



A novel FAD tracking device tested in the Pacific Ocean

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IATTC FAD marking requirements Resolution C-19-01 (Annex I) are:

*CPCs shall obtain **unique alphanumeric codes** from the IATTC staff on a periodic basis and distribute those numbers to the vessels in their fleets for FADs that may be deployed or modified, **or in the alternative**, if there is already a unique FAD identifier associated with the FAD (e.g., the manufacturer identification code for the attached buoy).*

- Nowadays in IATTC the **buoys used by fishers** to monitor their FADs are the principal FAD marking system.

IATTC scientific staff presented the difficulty to follow the track of a given FAD from its deployment to the end of its lifetime.

- (i) fishers' appropriation of other's FADs and thus, exchanging the tracking buoys, and
- (ii) the deactivation of tracking buoys once FADs drift out of the fishing ground.

FAD tracker (NAOS) specifications



- It is robust and small (280mm x 160mm and 1.23kg),
- it floats by itself,
- it is activated just by removing a magnet.
- Buoy with 1 cell and others with 2 cells battery

NAOS specifications

For buoys with 2 cells:

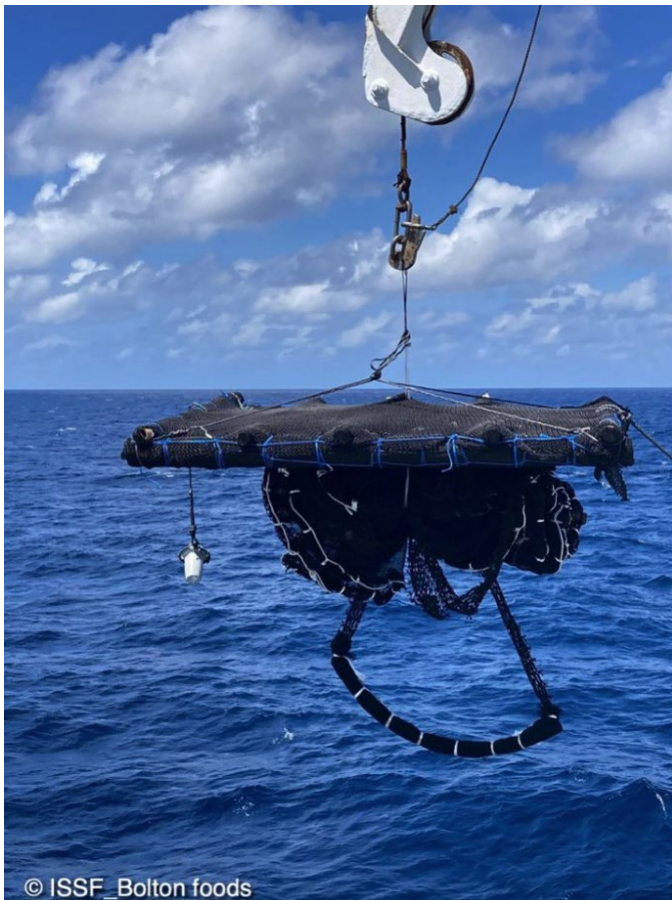
Number of location per day	Days of autonomy
1	560
2	340
4	150
12	120
24	110
96	90

From the 20 beacons tested:

- **10** had **2 cells**, providing 2 positions per day.
- **10** had **1 cell**, providing, half of them 1 position per day and half 2 positions per day

