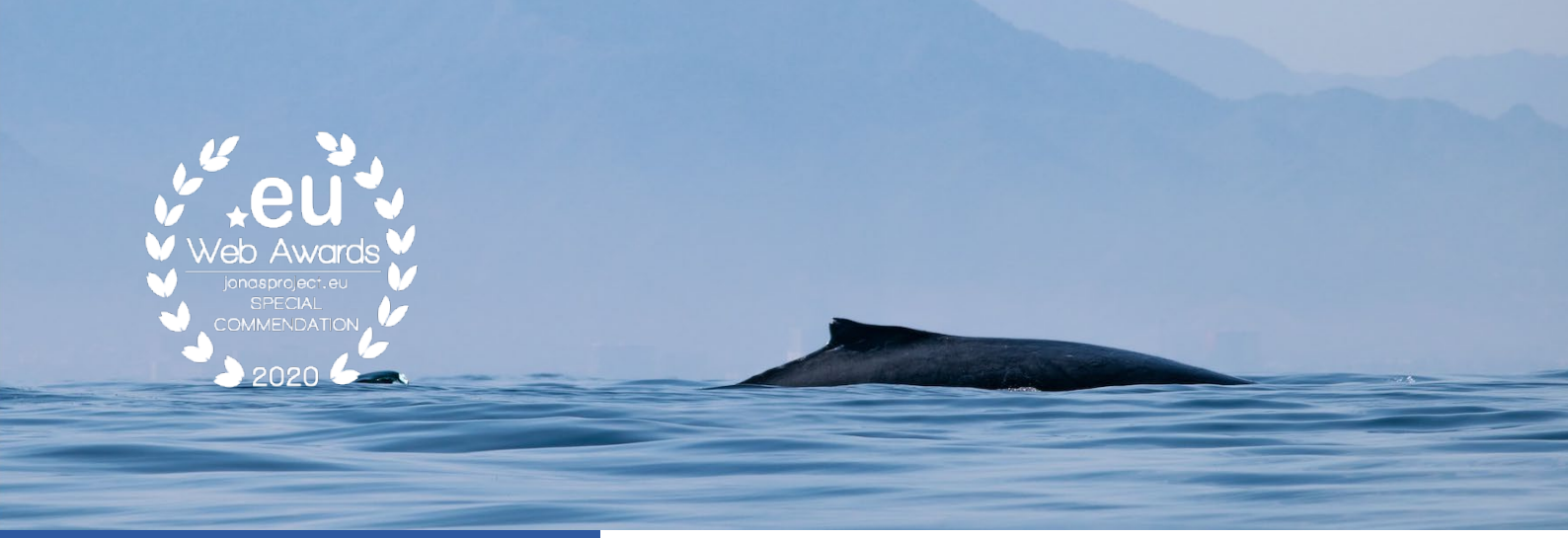

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Joint Framework for Ocean Noise in the Atlantic Seas

Project Newsletter
Issue No. 2
January 2021

JONAS (Joint Framework for Ocean Noise in the Atlantic Seas) is delighted to bring you our second project newsletter covering our research progress over 2020. Although the COVID-19 pandemic disrupted some of our activities, including the deployment of hydrophone arrays and our first stakeholder workshop, we managed to stay incredibly busy! Work on noise and risk mapping has steadily continued, our stakeholder workshop was successfully moved online, and we've forged strong relationships with other projects working in the field of underwater noise.

We hope you enjoy this summary of our activities and that you have a happy and safe 2021.

The JONAS Team

Interreg Atlantic Area
European Regional Development Fund

EUROPEAN UNION

JONAS is co-funded by the European Regional Development Fund (ERDF) under the Interreg Atlantic Area Programme.

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Joint Framework for Ocean Noise in the Atlantic Seas

About JONAS

Underwater noise from shipping, fossil fuel exploration, coastal development, and recreational boating is having a significant impact on marine life, impairing their ability to communicate, breed, avoid predators, and find food. Research is exploring how to reduce underwater noise and help EU countries monitor and comply with limits.

