

# Sustainable Science for a Brighter Future

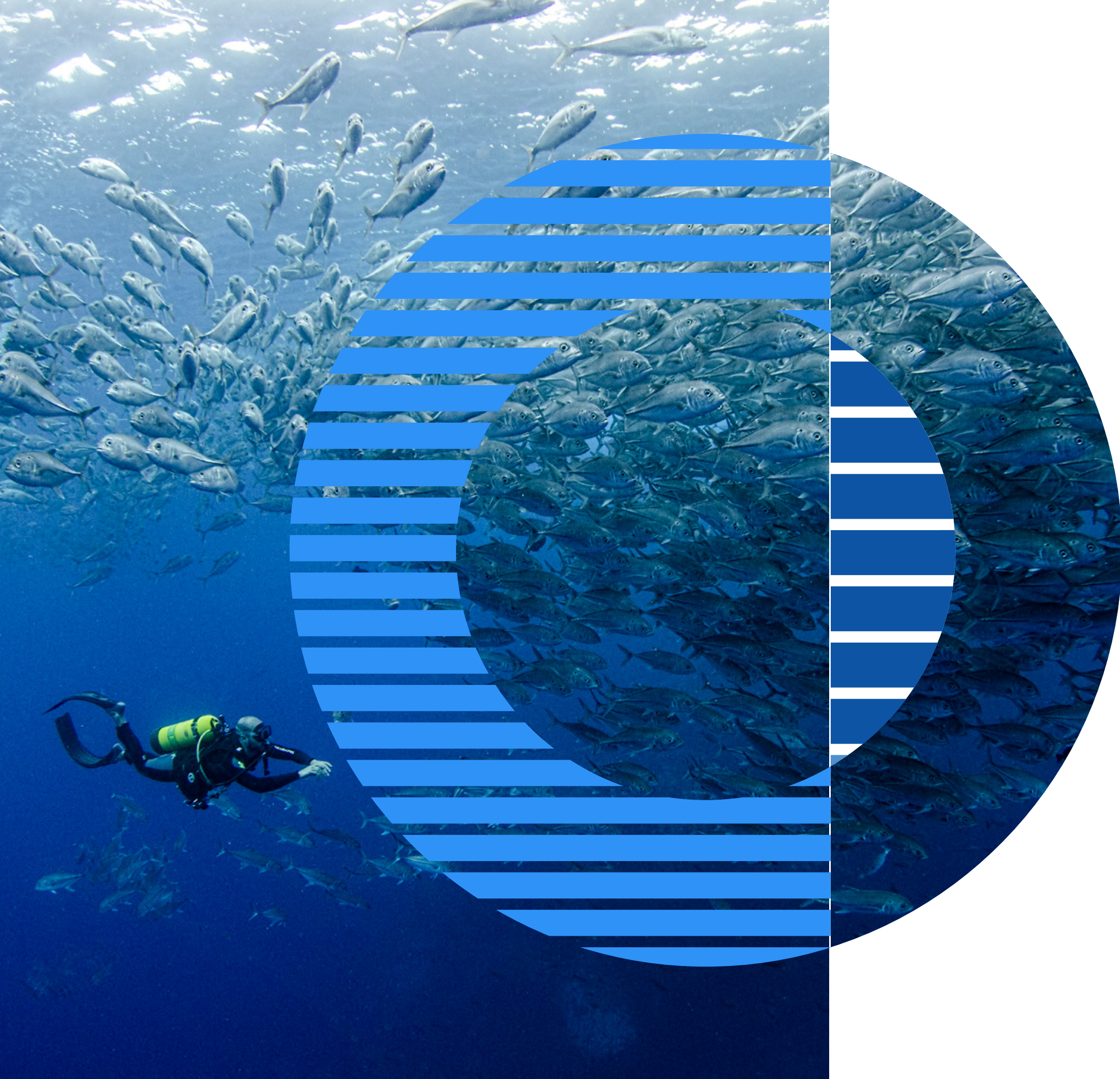


**Annual report 2023**



**EMBRC**  
EUROPEAN  
MARINE  
BIOLOGICAL  
RESOURCE  
CENTRE





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## A message from our Executive Director

The signs of our long-term environmental crisis are evident: dwindling fish stocks, extinctions, temperature records being broken year after year, and catastrophic biodiversity loss from degraded and destroyed habitats. We cannot continue to abuse our natural systems in this way.

“Sustainability” is a new buzzword being used everywhere. But what is sustainability? It’s often understood that activities should operate without depleting the resources they rely on. But our society is geared towards high consumption and continuous financial growth: the antithesis of sustainability. Six of the nine planetary boundaries – the critical processes for maintaining the planet in a favourable state – have been transgressed, and Earth is now outside the safe operating space for humanity<sup>1</sup>. We must evolve away from this consumerist philosophy to protect the planet we depend on.

Governments understand that change is needed. The 30x30 concept has emerged to protect 30% of the Earth by 2030. The European Commission has developed its Biodiversity 2030 strategy, which commits to increase protected areas, restore degraded ecosystems, increase funding to tackle biodiversity issues, and integrate biodiversity targets into decision-making.

**Achieving sustainability faces many challenges, including a poor understanding of biodiversity, particularly in the ocean,** and a lack of mapping of where biodiversity occurs. We also have limited baseline data.

**How can we achieve a good environmental state if we don’t understand what healthy biodiversity should look like?**

EMBRC aims to overcome these issues by facilitating the study of life in the sea.

**Our engagement in marine biodiversity initiatives helps the development of European capacity to monitor marine biodiversity, determine where it is concentrated and follow the impact of new policies.** The data generated will plug numerous knowledge gaps and inform decision-makers.

Projects that help more researchers access our services will pave the way for a sustainable future by closing knowledge gaps. For example, Horizon Europe’s AgroSERV and AquaSERV are helping scientists learn how to improve aquaculture practices, IRISCC improves the understanding and mitigation of climate change impacts, and data initiatives such as FAIR-EASE and BlueCloud2030 ensure biological data is accessible and that the whole scientific community has the technical capacity to analyse and use it.

Our commitment to sustainability goes beyond ambitious goals. At the operational level, we are working to strengthen science and ensure our tools, standards, protocols, and platforms are robust, reproducible, and trustworthy. This year, we integrated our Belgian training initiative, Marine Training, which will now enable EMBRC to support capacity enhancement in Europe and beyond – doing our bit to **make science a real enabler of sustainability.**

As we race towards 2030, science must play its role in filling knowledge gaps and offer alternative solutions if we are to successfully understand and protect our planet and the natural systems we depend upon

**Nicolas Pade,**  
Executive Director, European Marine Biological Resource Centre (EMBRC)



## A message from our Chair of the General Assembly

Our oceans sustain life on this planet: they power the atmosphere, regulate the climate, and are home to vital mineral resources and diverse ecosystems. Most of the human population lives less than 100km from the sea and depend on it for their sustenance, livelihoods, and wellbeing.

Yet, we’re not looking after our oceans. As human activities contribute to global warming, pollution, overexploitation, and species displacement, the oceans face unprecedented challenges.

Ocean observation is vital in safeguarding this essential ecosystem. It is at the heart of our understanding of how oceans impact the Earth’s processes and people’s activities. Detailed observations in space and time of both living and non-living components of the ocean allow us to monitor these habitats, detect trends, spot issues early, and mitigate damage. This can advance sustainability by enhancing data collection on marine ecosystems, facilitating informed policies, and promoting global collaboration to address issues like climate change, pollution, and overfishing. Protecting these habitats, and creating healthier and more resilient oceans, also provides economic benefits for present and future generations.

As EMBRC’s top decision-making body, the General Assembly considers the organisation’s strategy for sustainable research into understanding, protecting, and exploring the ocean. Among several other decisions, it approved the funding

of joint development activities involving multiple partners to develop services and technologies that will help scientists across Europe and around the world advance their marine research.

We’re proud of EMBRC’s success in accessing funding – much of which comes from Horizon Europe – to provide access to facilities, instruments, and knowledge to help researchers carry out their projects as effectively as possible. **A sustainable future depends on robust science and we’re playing our part by serving a growing scientific user community,** many of them young scientists.

For example, as its spatial and temporal coverage grows, EMO BON (the European Marine Omics Biodiversity Observation Network) will provide a detailed view of how micro-diversity around our coasts varies in composition and abundance. **By improving our knowledge, we can better inform decisions and ensure activities around the oceans are in line with a sustainable future.**

Most people dream of a balanced and resilient planet; where renewable energy is dominant, ecosystems thrive, and sustainable practices are the norm. Knowledge, innovation, and technology are necessary if we are to create that world. By supporting the science that will lead to a sustainable Blue Economy, EMBRC’s work is helping to achieve this vision.

**Adelino Canario**  
Chair of the General Assembly,  
European Marine Biological Resource Centre  
(EMBRC)



# Our purpose

*Pushing the frontiers of marine research*





# EMBRC: accelerating marine biology and ecology research through its infrastructure network

The European Marine Biological Resource Centre (EMBRC) is the only research infrastructure (RI) for marine biology and ecology research. We work with partners to accelerate knowledge of marine biodiversity through research and ocean exploration so we can understand the pressures on life in the ocean, advance scientific innovation, and promote the sustainable use of marine resources.

Our work to advance marine science is underpinned by our commitment to meet the UN's Sustainable Development Goals (SDGs) and tackle societal problems. Through our network of marine sites across Europe, we provide access to ecosystems, organisms, resources, services, and facilities to help researchers from academia and industry study the ocean and develop innovative solutions to issues.

## Our vision

To advance the understanding of marine life and harness its potential to create a sustainable future for the billions of people who rely on our ocean.

## Our mission is to...

### → Promote open science to support marine research globally by

- Providing access to marine ecosystems and their biodiversity, innovative facilities, services, resources, and expertise to academic and industrial researchers globally

- Following inclusive, global standards and sustainable practices

### → Push the frontiers of science and deepen fundamental marine knowledge by

- Pushing for ocean observation technologies and genomics methods that provide a holistic view of the marine environment and help us understand the role of ocean life and their response to stressors. For example, by creating Europe's first permanent, coordinated genomics observatory network (EMO BON)

- Taking part in innovative EU research projects that enable shared scientific approaches to explore biodiversity in the ocean

- Studying the impact of environmental changes so we can protect vital ecosystems

### → Support a sustainable blue economy by

- Interacting with European and international policymakers

- Promoting collaboration between academia and industry

- Exploring marine biodiversity for new products, inspiration, and innovation

- Fostering new training initiatives for the current and next generation of 'blue workers'

- Encouraging the sustainable use of marine resources

As a participant of the UN Decade for ocean sciences, EMBRC's work is underpinned by our commitment to meet the UN's Sustainable Development Goals (SDGs).





