



# Delmoges Project

## Common Dolphin Species Action Plan

Marion PILLET, Tiphaine CHOUVELON, Amélia VIRICEL-PANTE, Mathieu DORAY, Matthieu AUTHIER, Antoine Huguet, Hélène PELTIER, Robin FAILLETTAZ, Laurent DUBROCA, Sophie GOURGUET, Vincent RIDOUX, Sigrid LEHUTA, Clara ULRICH, Pierre PETITGAS, Jérôme SPITZ...

09-10 January, 2024



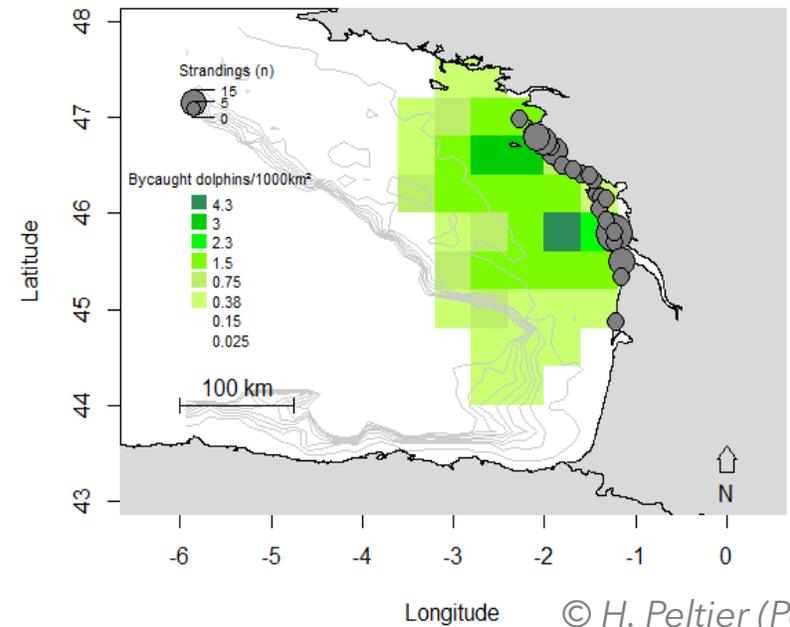
# Environmental context

Hundreds of dolphins are stranded on the Atlantic coast each year



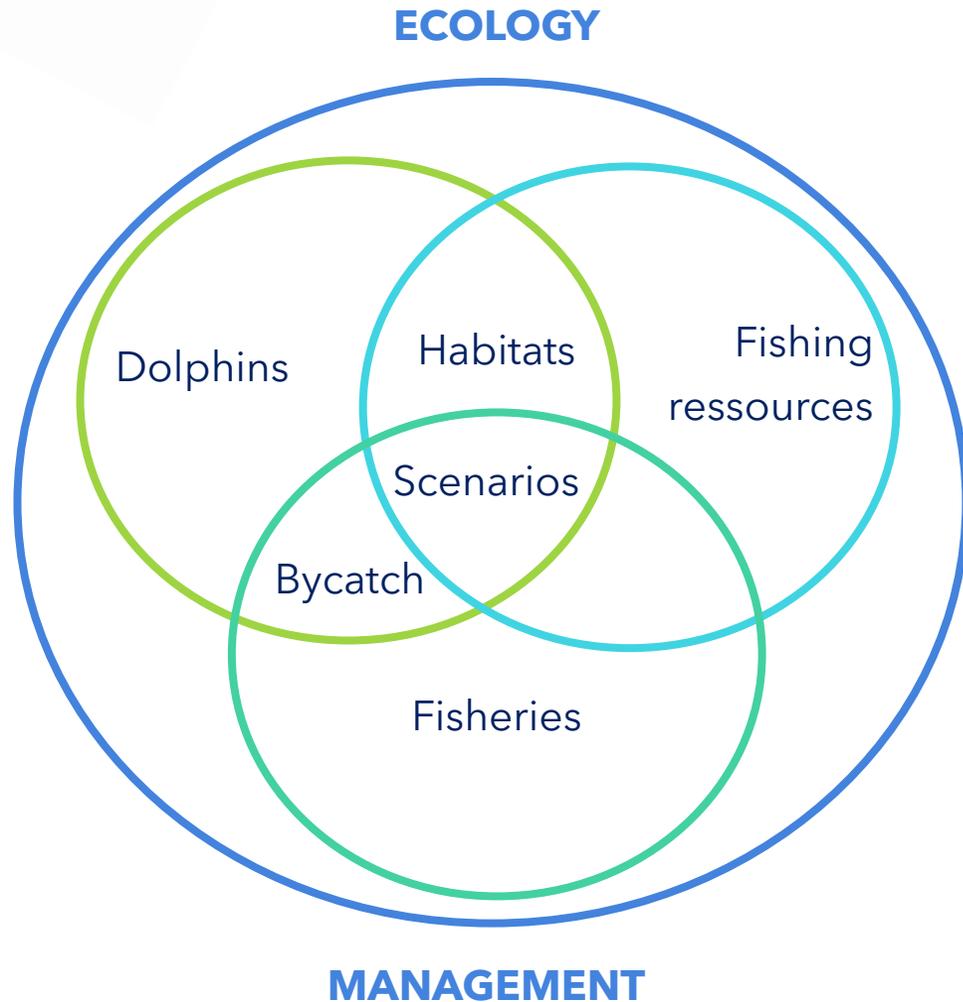
@photopqr/ouest france/maxppp

Origin of stranded individuals



Marks of capture on most individuals stranded during winter

# Delmoges structure & objectives



## Knowledge acquisition



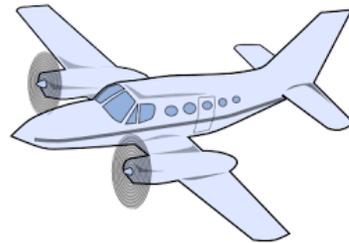
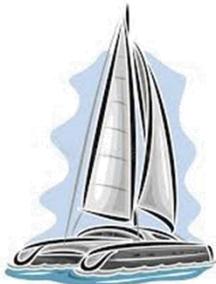
- To better understand of the bycatch mechanisms
- To built remediation scenarios through action lever

# Common Dolphins in the Bay of Biscay



- To characterize the common dolphin population(s) affected by bycatch in the Bay of Biscay, and the coast-wide structuring
- To provide information on ecology aspects that could influence the risk of capture levels, the spatial distribution, the fine-scale winter movements, and feeding ecology

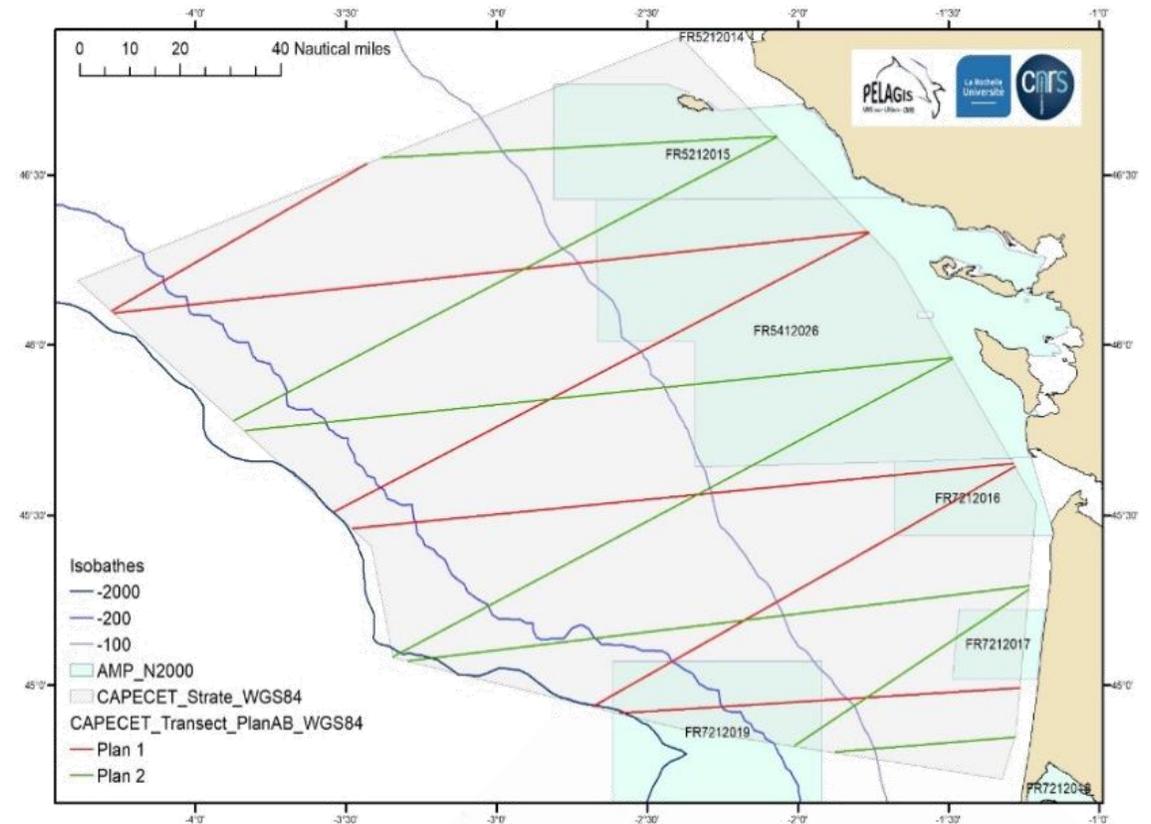
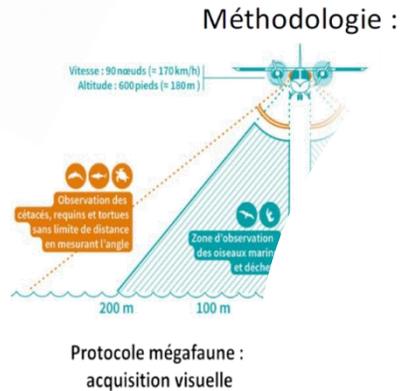
## Surveys at sea



