

On-board cameras to monitor marine mammal bycatch?

The OBSCAMe project on gillnetters in the Bay of Biscay



OBSCAMe
OBSERVATION ELECTRONIQUE



Context



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- **Intensification of strandings of small cetaceans** with evidence of bycatch since 2016/2017 in the Bay of Biscay - *Bycatch estimates of common dolphin for years 2019-2021 based on stranding data (all gears): 9040 individuals per year (ICES , 2023 ¹)*



- **Insufficient data from « traditional » monitoring systems** especially on gillnetters (on-board observers and fishermen declarations) in order to fully understand level and factors influencing bycatch
- **Preliminary study in 2020:** bibliographic review, french scientists and fishermen representatives interviews, benchmark of the different REM solutions => synthetis presented in november to fisheries, sea and environment Ministries, fishermen representatives and NGO

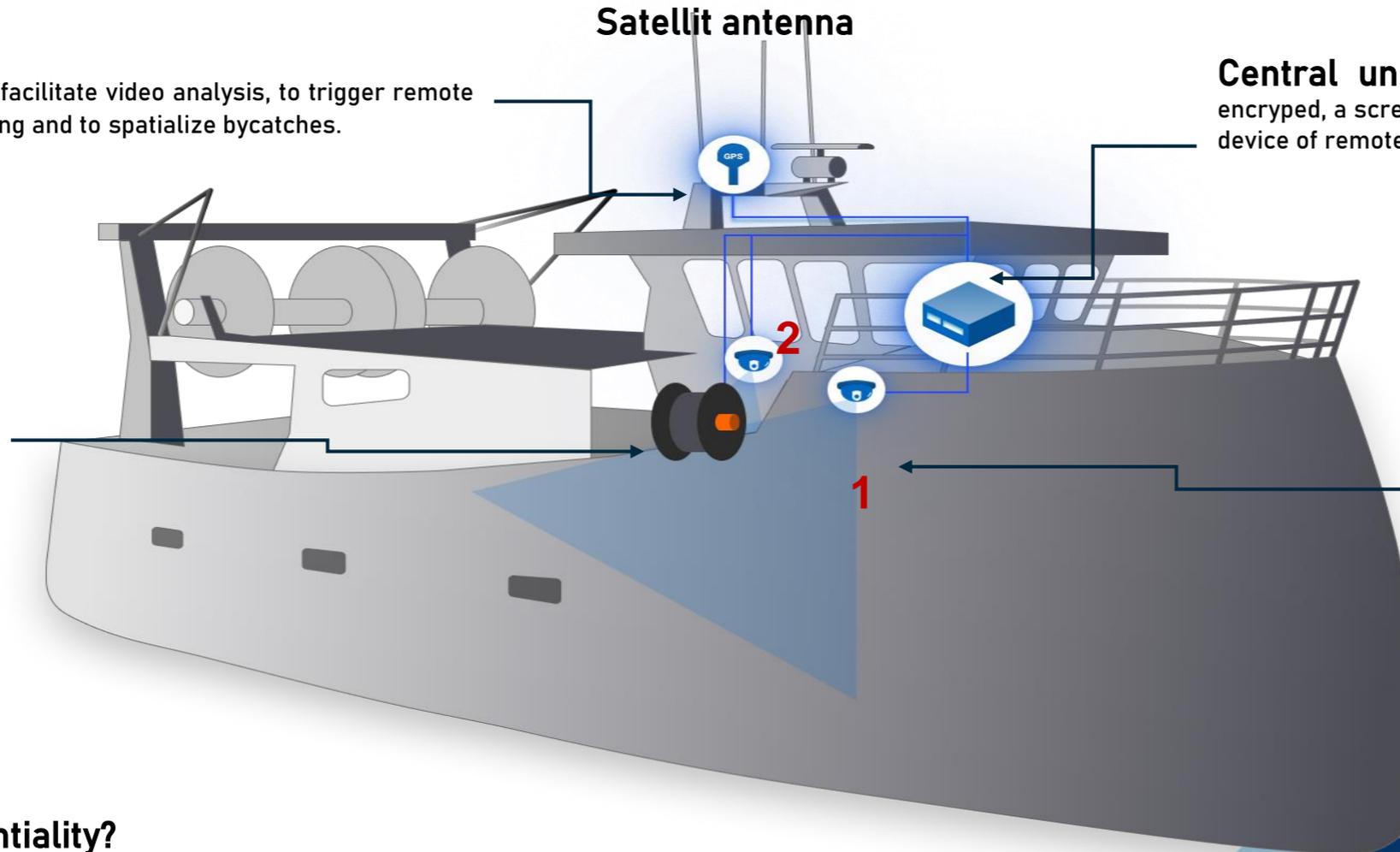
Remote electronic monitoring on french gillnetters?