# Key EMBRC activities in 2023

2023 was an exciting year for EMBRC with many milestones across the network, including the development of a new FAIR training course.

Here are a few of our activity highlights.

*In 2023, EMBRC's dedicated community continued to take significant steps to support and improve marine research across Europe.*



## March

EMBRC brings together 80+ partners through the launch of MARCO-BOLO

The Israel Oceanographic and Limnological Research (IOLR) joins EMBRC Israel

## April



EMBRC, Tara Ocean Foundation, and EMBL launch the Traversing European Coastlines expedition (TREC)

TREC researchers sample and analyse marine ecosystems around the Station Biologique de Roscoff, France

## May

TREC visits research stations including the Flanders Marine Institute (VLIZ – EMBRC Belgium) in Oostende, West Flanders, Belgium

EMBRC's EMO BON framework is published in *Frontiers in Marine Sciences*

EMBRC Belgium hosted its first Community Day at VLIZ, Ostend

EMBRC Portugal implements new procedures to monitor marine biotoxins

EMBRC promoted its flagship initiative EMO BON at the European Maritime Days in Brest, France

## June

EMBRC presents EMO BON, eDNA and the growing capacity for genomic observation in Europe and beyond at UNESCO HQ in Paris

EMBRC Norway begins a new Horizon project, LOCALITY<sup>1</sup>, using algae to reduce waste streams



## August

EMBRC Sweden provides a supersite for TREC at Kristineberg Marine Research Station

EMBRC Norway hosted TREC at UiB; the Marine station of Espesgrend (Department of Biological Sciences) and the Michael Sars Centre, Bergen – the expedition's northernmost stop

## September

The official start of the eDNAqua-Plan project

MBRC Spain hosts TREC in Plentzia-Bilbao



## October

EMBRC attends the GEO BON Global Conference in Montreal

Centro de Ciências do Mar (CCMAR – EMBRC Portugal) and Coimbra Collection of Algae (UC-ACOI) were granted funding for the Horizon-Infra project AQUASERV

The eDNAqua-Plan project (coordinated by EMBRC) held its kick off meeting

## November

EMBRC exhibits at the EMODnet Open Conference and presents EMO BON

A new EMBRC paper shares recommendations for implementation of FAIR principles in life science data<sup>2</sup>

## December

EMBRC announces the funding of five new services through its Joint Development Activities initiative

<sup>1</sup> [www.locality-algae.eu](http://www.locality-algae.eu)

<sup>2</sup> "Be sustainable": EOSC Life recommendations for implementation of FAIR principles in life science data handling, *The EMBO Journal*: [www.embojournal.org/doi/full/10.15252/embj.2023115008](http://www.embojournal.org/doi/full/10.15252/embj.2023115008)



# Boosting ocean progress in 2023

**2**

new marine institutes joined EMBRC (in Israel)

**172**

papers in 80 journals published acknowledging EMBRC

**18**

Conferences, events and webinars promoted on our channels

**444**

services available

**216**

users of EMBRC's research services

**197**

service requests granted

**2**

Horizon Europe projects coordinated by EMBRC (MARCO-BOLO and eDNAqua-Plan)

**72**

EMBRC institutes with 77 marine sites

**7**

EMBRC operators supported the TREC expedition: SBR, VLIZ, KMRS, UiB, PIE, CIIMAR, CCMAR

**20**

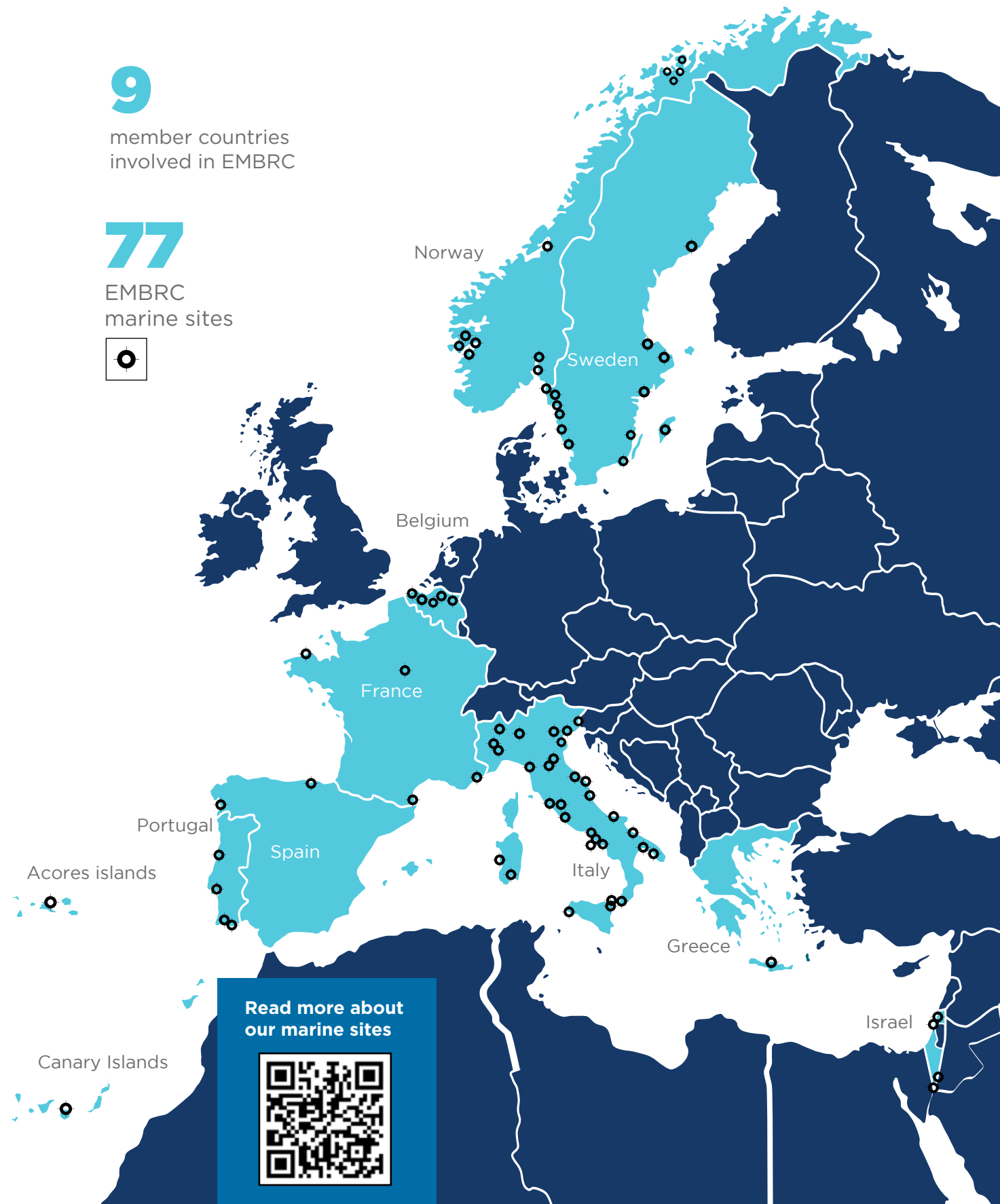
ongoing projects (19 Horizon Europe, 1 Interreg Europe)

**9**

member countries involved in EMBRC

**77**

EMBRC marine sites





# Managing marine science data for a sustainable future

**NICOLAS PADE**  
Executive Director,  
EMBRC Headquarters

The digitisation of science offers massive potential for advancing marine science. Tackling complicated topics, like how marine biodiversity responds to climate change, requires lots of data.

*We have enormous volumes of existing data that we must mine to properly understand our ocean and reach our global target of protecting 30% of the ocean by 2030.*

Robust data helps us avoid arbitrary decisions and ensures we protect the right 30%. But the huge amounts of data produced also creates challenges we must overcome to reach a sustainable future.

The question of how to maximise data is central to EMBRC's work towards better understanding marine biodiversity. We're filling gaps in biological observation (e.g. through our genomics observatory EMO BON), pushing for technologies that enable ocean monitoring, and facilitating data access. We're also reducing time-consuming data analysis processes by creating automated workflows. Our metaGOflow tool removes the need to manually analyse thousands of base pairs when crunching metagenomics data.

Good science also needs standardised data. Several researchers can use the same data to answer different questions but only if results are comparable. Standardised data, generated using the same methods, leads to more powerful results and better understanding. We're focused on facilitating the creation of Findable, Accessible, Interoperable, and Reusable (FAIR) data and our new Standard Operating Procedures (SOPs) are helping observatories generate comparable and interoperable results from their work.



Most people recognise the importance of standardisation, but many don't appreciate how hard it is to get everyone to agree. We're overcoming this through projects like eDNAqua-Plan, which looks at streamlining eDNA data for easy access by all. Streamlined, interoperable data allows us to understand how what happens in one marine ecosystem impacts another. We can also make the data easily accessible to the decision-makers who need it - a goal of MARCO-BOLO which we launched last year as coordinators of the project.

*Standardisation also gives us a universal language so we can collaborate more effectively.*

Countries with fewer resources can benefit from our computing power, and we can learn from their talented scientists. EMBRC works for the benefit of the whole scientific community. **By providing services, resources, protocols, and facilitating open access to data to everyone no matter their expertise, we strive towards Open Science that is as good as it can be.** The proper collection, use, and analysis of marine biological data is integral to this. By leveraging the power of data, we can create a sustainable future and meet the 30x30 goals.



