

Photo: JONAS partner Instituto Hidrográfico and the Portuguese Navy launch a monitoring buoy, to which a JONAS hydrophone is attached.



Joint Framework for Ocean Noise in the Atlantic Seas

Project Newsletter

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*Newsletter designed by Amy Dozier,
WP2, MaREI, University College Cork*

Another Year Draws to a Close!

JONAS (Joint Framework for Ocean Noise in the Atlantic Seas) is delighted to bring you our third project newsletter covering our research progress over 2021. In the following pages you'll find updates from our researchers on the work they've been conducting, along with communications highlights.

We still have many exciting things to come as we enter the final year of the project, including upcoming publications, workshops, and the launch of our Virtual Research Environment on underwater noise. To keep up to date in 2022, make sure to follow us on Twitter ([jonas_project](https://twitter.com/jonas_project)) and to check our website news section!

We hope you enjoy this summary of our activities and that you have a very happy 2022.

The JONAS Team





JONAS hydrophone awaiting deployment

New Hydrophone Deployed

In Spring, partners at Instituto Hidrográfico launched a hydrophone in Portuguese waters with the assistance of the Portuguese navy. This device was attached to an IH buoy and will record ambient underwater noise to determine what species are present. The hydrophone is expected to be recovered early next year, after which the recordings will be analysed to provide data for risk mapping.

JONAS Billboard

Our billboard at Brussels Airport – which we received as a prize at last year's .eu Web Awards – was up for three months in Spring and was seen by thousands of people. We hope that it has encouraged more people to visit our website and learn about the issue of underwater noise!



Welcome New Staff!

Susanna Quer Marine Scotland Science

"I recently joined Marine Scotland Science as a Marine Mammal Scientist; part of my role is to support several INTERREG projects that MSS are involved in, including JONAS. I hold a BSc in Biology from the University of Barcelona and an MSc in Applied Marine and Fisheries Ecology from the University of Aberdeen in Scotland. I have experience working on projects looking to better understand the interactions between human activities at sea and marine species, particularly marine mammals and seabirds. Previously I have worked within several universities and organizations, including, most recently, the Catalan Government within the Marine Affairs and Fisheries department, where I was working on coastal protection and protected species lists. Within JONAS I will be responsible for providing support to the deliverables that MSS are responsible for, which includes one of the case studies in Work Package 8."

Giulia Spadoni University of Algarve

"I graduated in Natural Sciences from the University of Rome La Sapienza and continued my studies in France, attending the two-years master course "Biodiversity, ecology and evolution" taught by the University of Bordeaux. My main areas of interest are conservation of biodiversity and marine biology, this last one with a special focus on marine mammals and the ecology of these species. Before joining the JONAS project, I worked on the CETUS project at MARE-Madeira center, where I collected data and built a photographic repository of cetaceans in Madeira's waters. It is in this context that I got involved with the JONAS project at the University of Algarve and joined it in March 2021. Within Work Package 8.3 I am responsible for the production of species distribution maps and making the connection between underwater noise and its impacts on marine species."

Jessica Giannoumis MaREI, UCC

"With a diverse background in marine governance and coastal and marine management, and my unwavering excitement for the ocean I am delighted to be joining the JONAS project at MaREI, UCC. I hold a MSc in International Environmental Studies from the Norwegian University of Life Sciences where my research focused on the governance of underwater noise pollution and a BA in Media Science from the University in Oslo, and am an experienced Marine Mammal Observer. As project manager, I have worked on the ProtoAtlantic project (INTERREG AA), focussing on developing marine-based innovation ecosystems, and the COAST project (INTERREG NPA), looking at using innovative solutions such as drones to enable sustainable development in coastal regions. I will be joining the project management team."

PAM2Py

A new JONAS tool for passive acoustic monitoring in Python using PamGuide, developed by SiPLAB.