Satellit antenna

GPS tracker : to facilitate video analysis, to trigger remote system/camera recording and to spatialize bycatches.

Central unit: data storage in the computer, the data is encrypted, a screen permits to check the correct operations of the device of remote system and cleanliness of the camera

A sensor on net hauler: to collect data on speed and power of the net hauler rotations, start and stop. These data help to better target the video sequences to be analyzed ashore and can be a trigger for the camera recording.



One (1) or two (2) cameras:
The first one is essential to record images when the nets is hauling on board along the hull. The second one helps to identify species and to do measurements and to get a more stabilized image. The acceptance of the 2nd one is more difficult for the crew even we engage ourself to delete images from the crew.

What about confidentiality?

All data are encrypted and only authorized persons (with dedicated software) are able to watch the video. We are careful of business secrecy (we don't publish any data of vessel position which could permit to identify the vessel concerned). We care about General data protection regulation - regulation (UE) 2018/1725) and the images of the are deleted or blurred.

* Few trips with observers on board

* 2 systems of data transfer: changing hard disk and/or 4G



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First phase

January to May 2021

➤ Test the feasibility of REM on 5 fishing vessels

Second phase

October 2021 to April 2023

➤ Experimentation of REM on 20 fishing vessels (volunteers)

OBSCAMe+

Soon to begin

Remote Electroning Monitoring (REM) on fishing vessels (gillnetters) in order to

- reinforce the observation of marine mammal bycatches ;
- test the scientific contributions of REM observations to better understand the interactions between gillnetters and marine mammals in the Bay of Biscay ;

Technical validation is done, some difficulties identified and improvements have to be implemented:

- difficulties with small vessels with little place in the cabin (no place to put the computer...)
- difficulties in video analysis during night fishing activity due to light overexposure
- unnecessary video volume (activation of the camera when vessels at anchor, adrift, underway, etc.) => seek to reduce unnecessary video time (focus on hauling)
- GSM transfer is validated only for small vessels (<24 hours trip)