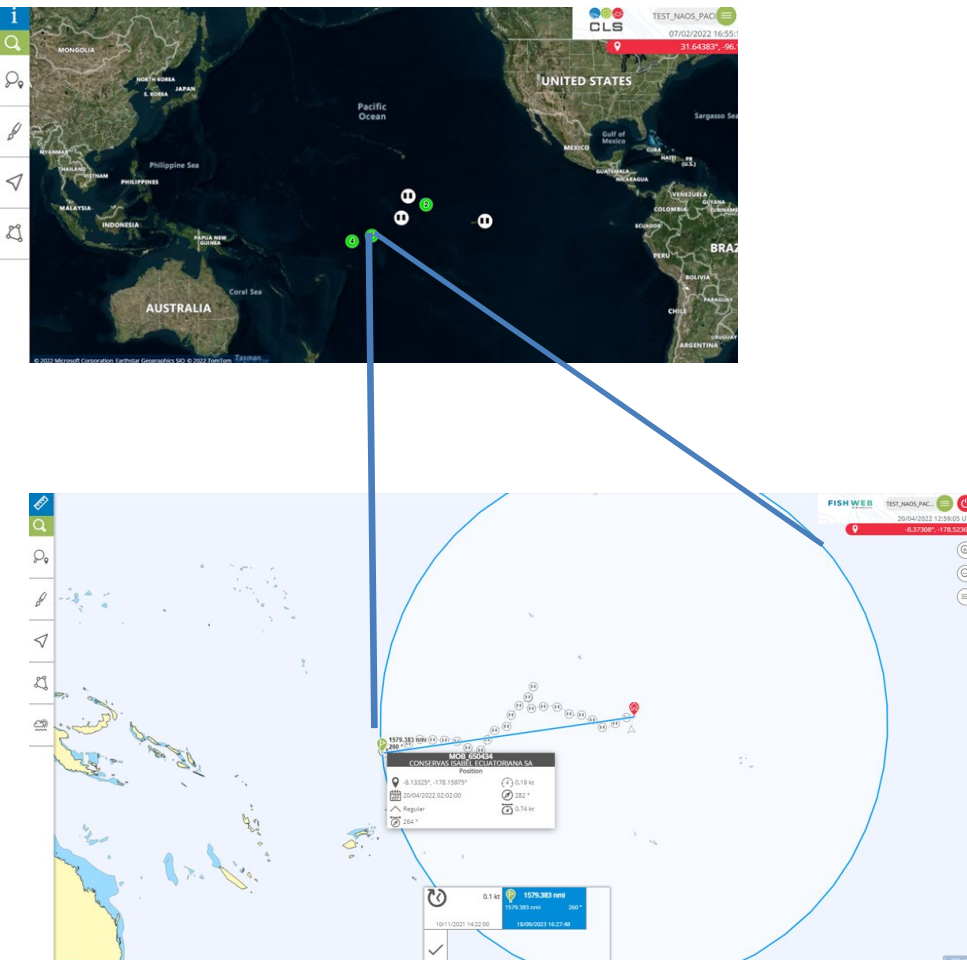
Trials at sea

**20 beacons tested in the EPO with the help of
Atunera Dularra (Opagac) fleet**

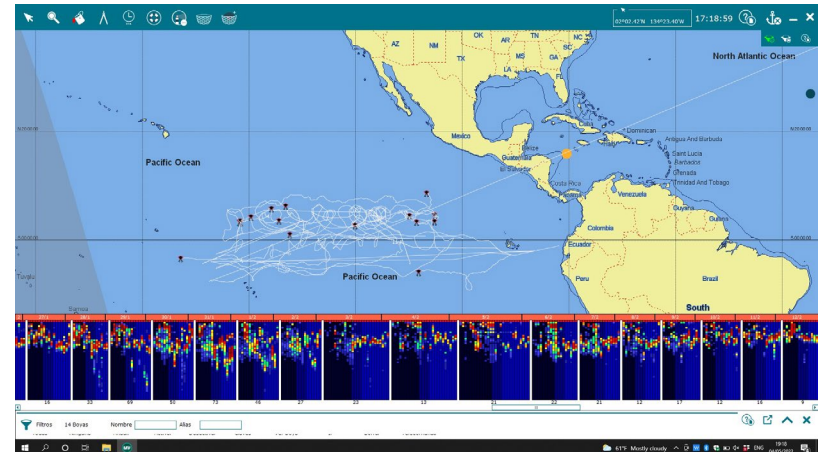