DOWNLOAD FREE AT WWW.JONASPROJECT.EU

Pam2Py: A New Tool for Passive Acoustic Monitoring

Ricardo Duarte, Orlando Rodríguez and Sérgio Jesus, University of Algarve

Accurate ocean sound monitoring requires an endless number of continuous recordings, which can only be achieved by the cooperation between different teams. However, exchanging data can be extremely sensitive and requires various considerations in order to enable comparison of results between institutions, including a complete technical description of the data being shared, any privacy issues, and evidence of calibration to a common standard.

Effective acoustic data sharing will only succeed if: a) there is a simple mechanism to manage privacy concerns, e.g. by enabling the exchange of essential statistical quantities derived from the original raw data; b) contextual information and acoustic data are packed together; and c) transformation from raw data is standard and supported by open-source code running in open platforms. These factors led us to develop **PAM2PY**, an open-source and open-code tool that encourages and facilitates the exchange of acoustic data between institutions and consequently promotes collaborative ocean sound monitoring.

Developed by researchers at the University of Algarve's **SiPLAB**, Pam2Py enables users to analyse underwater sound recordings using **PamGuide** in **Python**. Because our code is written in the open source Python language, PAM2Py is license free and independent of proprietary software (such as Matlab). Learn more about PAM2Py at and download it for free on our dedicated page.

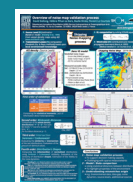
[Download Pam2Py](#)

[Learn about PamGuide](#)

Coordination Update

Pauhla McGrane, MaREI, University College Cork

2021 solidified our collaboration and cooperation with a number of other projects. This year we signed a Data Sharing Agreement with the **MARPAMM** and **COMPASS** projects, as well as a Memorium of Understanding with the **Blue Cloud** project. We also established an international **Transnational Advisory Committee** to support governance, oversight and external cooperation across underwater noise research, with Niels Kinneging (of the **JOMOPANS** project) serving as Chair and with representatives from TG Noise, OSPAR, and more. The TAC will increase harmonisation across underwater noise projects in Europe and their outputs.

