

# FISHOWF

Effective monitoring strategies to identify and evaluate effects of offshore wind farms and their export cables on fish communities  
(2021 - 2024)

## NEWSLETTER #3

June 2025

### A word from the project coordinator...



« Improving our understanding of the effects of offshore wind farms on mobile species such as fish depends on our ability to implement appropriate monitoring methods. Acoustic telemetry is one such method. The FISHOWF project, which finished at the end of 2024, demonstrated its relevance in addressing major gaps in our knowledge of fish movements within and across offshore wind farm development zones. What happens next? This monitoring approach will be continued in the FISHOWF+ project to answer several key questions about the presence and behaviour of fish in and around offshore wind farms. »

**Lydie Couturier** | Researcher at France Energies Marines

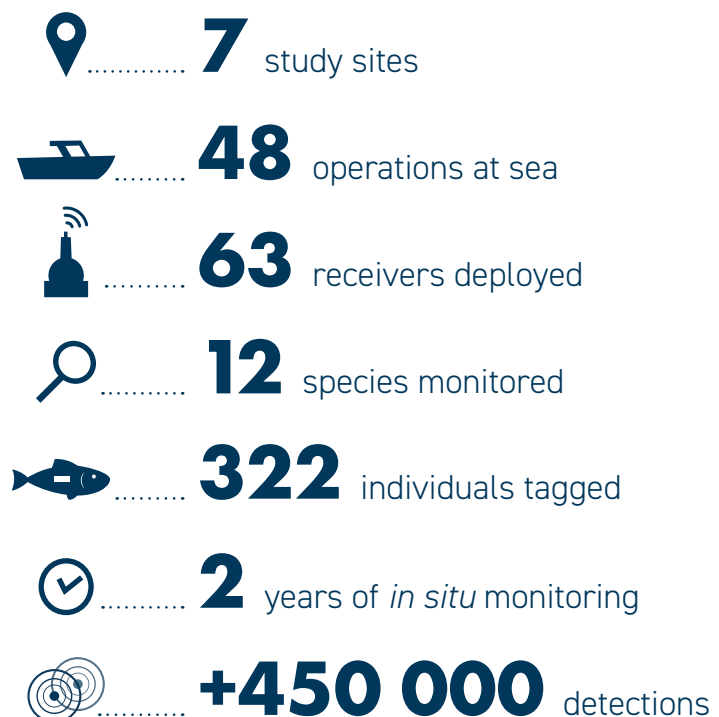
### Partners



This project receives funding from the French government, managed by the National Research Agency (ANR), as part of the France 2030 investment plan.

With financial support from Université de Bretagne Occidentale, régions SUD Provence-Alpes-Côte d'Azur and Brittany regions.