# Our services

*Accessing marine facilities for research*





# Supporting marine research



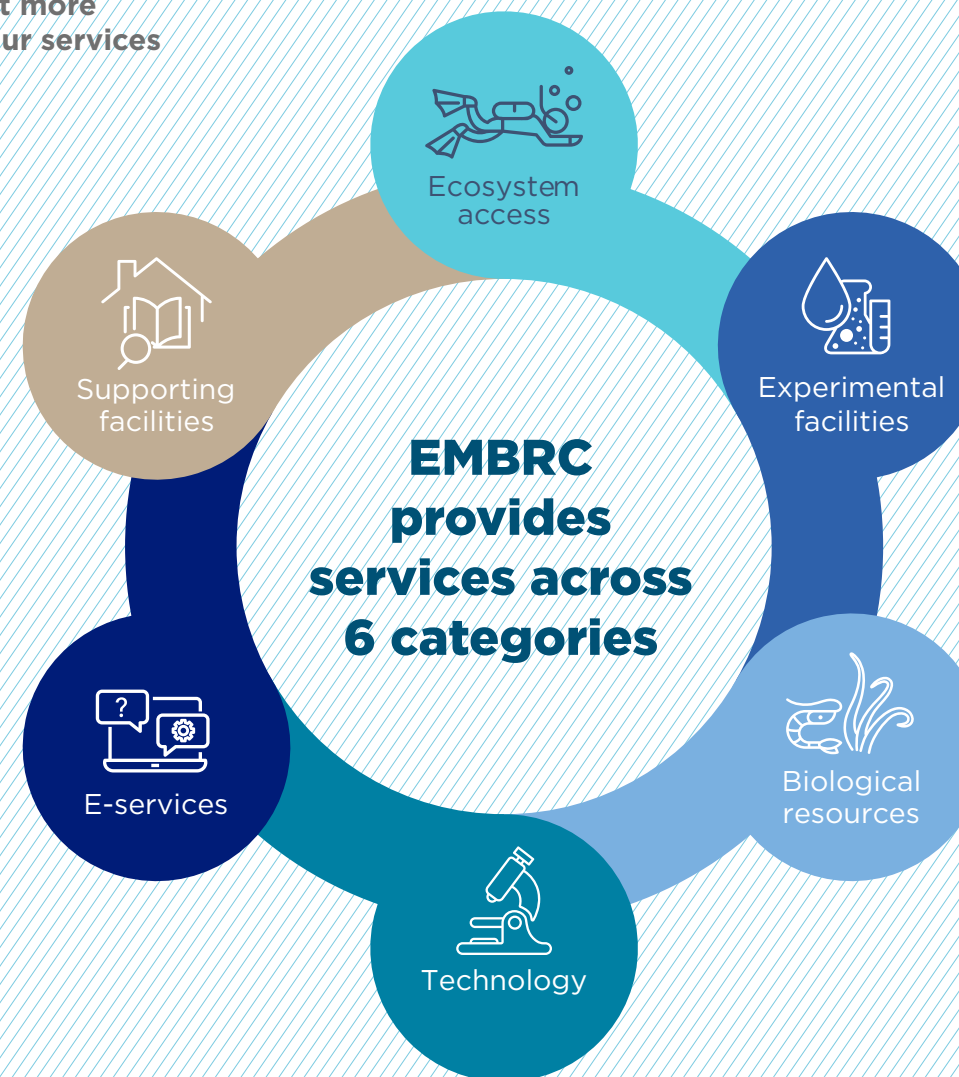
## Our services in 2023

In 2023, EMBRC's research services continued to enable researchers to access marine organisms from a variety of European ecosystems, habitats and organisms: whether cultured, reared or collected from the field. This year, we've continued to improve our catalogue, thanks in part to EMBRC Italy's full refresh of its service catalogue, which helps each Italian partner highlight their best offering.

We can support visiting researchers from academic institutions and industry through our wide range of biological and ecological tools, techniques and experimental platforms. Our technical staff are highly experienced and we also offer experimental facilities, whether scientists are conducting their research on-site or remotely.



Find out more about our services



## We support research and a wide range of applications, including:

### FUNDAMENTAL RESEARCH

Environmental science, taxonomy, ecology, physiology, evolution and development, ecotoxicology and climate change impacts.

### SOCIETAL APPLICATIONS

Husbandry, culture and biomass production, aquaculture and fishing practices, biomedical research, blue bioeconomy (food and feed, bioplastics, nutraceuticals, pharmaceuticals and cosmetics), agronomy, conservation, environmental monitoring and biodiversity observation.



# Success stories

In 2023, 216 users accessed EMBRC's services to support their marine biological research with 112 of those being involved in TREC - a two-year expedition studying how coastal ecosystems across the continent respond to environmental changes.

We spoke to two researchers who worked with EMBRC to find out how they used our services and how this benefitted their scientific projects.



**Name:** Tobias Gerber

**Organisation:**

EMBL (European Molecular Biology Laboratory)

**Marine site:**

Kristineberg Marine Research Station (KMRS) (EMBRC Sweden)

**Funding source:**

ASSEMBLE Plus

**Service accessed:**

In-situ collection of organisms

**What are you studying and how have you used EMBRC's services in your work?**

We're studying a marine ragworm called *Platynereis dumerilii* - we always call it platy for short. The adults can grow up to 3-4cm and they're found on coastlines all across Europe, from Norway to Italy. We've been using specific timepoints in the development of this model organism (six days after hatching when they are still in the intermediate phase between larvae and juvenile worm). At this point, they're still small enough to sample each cell of their body for transcriptomic analysis.

The idea behind the project is to use gene expression information to understand how different cell types adapt to different environments. EMBL is about as far away from the sea as you can be so EMBRC gave us vital support in accessing 100s of these organisms. Their boats enabled us to get into the field at midnight to collect samples when the adults swim up to the surface to find a mating partner (we have to catch them with nets before it happens so the reproduction can be controlled in our lab). And they provided liquid nitrogen and fume

hoods so we could freeze and fix the samples before transporting them back to the EMBL lab for processing.

**What's the most exciting part of your research project?**

Since I've been looking at questions around single-cell technology, my work has mostly been done in the lab so it's nice to get out of this bubble, contact other researchers and talk to people working on completely different topics when I'm visiting the marine stations.

**How do you think marine biodiversity research can bring about a sustainable future?**

Marine biodiversity research can teach us so much about our changing planet, such as how animals are adapting to temperature, pH, and salinity changes. And as some cell types might be shared between different animals, or kingdoms of animals, across the tree of life, this knowledge helps us make predictions about other organisms too. The more we can learn, the better chance we have of understanding which species are more resilient to global warming and which are having a harder time.



**Name:** Flora Vincent

**Organisation:**

EMBL (European Molecular Biology Laboratory)

**Marine site:**

KMRS - Kristineberg Marine Research Station (EMBRC Sweden), Station Biologique de Roscoff (EMBRC France), Plentzia Marine Station (EMBRC Spain), CIIMAR - University of Porto (EMBRC Portugal), Stazione Zoologica Anton Dohrn (EMBRC Italy)

**Funding source:**

EMBL core funding (through the TREC expedition infrastructure)

**Service accessed:**

Ecosystem access & experimental facilities  
Filtered seawater, sailors, liquid nitrogen to process samples, facilitating access

**What are you studying?**

My lab is interested in the ecological role of phytoplankton - in particular, unicellular photosynthetic eukaryotes called diatoms. These primary producers are responsible for half of the world's annual primary production and are the foundation of the food chain which makes them really important to study. In particular, we're looking at how microbial interactions between diatoms and other planktonic organisms, such as viruses and bacteria, can affect diatom cell fate and, ultimately, their role in the ecosystem.

**How have you used EMBRC's services in your work?**

My main interaction with EMBRC in 2023 was through the pan-European TREC expedition. Our advanced mobile lab visited several EMBRC supersites where we could use the infrastructure's labs and resources to sample plankton and run our experiments. For example, local EMBRC stations provided us with filtered seawater and liquid nitrogen - to run our machines and process our samples - facilitating access to local resources, and providing housing for visiting researchers.

**What's the most exciting part of your research project?**

For me, it's the enriching cycle between fieldwork and lab work. For example, by going into the natural environment, we can observe microbial interactions for the first time that we can bring into the lab. That lab work then enables us to generate new hypotheses or develop tools that we can then use to better understand the natural environment. It's a stimulating feedback loop and gives us a new way of asking questions.

**How do you think marine biodiversity research can bring about a sustainable future?**

As a researcher, of course I think marine biodiversity holds immense potential for solutions that we can harness for a sustainable future. But I'm also responsible for generating the information that supports the work of activists, politicians, and decision-makers so they can back up their actions with scientific fact. Politicians and activists need good data if they are to make good decisions. Sharing our science, and raising awareness of the need for people to change, also plays an important part in bringing about a sustainable future.

## ASSEMBLE PLUS

From 2017 to 2022, Assemble Plus offered access to marine research infrastructures through funding programmes across Europe and overseas to carry out scientific research in the field of marine sciences.



## ACCESSING EMBRC SERVICES

In 2023

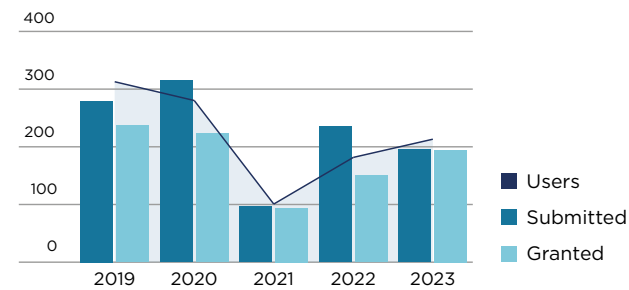
**216 users**  
(+17% compared to 2022)

**198 access requests submitted**  
(-17% compared to 2022)

**197 access requests granted**  
(+30% compared to 2022)

From 2019 to 2023

Trends in the access requests over the years



In 2023, EMBRC saw a slight decrease in access requests for its services, however more access requests were granted than the previous year, due to the conclusion of most of the Transnational Access (TA) funded projects that had been live in 2022. Our users have increased steadily since 2021 - with the successful TREC expedition bringing in many more users this year - so we know our services remain popular with and beneficial to the European research community. We're confident our numbers will continue to grow in 2024.