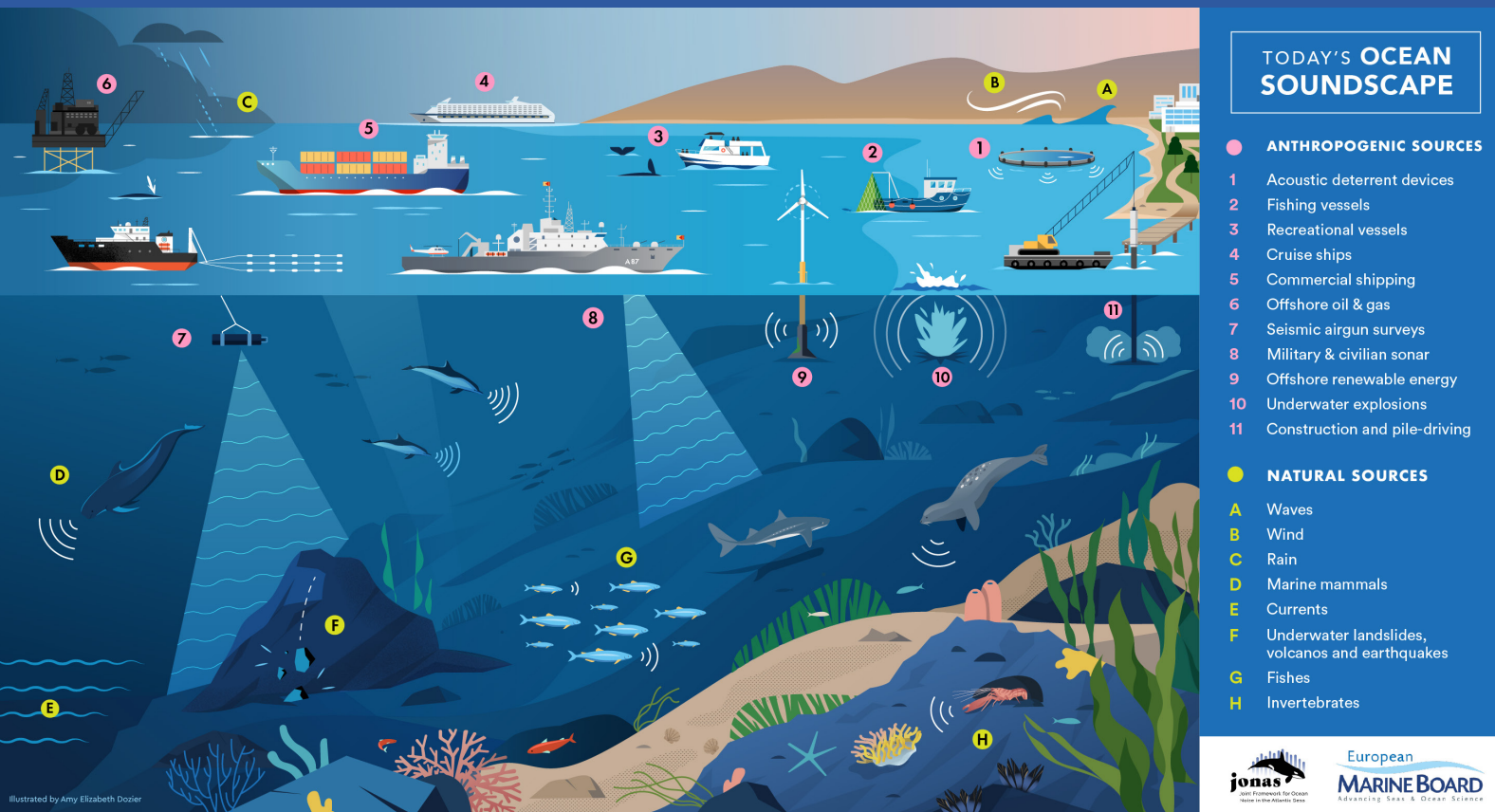


2021 Posters & Presentations

JONAS partners presented at a number of events this year, including the 19th **TG Noise Meeting**, **SEARICA's World Oceans Day Event**, and at the **EMSO ERIC Time Series Conference** on Measuring Ocean Sound. Select presentations and posters can be viewed and downloaded on the JONAS website at:

jonasproject.eu/multimedia

New Ocean Soundscape Infographic



JONAS Collaborates with European Marine Board

In October, the **European Marine Board** released their latest Future Science Brief, 'Addressing underwater noise in Europe: Current state of knowledge and future priorities.' The publication describes the sources of anthropogenic sounds and their effects on marine organisms, identifies research gaps, and recommends priority actions for the development of proportionate mitigation strategies and effective regulation of underwater noise.

JONAS's communications officer **Amy Dozier** at MaREI, University College Cork contributed a suite of illustrations to the report highlighting sources of sound in the current ocean soundscape, as well as a number of mitigation measures that can be taken to reduce underwater noise. The infographic above, titled "Today's Ocean Soundscape" highlights the sources of sound in today's marine environment, illustrating both natural and anthropogenic sources. We hope that this illustration will educate audiences on the acoustic atmosphere of the ocean, and draw

Above: infographic designed by WP2's Amy Dozier with the European Marine Board, available to download and use on the JONAS website.