OBSCAMe gillnetter fleet – phase 2 – 2021/2022



OBSCAMe
OBSERVATION ELECTRONIQUE

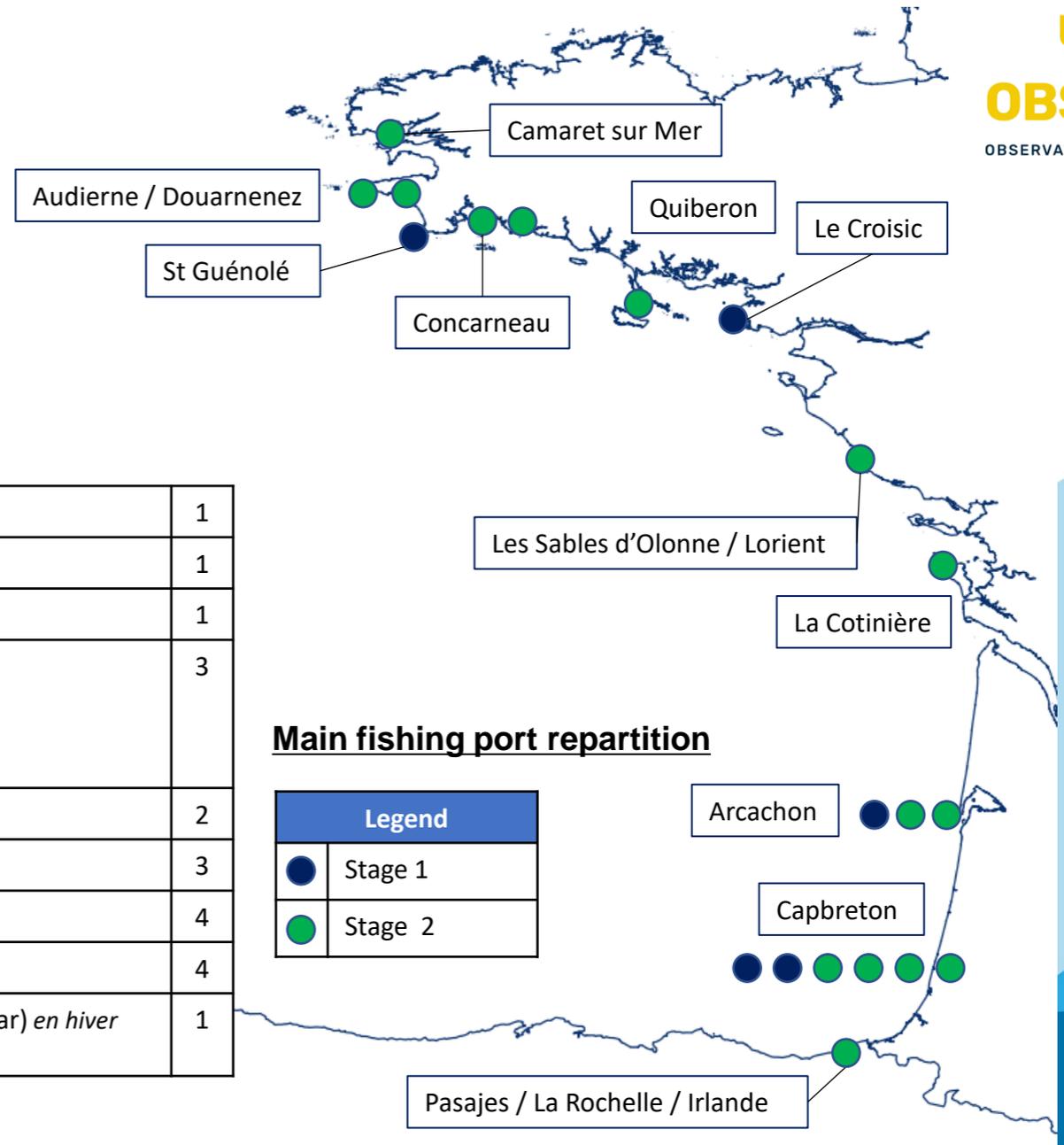
Vessel length

Vessel [24 m & more[1
Vessel [18 - 24 m[2
Vessel [15 - 18 m[2
Vessel [10 - 15 m[10
Vessel [8 - 10 m[4
Vessel]less than 8 m[1

Sub-fleet (winter 2020/2021)

Off-shore gillnetter Fileyeur du large	A merlus dominants	1
	A baudroies dominants	1
	A soles dominants	1
Mixed (off-shore and in-- shore) gillnetter Fileyeur mixte	A soles dominants	3
Costal gillnetters Fileyeur côtier	A lieux jaunes dominants	2
	A soles dominants	3
	A bars dominants	4
	A divers espèces côtières	4
Without data in winter 2020/2021 (no gillnets activity year) <i>en hiver 2020/2021)</i>		1