## TYPE OF SERVICES

Services used in 2023

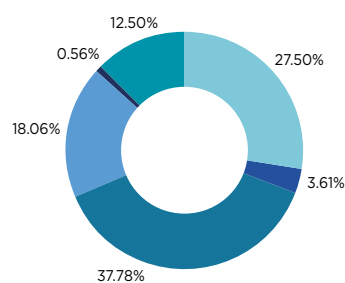
**38%**  
**experimental facilities**  
(e.g. aquaria and tanks, mesocosms, dry and wet labs, and climate-controlled rooms)

**28%**  
**ecosystem access**  
(e.g. vessels, diving equipment and scientific diving teams)

**18%**  
**technology platforms**  
(e.g. imaging, molecular biology and omics laboratories, bioprospecting platforms, high pressure liquid chromatography, remote sensing and telemetry)

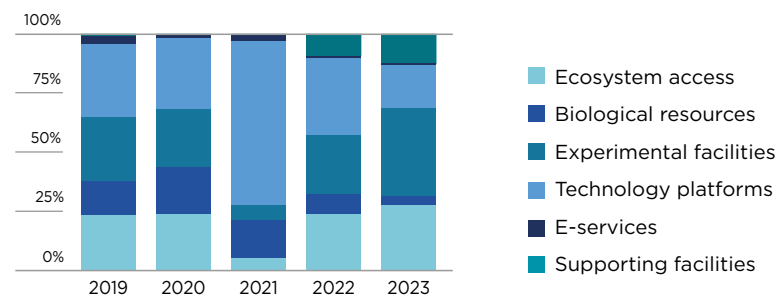
Experimental facilities (e.g. wet and dry laboratories, aquaria, tanks) remain our main category of services requested, largely due to the TREC expedition's visits to several EMBRC marine stations across Europe. Ecosystem access and technology platforms, which form an important part of EMBRC's offering, are also popular services.

In 2023



From 2019 to 2023

Trends in the use of services over the years



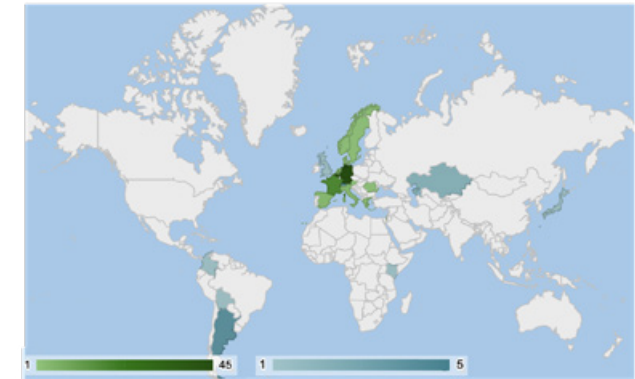
## GEOGRAPHIC DISTRIBUTION OF ACCESS REQUESTS

EU countries:

**89% of access requests**  
in particular:  
Germany, Belgium, France,  
Netherlands, Italy, and Spain

Non-EU countries:

**11% of access requests**  
In particular:  
Switzerland and Argentina



## FUNDING TO ACCESS EMBRC SERVICES

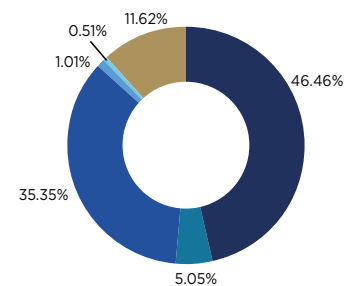
**47%**  
**benefited from international funding**  
(mostly from the TREC expedition)

**35%**  
**of researchers**  
**were self-funded**

**12%**  
**received other, non-specific**  
**funding sources**

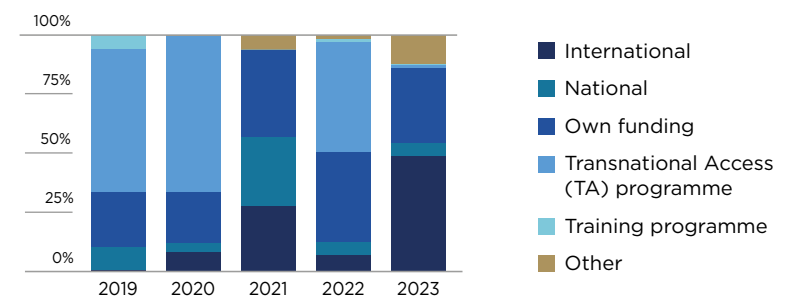
This year, the majority of our users were able to access EMBRC services thanks to international funding, with the TREC expedition making up a large proportion of that. We also saw over a third of researchers self-fund and some whose activities were conducted without specific funding sources, such as students or volunteers. The increase in self-funded users is highly encouraging as it shows a shift from users accessing EMBRC via Transnational Access (TA) funding to a willingness to use their own grant money. If this trend continues, it would suggest the use of EMBRC is becoming more widespread and that our services are pertinent to current research trends.

In 2023



From 2019 to 2023

Funding type



## ON-SITE VS. REMOTE ACCESS

**95%**  
**of users have used on-site access**

**5%**  
**of the services were accessed remotely**



## HOME INSTITUTION

In 2023

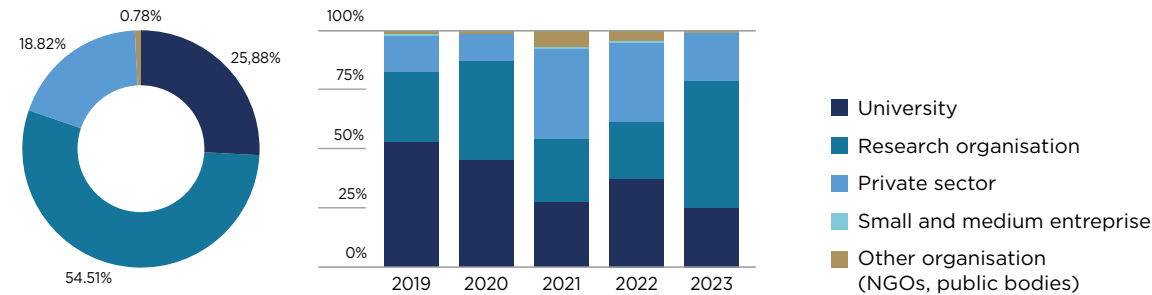
**80%**  
of EMBRC users are based in academic institutions (universities and research organisations)

**20%**  
of EMBRC users came from the industrial sector (private, SMEs) and other institutions

As in previous years, academic users (universities and research organisations) remain EMBRC's largest user community by a significant margin. However, we do also see an important user base among the industrial sector, which has increased in recent years since EMBRC has focused on promoting its facilities to private companies.

In 2023

From 2019 to 2023  
**Type of home institution**



## SCIENTIFIC DOMAIN

In 2023

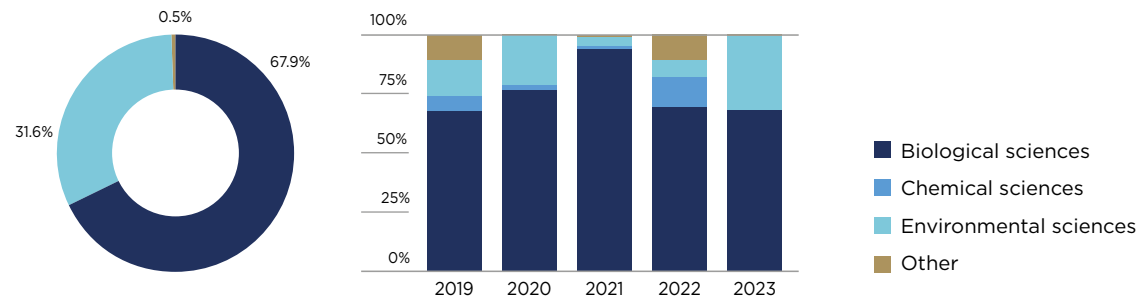
**68%**  
of users came from the domain of biological sciences

**32%**  
of users came from an environmental science discipline

Due to the nature of the EMBRC infrastructure, researchers using our services are mainly marine scientists from biological and environmental domains. However, we also support researchers from other disciplines. These include domains such as chemistry, health sciences and clinical medicine and highlights how many scientific specialisms benefit from access to EMBRC facilities.

In 2023

From 2019 to 2023  
**Scientific domain**



## CAREER STAGE

EMBRC provided services to researchers at all career stages.

In 2023

**40%**  
researchers

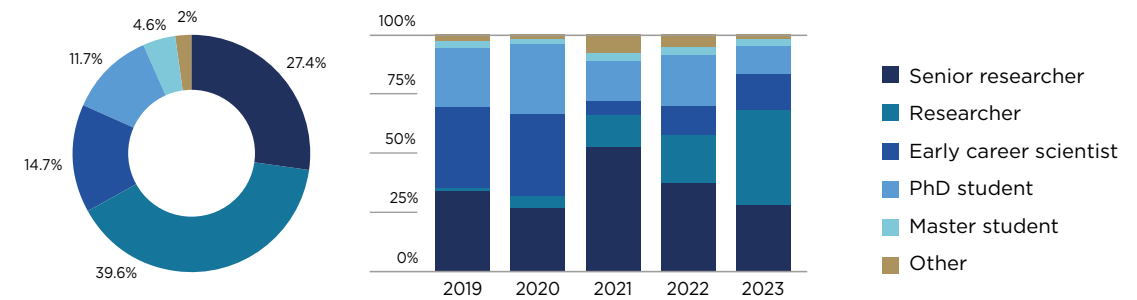
**27%**  
senior researchers

**15%**  
early career researchers

EMBRC continues to support researchers throughout their career, with researchers being the largest group of people who benefit from our services. Early career researchers also make use of our marine stations, although at a lower volume than those with more experience.