## Lab analysis



# CAPECET aerial survey

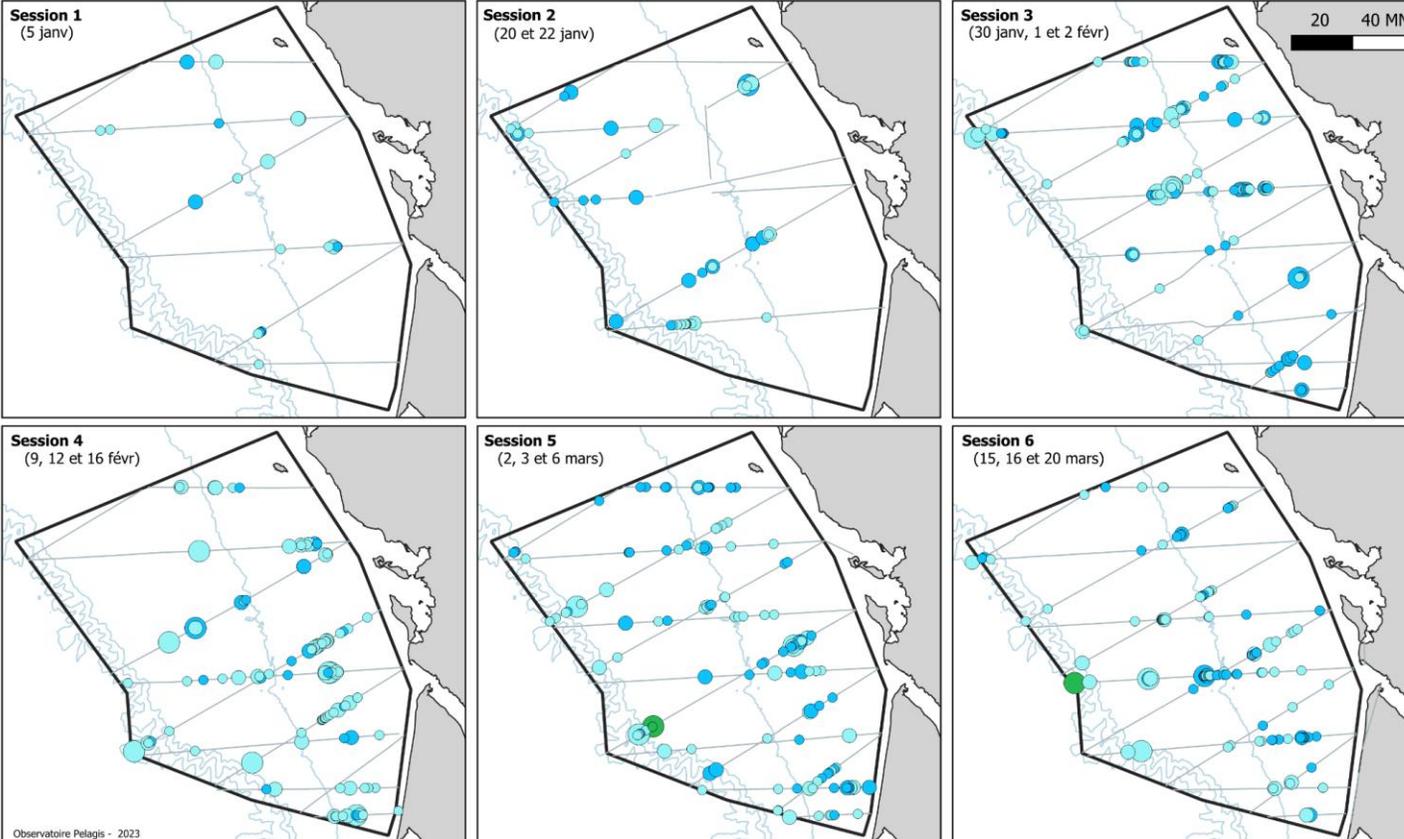


- 8 840 km covered
- 3 371 marine mammals of 8 different species were detected (2 473 small delphinids, mostly common dolphins)
- 25 dead cetacean carcasses

# CAPECET aerial survey



## CAPECET 2023



High density of dolphins and porpoises around Rochebonne and off the Gironde plume

### Observations de petits delphininés

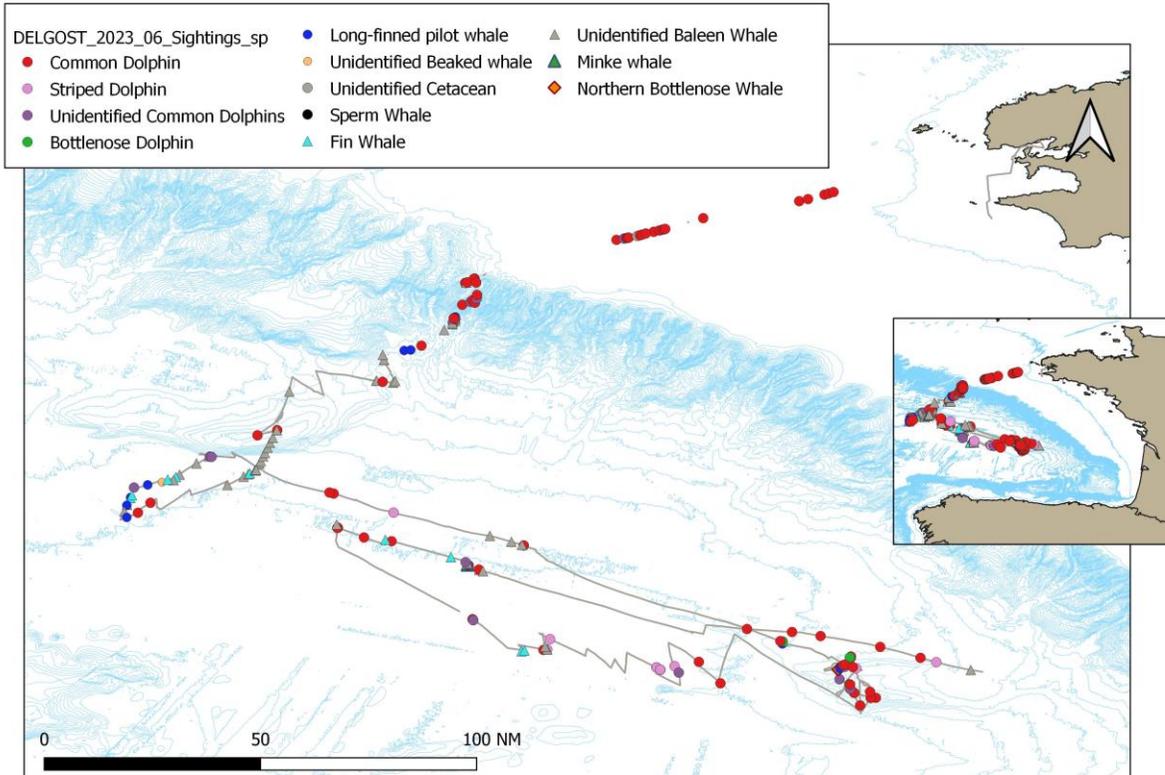
● Delphinus / Stenella ● Delphinus delphis ● Stenella coeruleoalba

○ 1 à 5 ind ○ 16 à 50 ind  
○ 6 à 15 ind ○ 51 à 100 ind

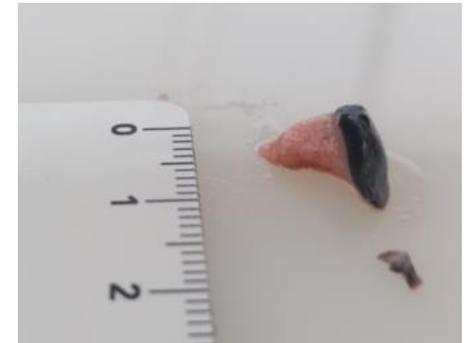
# DelGOST surveys



**June 2022  
and 2023**

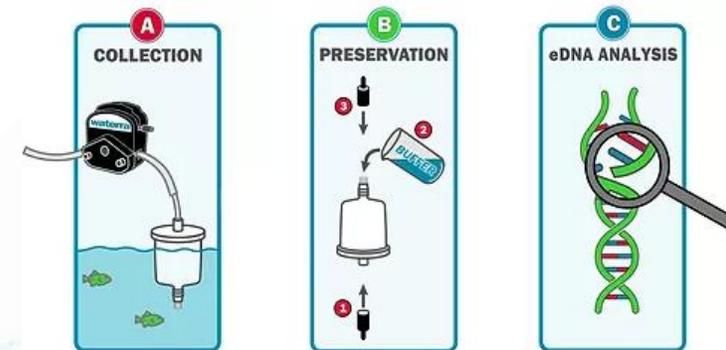


*30 biopsy  
samples/year*



+

*11 water  
samples  
(eDNA)/year*



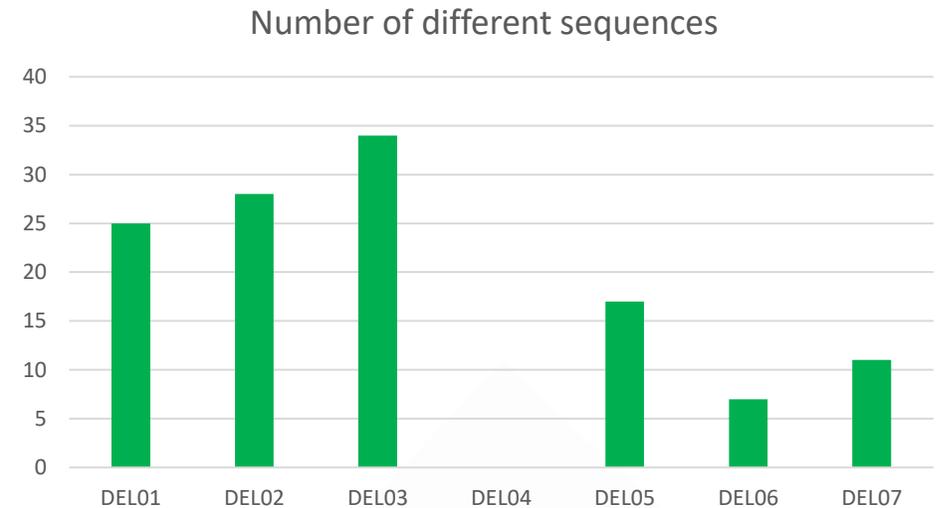
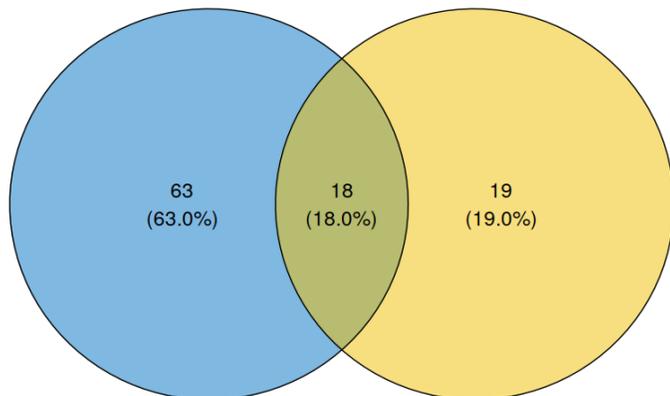
# eDNA approach