Comparison of FADs trajectories

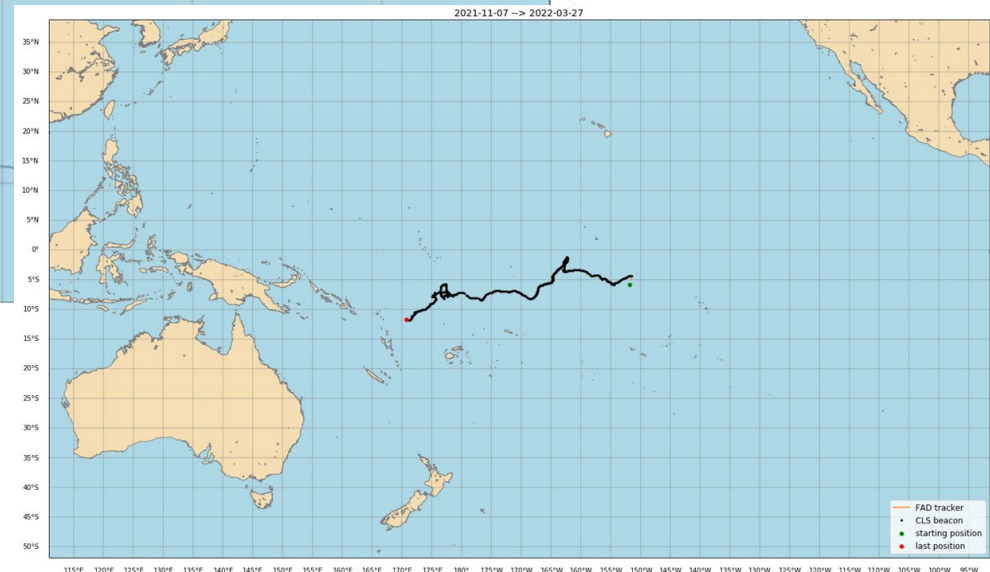
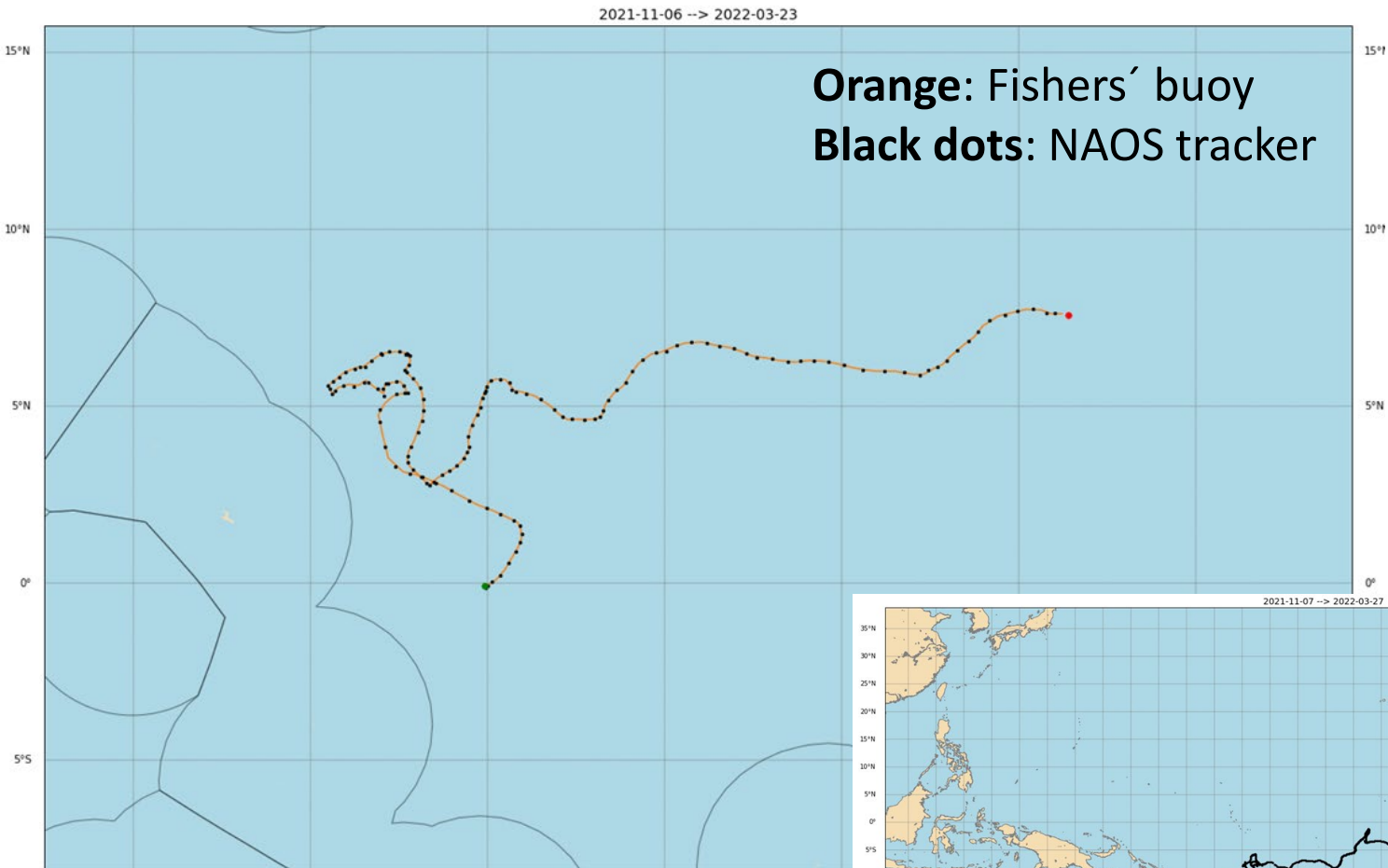
NAOS trackers' Interface



