MAR TECH 16–18th June 2021

SILENCIO: Introduction of electric propulsion to small inshore fishing boats to reduce their impact in the environment

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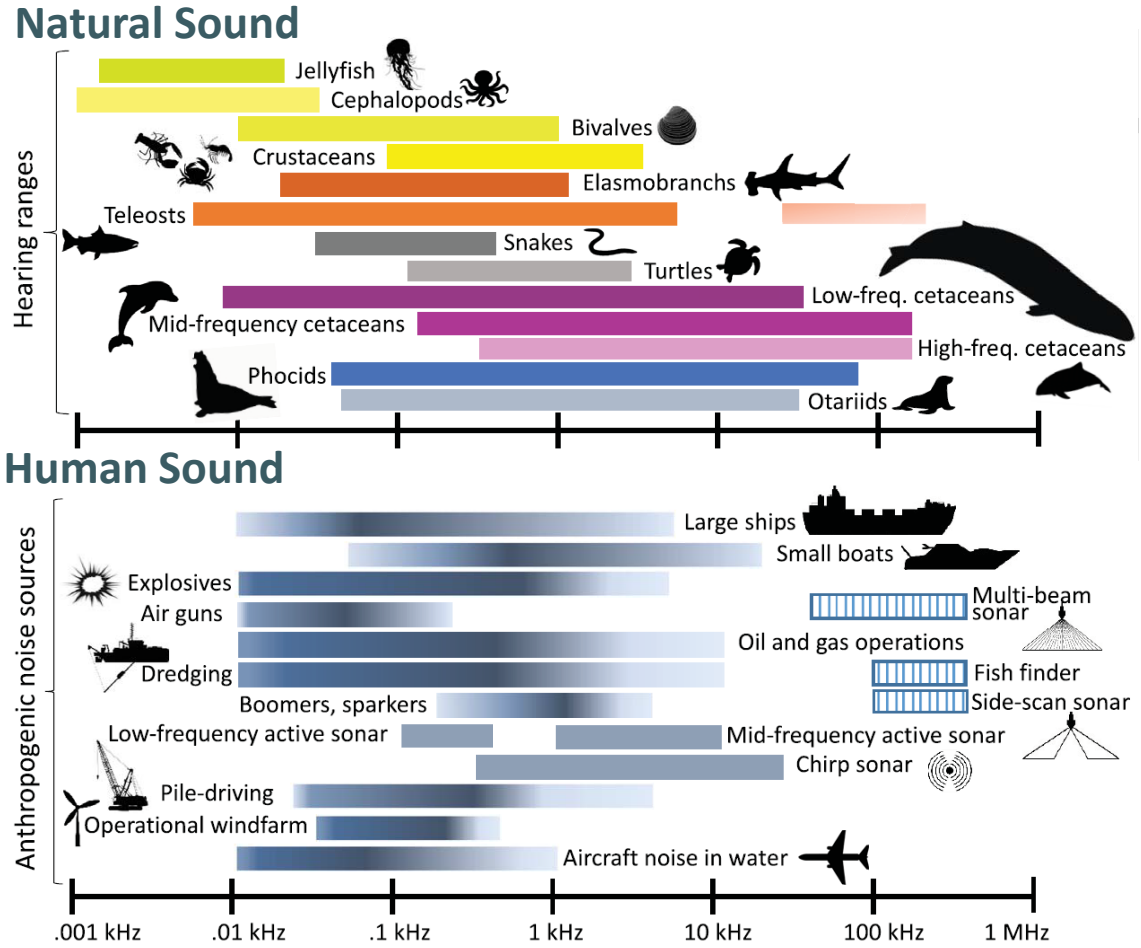
Silencio Project is performed by Unidad de Tecnologías Marinas from Centro Tecnológico del Mar, in collaboration with Fundación Biodiversidad, from Ministerio para la Transición Ecológica y el Reto Demográfico of Spain, by the Programa Pleamar, cofounded by EMFF .