Using eDNA to characterize intrapopulation genetic diversity in common dolphins

Mitochondrial control region (461 bp)

- 81 different sequences among 6 sampling sites
- 37 haplotypes among biopsy/necropsy samples
- 18 are shared between the two approaches

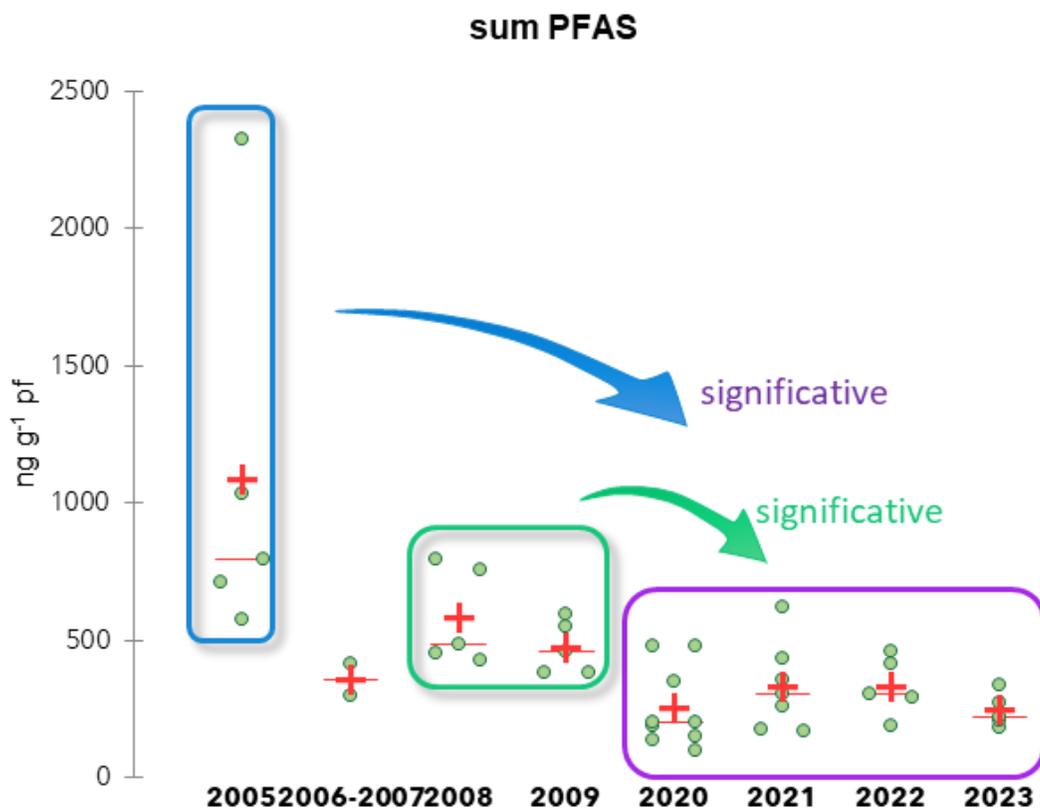
Shared haplotypes between all eDNA and biopsy/necropsy samples in the Bay of Biscay



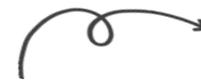
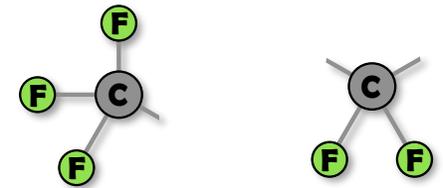
↑  
eDNA sampling in the absence of dolphins

# Contamination (Per- and polyfluoroalkyl substances / PFAS)

« fluorinated substances containing at least one fully fluorinated methyl or methylene carbon atom, i.e., with a few exceptions, any chemical containing at least one perfluorinated methyl (-CF<sub>3</sub>) or perfluorinated methylene (-CF<sub>2</sub>) group is a PFAS »



Thousands of compounds

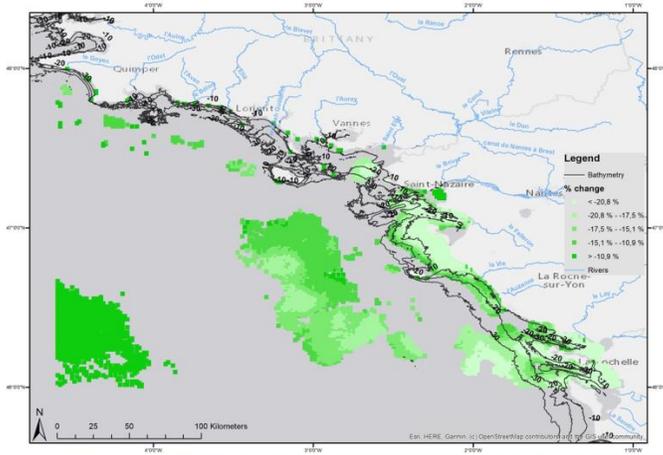


- Maximum of concentrations in 2005
- Minimum of concentrations between 2020 and 2023

# Key points

- Offshore observations show groups of dolphins composed of few individuals. They do not approach the ship
- The individuals present a great genetic diversity
- The contamination (PFAS) in dolphin tissues decreases since 2005

# Cascades in the Ecosystem



- To link the distribution of common dolphins to the dynamics of their environment
- To characterize their probability of occurrence in habitats in relation to physical and trophic conditions