JONAS (Joint Framework for Ocean Noise in the Atlantic Seas) is an INTERREG Atlantic Area funded project that addresses the issue of underwater noise and the threats it poses to sensitive species in the northeast Atlantic.

JONAS will develop better noise monitoring and risk management for the region, a noise monitoring and visualisation platform, streamlined technical approaches for assessment, and will promote the adoption of joint operational practices that are proven to reduce the effect of noise on European marine biodiversity.

JONAS will run from 2019 to 2021.

Key Deliverables

1. Data Sharing Platform
2. Validated Risk Maps
3. Common Methodologies
4. Noise Reduction Case Studies

Expected Outcomes

> CAPACITY

Enhanced technical capacity to address MSFD D11 obligations in Atlantic Area

> HARMONY

Harmonised methods based on best practice and a cooperative transnational approach

> QUALITY

Improved quality and consistency of MSFD reporting in the northeast Atlantic

JONAS wins at the .eu Web Awards!

JONAS was presented with a Special Commendation for creativity and imagination in the 2020 .eu Web Awards, which was held on 16 December 2020. WP2 (Communications) Lead Kathrin Kopke (MaREI UCC) accepted the award on behalf of Amy Dozier (MaREI UCC), who designed and manages the JONAS website for WP2. The entertaining awards ceremony was streamed live from the Teatro Verdi in Pisa, Italy and featured a number of live performances, including one by grammy-winning artist Sting. Kathrin's acceptance speech is available to watch on the JONAS website.

Watch JONAS's acceptance video at www.jonasproject.eu.

Welcome New Staff!

Pauhla McGrane — MaREI, UCC

Pauhla joins the JONAS project as our new project manager. She has a research background in biological oceanography and holds a PhD in plankton ecology. Since 2007, Pauhla has focused her efforts on building capacity in operational ocean research through the collaborative development of innovative, multidisciplinary research vessel-based training programmes. During this period, Pauhla worked on a number of related European and International programmes including EUROFLEETS, HABIT and GEOHAB. Pauhla is a member of the Intergovernmental Oceanographic Commissions (IOC) expert group in Capacity Development (CD), where she serves as Chair of the CD task team, focused on the capacity requirements of Small Island Developing States and Least Developed Countries. She has served on the European Marine Board's working group on Marine Training and Education and DG MARE's expert group on Skills and Career Development in the Blue Economy.

José Antonio Díaz — PLOCAN

José joins the Work Package 3 (Capitalisation) team at PLOCAN, where he will be instrumental in developing the JONAS underwater noise visualisation platform. José holds a PhD in Electrical and Computer Engineering and prior to joining us was a professor at the Universidad de Carabobo and a researcher with the University of Florida. José has already begun work developing the system requirements for the platform and processing data from noise maps produced thus far in the project.

New Website Page on Ocean Noise

In 2020 we created a new page on our website all about the issue of anthropogenic underwater noise in our world's oceans and how it's affecting marine life, as well as ways we can reduce the noise pollution from human activities. Head over to **jonasproject.eu/oceannoise** to take a look.

Noise & Risk Mapping

***Below**: The EMSO Generic Instrument Model (EGIM) deployed to the seafloor at ESTOC by PLOCAN.*

Over the past year the consortium has been busy with noise mapping activities for the northeast Atlantic and the Azores archipelago. Acoustic propagation models have been developed to predict the risk of high noise areas using ship positions, and the next step will be ground truthing the data using sound measurements at selected spots to calibrate these models. Among the acoustic data collected was that from the EMSO ERIC Canary Islands Regional Facility, where PLOCAN deployed the EMSO Generic Instrument Module (EGIM) on the seafloor (3650m) at the European Station for Time series in the Ocean Canary Islands (ESTOC).

