

# Fishing gear and its backward trajectories in Canary Islands waters

Bárbara Abaroa-Pérez<sup>1</sup>, Marina Vargas-Ferraz<sup>2</sup>, Ana Molina-Rodríguez<sup>3</sup>, Miriam Noemí Déniz-Martín<sup>3</sup>, Álvaro Nicolás Cubas-Viera<sup>2</sup>, Francisco Machín<sup>4</sup>, Eugenio Fraile-Nuez<sup>5</sup> and Daura Vega-Moreno<sup>3</sup>

<sup>1</sup>Marine Litter Observatory (OBAM), Fuerteventura, Spain

<sup>2</sup>Faculty of Marine Sciences, University of Las Palmas de Gran Canaria (ULPGC), Gran Canaria, Spain

<sup>3</sup>OpenPLAS Group, Chemistry Department, University of Las Palmas de GC (ULPGC), Gran Canaria, Spain

<sup>4</sup>OFyGA-ECOQUA, ULPGC, Spain

<sup>5</sup>Spanish Institute of Oceanography (IEO-CSIC), Tenerife, Spain

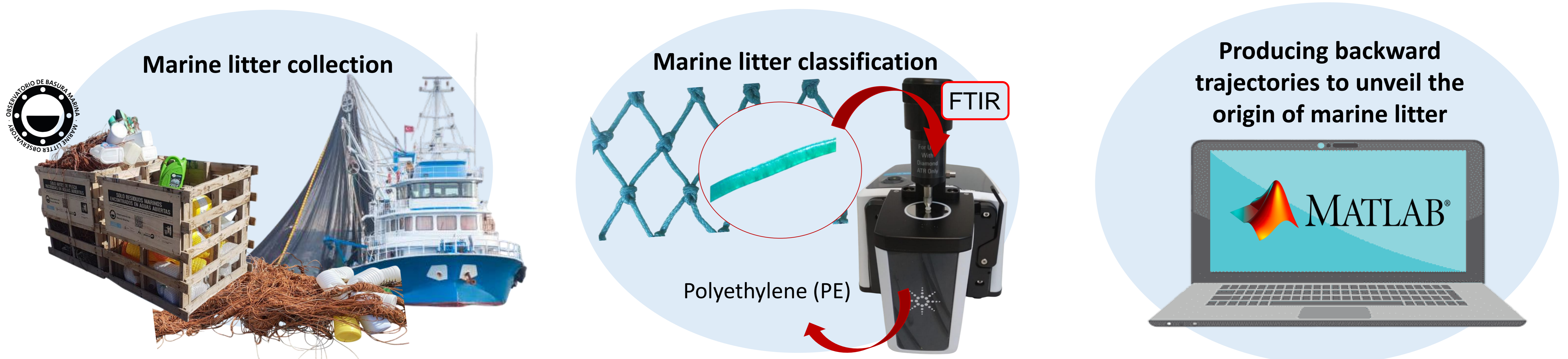


## Introduction

The accumulation of marine litter (micro and **macroplastics**) in the Canary Islands has been extensively documented by projects such as the Fuerteventura Marine Litter Observatory (OBAM). Started in 2020, it is dedicated to research, monitoring, and raising awareness about the impact of marine litter in the waters of the Canary Islands. Waste has been collected and sorted along the entire coast of Fuerteventura, reaching a total of **28 tons** of garbage, **70%** of which is **plastic**. As for floating waste, **96%** of the debris is related to **fishing gear**.

The analysis of the collected nets allows us to classify the types of fishing gear, helping to identify their possible origin. In addition, numerous cases of entanglement involving turtles and cetaceans have been documented in the Canary Islands, especially in areas south of Tenerife, Gran Canaria, and Fuerteventura. The **transport** of this debris from the African continent to the Canary Islands is influenced by specific **oceanographic processes**, such as **African upwelling** and the formation of **eddies**, which interact with currents and transport the floating waste towards the archipelago.