## Survey at sea

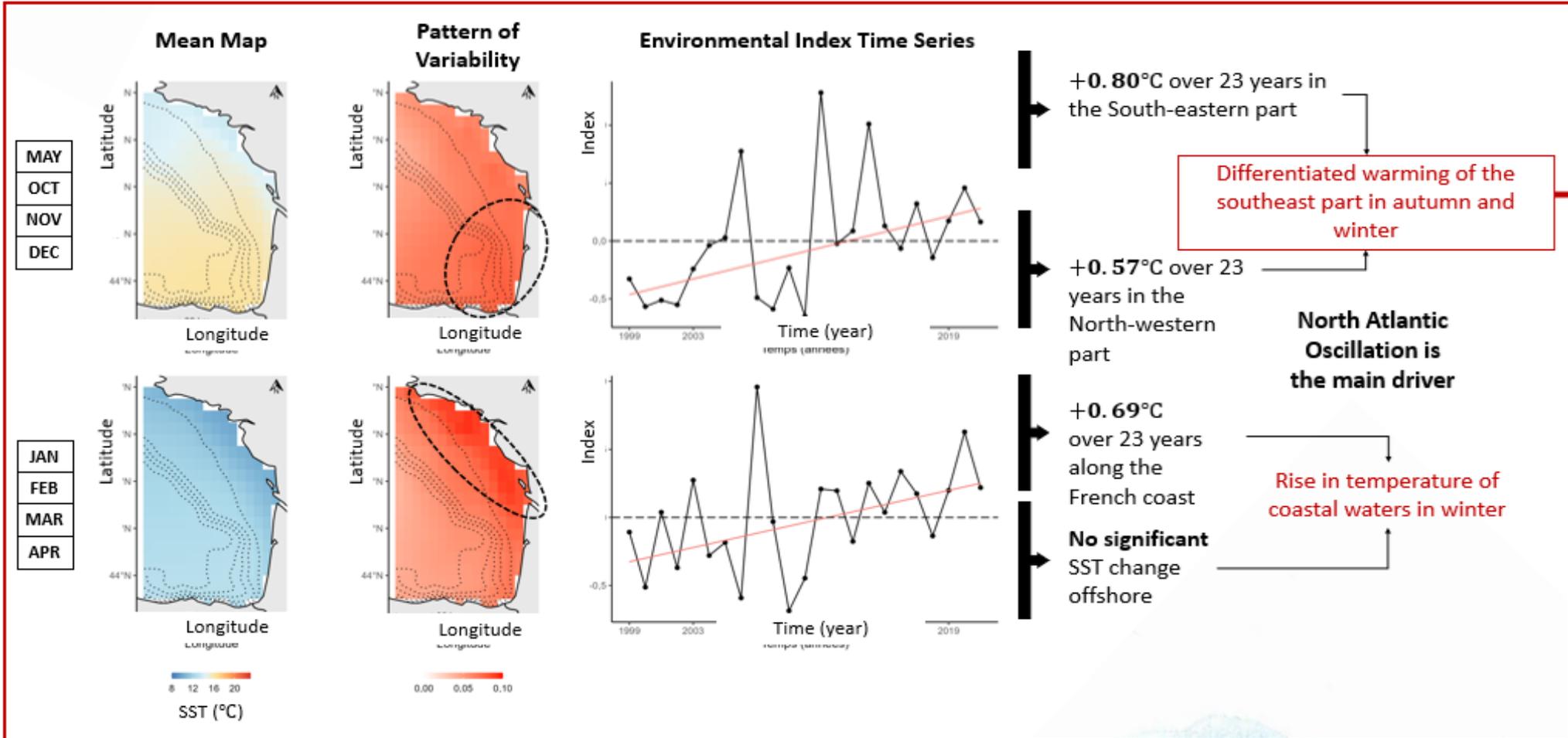


## Data modeling



# Habitats evolution

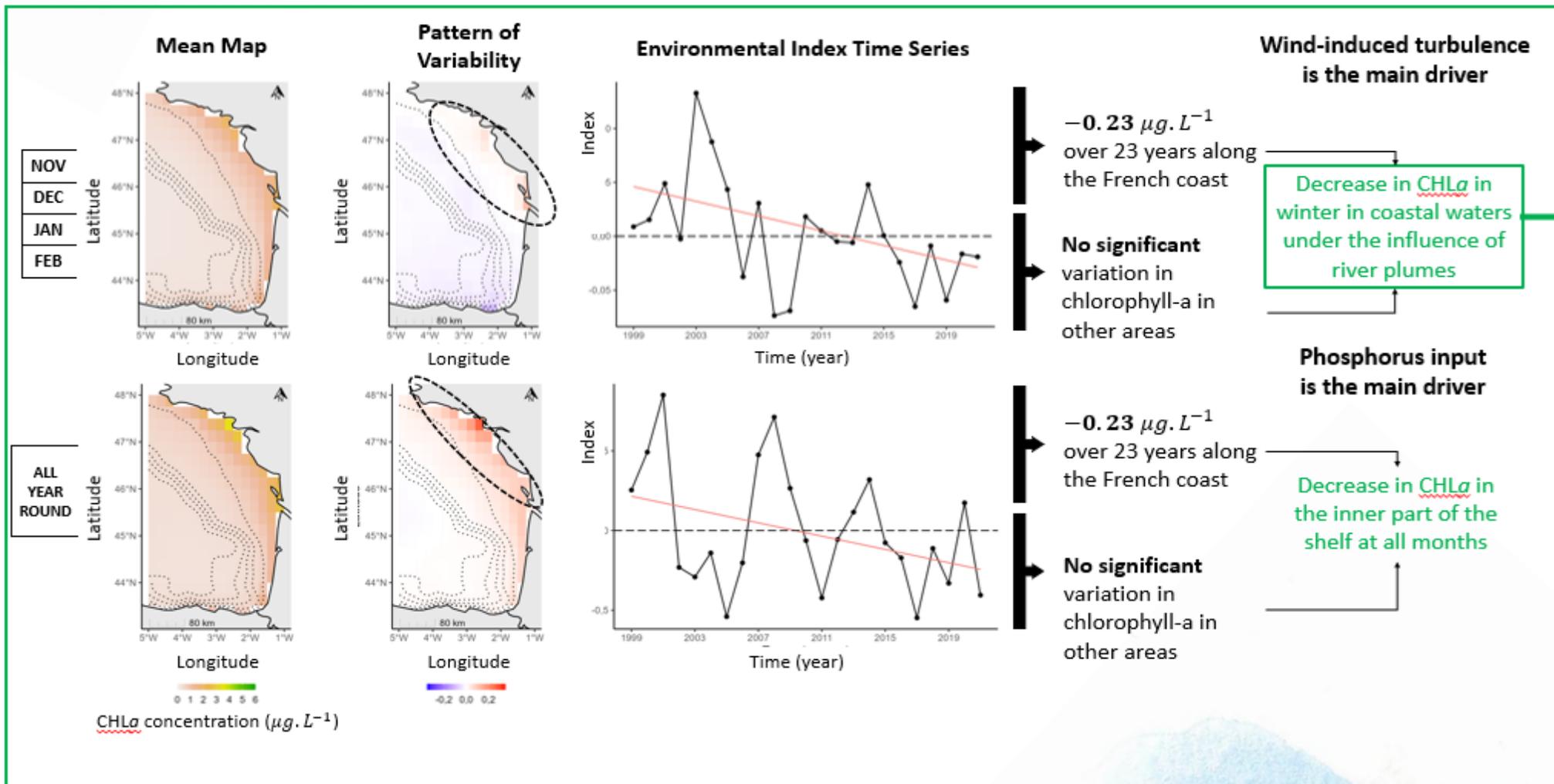
## SEA SURFACE TEMPERATURE



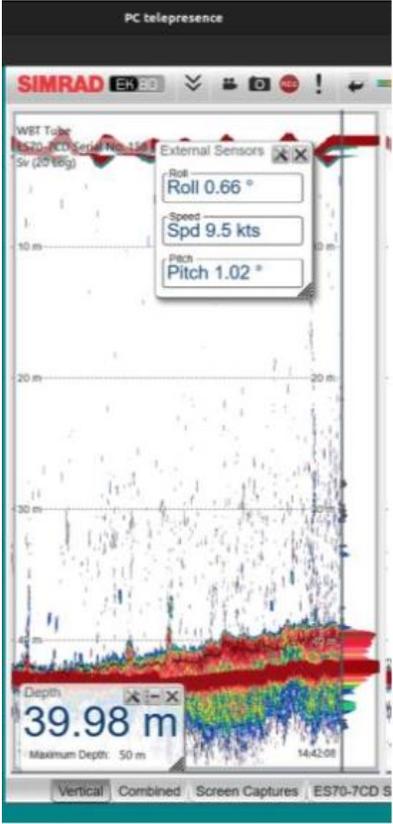
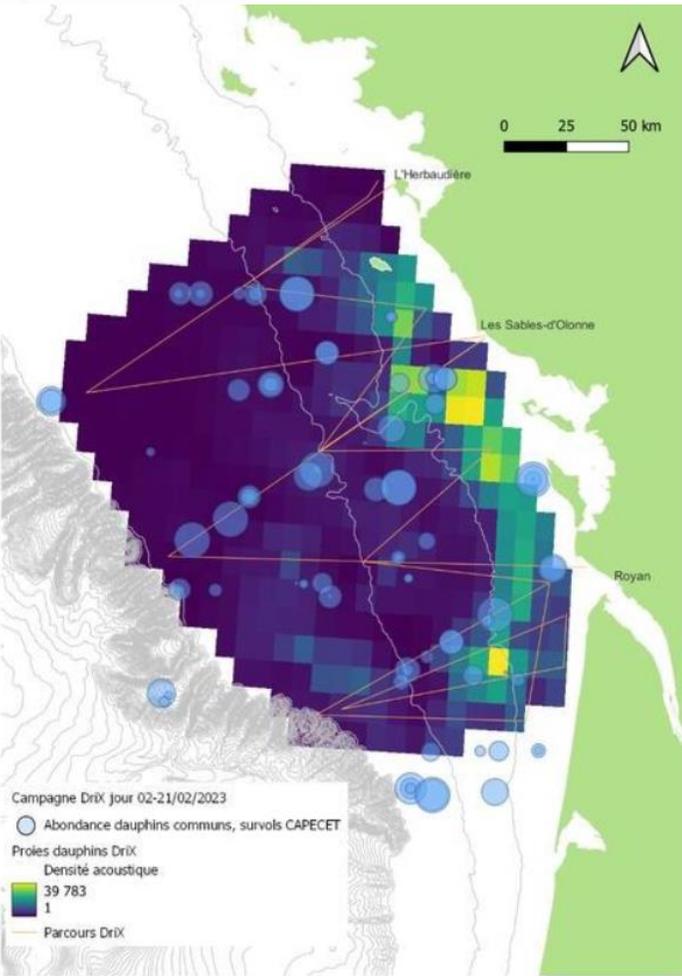
© B. Ozanam (Ifremer)

# Habitats evolution

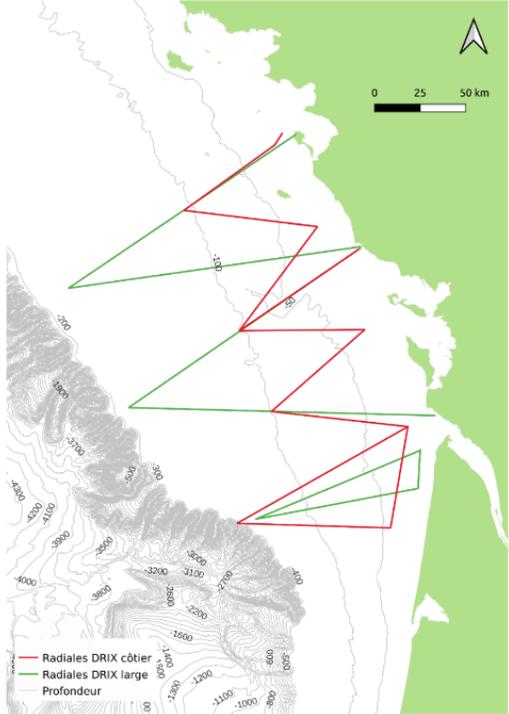
## CHLOROPHYLL-A



# Drix survey



exail



Detection of large, dense schools of small pelagic fish at the bottom of the water column (off Les Sables-d'Olonne and south of Yeu Island)

# Key points

Habitats evolution (2000-2020):

- Temperature increased (especially in coastal regions)
- Nitrogen flow and phytoplankton production decreased

During the winter season (2023), dolphins preys were detected at the bottom of the water column

# Fisheries and dolphins interactions



- To characterize the spatio-temporal and individual interactions of common dolphins with fishing activities and gear