Risk mapping activities are also underway. Last year, we selected focal species to represent a range of depths and acoustic sensitivities, including the European seabass, blue mussel, sperm whale, Norway lobster, long-finned pilot whale, and six others. In 2020 we finished gathering distribution data for each species to feed into risk maps, which will be created at the appropriate spatial and temporal resolutions. The methodology will be applied to the Atlantic Area for a period of one year, after which JONAS will deliver a risk-based assessment of underwater noise for the most endangered and affected species. To assess the quality of these results, we'll also be conducting a sensitivity study of the methodology.

Upcoming Special Issue on Ocean Noise

In lieu of this year's OCEANOISE2020 conference, JONAS researcher Michel André of UPC along with Christine Erbe of Curtin University have organised a special issue in the Journal of Marine Science and Engineering on ocean noise. They invite the submission of research articles, review papers, as well as opinion papers and commentaries relevant to the management of ocean noise. Focal points may include sound usage by marine and freshwater organisms; soundscapes; sound measurement, modelling and mapping; behavioural, physiological and pathological effects of noise; regulation and mitigation. All manuscripts will be peer-reviewed and open access. More information at oceanoise.com.

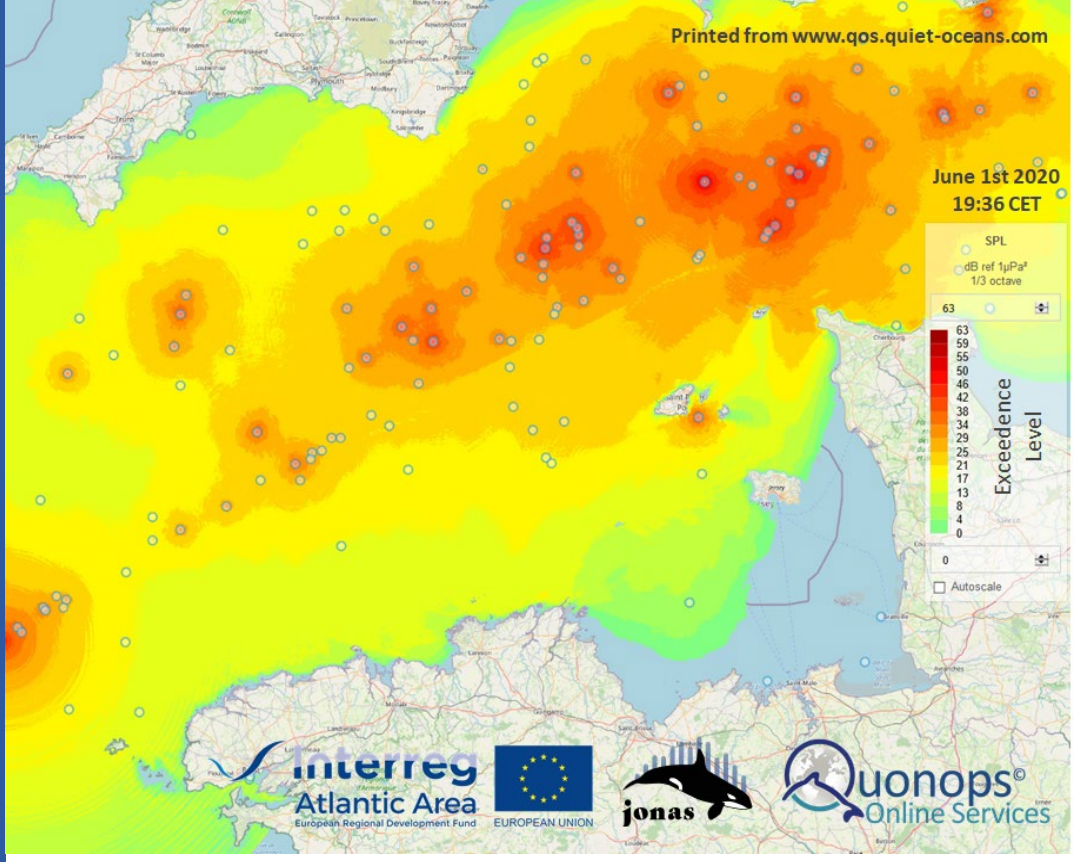
Publications

All JONAS publications can be accessed on the JONAS website at www.jonasproject.eu. Visit the Resources tab to view publications, videos, and more.