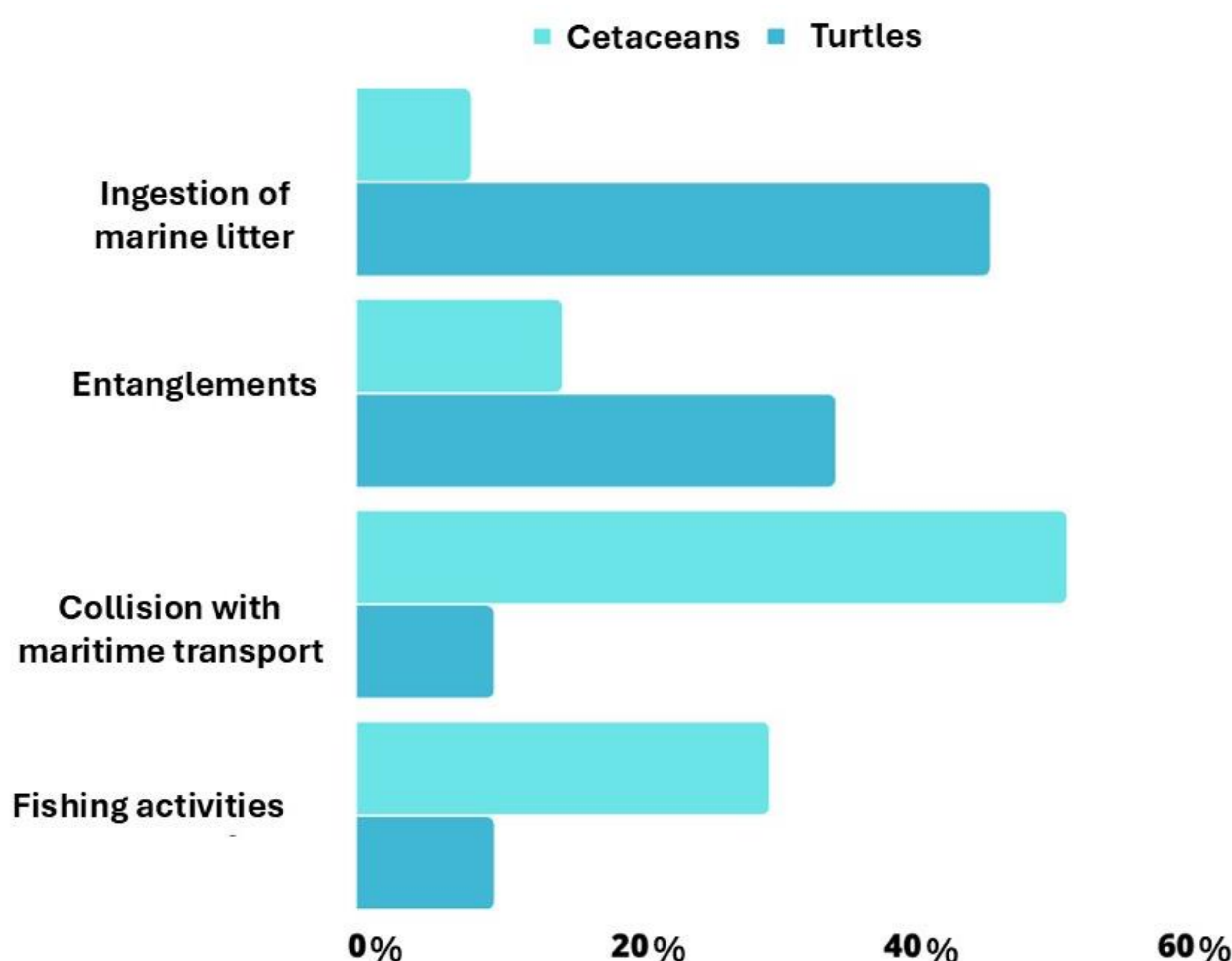
## Materials and methods



## Results

Different types of fibers were analyzed, most of which were composed of **polyethylene (PE)**. 5.7% of **fishing nets** and 29% of fishing lines end up abandoned, discarded or lost at sea.