Vessel	Date of equipment
Vessel 1	20-jan 2021
Vessel 2	29-jan 2021
Vessel 3	18-feb 2021
Vessel 4	25-feb 2021
Vessel 5	30-march 2021
Navire 6	16-dec 2021
Navire 7	23-dec 2021
Navire 8	24-dec 2021
Vessel 9	04-jan 2022
Vessel 10	10-jan 2022
Vessel 11	12-jan 2022
Vessel 12	13-jan 2022
Vessel 13	14-jan 2022
Vessel 14	18-jan 2022
Vessel 15	19-jan 2022
Vessel 16	25-jan 2022
Vessel 17	25-jan 2022
Vessel 18	28-jan 2022
Vessel 19	21-april 2022
Vessel 20	12-july 2022



Main fishing port repartition

Legend	
● (Blue)	Stage 1
● (Green)	Stage 2

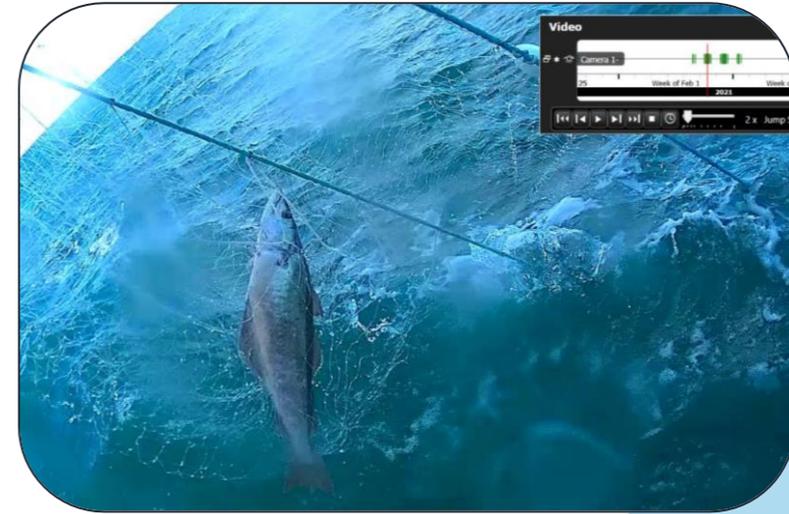
Unfortunately a shipwreck... not yet replaced
Some has shut down their cameras (actions plans, regulation and strike...)

Remote electronic monitoring on french gillnetters?