In 2023

From 2019 to 2023  
**Professional status**



## GENDER BALANCE

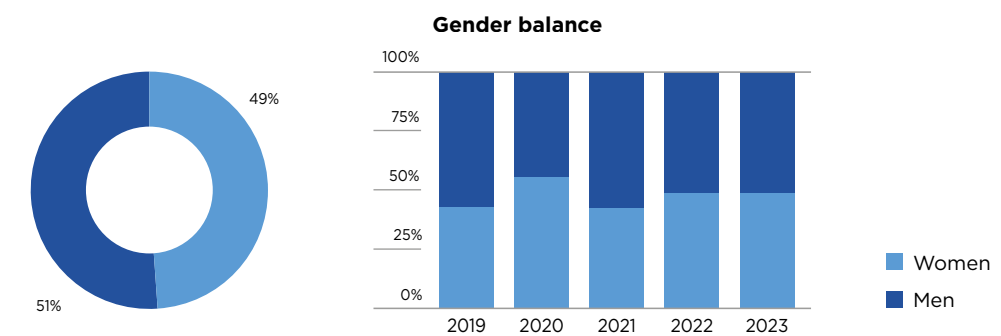
In 2023

**49%**  
women

**51%**  
men

In 2023

From 2019 to 2023  
**Gender balance**





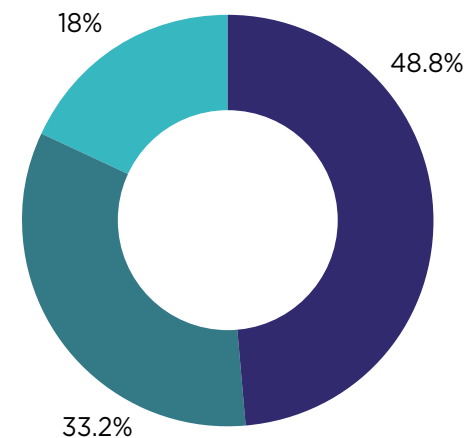
## Boosting learning opportunities through marine training

EMBRC's Marine Training Unit continued to help researchers further their knowledge and upskill by providing:

**217**  
courses

- on-site
- online
- blended

by **992**  
institutes /  
universities  
& **129**  
authors



These learning and development opportunities benefited a wide range of users :

**6,000**  
monthly  
unique visitors  
(+60% compared  
to 2022)

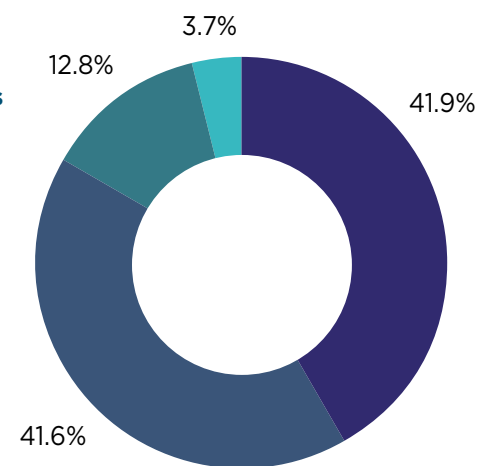
**11,000**  
page views  
(+40% compared  
to 2022)

From **82**  
countries worldwide

Speaking **38**  
languages

Involved  
in **3,312**  
training programmes

- bachelors
- masters
- PhD
- short cycle



## Learning opportunities in the world



## Adding more innovative services to our catalogue

We are also developing the next generation of scientific services for marine researchers through our Joint Development Activities (JDA) initiative. Five innovative projects have been chosen to develop new services for EMBRC's catalogue. They are:

- **A research infrastructure for chronic noise pollution studies in coastal waters and sediments (Ghent University and Austevoll Research Station):** building a soundscape sensor system (SoundSenS) and mesocosm tank facilities for noise pollution and marine bioacoustics research.
- **Identification and quantification of microplastics in marine samples by LC-MS (Centro de Ciências do Mar - CCMAR and the University of the Basque Country - PIE UPV/EHU):** using Pyrolysis, Liquid Chromatography and Mass Spectrometry (Py-LC-MS) to create simpler, faster and more effective ways of detecting microplastics.
- **3D Multimodal Atlas: Sea Life from Micro to Macro (Centro de Ciências do Mar - CCMAR, The Hellenic Centre for Marine Research - HCMR and the University of the Basque Country - PIE UPV/EHU):** developing a service to create comprehensive 3D multimodal imaging atlases of marine organisms.
- **MacroSea-MicroB: EMBRC Seaweed microbiome resources for a growing blue economy (Ghent University, Centro de Ciências do Mar - CCMAR, Station Biologique Roscoff and Tjarno Marine Laboratories):** establishing protocols for biobanking seaweed-associated microbiomes.
- **SeaCLEAN (The Oceanological Observatory of Banyuls-sur-Mer - Sorbonne University and Centro de Ciências do Mar - CCMAR):** developing pollution monitoring and environmental chemistry services.



## Experimental facilities

In 2023, EMBRC's most accessed service was its experimental facilities, such as aquaria and mesocosms, dry and wet labs, and climate-controlled rooms. One reason for the increased appetite for this service was TREC – a first-of-its-kind two-year expedition studying how coastal ecosystems across the continent respond to environmental changes – which visited many EMBRC members in 2023 and made use of their experimental facilities.

For example, when CCMAR (EMBRC-PT) hosted 11 TREC researchers in Faro, Portugal, access to their facilities, labs and imaging equipment enabled the visiting team to handle, preserve, process, and analyse samples (stored at -180°C, -20°C, 4°C, and room temperature). This included managing the supporting logistics for the TREC team, such as sourcing permits and approvals, desk space, parking and sampling vehicles. The Interdisciplinary Centre of Marine and Environmental Research (CIIMAR, Matosinhos, Portugal) also hosted 38 TREC personnel, and was involved in the sampling and engagement activities and provided all the logistical support required during the visit.

*The use of experimental facilities is particularly important when investigating our changing climate because it allows researchers to perform different experiments and see how marine biodiversity reacts to changing parameters.*

For example, how do species react to different temperatures, pH levels, microplastics, or the introduction of a toxin? By allowing access to our experimental facilities, EMBRC can help researchers predict the effects of a changing marine ecosystem and learn how to protect the underwater world.

### Highlights

71

access requests submitted

71

requests granted

112

users

- With the majority from Germany (63), France (17) and Switzerland (10)
- Mostly from EMBL, University of Basel, University of Grenoble Alpes
- Ranging from PhD students to senior scientists
- With expertise in Earth and related environmental sciences (53) and biological sciences (57)
- & an equal gender split (50.5% female, 49.5% male)

100%

on-site access

### Funding sources:

international and self-funded



# Our activities

*Collaborating for greater sustainable science in Europe & beyond*





# Collaboration across **Europe** and beyond: working together for increased impact



## **GERT VERREET**

Political Advisor, Department  
of Economy, Science and Innovation,  
Flemish Government and member  
of EMBRC General Assembly

Scientific cooperation has always been key in marine science because researchers must work efficiently to create new, rather than overlapping, pieces of the jigsaw, especially as they start tackling societally relevant issues. In marine sciences, there has always been a tradition of collaboration across disciplines: the underwater world is an open system and we must bring together many knowledge areas to understand it fully: biology, ecology, oceanography, and marine chemistry all work together to paint a picture of our changing seas.

As scientific endeavours become more sophisticated, the increasing number of tools available make it harder for individual researchers to be an expert in all the different technologies. This makes research infrastructures (RIs) – which help members of the scientific community from all different backgrounds collaborate on projects using the most advanced tools – even more societally relevant.

***EMBRC exists because some forms of advanced science couldn't be done without it.***

EMBRC not only fosters collaboration within its users and group of members but must work alongside other RIs to ensure research services are not unintentionally duplicated so the scientific community can progress quickly and efficiently.

***Working together with other research infrastructures in Europe even more than we already do will also be important as we build the European Ocean Observation System.***

Certain areas have proved challenging. A 2023 report from the European Court Of Auditors found that EU aquaculture is stagnating despite substantial support. Understanding the function of biological systems with relevance to aquaculture will be critical to boosting sustainable aquaculture production and the combined expertise of researchers across the EMBRC network can help bolster that knowledge.

With 9 member countries in 2023, EMBRC is continuing to facilitate collaboration across Europe. Scaling is important to ensure future support from major European projects. As part of this, funders want to see RIs working in alignment with adjacent infrastructures.

***Strong collaboration across Europe – among individual researchers, institutions, and even RIs – will help us all speed more quickly towards the UN's Global Goals.***



# Europe: leading global scientific research

In 2023, EMBRC continued to advance marine science through its involvement in 19 European projects, including many from Horizon Europe – the EU’s key research and innovation funding programme – and one from Interreg Europe. Our involvement in these projects is integral to our mission to foster innovation and boost European growth in the quest for solutions to important societal issues.



## BIODIVERSITY & OCEAN OBSERVATION



**AtlantECO**  
Atlantic Ecosystems Assessment, Forecasting & Sustainability

September 2020–August 2025

Developing a novel, unifying framework for a better understanding and management of the Atlantic Ocean and its ecosystem services

**Total budget:** 10,932,573.75 €  
**EMBRC budget:** 222,625.00 €  
<https://www.atlanteco.eu/>



**BIOcean5D**

December 2022–November 2026

Studying better the impact of human activity on Europe’s seas and coastlines

**Total budget:** 15,449,903.00 €  
**EMBRC budget:** 189,550.00 €  
<https://www.biocean5d.org/>



**Blue-Cloud2026**  
A federated European FAIR and Open Research Ecosystem for oceans, seas, coastal and inland waters

January 2023–June 2026

Providing a virtual environment with open and seamless access to services for storage, management, analysis, and re-use of research data

**Total budget:** 8,845,420.00 €  
**EMBRC budget:** 110,437.50 €  
<https://blue-cloud.org/about-blue-cloud-2026>



June 2021–May 2025

Streamlining research and providing the infrastructure to better understand the Black Sea

**Total budget:** 9,795,350.00 €  
**EMBRC budget:** 100,000.00 €  
<https://www.doorsblacksea.eu/>



September 2023–February 2027

Integrating biodiversity monitoring data into Digital Twins of the ocean

**Total budget:** 9,747,516.25 €  
**EMBRC budget:** 358,750.00 €  
<https://dto-bioflow.eu/>



September 2023–August 2026

Developing a digital ecosystem for eDNA reference libraries for marine and freshwater ecosystems

**Total budget:** 1,978,282.50 €  
**EMBRC budget:** 240,625.00 €  
<https://ednaquaplan.com/>



December 2022–November 2026

Strengthening biodiversity observation in support of decision-making

**Total budget:** 7,255,037.50 €  
**EMBRC budget:** 358,750.00 €  
<https://marcobolo-project.eu/>



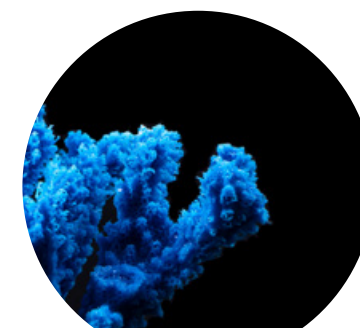
## AQUACULTURE



September 2022–August 2027

Providing customised and integrated RI services to support a sustainable and resilient agriculture and agroecological transitions

**Total budget:** 14,252,873.35 €  
**EMBRC budget:** 66,252.75 €  
<https://agroserv.eu/>



## BIOPROSPECTING AND THE USE OF BIORESOURCES



**BlueRemediomics**

December 2022–November 2026

Cataloging marine microbiome data and culture collections to improve aquaculture processes