Data has been collected on the number of **stranded** turtles and cetaceans in the Canary Islands (**Fig.1**). The main causes of **unnatural mortality** identified were **collisions** with maritime transport for cetaceans and the **ingestion** of marine litter for turtles. Recent reports indicate that **100%** of the **stranded** cetaceans and turtles contain **plastic inside** their **stomachs**. However, it cannot be definitively concluded that this is the cause of their stranding.



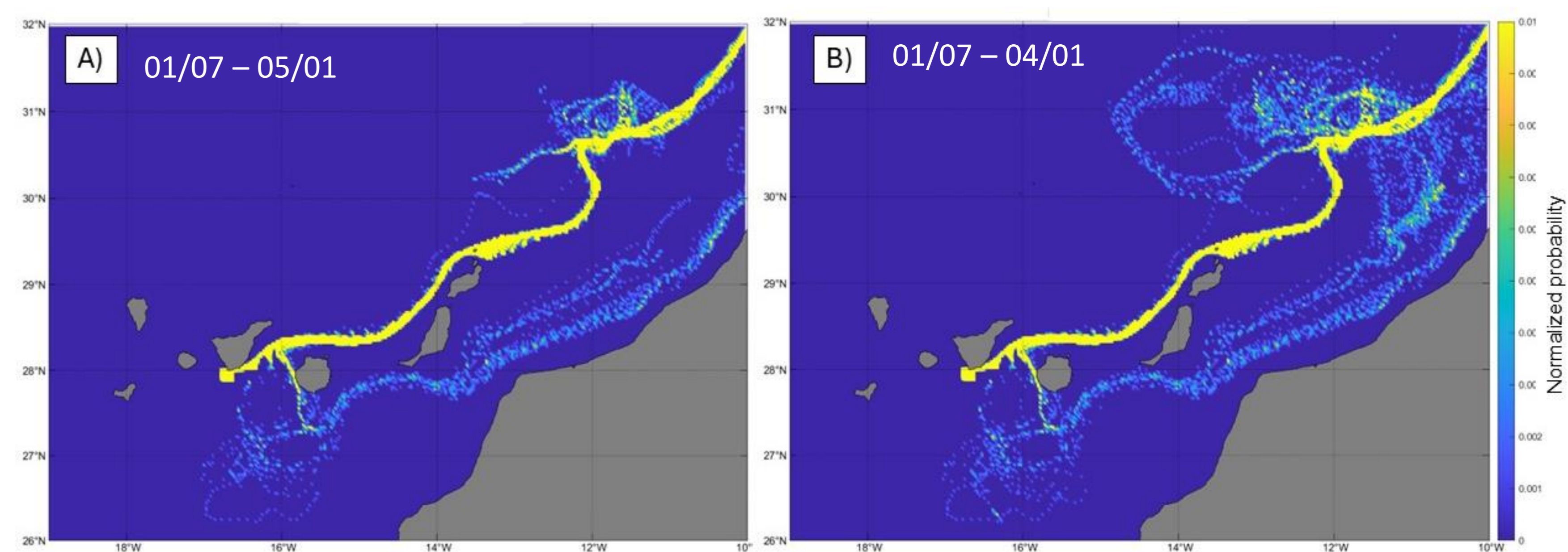
**Figure 1.** Percentage of turtles and cetaceans captured by stranded in the Canary Islands.

Considering the **geographical position** of the Canary Islands, there is a large contribution of marine litter from different sources. Data were obtained with a model of marine litter **backward trajectories** between April and September 2021 (**Fig. 2**) and 2022 (**Fig. 3**).