20 gillnetters already equipped

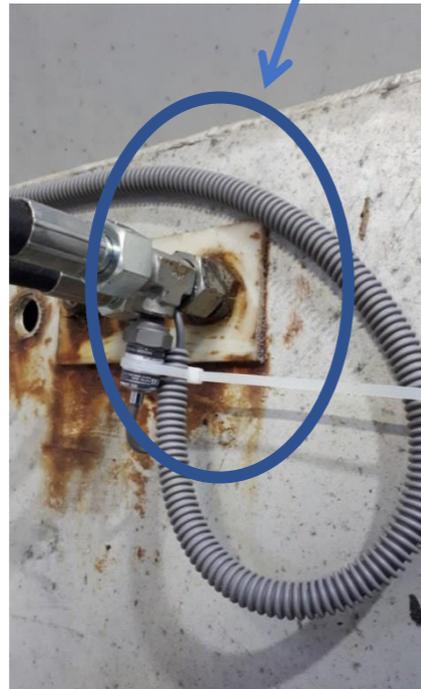


Video analysed on computer



Hydraulic net-hauler sensor

GPS tracker

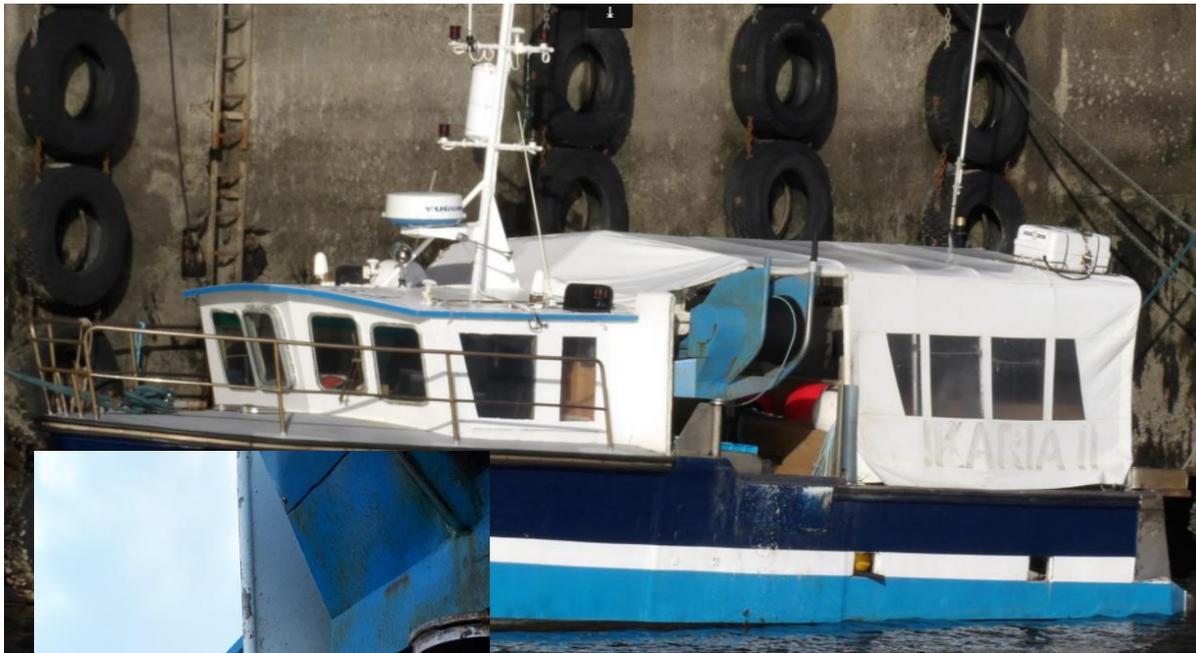


Images on screen control on dockside (below)