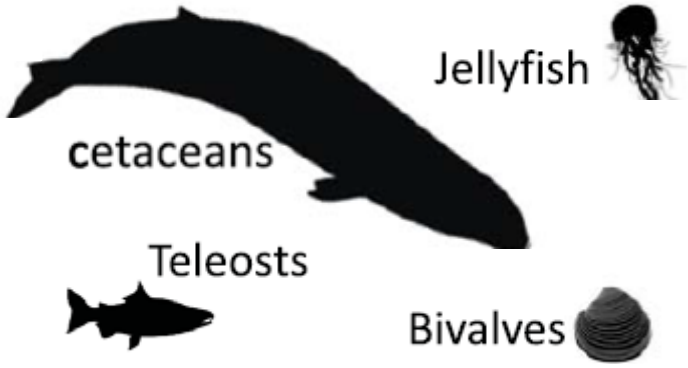
CONTEXT: HOW UNDERWATER NOISE IS.



Duarte *et al.*, Science 371, 583 (2021)

Human Activities are impacting in the biological and social functions of different animals:

- **Hearing**
- **Communication**
- **Behaviour**
- **Physiology**



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SILENCIO PROJECT

- **Different Policy Frameworks** (e.g. United Nations, European Union) **to support:**
  - Projects to improve the **knowledge of underwater noise** (MSFD, D.11)
  - Innovative solutions to **alleviate noise effects in the ecosystems**

- **SILENCIO is a project of Fishing Innovations funded by Fundación Biodiversidad** (MITERD) and **European Maritime and Fisheries Fund** (EMFF)

- **Main Goal** is to establish the bases for a **more sustainable and noiseless fishing and shell-fishing activities** contributing to **minimize their acoustic impact**

SILENCIO OBJECTVES

1. Improvement of knowledge about the **principal sources of marine noise in areas with high fishing and shell-fishing pressure** by the **characterization of the ambient noise in Rías Baixas,** an area exposed to significant inshore-fishing pressure and with special protection of natural values.

2. Development of **innovative and sustainable solutions to reduce the impact of fishing (and shell-fishing) activities** in the environment (noise and carbon footprint) by the assessment of the **use of electric propulsion by small inshore fishing boat.**

3. **Strengthening the fishing sector´s commitment** with the problem of **marine noise and** spreading the idea of an **environmentally sustainable, socially responsible and economically viable extractive sector.**

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CHARACTERIZATION OF UNDERWATER AMBIENT NOISE IN RÍAS BAIXAS (NW IBERIAN PENÍNSULA)

Silencio

Raia | Observatorio Oceanográfico da Marxe Ibérica
www.marnaraia.com

NATURA 2000
Marine ZEPA
Rías Baixas (ES0000499)

IcListenHF hydrophone (2016)

- Sampling rate: 51.2 kHz
- Recoding: 1 minute of raw data every 3 minutes
- Processing Data every 36 minutes: Sound Pressure Levels at 63 Hz, 125 Hz, 2 kHz and full band (EMFD)
- Results to Emodnet Physics Portal in real-time
- Raw data are downloaded every 2-3 weeks

EMODnet

Ría de Arousa

Cortegada platform

Oceanic and meteorological data since 2008

Why in Cortegada??

- Near to Parque das Illas Atlánticas
- Higher Energy Supply
- Very high fishing and shellfishing activities

ILLAS ATLANTICAS DE GALICIA
PARQUE NACIONAL

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The ambient noise records studied by

AtlantTIC Universidade Vigo — Multimedia Technology Group (GTM)

Development of an algorithm to detect natural and human sources of noise

CHALLENGES of PROCESSING the HYDROPHONE RECORDINGS	STRATEGIES to face CHALLENGES
High current flow noise dominates at low frequencies and makes automatic vessel detection difficult	Search for **robust indicators of vessel** presence
High noise from **impacts of sediments** carried by the current confused with the echolocation clicks of the dolphins	**Whistle detection**