**Total budget:** 7,683,577.50 €  
**EMBRC budget:** 303,812.50 €  
<https://blueremediomics.eu/>



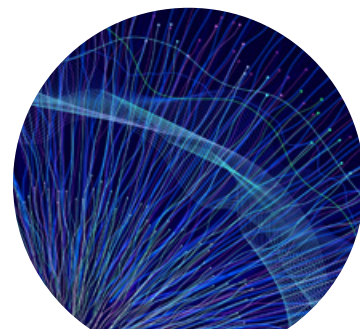
# Europe: leading global scientific research



September 2022–August 2025  
Providing cutting edge, interdisciplinary, and customised oncology services  
**Total budget:** 14,866,440.50 €  
**EMBRC budget:** 116,846.38 €  
<https://www.canserv.eu/>



January 2022–July 2025  
Supporting the generation of new knowledge and intervention tools to help control epidemic-prone pathogens  
**Total budget:** 20,998,624.00 €  
**EMBRC budget:** 48,750.00 €  
<https://isidore-project.eu/>



## TECHNOLOGY: OMICS & IMAGING



September 2022–August 2025  
Democratising access to FAIR data and open AI models by creating an accessible platform and offering training for life scientists  
**Total budget:** 4,141,167.50 €  
**EMBRC budget:** 34,500.00 €  
<https://ai4life.eurobioimaging.eu/>



January 2023–December 2026  
Developing the next generation of scientific tools and methods for sensing marine-life  
**Total budget:** 9,999,665.00 €  
**EMBRC budget:** 275,000.00 €  
<https://aneris.eu/>



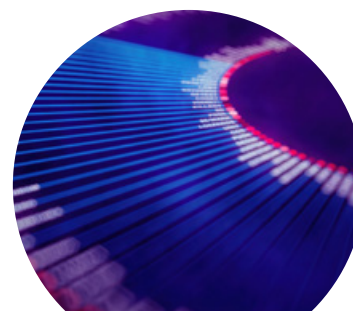
May 2023–April 2028  
Addressing socio-economic challenges through imaging technology developments  
**Total budget:** 9,569,677.50 €  
**EMBRC budget:** 121,250.00 €  
<https://www.eurobioimaging.eu/news/imagine-project-imaging-technology-developments-to-address-socio-economic-challenges/>



## ACCESS AND BENEFIT SHARING



December 2022–July 2023  
Facilitating sustainable access to Atlantic marine biodiversity, its associated data, and extractable products for academia and industry users  
**Total budget:** 332,222.08 €  
**EMBRC budget:** 58,250.00 €  
<https://www.bluebiobank.eu/biobanks/>



## DATA COLLECTION, MANAGEMENT & ANALYSIS



April 2021–September 2023  
Giving European researchers access to a wide web of FAIR data and related services  
**Total budget:** 42,077,088.84 €  
**EMBRC budget:** 62,400.94 €  
<https://eoscfuture.eu/>



March 2019–August 2023  
Creating an open, digital, and collaborative space for biological and medical research  
**Total budget:** 26,145,996.25 €  
**EMBRC budget:** 459,375.00 €  
<https://www.eosc-life.eu/>



September 2022–August 2025  
Building interoperable earth science and environmental services  
**Total budget:** 4,738,125.00 €  
**EMBRC budget:** 46,250.00 €  
<https://www.fairease.eu/>



## STRENGTHENING THE COORDINATION OF RESEARCH INFRASTRUCTURES



September 2023–August 2027  
Facilitating the establishment and operation of research infrastructures with European interest  
**Total budget:** 1,495,281.25 € €  
**EMBRC budget:** 26,100.00 €  
<https://www.eric-forum.eu/>



## eDNAqua-Plan:

### the next generation of aquatic biodiversity monitoring

EMBRC is leading 18 partners in 12 European countries in the eDNAqua-Plan project. Launched in September 2023, it will develop a blueprint for a unified European reference database for DNA sequences. EMBRC is collaborating with several partners, including IOC-UNESCO's Ocean Biodiversity Information System (OBIS), European Marine Observation and Data Network (EMODnet) and European Molecular Biology Laboratory's European Bioinformatics Institute (EMBL-EBI)'s European Nucleotide Archive (ENA).

One benefit of environmental DNA (eDNA) is that it helps scientists overcome aquatic biodiversity monitoring challenges through non-invasive DNA sampling methods.

The technology provides vast amounts of data much more quickly than traditional monitoring and holds huge potential for the advancement of marine research.

DNA barcodes can only indicate the presence of a species – whether it's a humpback whale, green turtle, or krill – if it's something we've seen before but reference databases are often incomplete. This is even more true of microorganisms which require DNA to identify them. Without a comprehensive repository, scientists are limited.

Generating, streamlining, and sharing data at European level will take a huge effort but the strong baseline will help us understand the effects of a changing climate on the planet's biodiversity. It could also be useful in environmental impact assessments because the same data could answer several policy questions about how our environment is changing without needing to replicate work.

***As coordinator, EMBRC is responsible for liaising with the European Commission on behalf of partners, facilitating implementation committee meetings and communicating milestones to the wider scientific community.***

Work Package 2 (Audit & Gap Analysis) results are expected in August 2024, which will be another exciting step towards the creation of this vital eDNA roadmap.



**eDNAqua-Plan will play a strategically important role in building synergies between European and international data sources.**

# 11

**countries involved to date :**

Norway, Finland, Poland, Germany, the Netherlands, France, Spain, Portugal, Greece, the UK, and Belgium.

The project is working with international partners to implement data standards that enable collaboration outside Europe.



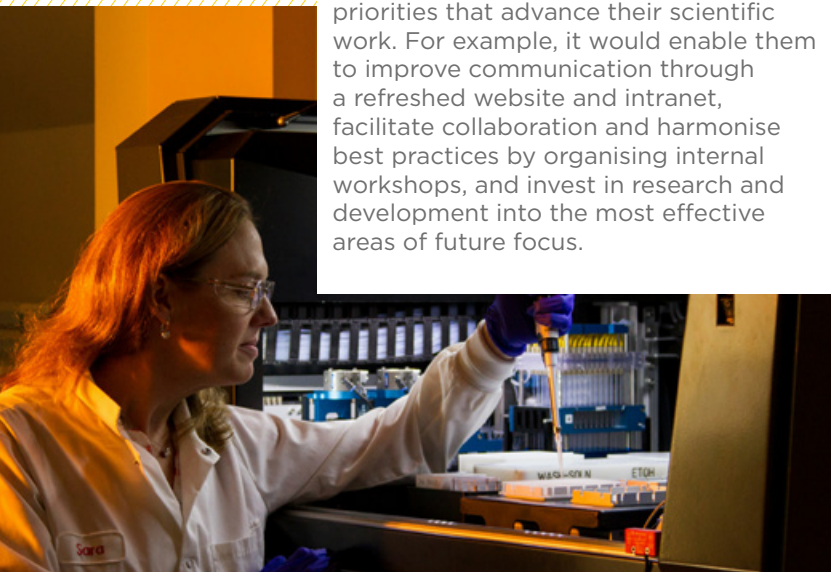
# European highlights



## EMBRC FRANCE APPLIES TO RECURRENT FUNDING PACKAGE

EMBRC France has applied for recurrent government funding which would stabilise the RI's financing and help improve coherence throughout the infrastructure. Since 2012, over 20 biology and health research infrastructures in France (including EMBRC-Fr) have been funded by Le Programme d'Investissements d'Avenir (PIA). EMBRC-Fr has now applied for recurrent funds to cover the governance of the infrastructure when the PIA's major funding package ends in 2024.

As well as providing ongoing security for the RI, this long-term unrestricted funding source is likely to require lighter touch reporting. This would reduce admin workload and give the team more time and resources to focus on priorities that advance their scientific work. For example, it would enable them to improve communication through a refreshed website and intranet, facilitate collaboration and harmonise best practices by organising internal workshops, and invest in research and development into the most effective areas of future focus.



## ATLASEA PROJECT SEQUENCING 4,500 MARINE SPECIES IN FRANCE

EMBRC-Fr's marine stations at Banyuls, Roscoff and Villefranche-sur-Mer are supporting ATLASea's €41.3 million initiative to sequence around 4,500 marine species around the coast of France and its overseas territories. EMBRC-Fr plays a vital role in this significant project by providing researchers with ecosystem access to collect samples.

By cataloguing the genetic biodiversity of our planet, ATLASea offers huge possibilities for both research and industry. The FAIR (Findable, Accessible, Interoperable, Reusable) data generated will teach researchers how marine species can be protected or exploited for socioeconomic gain and will lead to other exciting projects. Once a species has been identified, sequenced and catalogued, researchers can create genetically modified organisms with beneficial properties that could be economically valuable for pharmaceutical or cosmetic industries. As model organisms are also exported outside France, this project adds value to the global scientific community.



## INVESTIGATING THE ENVIRONMENTAL EFFECTS OF FLOATING SOLAR PANELS

EMBRC Belgium's infrastructure at UGent and RBINS is supporting research into eco-friendly floating solar panels. Through this pioneering work, EMBRC-Be is deploying artificial Hard Substrate Gardens at sea to facilitate a range of experiments in real conditions and ensure the sustainable technologies they develop are nature-inclusive from the start.

As well as ensuring these installations generate energy effectively, the team aims to minimise negative environmental impacts and maximise benefits. They can also experience and overcome the technical and logistical challenges associated with dynamic offshore conditions: ensuring equipment isn't lost, minimising anchoring damage, and taking into account the establishment of non-indigenous species.

Renewable energy is experiencing exponential growth (renewable electricity capacity in 2023 was almost 50% higher than in 2022, according to IEA) which is why it is a particular priority in EMBRC-Be's work towards a sustainable blue economy.



## EMBRC BELGIUM HOSTS ITS FIRST EVER COMMUNITY DAY

On 16 May 2023, EMBRC Belgium hosted its first Community Day at VLIZ, Ostend, inspired by the European-level Community Days in 2022. The event was organised from the bottom up and brought together 50+ participants from EMBRC Belgium's 5 partners – Ghent University, KU Leuven, RBINS, VLIZ and UHasselt – with the aim of creating a greater affinity between everyone.

The day began with presentations on EMBRC Belgium's vision, activities, and facilities before moving onto roundtable discussions on topics including culture collections, bioinformatics, biobanks and bioprospecting. These areas are evolving at a rapid speed so sessions were designed to meet researchers' need for skills development to keep up. Sessions on training and communications ensured the day catered to the whole group, not just the scientists, before ending with a quiz and drinks so people could get to know each other in a social setting.