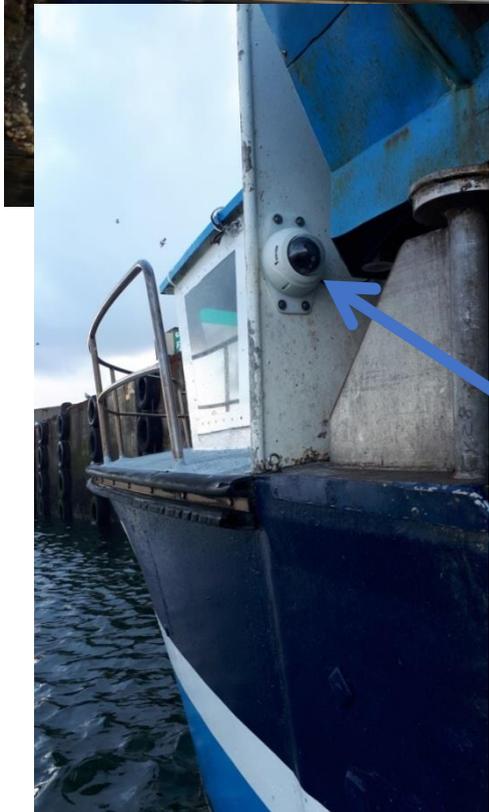
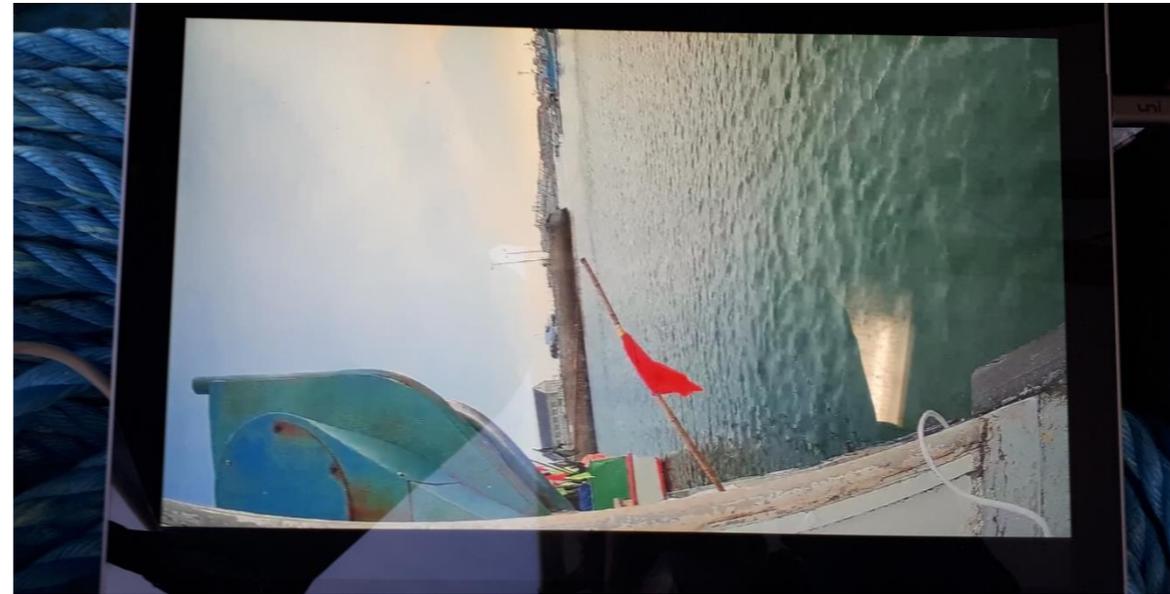


source: OBSCAMe (SINAY/OFB)

Remote electronic monitoring on french gillnetters?



Images on screen control



Camera

Different configurations tested



Source OBSCAMe (SINAY/OFB)

- * Different vessel configurations and metiers tested
- * Each installation (position of the camera, sensor or not, 1 or 2 camera) is discussed with the captain

First results on bycatch (results from January 2021 to November 2022)

20
vessels
(volunteers)*

> 3 760
days at sea
observed **

> 11 500
fishing
operations
observed (nets)

> 15 600
fishing hours
viewed
(hauling)

136
marine mammals
identified

Group or species	Number of individuals
Mysticete ***	1
Odontocete	7
Common dolphin (<i>Delphinus delphis</i>)	80
Harbour porpoise (<i>Phocoena phocoena</i>)	37
Common bottlenose dolphin (<i>Tursiops truncatus</i>)	3
Long-finned pilot whale (<i>Globicephala melas</i>)	1
Phocidae	2
Grey seal (<i>Halichoerus grypus</i>)	5