## Methods development



## Data collection



## Data modeling



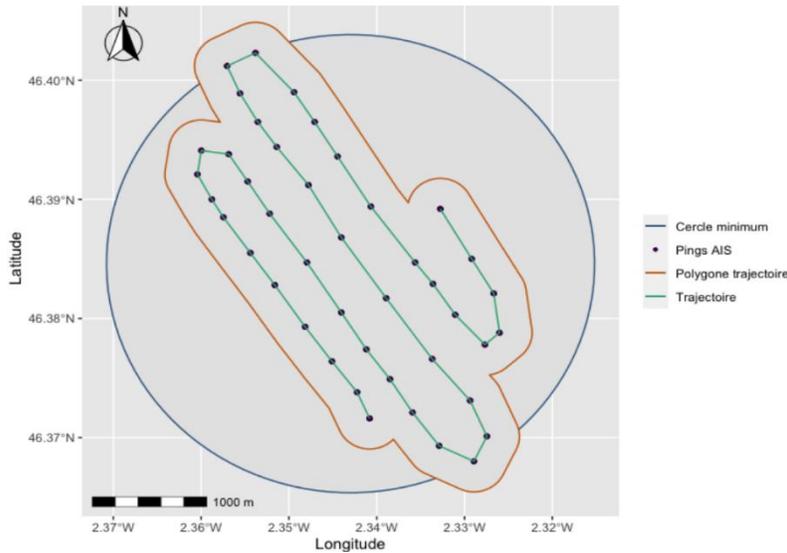
# Individual fishing strategies & fishing effort



ITras package

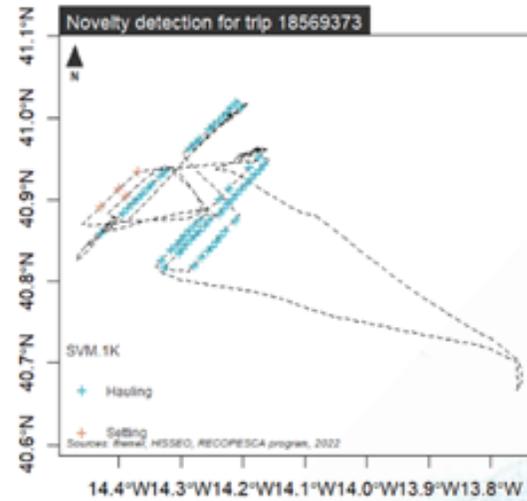


lapasca package



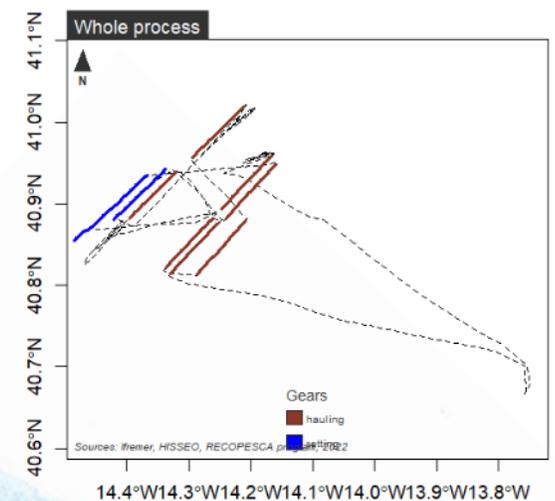
© J. Paillé (Pelagis)

## Vessel Fishing effort

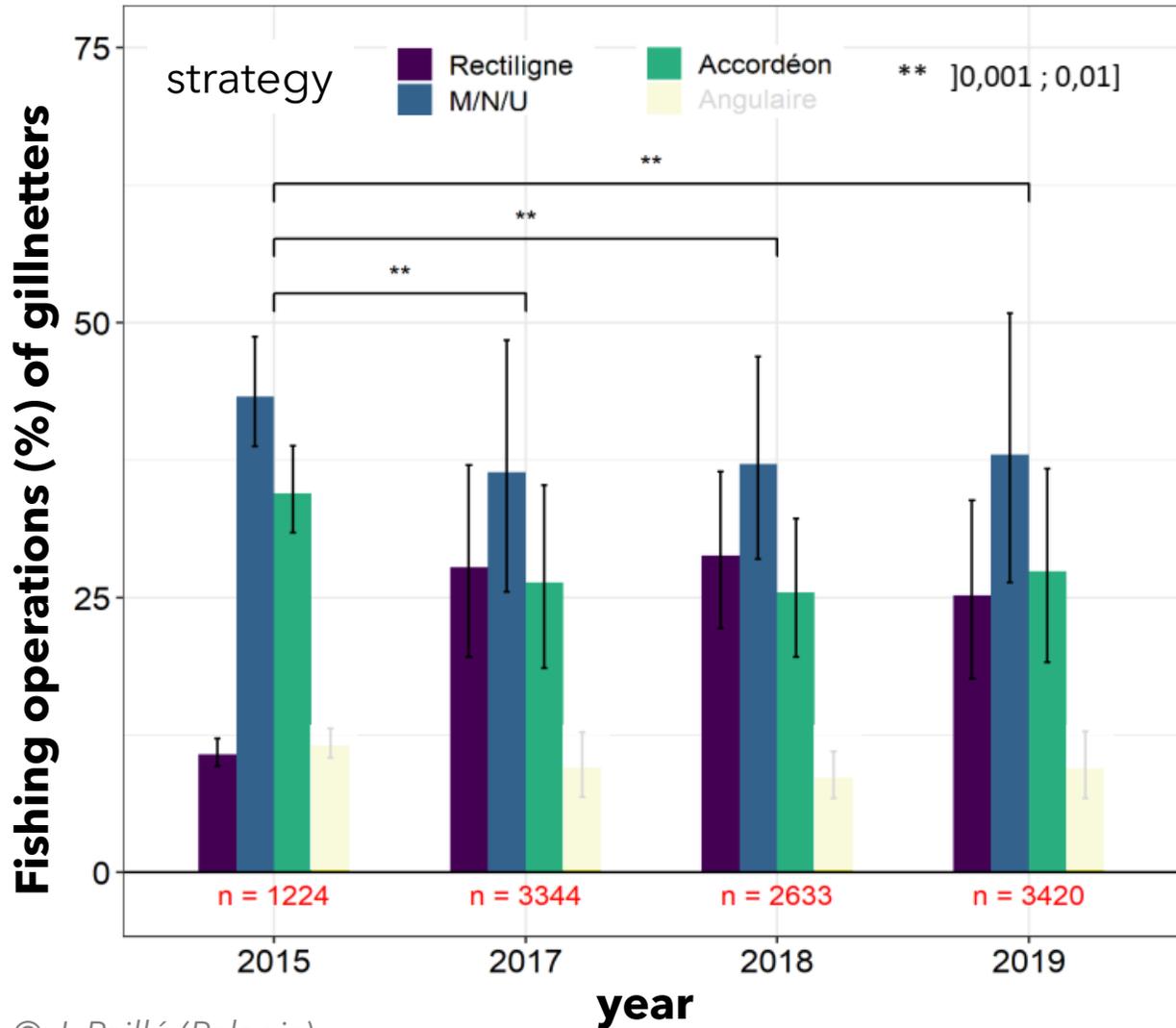


© J. Rodriguez (Ifremer)