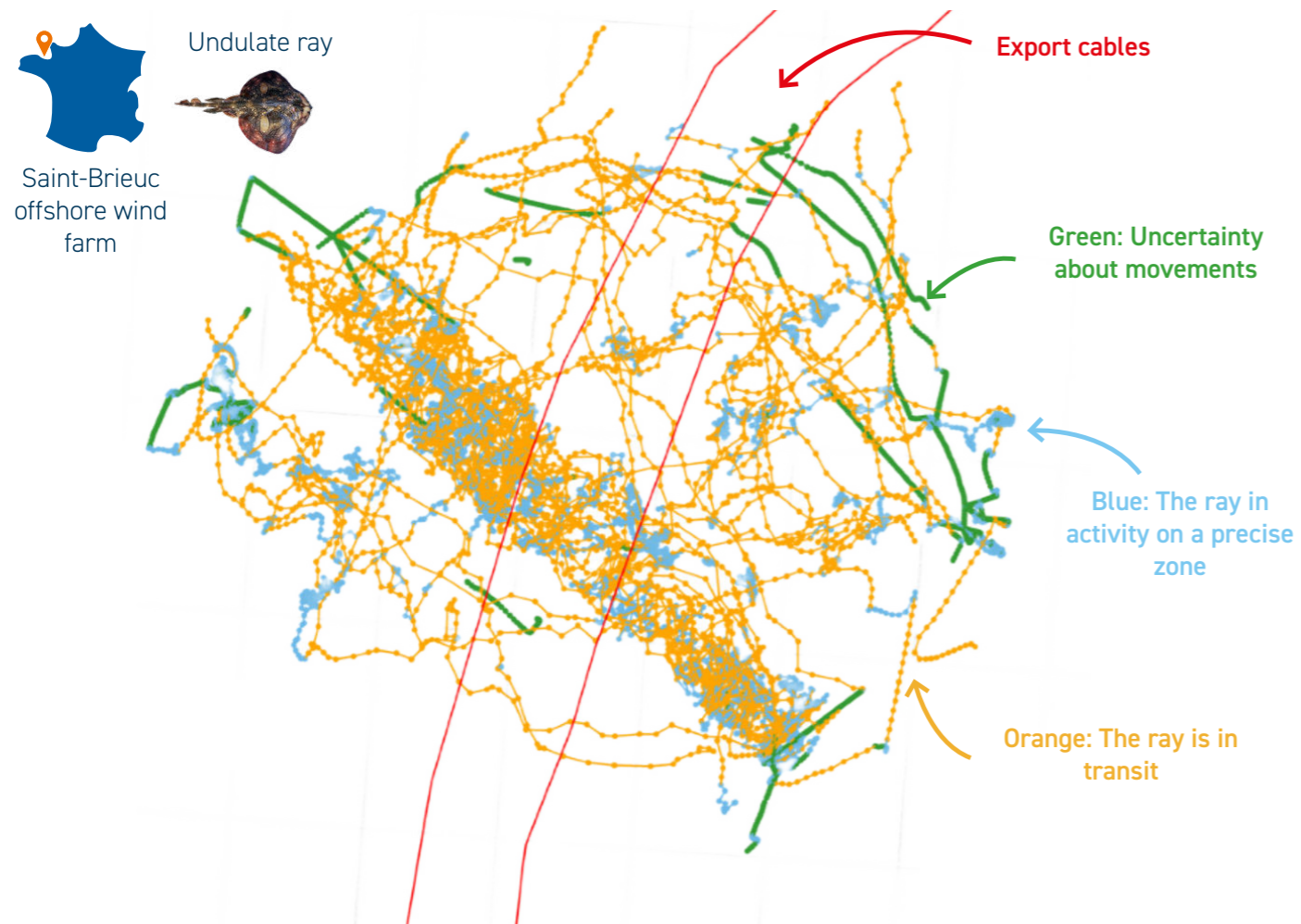
### The project in figures



# Electromagnetic fields and fish: an innovative study protocol

The electricity generated at sea by wind turbines is brought ashore via export cables. When current flows through a cable, it generates electromagnetic fields (EMFs). How do electrosensitive species such as rays and sharks behave near these cables? Can EMFs' effects be detected? To address these questions, an innovative protocol has been implemented and tested at fine scale around the cables. A total of 14 synchronised acoustic telemetry receivers were deployed around the Saint-Brieuc offshore wind farm export cables. This calibrated system ensures simultaneous detection of individuals by several receivers, making it possible to track their position precisely using a trilateration method. In addition, animals were equipped with acoustic tags fitted with a pressure sensor to determine the depth at which they are moving. Result: the position of the animals in the water column can be estimated within a metre! By analysing their behaviour around the cable, it is possible to detect any attraction or avoidance phenomena. This study validates a replicable method for studying, in their natural environment, the behaviour of fish around systems that emit electromagnetic fields.

**Below: example of the movements of an undulate ray within the study area.**



## When applied re-search feeds fundamental science

The project has produced very precise data on the movements of the small-spotted dogfish and the undulate ray, the first of its kind on these species, which have been little studied to date! They provide new information on their ecology, along with metric data such as their swimming speed and the depth at which they move.

# They're on the move...

By sharing their data through the European Tracking Network platform, the various acoustic telemetry networks (orange crosses on the map) along the Channel and Atlantic coasts make it possible to track tagged individuals over a wide spatial area, revealing that some species travel great distances.

Bluefin tuna tagged off Plymouth and the Channel Islands as part of the FISHINTEL project were detected in 2022 and 2023 in the Saint-Brieuc offshore wind farm between July and October.