## Acknowledgements

The OBAM was co-funded by the European Maritime and Fisheries Fund through the PLEAMAR program in 2020 and 2021, in collaboration with the Biodiversity Foundation and the Island Council of Fuerteventura. The implementation of its actions would not be possible without the support of the Fuerteventura Fishermen's Guilds. The authors would like to thank the Promotur Turismo Canarias Agreement for the joint implementation of initiatives aimed at intelligent management and the development of the Blue Tourism product. These efforts fall within the framework of the Recovery, Transformation, and Resilience Plan (Next Generation EU Funds) and align with Order No. 257/2023 issued by the Minister of Tourism and Employment, focused on the execution of cohesion actions in destinations as part of the Canary Islands Territorial Plan.

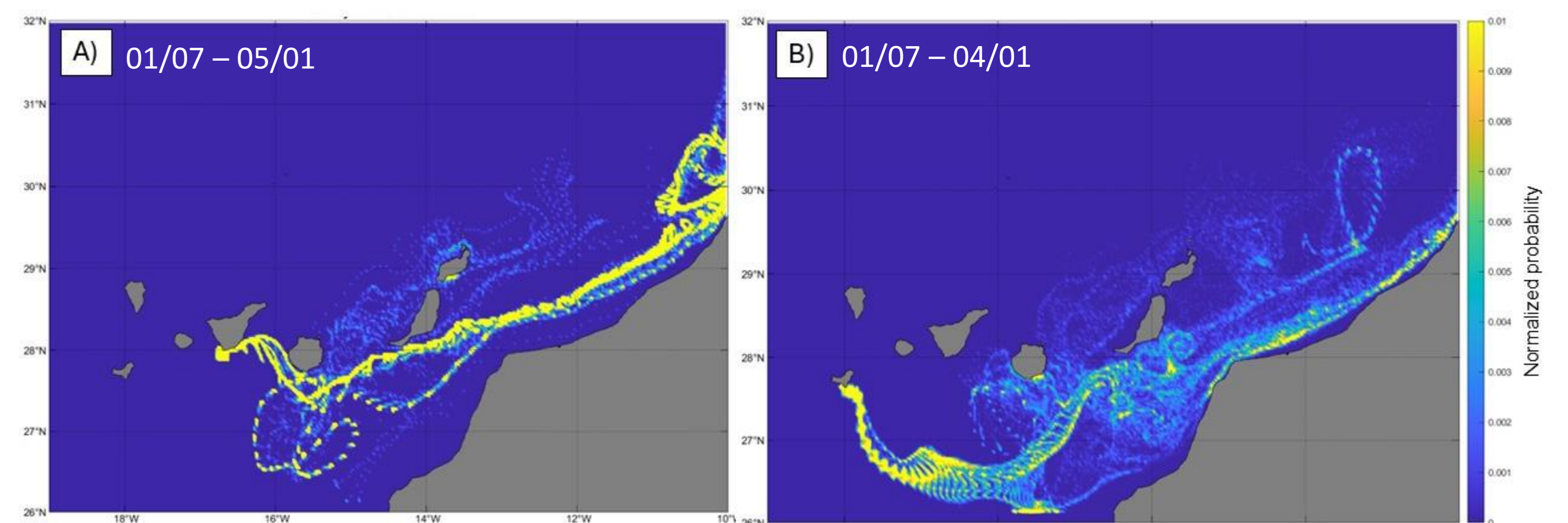
### Backward trajectories 2021



**Figure 2.** Backward trajectories with a duration of 2 months (A) and 3 months (B)

**Figures 2 and 3** display the **normalized probability** of a particle passing through this area. The **yellow** the trajectory, the **higher the probability** that marine litter had pass through this zone.

### Backward trajectories 2022



**Figure 3.** Backward trajectories with a duration of 2 months (A) and 3 months (B)

## Conclusions

- 70% of marine litter is composed of plastics.
- 96% of floating comes from fishing activities.
- The main cause of stranded in turtles is marine litter, while in cetaceans it is maritime traffic.
- Backward trajectory models make it possible to identify the origin of marine litter.