**+ at least 40
marine mammals
observed mainly
common dolphin
(60%) in december
2022 (on going analysis)**

Individual that couldn't be identified up to species

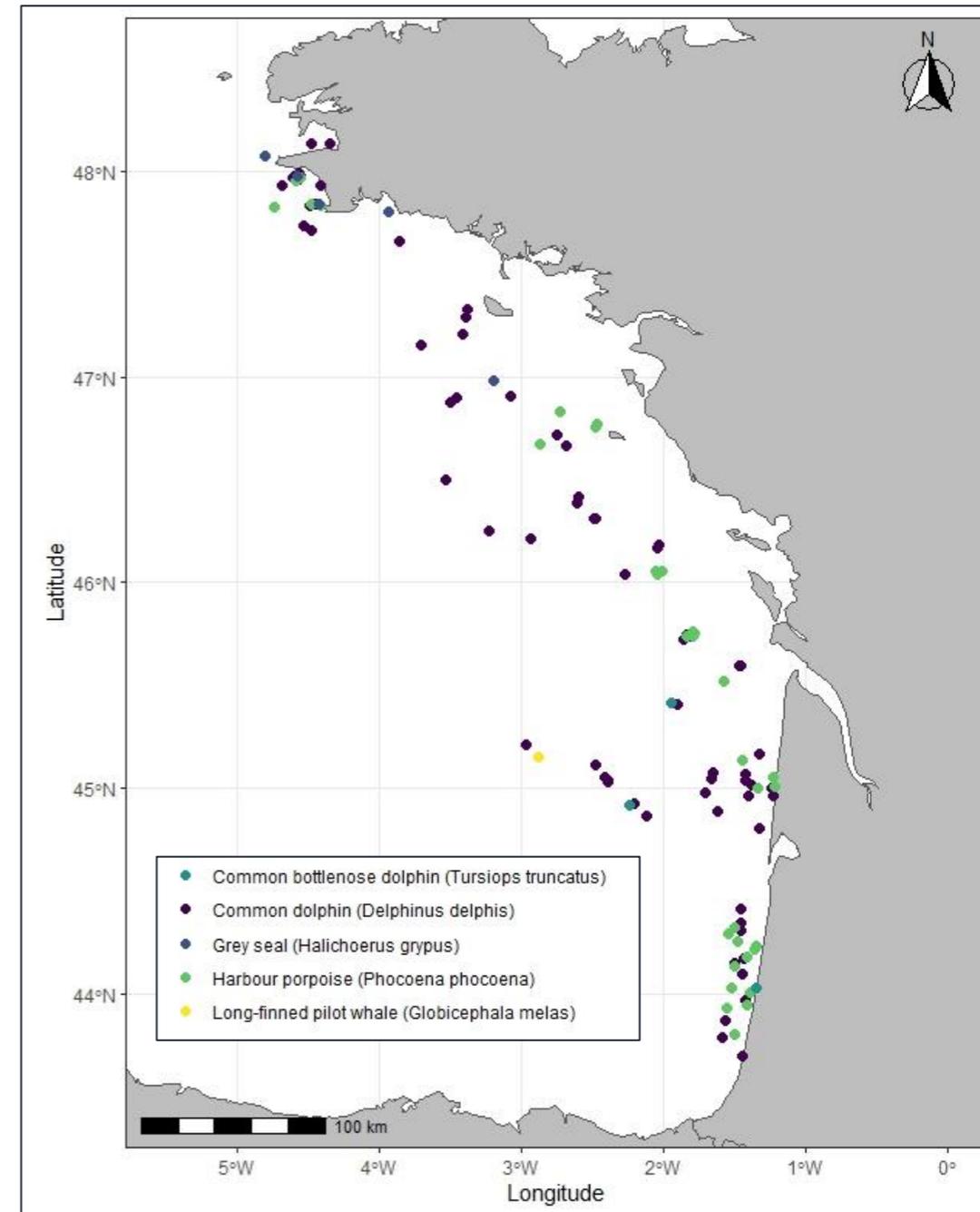
* Among them, one was shipwrecked

** Days at sea = number of calendar days on which fishing trips (with nets) are carried out

*** Very decomposed individual, probably not a bycatch

First results on bycatch (results from January 2021 to November 2022)

- Most of marine mammals were **fresh carcasses** (88%) and were caught by **GTR** (77%). GTR represents 53% of the fishing operations observed ;
- About 20% of the carcasses fell into the water and are not brought on board (may not have been observed on board by the crew or an observer) ;
- 17 vessels (out of 20) are involved in these bycatches (from 13% to 1% depending on the vessel) ;
- **Bycatch of other species** (seabirds, sturgeons, sharks, turtles) have also been observed. Those are not analysed since the project is focusing on marine mammals.