## Gear Fishing effort



# Individual fishing strategies



- Prevailing strategy : straight



- Interannual variation within strategy



Increase of fishing operation (11% → 27%) since 2017

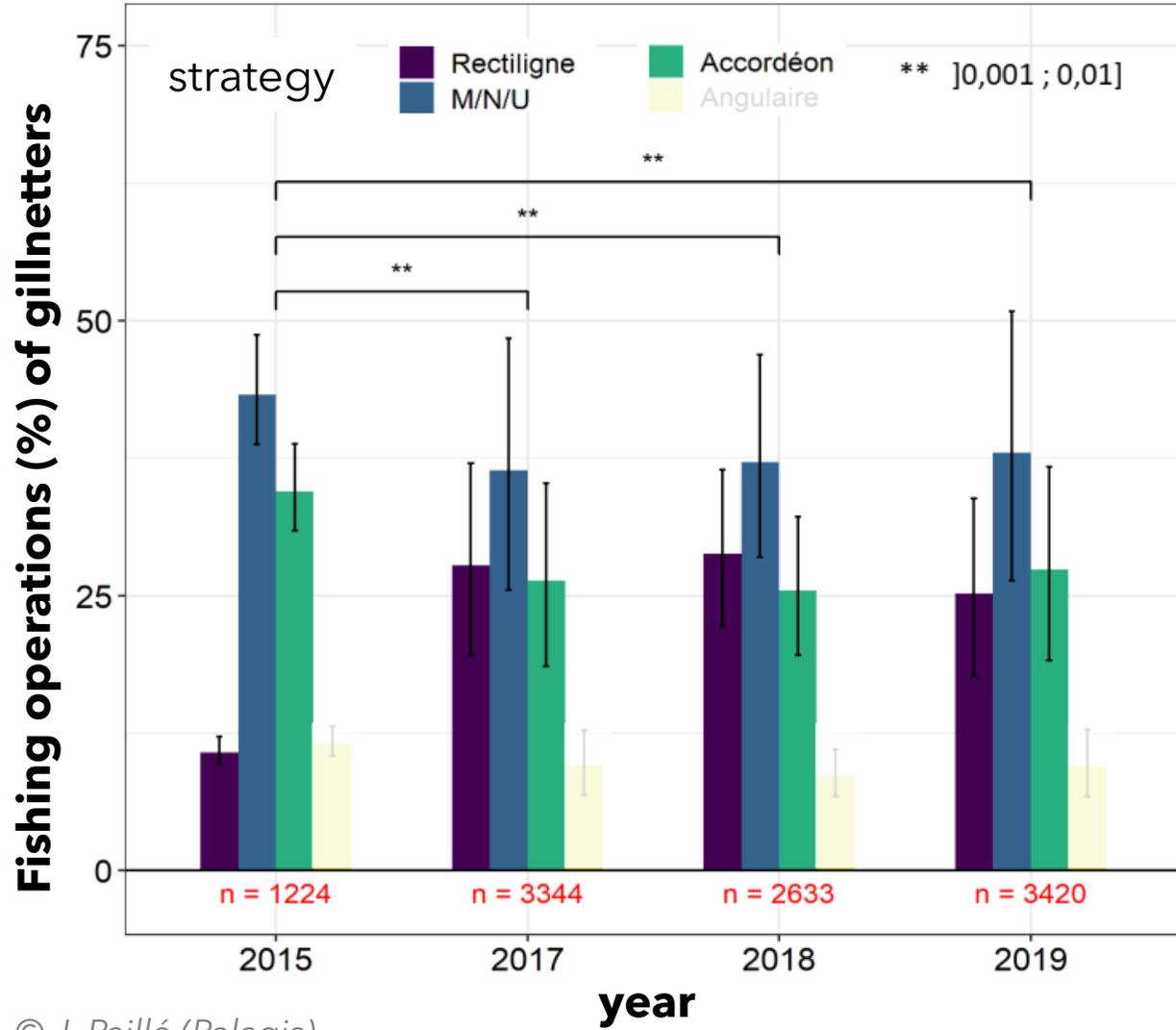


Decrease of fishing operation (43% → 37%) since 2017



Decrease of fishing operation (34% → 26%) since 2017

# Individual fishing strategies



- Prevailing strategy : straight
- Interannual variation within strategy



Increase of fishing quotas

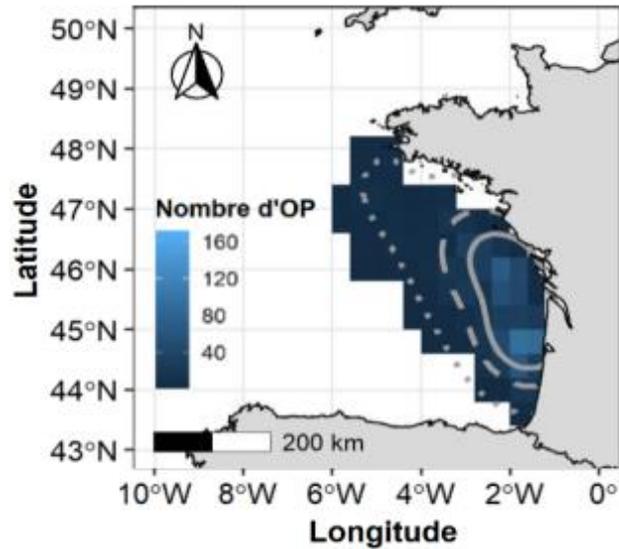


Annual catch limits

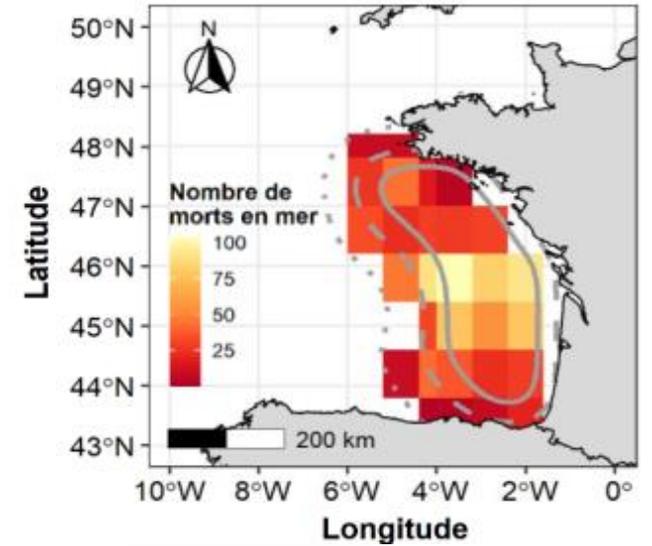
Shutdown period in winter

# Individual fishing strategies

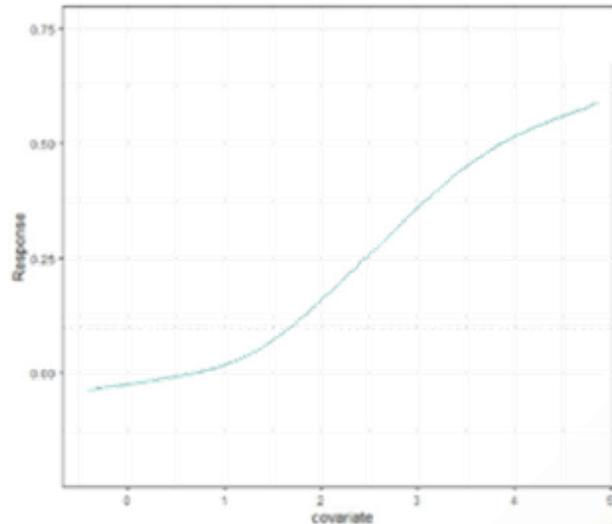
## Distribution of fishing operations



## Common dolphin mortality zone according to strandings data



## Spatial and temporal co-occurrence analysis (GAM)



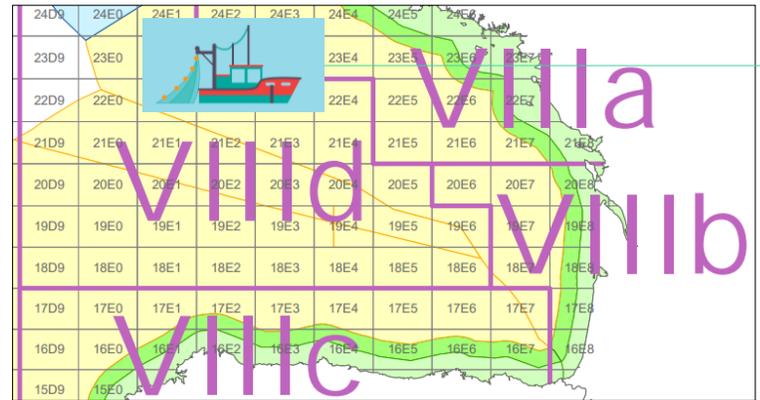
# Identification of annual fishing strategies

Landed taxa (sp, spp, family, order, isscaap code):  
 → fished taxa diversity  
 → weight and economic value of fished taxa  
 → main fished taxa

Vessel's characteristics



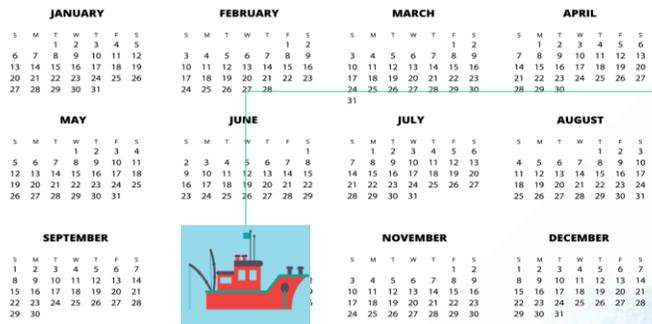
Spatial activity (ZEE, ICES areas, statistic rectangles, distance to the coast)



Fishing gears



Temporal activity (fishing effort, time at sea, main period of activity)

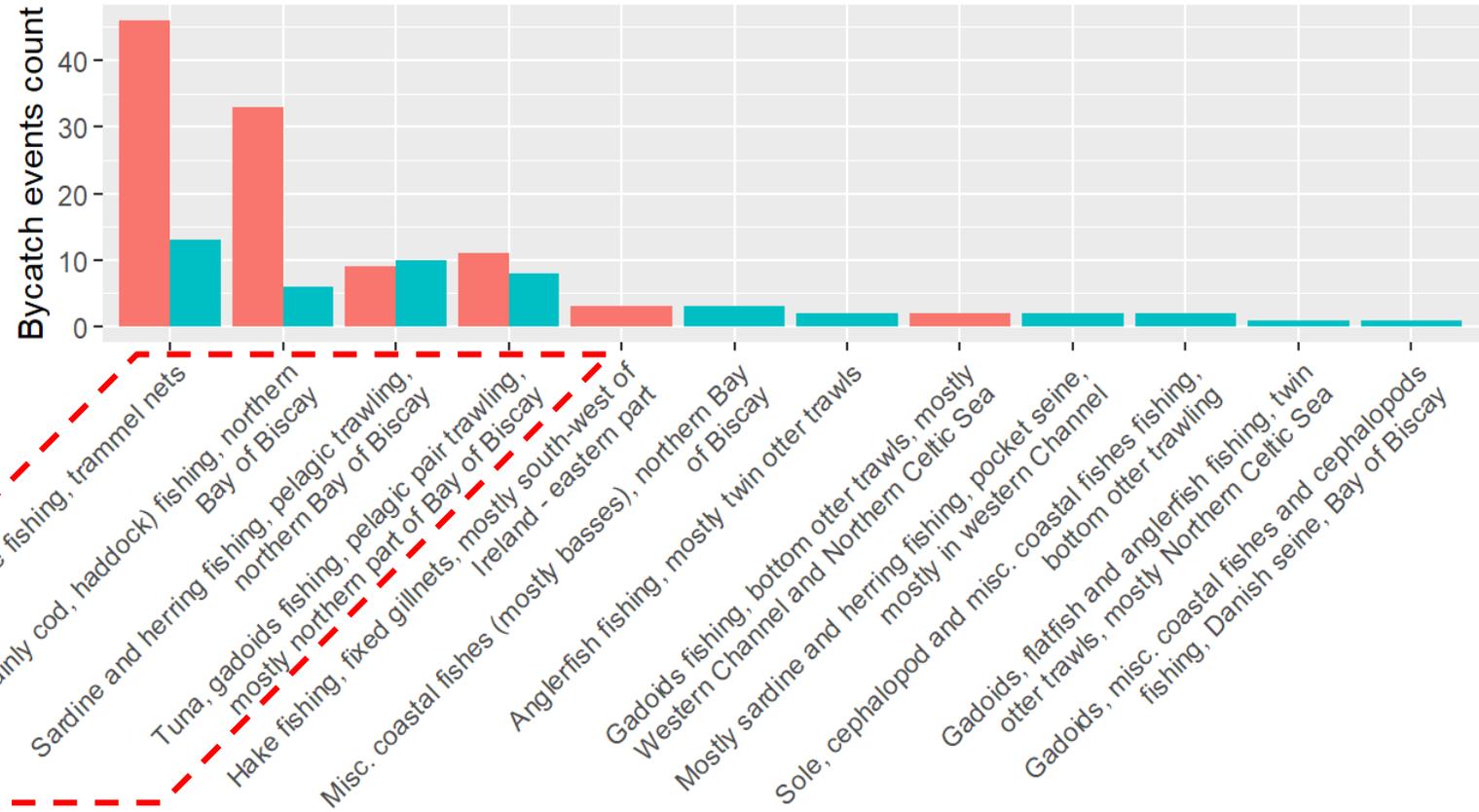


From fishing information to detailed yearly behaviours

# Identification of high-risk strategies

## Observation Program

- Fishermen Declaration
- OBSMER Program (on-board observers, based on voluntary participation of fishermen)

