</sup> Lopez et al. 2018. Review of IATTC Resolutions C-16-01 and C-17-02: available information, data gaps, and potential improvements for monitoring the fad fishery. IATTC Document FAD-03 INF-A. [http://www.iattc.org/Meetings/Meetings2018/SAC-09/FAD-03a/Docs/\\_English/FAD-03-INF-A-EN\\_Review-of-resolutions-C-16-01-and-C-17-02.pdf](http://www.iattc.org/Meetings/Meetings2018/SAC-09/FAD-03a/Docs/_English/FAD-03-INF-A-EN_Review-of-resolutions-C-16-01-and-C-17-02.pdf)

<sup>b</sup> Goal J of the IATTC Strategic Scientific Plan [http://www.iattc.org/Meetings/Meetings2018/IATTC-93/PDFs/Docs/\\_English/IATTC-93-06a\\_Strategic%20Science%20Plan.pdf](http://www.iattc.org/Meetings/Meetings2018/IATTC-93/PDFs/Docs/_English/IATTC-93-06a_Strategic%20Science%20Plan.pdf)

<sup>c</sup> Project C.1.a of [http://www.iattc.org/Meetings/Meetings2018/IATTC-93/PDFs/Docs/\\_English/IATTC-93-06c\\_Unfunded%20projects.pdf](http://www.iattc.org/Meetings/Meetings2018/IATTC-93/PDFs/Docs/_English/IATTC-93-06c_Unfunded%20projects.pdf)



**Thank you!**

**Questions?**