Spatial distribution of marine mammals identified to species on the OBSCAME project (until November 2022)

This distribution must take into account the fishing effort of the voluntary vessels (which may not be representative of the entire fleet in the Bay of Biscay)

First results on the interest of on-board cameras for marine mammal bycatches by gillnetters

Contributions

- REM validated on those fishing vessels with a good species identification rate for marine mammals (95%) ;
- Fishing activity monitored all the time: unlikely to miss a bycatch (unless technical problem) ; *winter 2021/2022: 5 cetacean bycatches observed by a dedicated observer program (target: 10% fishing effort observed) compared to 43 cetacean bycatches observed with REM (with less than 20 vessels equipped: under 10% of the fleet)*
- Existing database for the development of an automated algorithm to facilitate video processing.

... and perspectives OBSCAMe+ (april 2023 to april 2025)

- ❑ To **extend the monitoring to other marine protected species** (turtles, birds, sturgeon and marine mammals) and to a **hundred of gillnetters** at the end of 2023
- ❑ To **evaluate the effectiveness of technical devices** (such as pingers) with REM
- ❑ To develop with IFREMER an **automated algorithm to facilitate video processing** → **international scientific collaboration would be useful** – contact at Ifremer Lorient: robin.failletaz@ifremer.fr



THANK YOU FOR YOUR ATTENTION

A project in partnership with ministries, scientists, fishermen and their representatives – many thanks to all of them!

On-board cameras to monitor marine mammal bycatch?
The OBSCAME project on gillnetters in the Bay of Biscay

Context

- Intensification of strandings of small cetaceans with evidence of bycatch since 2016/2017 in the Bay of Biscay
- Bycatch estimates of common dolphin for years 2019-2021 based on stranding data (at least 1000 individuals per year (ICES, 2022))
- National Marine Strategy Framework: good ecological status not achieved due to bycatch for harbour porpoise and common dolphin in the Bay of Biscay (Sistler et al., 2019)
- Insufficient data from traditional monitoring systems especially on gillnetters (on-board observers and fishermen declarations) in order to fully understand level and factors influencing bycatch

The OBSCAME project

Remote Electronic Monitoring (REM) on fishing vessels (gillnetters) in order to:

- reinforce the observation of marine mammal bycatches;
- test the scientific contributions of REM observations to better understand the interactions between gillnetters and marine mammals in the Bay of Biscay;

illustrations of the REM system

Stages of the project

First phase (January to May 2021) → Second phase (October 2021 to April 2022) → OBSCAME+ (Soon to begin)

... and perspectives

- To extend the monitoring to other marine protected species (turtles, birds, sturgeon and marine mammals) and to a hundred of gillnetters at the end of 2023
- To evaluate the effectiveness of technical devices (such as pingers) with REM
- To develop with IFREMER an automated algorithm to facilitate video processing → international scientific collaboration would be useful

First results on bycatch (between January 2021 and November 2022)

20 vessels (volunteers)	> 3 700 fishing operations observed - > 11 900 fishing hours viewed (board)	136 marine mammals identified
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Most of marine mammals were fresh carcasses (88%) and were caught by GTR (77%). GTR represents 53% of the fishing operations observed;

- About 20% of the carcasses fell into the water and are not brought on board (may not have been observed on board by the crew or an observer);
- 17 vessels (out of 20) are involved in these bycatches (from 13% to 7% depending on the vessel);
- Bycatch of other species (seabirds, sturgeons, sharks, rays) have also been observed. Those are not analysed since the project is focusing on marine mammals.

... and on the interest of on-board cameras

Contributions

- REM validated on those fishing vessels with a good species identification rate for marine mammals (95%);
- Fishing activity monitored all the time: unlikely to miss a bycatch (unless technical problem);
- Existing database for the development of an automated algorithm to facilitate video processing.

and challenges

- Difficulties with remote video transfer for offshore fishing vessels;
- Difficulties in videos analysis during night fishing activity due to light overexposure;
- Unnecessary video volume (activation of the camera when vessels at anchor, adrift, underway, etc.).

More details poster ID n° 301 at ECS conference 2023

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