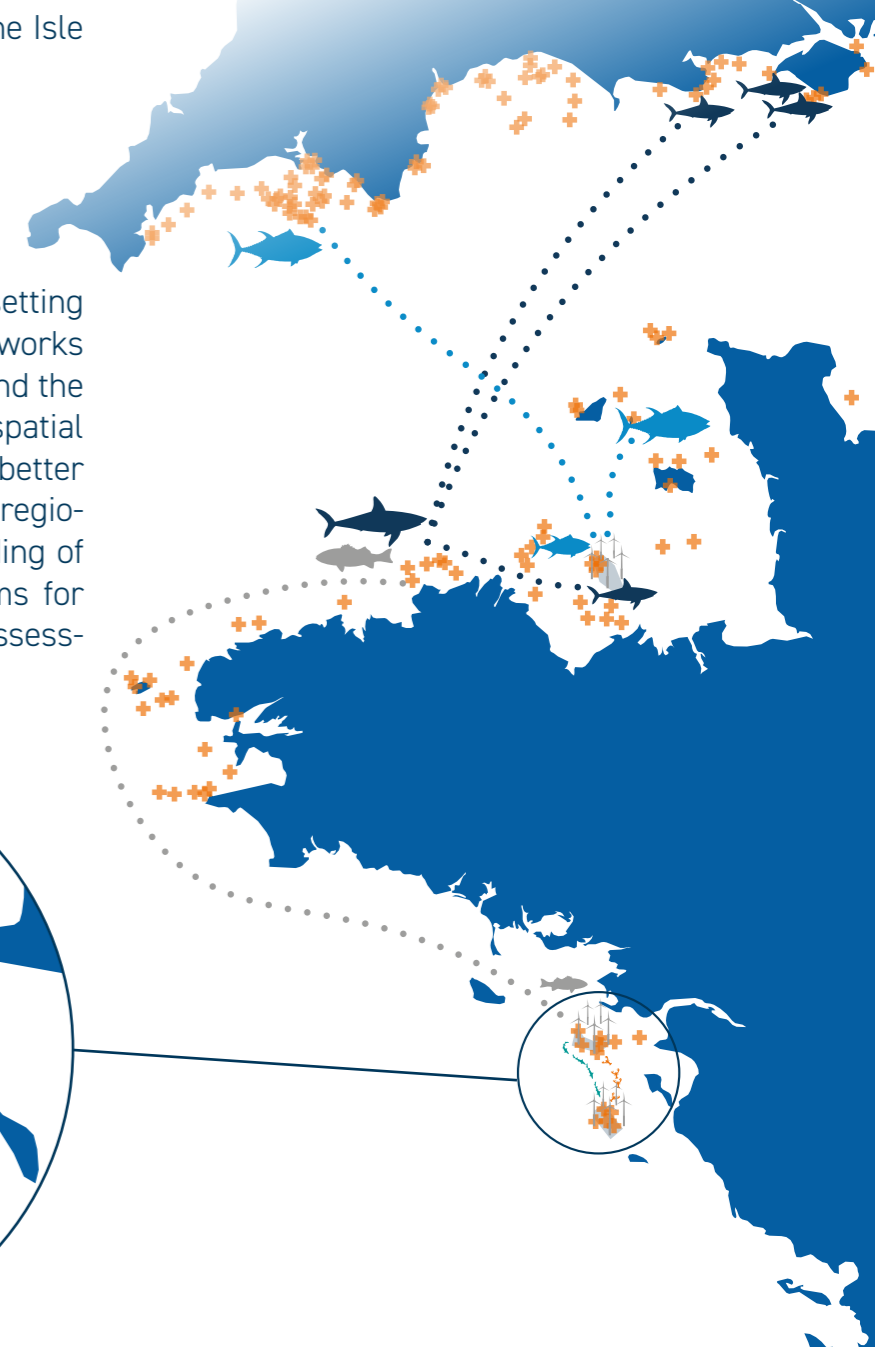
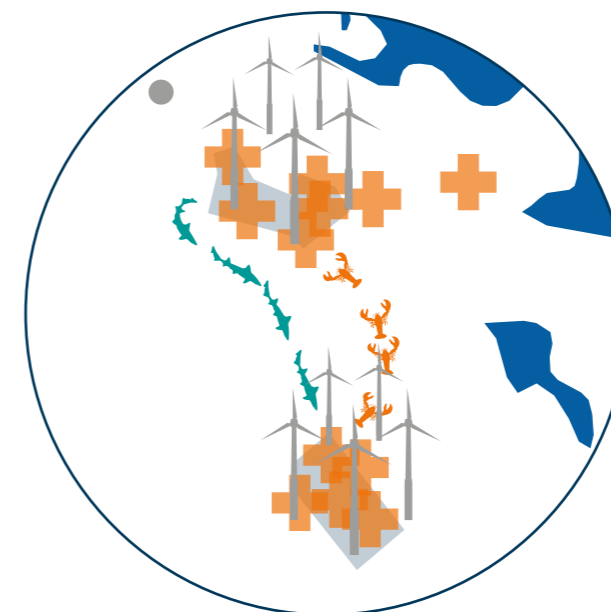
Three porbeagle sharks tagged off Perros-Guirec (France) were detected near the English coast, not far from the Isle of Wight.