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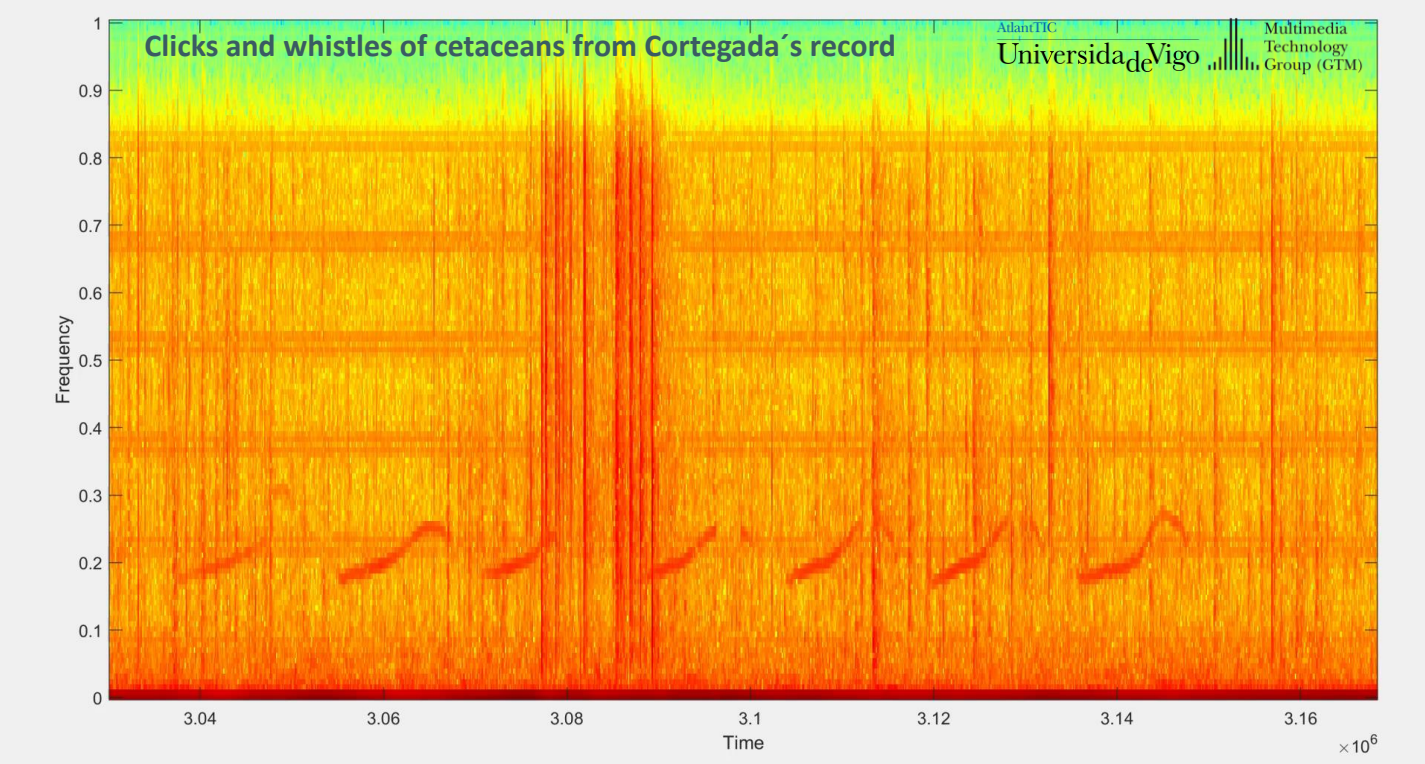

Online Repository will be developed to make available the Interesting Noise Events in the Cortegada´s record

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CHARACTERIZATION OF UNDERWATER AMBIENT NOISE IN RÍAS BAIXAS (NW IBERIAN PENÍNSULA)

- **Different actions to encourage and reinforce the TRANSFERENCE OF RESULTS to other COASTAL AND MARINE OBSERVATORIES**

Twin hydrophone

- compare the underwater sound record
- assess the capability of applying the algorithm to other noise records

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pt-PROTECMA

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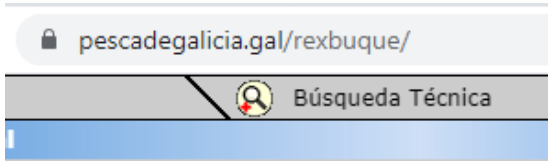
THE ASSESSMENT OF THE USE OF ELECTRIC PROPULSION BY SMALL INSHORE FISHING BOAT