Kopke K., Dozier A., McGrane P., Delory E., Merchant N. and Sutton G. (2020). **JONAS 1st Online Underwater Noise Workshop – Event Summary & Participant Recommendations.** Joint Framework for Ocean Noise in the Atlantic Seas (JONAS) project, co-funded by European Regional Development Fund (ERDF) under the INTERREG Atlantic Area Programme.

Soares, C., Duarte, R. J., Silva, M.A., Romagosa, M., Jesus, S. M. (2020). **Shipping Noise in the Azores: a threat to the Faial-Pico cetacean community?** Proc. Mtgs. Acoust. 40, 070012 (2020). https://doi.org/10.1121/2.0001313.

Soares, C., Duarte, R. J., Zabel, F., Silva, M.A., Jesus, S. M. (2020). **Shipping noise predictions from AIS in the Faial-Pico area, Azores archipelago.**



New: Exceedance Maps

Wind and waves produce natural sounds that form part of the ocean soundscape, along with the sounds produced by marine species. Anthropogenic noise that is introduced into the marine environment and dominates over these sources of pristine noise is referred to as "exceedance sound levels" or "exceedance levels". Descriptor 11 of the Marine Strategy Framework Directive recommends that EU Member States assess the amount of noise above natural sound levels in order to meet Good Environmental Status.

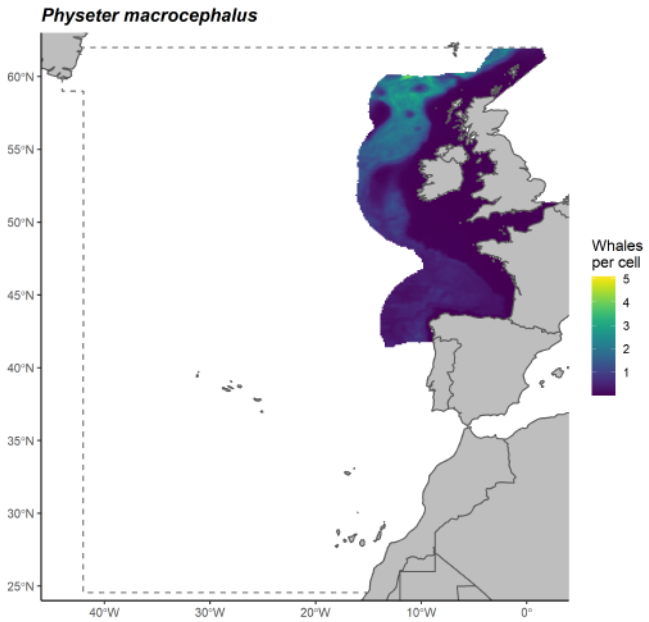
JONAS partner Quiet-Oceans has recently developed the capability to produce real-time and statistical exceedance maps which will be a cornerstone for the assessment of the anthropogenic risks induced by underwater noise to the marine living species across the Atlantic Area. These exceedance levels will be directly used to evaluate the risks and elaborate an indicator for masking effects, and is a major achievement of Work Package 5.

Exceedance maps all around the world can now be ordered online at **qos.quiet-oceans.com** after registering for an account. This on-demand service provides real-time, predictive, statistical noise mapping of underwater sound worldwide for activities such as impact assessments, monitoring, and regulation of the effects of noise to marine life.

Mapping Species Distributions

To quantify the risk of exposure to underwater noise posed to the animals in the NE Atlantic, JONAS has been mapping the distributions of key representative species. Both presence-absence maps and density maps are helping us determine the likelihood of noise exposure. While presence-absence maps show us the species ranges, density maps show us how many individuals of our representative species are likely to be disturbed by noise. There's also a temporal aspect to this data, especially for migratory species. Some species may be found in one spot in summer but not in winter, or near the surface of the water column during the night but deeper during the day.