A European seabass tagged in June 2022 in the Sept-Îles archipelago was detected in November in the Saint-Nazaire offshore wind farm. This field data confirms migration patterns predicted through modelling (BarGIP project led by Ifremer).

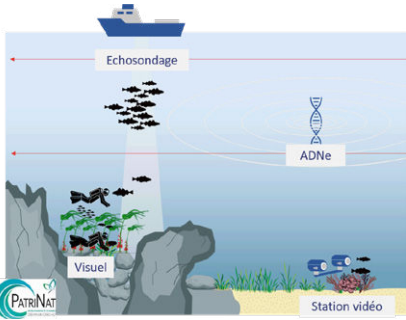
More locally, a starry smooth-hound tagged in the Saint-Nazaire wind farm was later detected in the Yeu-Noirmoutier wind farm.

One lobster took the reverse route — tagged in the Yeu-Noirmoutier wind farm, it travelled nearly 23 km to reach the Saint-Nazaire wind farm!

These results highlight the relevance of setting up and maintaining acoustic telemetry networks along the coasts of the English Channel and the Atlantic to improve knowledge on the spatial ecology of the species being monitored. A better understanding of species movements at a regional scale will lead to a better understanding of the ecological role of offshore wind farms for these species and thus enable a better assessment of potential impacts on populations.



# Combining methods: the key to relevant monitoring



Acoustic telemetry provides detailed information on the behaviour of the monitored species, but used on its own, it cannot answer all the questions relating to offshore wind farm effects on fish populations. The complementarity of different monitoring methods was therefore assessed

as part of the FISHOWF project. Conducted by PatriNat, this pilot study compared the results obtained from three methods deployed at the Yeu Noirmoutier offshore wind farm: experimental fish netting, environmental DNA sampling and the use of baited remote underwater videos. Results show that these three methods used together enable different species to be identified, thereby providing a better representation of the fish present on the site. This work illustrates the value of using a combined approach to gather general information (species density, abundance, juvenile/adult proportion) on fish populations and to be able to monitor their evolution over time. As a result of this study, recommendations for the development of a shared approach to monitoring fish populations have been proposed.

## In pictures



On 2 October 2024, the partners met in Martigues to review the project at its closing. FISHOWF demonstrated the relevance of acoustic telemetry in addressing the main gaps in our knowledge of fish occupation patterns in and between offshore wind farms.



Following on from FISHOWF, the FISHOWF+ project was launched on 3 October 2024 in Martigues. Still relying on acoustic telemetry, which the project aims to promote as a monitoring method, FISHOWF+ will further investigate the interactions between offshore wind farms and fish.

### Agenda

#### End of the project

- 2 October 2024
- Martigues (France)

#### Launch of FISHOWF+

- 3 October 2024
- Martigues (France)

### Replay

The **final webinar** of the project was held on 4 April 2025. Scan the QR code to watch the replay



### STRICT REGULATIONS

All France Energies Marines projects involving animal handling comply with a very strict regulatory framework. They have been approved by an ethics committee and have obtained authorisation from the French Ministry of Research, which must be renewed every five years. All staff involved in these operations have attended and passed specific training courses on animal experimentation. In addition, the Institute has developed collaborations with approved partners to ensure the monitoring of protocols and their adjustment to any new practices, as well as ongoing staff training.