- **Characterization of Galician inshore fishing fleet** by the use of the Register of Fishing Vessels
  - **Fishing guilds** that collaborated with SILENCIO
  - Boats up to **7 meters of length**
  - **Fishing gear**
  - **Engine power**



- Identify and typify the **more usual inshore fishing-activities**

- Some of them are being also **tracked by a GPS** device

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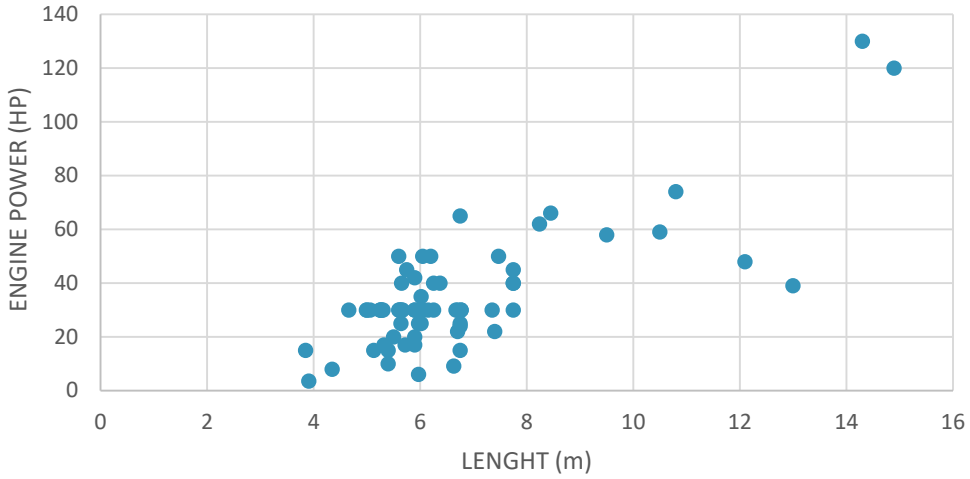
BAIONA DATA

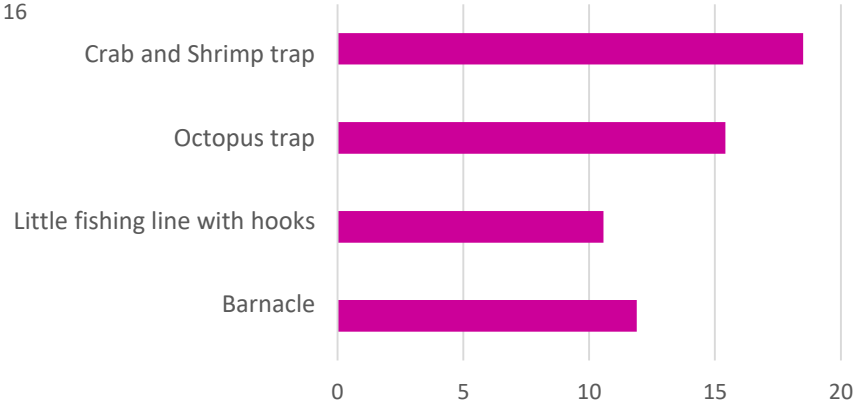


- **Boats: 71**
- **Lenght: from 3,85 to 14,9 m**
- **Engine Power: from 3,5 to 130 HP**