Unfortunately, this is where we run into limitations in our research. Detailed data is unavailable for all our focal species in multiple seasons—for some, we only have presence-absence maps, for others we have density maps that are temporally static, and for others still we have density maps for each month of the year on which to base our risk predictions.



***Above**: Example of a fine-scale sperm whale density map adapted from Waggitt et al. (2020).*

Presentations & Events

Atlantic Project Awards

ASPC2020 » 19-20 November, 2020

JONAS was nominated for the Atlantic Project Awards this year, which took place on 19-20 November at the online Atlantic Stakeholder Platform Conference. As part of our attendance at the event, we hosted a virtual conference booth where attendees could chat with us online and view information about our project.

CommOCEAN 2020

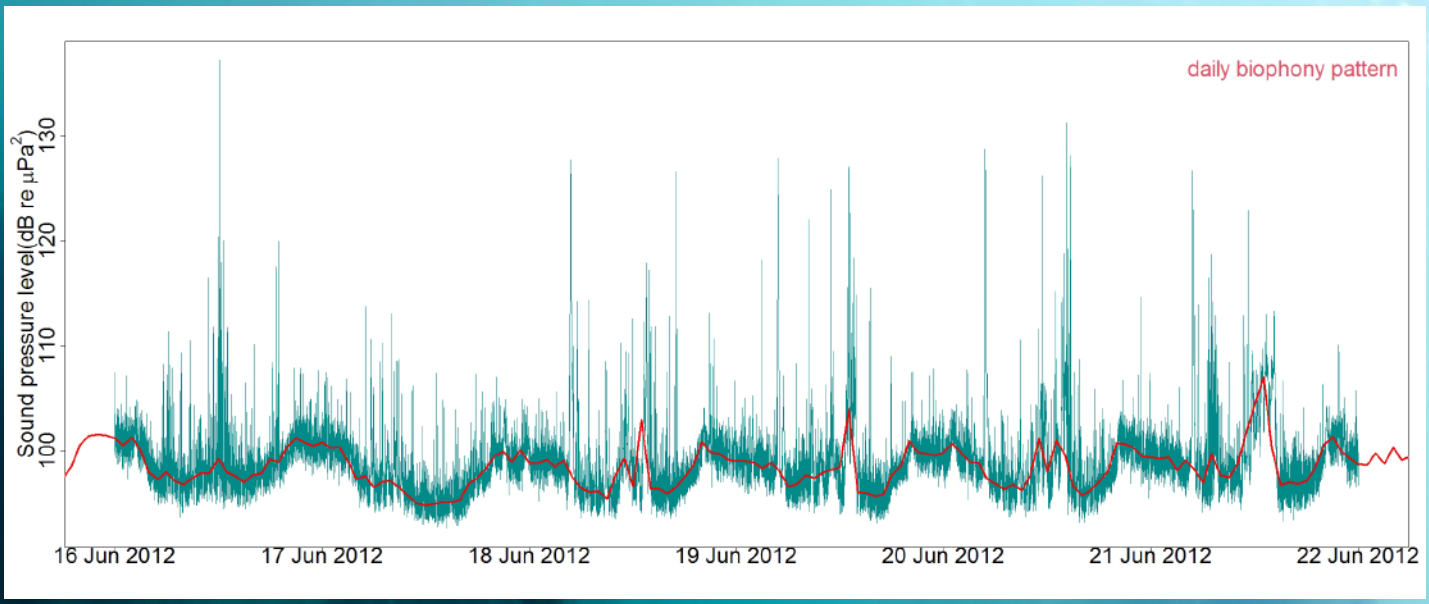
» 1 December 2020

Work Package 2 lead Kathrin Kopke delivered a presentation on JONAS's first underwater noise stakeholder workshop at at CommOCEAN 2020, the fourth edition of the marine science communications conference. Kathrin and Amy Dozier were both in attendance to represent JONAS at the event and discuss the process of taking a stakeholder workshop online while collecting valuable input on research goals. A video of Kathrin's presentation will be available soon on the JONAS website.