After a day dedicated to exchanging ideas and fostering collaboration, the team came away feeling part of EMBRC Belgium. They hope to host the next Community Day in 2025.



# European highlights



## EXPLORING THE GENOMICS AND BIOLOGY OF INVASIVE SPECIES

Invasive species are a global threat but they pose a particularly significant problem in the Mediterranean, and so are a focus area for EMBRC Greece. As climate change causes waters to warm, the Mediterranean is becoming more similar to the Red Sea, which makes it easier for non-native species to spread. New invasive species are arriving in waves, becoming more intense as the seas warm. This changes the dynamics of the ecosystem and threatens endemic species.

EMBRC-Greece, led by Dr. Tereza Manousaki, is studying the genomics of these species and conducting bioinformatics analysis and chemical investigations to learn what makes aquaculture fish and invasive species special: for example, why lionfish are poisonous (producing toxins offers a defence against predators and so facilitates invasions) and how they interact with other species. A second layer of analysis enables them to learn about populations, and study the speed and route of their spread.

This is part of developed bundle services, including genome and transcriptome sequencing, production of molecular and biological data, bioinformatic analysis and interpretation. Through this work, EMBRC-Greece is able to observe how this global phenomenon is evolving to give us a better chance of predicting and mitigating future changes.



## SARDINE SEASCAPE GENOMICS

Led by Dr. Aglaia (Cilia) Antoniou at the Hellenic Centre for Marine Research (HCMR), EMBRC Greece has standardised methods to monitor and explain changes in populations of sardines to find causation in their changing distribution. As a multi-disciplinary topic, these types of seascape genomics projects are closely tied to EMBRC's goal of strengthening collaborations because no research team can solve these issues alone.

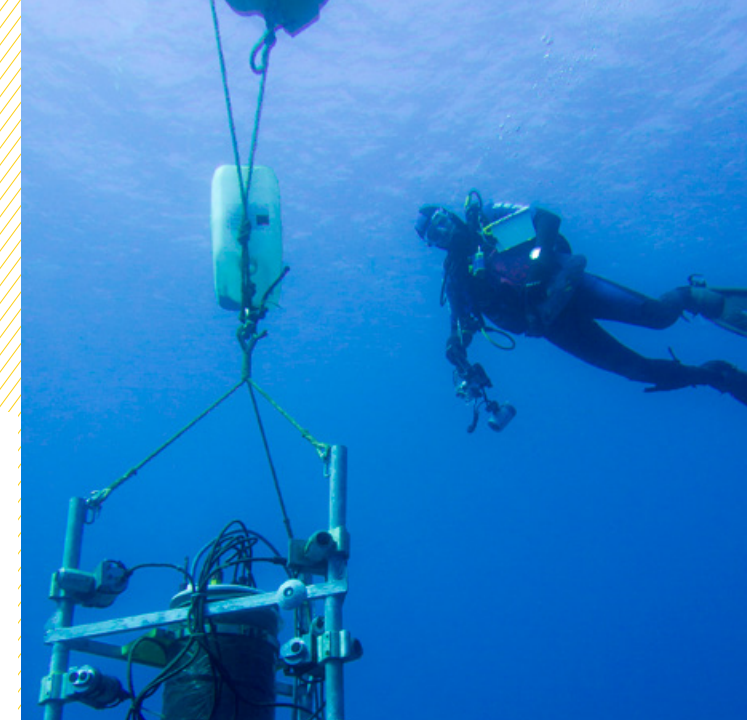
Small pelagic species, like sardines, are important ecologically, economically, and politically so learning about their status can inform a more sustainable way of using fish stocks. In order to understand an animal's potential to adapt to the building climate crisis – particularly in the Mediterranean where impacts are more pronounced – scientists need to describe their current status. Combining information about the species' genomics with oceanographic and ecological data allows researchers to see patterns in an animal's genetic response to changes in the environment. This knowledge will help researchers predict how things will evolve in different scenarios and make the right science-based policy decisions for a sustainable future.



## ISRAEL OCEANOGRAPHIC AND LIMNOLOGICAL RESEARCH INSTITUTE (IOLR) JOINS EMBRC

IOLR – a research institute made up of the National Institute of Oceanography, Kinneret Limnological Laboratory and National Centre for Mariculture – has joined EMBRC Israel, alongside the Interuniversity Institute for Marine Sciences (IUI), and University of Haifa. Strengthening EMBRC-IL through this collaboration enables our researchers to share knowledge, learn from each other, secure more grants, and publish more papers.

IOLR has significant budgets, large volumes of data, and extensive facilities. Other EMBRC member countries can benefit from its new algae research centre, range of equipment – sensors, underwater drones, ROVs, and AUVs – and its management of Israel's national research vessel. IOLR can facilitate the collection of hundreds of species from unique habitats, including the Mediterranean Sea, Lake Kinneret, Red Sea and the Dead Sea. With strong expertise in deep sea research, the institute can also share data, help researchers access ecosystems, and train them on best practices in deep sea research.



## SIGNIFICANT FUNDING AWARDED TO THE INTERUNIVERSITY INSTITUTE FOR MARINE SCIENCES IN EILAT

The Interuniversity Institute for Marine Sciences in Eilat (IUI) was awarded a significant infrastructure grant towards the support it can offer to future users.

A report by an international expert committee on marine sciences, appointed by the Israel Academy of Sciences and Humanities, recommended further investments in the Interuniversity Institute for Marine Sciences in Eilat (IUI), as it is a hub of scientific excellence. On the basis of that report, the Israel Council for Higher Education has started a process to reevaluate the IUI's funding framework. The new model that resulted from this work increased IUI's operational budget by ~20% and a committee of the Council made recommendations for further investments in marine science in Eilat. This process is still ongoing and relevant calls for proposals are expected in 2024.



# European highlights



## EMBRC ITALY LEADS REFRESHED MARINE BIOPROSPECTING WORKING GROUP

EMBRC-IT has led the revamp of the Bioprospecting Working Group, first developed in 2020. New projects (e.g. EUREMAP) and new EMBRC country members gave the opportunity to start the working group afresh, building on previous successes. Italy was an apt lead partner as Stazione Zoologica Anton Dohrn, Naples (SZN) is home to Italy's only blue biotechnology department – and one of the few in Europe.

The need for redevelopment stemmed from the complexity of bioprospecting. Many working groups are dedicated to one clear service – such as e-data or model species – but bioprospecting operates at the intersection of many capabilities. The group brings together broad expertise and facilities to create enhanced, sustainable biodiscovery pipelines from marine resources.

The new Group launched in September during a two-day workshop at SZN's Ecosustainable Marine Biotechnology Department. It will organise many activities, including online training, a service sub-catalogue to foster industry interaction, a meeting calendar to encourage collaboration and a Protocols Handbook, inspired by EMO BON, EMBRC genomics observatory. Its creation enables members to share the protocols, expertise, tools and best practice needed for impactful research as well as creating the critical mass to apply for larger funding projects.



## EMBRC ITALY LAUNCHES REFRESHED SERVICE CATALOGUE

EMBRC-IT completed a refresh of its service catalogue, led by Stazione Zoologica Anton Dohrn (SZN). With 16 partners covering most of Italy's coasts and ecosystems, the node had a large catalogue of 300 services. It now showcases 120 carefully selected offerings, removing duplicates and ensuring every partner highlights their best expertise.

SZN streamlined the cost of services across organisations to prevent false competition and launched an innovative governance model: using 10–12 thematic spokes to remove duplication and make a clearer, more impactful catalogue. For example, rather than separating all bodies offering research vessels, they fell under the relevant theme, e.g. taxonomy.

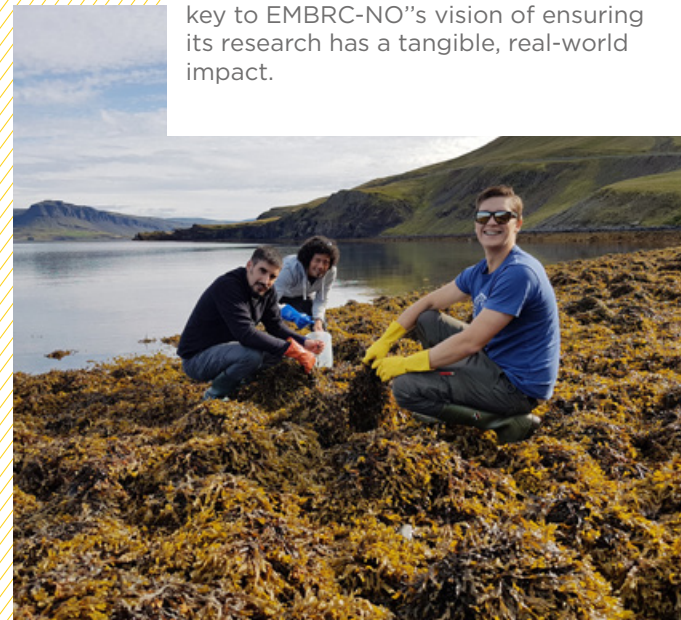
The process involved continuous dialogue between partners; increasing awareness of EMBRC, fostering collaboration, encouraging knowledge sharing and enabling EMBRC-IT to launch a 2024 access call. Giving different partners responsibility for each spoke also increased their commitment to EMBRC. This new model will help researchers, technicians and users collaborate for better results and could offer inspiration for other large country nodes.



## LOCALITY EXPLORES ALGAE APPLICATIONS

Having been fundamental in the development of the algae culture collection (NORCCA) at NIVA and the University of Oslo, EMBRC Norway allowed NIVA to lead a new HORIZON project: LOCALITY. After many years researching the negative effects of algae and the toxins they produce, they will now explore algae's benefits and develop circular value chains based on algal biomass.

This includes using industrial waste streams as a nutrient source for algae cultivation which then treats the waste. Seaweed cultivation will protect ecosystems while removing nutrients and mitigating pollution. Biotechnology is the key to incorporate algae biomass into sustainable food (e.g. algae burgers), aquafeed (supplements that prevent fish from getting parasites), agriculture (biostimulants) and textiles (fabrics with enhanced properties). Working with industrial partners to get commercially-ready products all the way to market is key to EMBRC-NO's vision of ensuring its research has a tangible, real-world impact.