7m boats

Boats: 55 boats
Engine Power:
54 boats ≤ 50HP;
45 boats ≤ 30HP
20 boats ≤ 25HP

% Fishing gear



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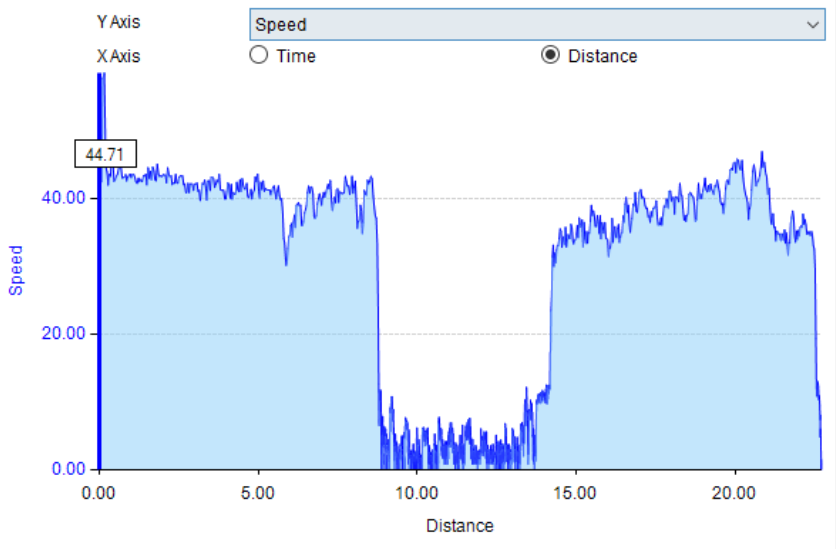
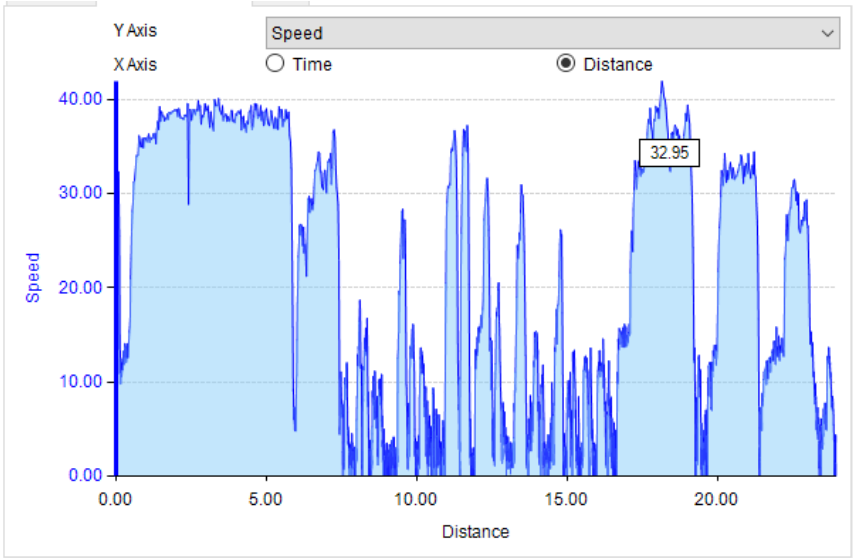


Barnacle 20€



Small fishing line with hooks 20€

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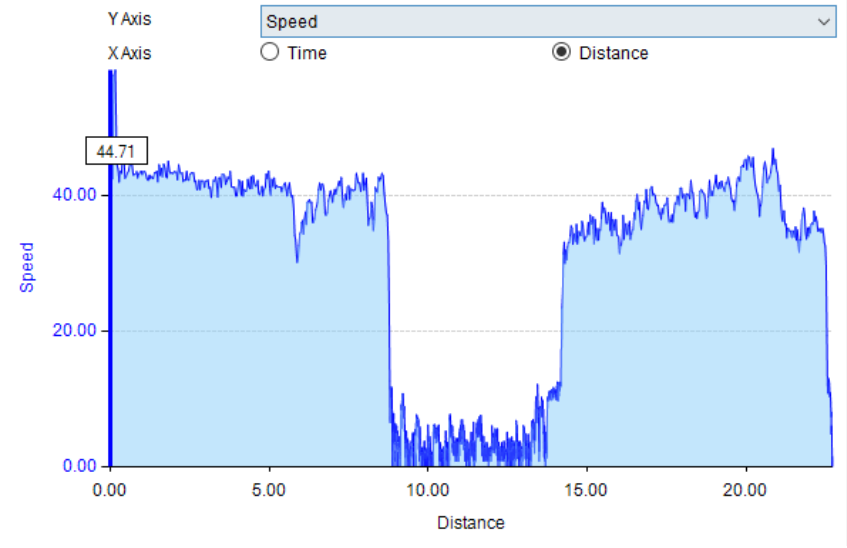
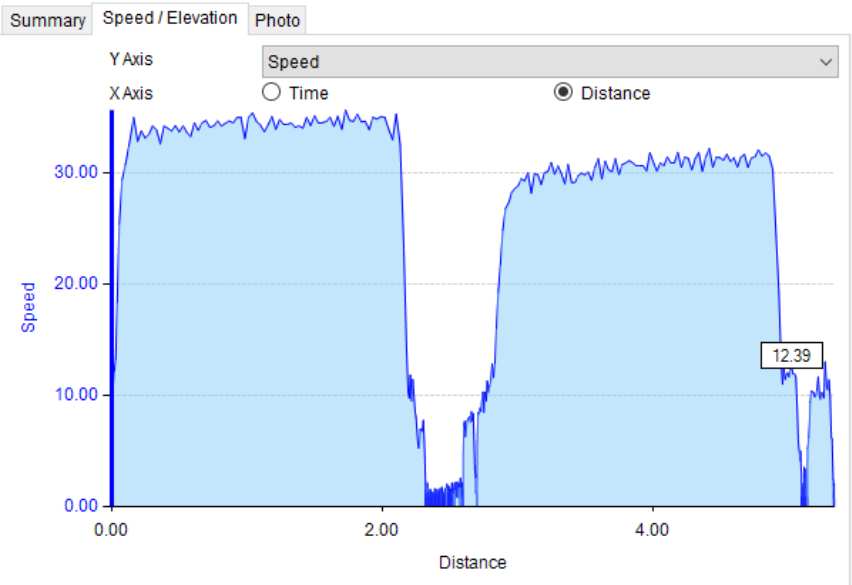