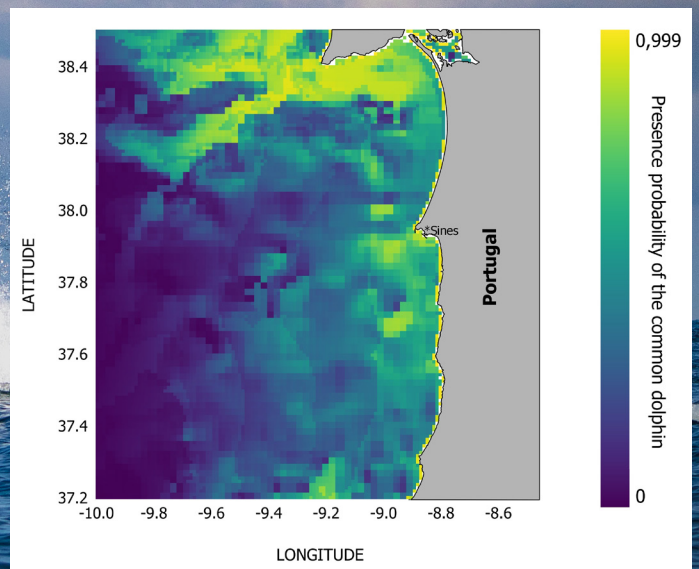
attention to ways in which the marine soundscape can become unblanced by human activities.

You can view and download the full-size infographic shown above on JONAS's **Multimedia** page, while the full publication can be downloaded from the European Marine Board's website. Links have been provided below.



- [View the Graphic](#)
- [Read the Report](#)

Noise Modelling



Above: Presence probability of the common dolphin. Image provided by Ricardo Duarte and Giulia Spadoni, of UALG.

Ricardo Duarte,
University of Algarve

The **underwater soundscape** is characterized by natural sound and anthropogenic noise. The latter is known to have impacts on marine life because vision is limited underwater, whereas sound can be heard for even thousands of kilometres and is key for marine communication.

The Portuguese coastline is a rich ecosystem with an important presence of a vast range of cetaceans that use this area as a territory for feeding and reproducing, which makes them especially vulnerable to human-induced disturbance. Understanding cetacean distribution along the coast is a fundamental step in selecting more vulnerable areas that are exposed to noise in order to highlight management implications and the role of marine protected areas.

Additionally, the slow change from fossil to renewable energy has shifted the requirements for seismic surveying at sea from deep to shallow coastal water. The requirements for the installation of renewable energy platforms are similar to those of the construction of coastal infrastructure such as bridges and ports. Normally, these surveys occur in the continental platform in areas up to 50m depth using light seismic survey techniques that are composed by a couple of high-resolution seismic sources and a few receiving arrays running over the target area. The impact of such surveys is not well known because they are relatively brief and occasional. However, the high intensity and the wide band of sound sources being employed, as well as the close distance to shore, is a matter of concern for local animal communities of small marine mammals (e.g. dolphins).

Based on this, partners at the University of Algarve have been 1) modelling the dolphins' habitat suitability in the Portuguese coastline, and 2) modelling the noise distribution of light seismic surveying in a hypothetical scenario along the Portuguese coast to determine its impact on local communities. This work is the first step to identify the most endangered and at-risk areas.

Sound Mapping

UALG have been creating strategies to adjust propagation model parameters and calibrate sound maps using ground truth data. The proposed strategy consists of determining sound distribution statistical parameters as mean and variance, and comparing the results obtained with real field data. If needed, input parameters are adjusted (as environmental, source level and wind generated noise). This strategy allows us to obtain more accurate noise maps.