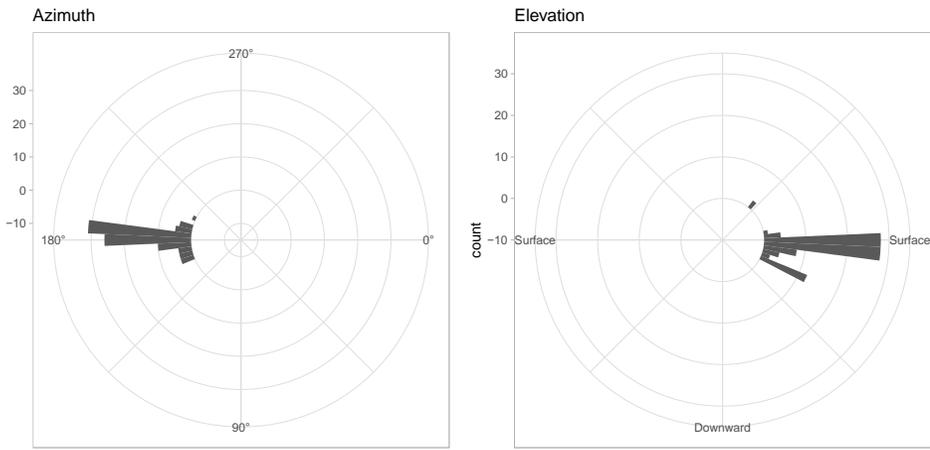
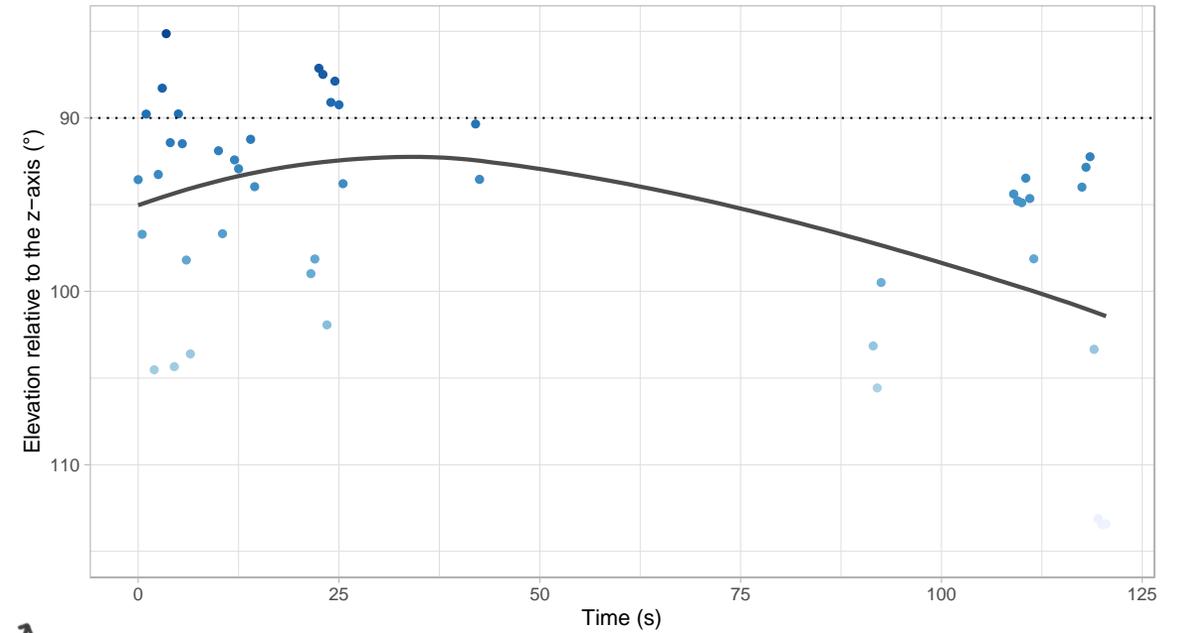


~90% of all accidental bycatch observations (2019-2022) included in these 4 strategies

Strategies with at least one accidental bycatch event (Common dolphin)

# Sphyrna survey

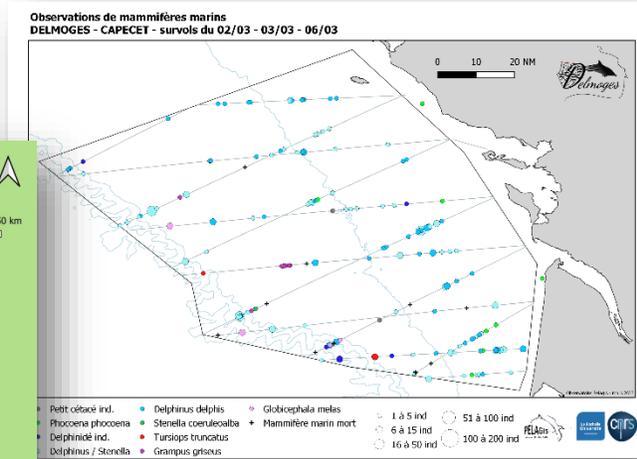
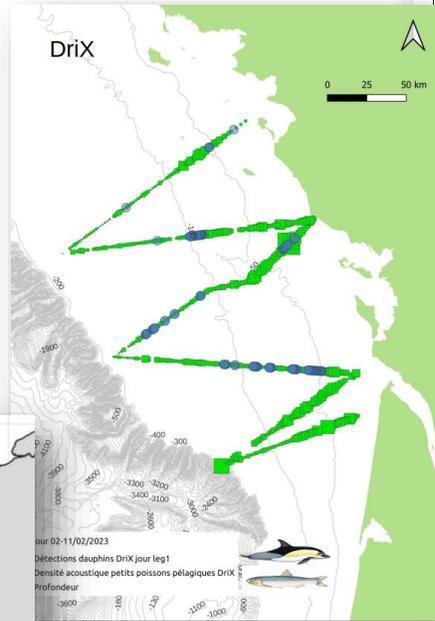
Characterization of dolphin individual behaviour near fishing vessel (acoustics)



© R. Failletaz (Ifremer)

# Risk mapping

Winter season  
2022-2023

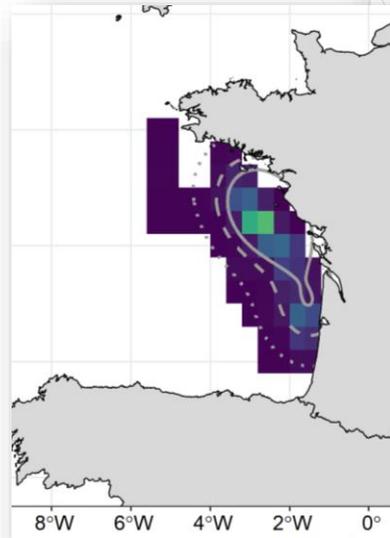


**CAPECET2**

This block features the text 'CAPECET2' in a bold, black font, enclosed in a rounded green border. To the right of the text are two black silhouettes: a whale breaching the water and a dolphin leaping.

**DriX**

This block features the text 'DriX' in a bold, black font, enclosed in a rounded blue border. To the right of the text are three black silhouettes: a submarine, a fish, and a dolphin.



**Fisheries**

This block features the text 'Fisheries' in a bold, black font, enclosed in a rounded green border. To the right of the text are two black silhouettes: a satellite in orbit and a fishing boat.