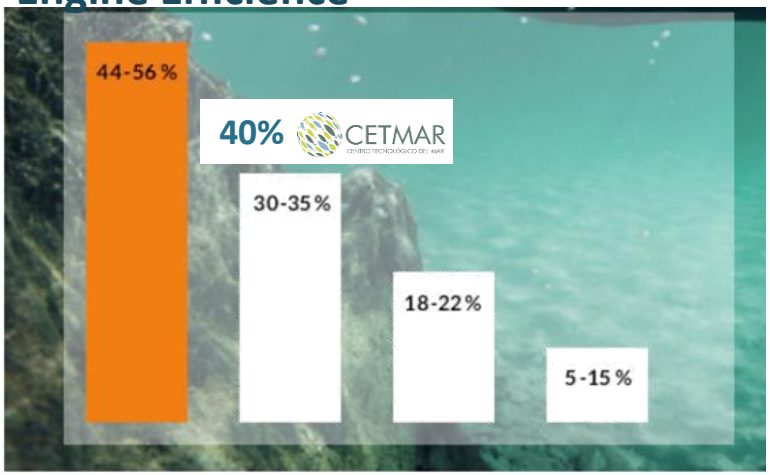


THE ASSESSMENT OF THE USE OF ELECTRIC PROPULSION BY SMALL INSHORE FISHING BOAT

- Some of these activities will be recreated by the use of some electrified outboard engines, developed in Silencio.

2 engines supplied by 70 (48Ah) volts with a power of 10-15 HP

Engine Efficience



Torqeedo | Motores fueraborda eléctricos convencionales | Motores de pesca | Motores fueraborda de gasolina

-Classic 25HP real power 3,75 HP

-Electric 10-15HP real power 4-6 HP

https://www.torqeedo.com/es

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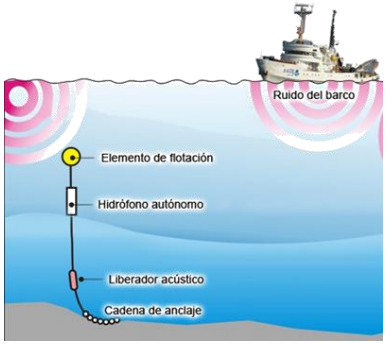
- Assess the **capability of current affordable technology to perform some of these fishing activities** attending to
  - autonomy
  - volume and weight of batteries
  - price
  - profitability
  - Etc.

- **Some experiencies** will be recreated to **cuantify the noise and carbon footprint reduction**



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THANKS!!!!

GRAZAS!!!

GRACIAS!!!!

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REMEMBER JOINING US NEXT 22nd JUNE

Jornada "Retos tecnológicos para la monitorización y reducción del impacto del Ruido Submarino"

22 de Junio de 2021, 10h
Online (Zoom)

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