Interreg VA Webinar on Marine Protected Areas

» 26 November 2020

Project Coordinator Gerry Sutton delivered a presentation about JONAS in November's INTERREG VA joint webinar on Marine Protected Areas, hosted by the COMPASS, MarPAMM, and SeaMonitor projects. The video is now online and can be viewed on YouTube via our Resources & Media page under the Video tab.



Measuring Biophony

As part of Work Package 8, UPC has been applying risk mapping and indicator methodologies developed within the project to concrete management scenarios. One of these case studies concerns the measurement of bioacoustic indicators as a proxy for monitoring biological activity in the northeast Atlantic. The first step in developing such bioacoustic indicators is to identify the major contributors (biological, physical or anthropogenic) to the underwater acoustic environment through the analysis of raw acoustic recordings.

Thus far, the UPC team has performed this first analysis on data obtained from the UPC shallow water OBSEA platform where we found that the biological contribution (biophony) followed a diurnal pattern explained by the sun's altitude. An example of this pattern can be seen in the image above. The red line displays the daily acoustic activity of invertebrates and fishes, which was higher during at night than during the day. It also seems as if temperature is affecting biophony.

For physical contributors, the team has looked at wind speed and rain to quantify their effect on the measured sound levels. For anthropogenic sources, we have explored AIS data (Automatic Identification System) transmitted from ships that contains positional information used by vessel traffic services, and other indicators of shipping presence, such as high received sound levels at typical shipping sound frequencies.

1st Stakeholder Workshop

In light of the COVID-19 pandemic, our plans to hold our first stakeholder workshop in Portugal had to be cancelled just as we were about to depart for Lisbon in March 2020. To comply with government guidance and ensure the safety of both our researchers and attendees, we were confident that we could take the workshop online to gather input on user requirements for the JONAS Underwater Noise Visualisation tool. The workshop was held digitally on June 30 and was a success, providing us with valuable feedback from a

1st Stakeholder Workshop, continued

number of researchers and policymakers. This online event aimed to facilitate a knowledge exchange between regulators, policymakers and scientists, with a focus on i) an initial proposal for defining an indicator concerning the risk of impact from shipping noise, and ii) the development of a user-friendly JONAS underwater noise (UWN) visualisation platform.

After presentations from Project Coordinator Gerry Sutton (MaREI UCC), Nathan Merchant (CEFAS) and Eric Delory (PLOCAN), participants provided recommendations during a guided discussion facilitated by Kathrin Kopke. Prior to the workshop, participants were sent a draft report compiled by CEFAS on an initial proposal for defining an indicator for risk assessment from shipping, which was reflected upon during the discussion. All recommendations can be viewed on our website under "Resources & Media", where you'll find a detailed workshop summary report and a two-page At-A-Glance.

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

www.jonasproject.eu

Working Together: JONAS & RAGES

In order to facilitate research cooperation to further develop the work on risk to sensitive species from underwater noise, JONAS and the RAGES (Risk-based Approaches to Good Environmental Status) project entered into a formal collaboration agreement in October 2020. RAGES is developing a conceptual framework for the incorporation of risk-based approaches into the MSFD, including Descriptor 11 (Underwater Noise). Through this partnership, JONAS and RAGES aim to:

(a) attain improved levels of integration and cooperation in the co-ordination of research and associated actions in order to streamline, integrate and synchronise development of coherent risk-based approaches to addressing the impacts of underwater noise in the context of MSFD D11;

(b) maximise cooperation, collaboration and harmonisation at the conceptual and technical levels to ensure consistency, interoperability and to maximise synergies between operations at local to regional scales. This applies to methods, data, publication and outreach

(c) strengthen the impact of both projects through mutual exchange and knowledge transfer.

JONAS and RAGES will hold a joint workshop in January 2021.