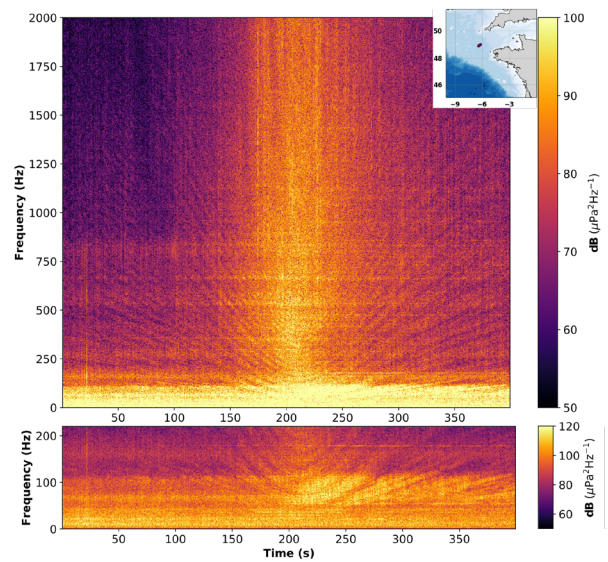
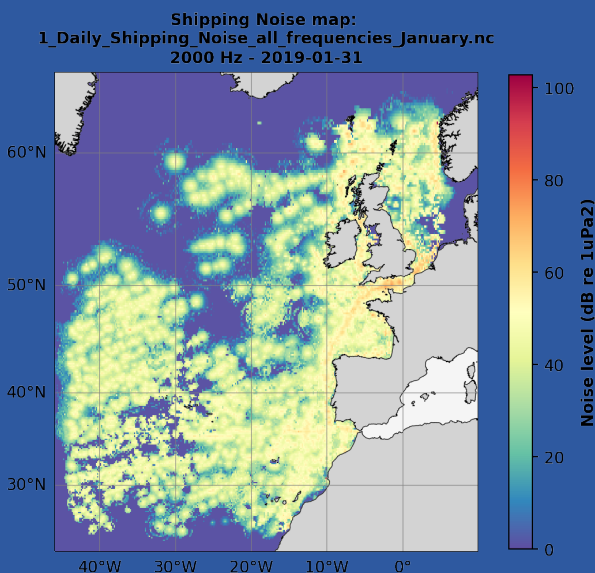
This action was conducted taking into account the Azores archipelago and more specifically the data collected in June 2018 in a small area to the south of the islands of Faial and Pico. During this action, we also determined the excess noise level (ENL) and listening space reduction (LSR).

The Latest from PLOCAN

José Antonio Díaz,
PLOCAN

In 2021, PLOCAN completed the Requirement Analysis for Data Products and VRE Functionalities, which sets the basis for the development of the JONAS Virtual Research Environment (VRE) on underwater noise, which will be made public next year. New notebooks have been written for reading, processing and display of fine and coarse resolution noise maps (see figure below), exceedance maps and species maps. Also, the Kubernetes platform and JupyterHub were deployed and tested with our own notebooks on the cloud and in our local servers. Python code and the PAM2Py tool were uploaded into the VRE for raw data processing. The JONAS VRE was presented at the EMSO 2021 Observing Ocean Sound conference in October this year.

PLOCAN has also been contributing to JONAS's case study risk mapping of offshore wind (both fixed and floating) at a large scale. All experiments and simulations have been completed, and the Offshore Wind Case Study Report has been finished and is currently in review. This case study was presented at the EMSO 2021 Observing Ocean Sound conference in October this year. Final submission is planned for the end of this year.



Above: A spectrogram of a ship passing close to Shom hydrophone in the Celtic Sea. You can see the noise levels are increasing, then decreasing while the ship is passing. Also, an interference pattern can be observed. This pattern is related to the sound produced by the ship and propagated in the local environment.

Noise Mapping at SHOM

David Dellong and Florent
Le Courtois, SHOM

2021 highlighted the achievement of noise maps over the large area of the JONAS project. It has been a huge challenge to deliver such results. These maps will be used to assess risk on populations of marine species.

We are currently investigating acoustic data from Jonas partners and from the MARPAMM and COMPASS projects, secured under a data sharing agreement. Too few noise measurements are currently available over the project area, in particular in deep sea locations. Thus, the capacity to validate these maps is limited, and it may have impact on the risk assessment. We work on the comparison between measured and modeled noise levels, in order to provide insights on knowledge gaps in the modelling process. Confidence in models is inferred using several mathematical metrics, and then spatially extended to wider areas around the measurements location. The next step will be to produce confidence maps.

We look forward to sharing more of
our research with you over 2021!

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