Fishers' FAD tracking buoys



Results on track accuracy



Almost identical trajectories

Results on FAD structure fate

- Average **monitoring period** was **4.5 months**, for the fisher that deployed the FADs, with a minimum and maximum of 3 and 7 months of monitoring respectively.
- **35%** (n=7) of FADs deployed by the vessel were **appropriated** by other vessel, between 3 and 5 months after deployment.
- **30%** (n=6) of the FADs and NAOS beacons were **out of the fishing ground** around by the end of Q1 2022.
- **15%** (n=3) of tested FADs were **sold** to another company operating in the western Pacific Ocean
- **20%** (n=4) had an **unknown** fate

- For three of the FADs that were stolen, and one that was sold, **NAOS beacon continued providing position**, so the trajectory of the FAD was monitored even when fishers changed their tracking buoys.
- The NAOS beacon that reported longer, 11 months, was a **1 cell (battery) beacon programmed to report 2 positions per day**. So, it seems the lack of data from other beacons may not be related to the lack of battery.
- One of the beacon that stopped reporting was retrieved by Atunera Dularra fleet and sent to CLS in France. It appeared that the casing was not robust enough and water filtered inside.

Conclusion 1/2

1. NAOS and fisher's buoy provided almost identical trajectory. KINEIS constellation will be used soon and will decrease the delay to visualize positions.
2. FADs remained for a limited time in the hands of the fisher that deployed them, and NAOS continued tracking FAD's drift.
3. Most of NAOS stopped transmission by month 7 and after 11 months only one beacon was still transmitting. The hardware has been reinforced to avoid water leaking in the system.
4. Batteries may not be a limiting factor, new improvements with more batteries and rechargeable batteries will be soon available.

More trials would be needed with a larger number of beacons and FADs, to test:

- Improved hardware
- Technology improvements (batteries, comms)
- Beacon's attachment options to FAD structure

Finally, a parallel discussion would be needed to define the potential use of this beacon or any other FAD marking systems in the future.

A large school of blue tunas swimming in deep blue water. The fish are sleek, silver-blue with yellowish-orange fins, and are swimming in various directions, creating a sense of movement. A semi-transparent white box is overlaid on the right side of the image, containing the text.

Thanks! Gracias!

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