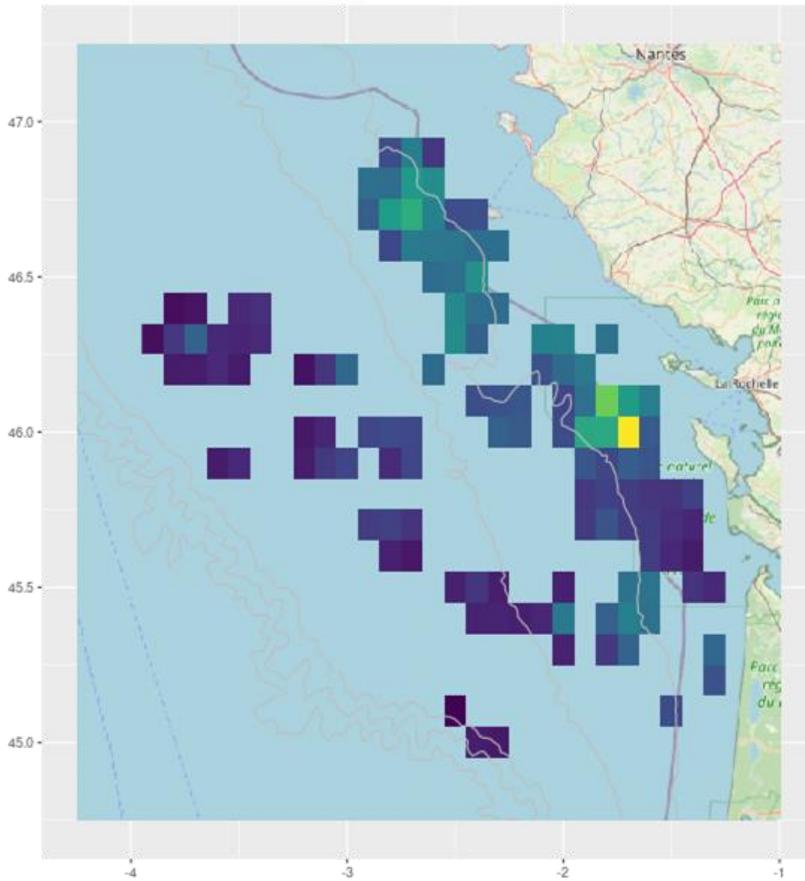
# Risk mapping

WP1

WP2

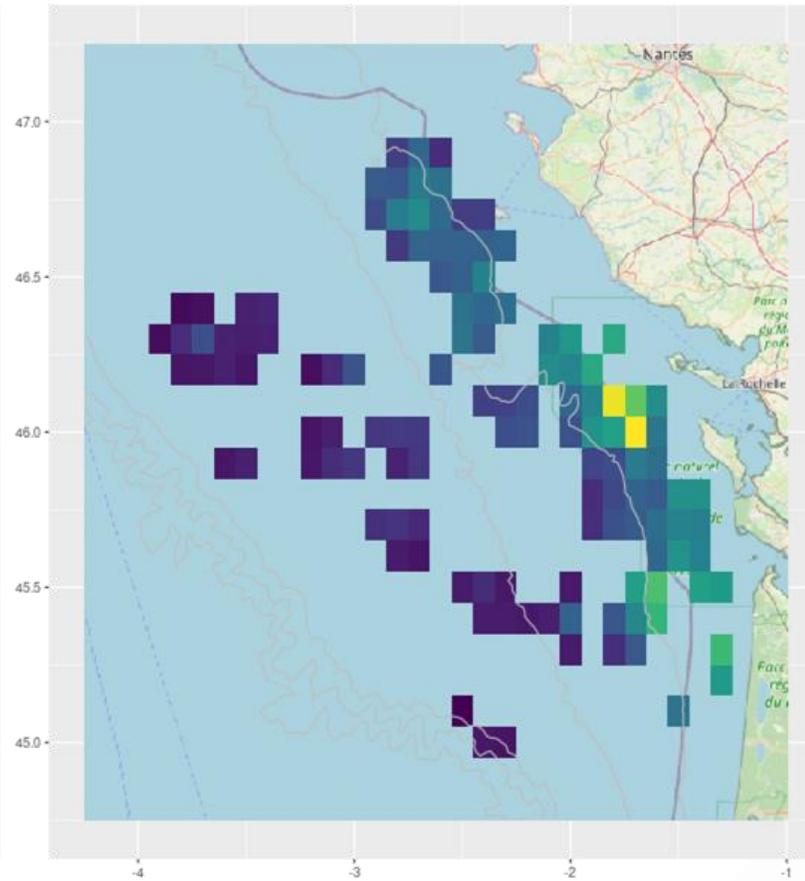
WP3

Preys density x common dolphins sightings x  
GFW gillnet effort, 02-11/02/2023



Dolphin bycatch risk (average) 0.2 0.4 0.6

Prey risk&density x dolphins sightings x  
GFW gillnet effort, 02-11/02/2023



Common dolphin bycatch risk (average) 0.1 0.2 0.3 0.4 0.5



Potential risk of capture on all continental shelves:

- higher risk at less than 100m depth, in a continuous zone along the 50m isobath, from the Gironde to Noirmoutier;
- lower and more dispersed risk between 100 m and the edge of the continental shelf.

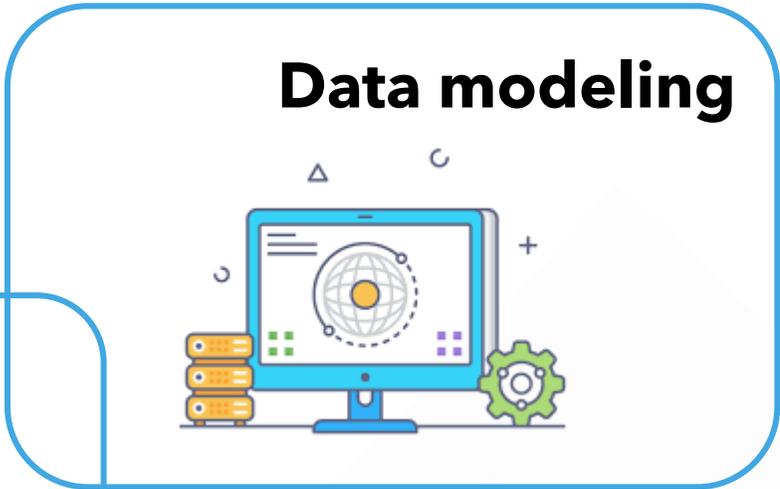
# Key points

- Highlighting of possible changes in fishing practices in the Bay of Biscay
- Co-occurrence between fishing operations and dolphin mortality
- Identification of high risk strategies and regions

# Fisheries and dolphins interactions



- Facilitate the co-construction of remedial measures and evaluate their performance according to multiple qualitative and quantitative criteria



# Incentives approaches

© JJ Boujart - Pelagis (La Rochelle Université / CNRS)

**INTERNATIONAL WORKSHOP**

*Delmas*



**POTENTIALITIES OF INCENTIVE-BASED APPROACHES TO REDUCE DOLPHIN BYCATCH IN THE BAY OF BISCAY**

16-17 March 2023  
Oceania Brest Centre hotel  
Brest,  
FRANCE

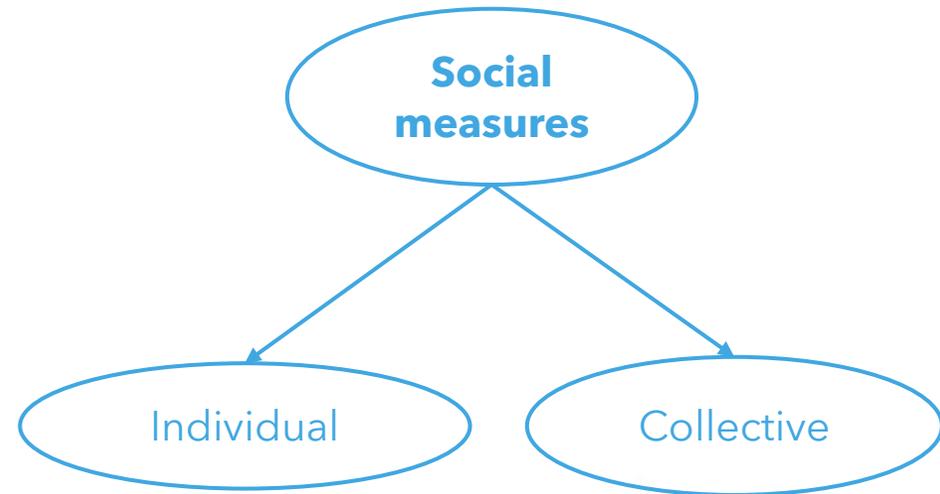
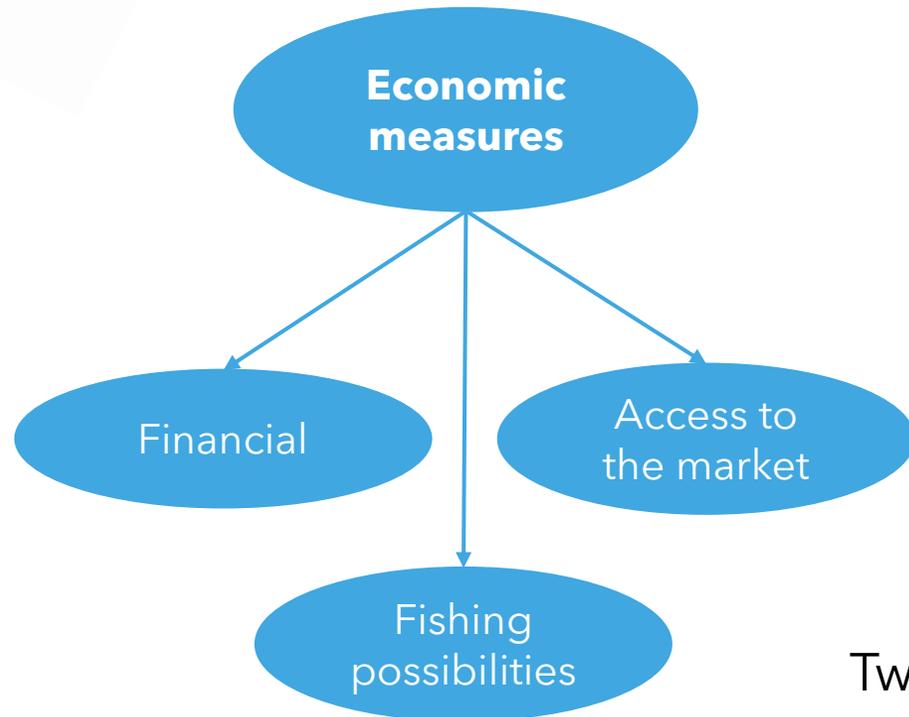
contacts:  
manuel.bellanger@ifremer.fr  
benjamin.dudouet@ifremer.fr  
olivier.thebaud@ifremer.fr  
sophie.gourguet@ifremer.fr

The poster features a background image of a boat's deck on the sea. A diagonal yellow and black stripe runs across the image. In the bottom left corner, there is a small image of a dolphin's head.



- Validate a typology of incentive measures
- Review international case studies
- Identify opportunities and obstacles
- Discuss the Bay of Biscay case study

# Incentives approaches



Two prerequisites:

- a credible threat
- detailed information on the conditions under which bycatch occurs

# Online platform



- Facilitate discussion and compromise
- Allow the general public to react to proposals
- Help implement remediation scenarios

# Key points

- Need for measures adapted to the environment
- Importance of maintaining dialogue with all parties

Thank you  
for your  
attention