## THE TREC EXPEDITION VISITS EMBRC NORWAY

EMBRC Norway's University of Bergen (UiB) hosted TREC in August 2023 in Bergen: the expedition's northernmost stop. Contributing to this large-scale research project supports UiB's mission to become Norway's leading marine university and cements EMBRC's role as a key partner.

The TREC mobile lab team was based at Espegrend Marine Biological Station. This experimental facility, run by UiB's Department of Biology since 1957, is uniquely located in one of Scandinavia's marine biodiversity hotspots. The region's interactions between marine and freshwater – through glaciers, fjords and coastline – and the short distance between the fjords and the city of Bergen make this a fascinating landscape for TREC's studies into human impacts on coastal ecosystems.

Researchers and technicians from the Michael Sars Centre also visited the Tara schooner and welcomed the TREC team to their own facilities. These meetings help to exchange knowledge and strengthen relationships. Along with the expedition's data, which will be open to the global scientific community, these partnerships will have a long-lasting impact.



# European highlights



## NEW FUNDING SECURED FOR HORIZON-INFRA PROJECT AQUASERV

In 2023, CCMAR (EMBRC Portugal's coordinator) led a successful funding application for the AQUASERV project. EMBRC France, Norway, Belgium, Spain, Sweden, Italy, and Greece were also involved in the application. With a total budget of over 14 million euros, AQUASERV will facilitate scientific research by providing transnational and virtual access to EMBRC and partners' infrastructure services, including diving, vessels, telemetry, and a range of lab equipment.

This long-term project brings together scientists from different disciplines – who can use their varying expertise to find innovative solutions to societal problems – and 40 entities, including several EMBRC members, across 80 spots in Europe.

Its focus on the implementation of important green policies – including the European Common Fisheries Policy, the Farm to Fork Strategy, the Sustainable Blue Economy, and the European Green Deal – also ensures EMBRC Portugal can continue working to resolve important societal problems.



## NEW PROCEDURES FOR MONITORING MARINE BIOTOXINS

CCMAR has implemented monitoring techniques used by governmental authorities to detect marine biotoxins in gastropods. The project is important for the health of marine organisms and also aims to inform changes in European legislation and protect people who consume seafood.

The research team found Tetrodotoxin (TTX) at concentrations above the European Food Safety Authority (EFSA)'s recommended limit in edible and non-edible tissues of Charonia lampas trumpet shells. This potent neurotoxin is most famously found in the Japanese delicacy fugu (blowfish sushi), and can lead to cardiac arrest and even death but is not currently regulated or monitored in Europe. This work will be key to learning about its European spread.

The work also aligns with EMBRC Portugal's goal of collaborating to advance science. The technique used – liquid chromatography mass spectrometry – requires expensive equipment and specialist personnel, making it inaccessible to many biotoxins labs. They hope the results of this project might inspire other researchers to test existing samples using this method.



## THE PLENTZIA MARINE STATION (PIE-UPV/EHU) BECOMES A TREC EXPEDITION HOTSPOT

From 13 Sept to 18 Oct, TREC stopped in Plentzia-Bilbao and undertook soil, sediment, water, and aerosol samplings in six different sites – at the intersection between land and sea – in the Southern Bay of Biscay. Opening its marine stations to the expedition enabled EMBRC Spain to provide valuable insights to the TREC teams, including members of EMBL, Tara Foundation, and collaborating researchers. In the future, it will also provide additional data to the EMO BON project and other in-house One-Health research projects on the impacts of hospital water runoff on marine ecosystems.

The visit also demonstrated the strength of EMBRC Spain's outreach in collaboration with TREC's science dissemination programme. Thanks to strong media connections and a dedication to science communication, they raised the visibility of the expedition through 60+ pieces of coverage (outreach materials were translated into Basque and Spanish) and two TV documentaries. They also reached 6,000+ citizens, scientists, students, and children through conferences, exhibitions, workshops, beach cleanups, and visits to the marine station, mobile lab, and Tara schooner.

The EMBRC Spain team is excited to continue the long-lasting collaborations forged by hosting 40 members of the TREC team and plugged-in research projects.



## FUNDING GRANTED FOR EMBRC-SPAIN'S NETWORK OF EXCELLENCE

A new 2023-2027 agreement has been signed between the Spanish Ministry of Science, Innovation and Universities and EMBRC Spain's three operators: the Toralla Marine Sciences Station of the University of Vigo (ECIMAT-UVIGO), the Plentzia Marine Station of the University of the Basque Country (PIE-UPV/EHU) and the Spanish Bank of Algae of the University of Las Palmas de Gran Canaria (BEA-ULPGC) in support of their participation in EMBRC.

The node also received funding from the Spanish Research Agency to help EMBRC-ES elevate its operations and build bridges with EU priorities such as SDG 14 (Life Below Water) and the EU Mission "Restore our Ocean and Waters". In line with its strategic plan, this enables EMBRC-ES to develop a project\* to strengthen and consolidate its communications, activities, and operations at the regional, national, and international level. For example, in Autumn 2024 the node will host a networking event, inspired by the ERIC Forum, bringing together Spanish representatives from 15 European RIs to encourage collaboration and establish synergies. They are also developing internal and external communications materials and an exchange programme for researchers and technicians. By spreading the word about what EMBRC-ES can do, these activities help more researchers understand its value and benefit from its services.

*\*Coordination of EMBRC-ES for consolidating its strategic position and adaptation to the Future Strategic Priorities of the European Marine Biological Resource Centre-ERIC.*





# European highlights



## EMBRC SWEDEN JOINS FOUR HORIZON EUROPE PROJECTS

EMBRC-SW received funding in four new Horizon Europe projects: AQUASERV, IRISCC, MARCO-BOLO and DTO-BioFlow. Sweden joined EMBRC to help organise their research stations on a national level and benefit from the European community's international connections – while Swedish scientists had individual international contacts, these improve every year as the infrastructure's network is formalised and consolidated. By bringing the infrastructure's work to life, these new projects will further integrate Swedish institutes into EMBRC Europe.

With more Swedish marine stations getting involved in European projects, EMBRC-SW is focused on spreading EMBRC involvement across their network so it looks like a web rather than a bowtie with Kristineberg at the centre. A range of institutions are involved with AQUASERV (Umeå University and Gothenburg University), IRISCC (Gothenburg, Umeå and the Swedish University of Agricultural Sciences), MARCO-BOLO (Kristineberg), DTO-BioFlow (Kristineberg and Gothenburg). Strengthening the network in this way is important for EMBRC Sweden's future development.



## EMBRC SWEDEN PROVIDES A SUPERSITE FOR THE TREC EXPEDITION

The Traversing European Coastlines (TREC) expedition visited Sweden (16 July–23 August) to conduct several scientific activities, including sampling, technical training, education and outreach. Kristineberg Marine Research Station, which can be reached easily by both land and sea, was chosen as a supersite thanks to its exceptional infrastructure and accessible ecosystems.

EMBRC-SW was excited to welcome this pioneering expedition to the region. This visit adds to over 10 years of collaboration between Kristineberg and the European Molecular Biological Laboratory (EMBL). The strength of the relationship, and EMBL's existing knowledge of the area, allowed the TREC team to plan ahead and maximise the results of their visit.

The partnership brings together strong expertise in molecular biology (EMBL), genomic diversity (Tara) and ecosystem knowledge (EMBRC). Combining these overlapping skill sets allows researchers to improve methods and gather long-term data to learn why environmental changes occur.





# Ocean Observation



**EMO BON**  
EUROPEAN  
MARINE  
OMICS  
BIODIVERSITY  
NETWORK

## Driving marine genomics data

EMO BON (European Marine Omics Biodiversity Observation Network) is the first coordinated long-term genomic biodiversity observatory in Europe. The ambitious project uses eDNA methods to create a steady flow of FAIR (Findable, Accessible, Interoperable, and Reusable) baseline biodiversity data at EMBRC marine sites.

The EMO BON network is made up of 16 marine stations across Europe which regularly take marine genomic data to fill gaps in ocean observation data and better understand biodiversity. Through EMO BON, these experts share knowledge, coordinate research and improve methods – continuing to push the frontiers of marine science and speed up discoveries. Collecting information on biodiversity health – such as its composition and how it responds to external pressures like climate change or pollution – is vital as we try to tackle pressing environmental and societal issues. This knowledge will be integral to advancing marine biodiversity research and understanding how to protect important habitats and use their resources sustainably.

In May 2023, the paper ‘European marine omics biodiversity observation network: a strategic outline for the implementation of omics approaches in ocean observation’ was published in *Frontiers in Marine Science*. It outlined the need for a pan-European genomics network and how EMO BON’s cohesive approach can maximise resources, standardise data and facilitate better science. EMO BON’s upcoming update to its Standard Operating Procedures (SOPs) will also help marine stations produce comparable and interoperable results.

The launch of the French national biodiversity strategy 2030 – which aims to reverse biodiversity decline – demonstrates a national commitment to preventing the loss of important species and highlights why genomics research is critical. Getting a better picture of what’s happening in the ocean is crucial for our move towards a sustainable Blue Economy.

*By helping us understand how ocean life responds to human activities, EMO BON’s comprehensive datasets can inform both ecosystems and biodiversity health management, economic strategies and ensure marine resources are used sustainably.*

## 2023 HIGHLIGHTS

EMBRC updates its Standard Operating Procedures (SOPs) for EMO BON observatories to help researchers avoid biases and produce comparable, interoperable results.

EMBRC’s EMO BON framework is published in *Frontiers* (May).

Several EMBRC nodes collaborated closely to develop a new data analysis workflow – metaGOflow – to analyse EMO BON’s marine genomic data. This work, which was part of the EOSC-Life project, has now been published.

EMBRC hosted a webinar to update the network on EMO BON’s sampling campaigns, protocols, data collection and analysis (June).

EMBRC presented how EMO BON is boosting marine biodiversity data collection across Europe and beyond at UNESCO HQ (Jun) and the EMODnet Open Conference (Nov).

EMO BON enabled EMBRC to take part in the OmicBON panel at the GEO BON Global Conference in Montreal (Oct).

Learn more about metaGOflow



## THE PARADIGM OF EMO BON

EMO BON supports open and transparent science practices and is taking steps towards reproducibility and inclusivity. All protocols and guidelines for scientific, data, ethical and legal procedures are openly available.

This initiative is pioneering marine biology observation and comprises a paradigmatic observatory, inviting other stations or networks in Europe and beyond to join the effort.

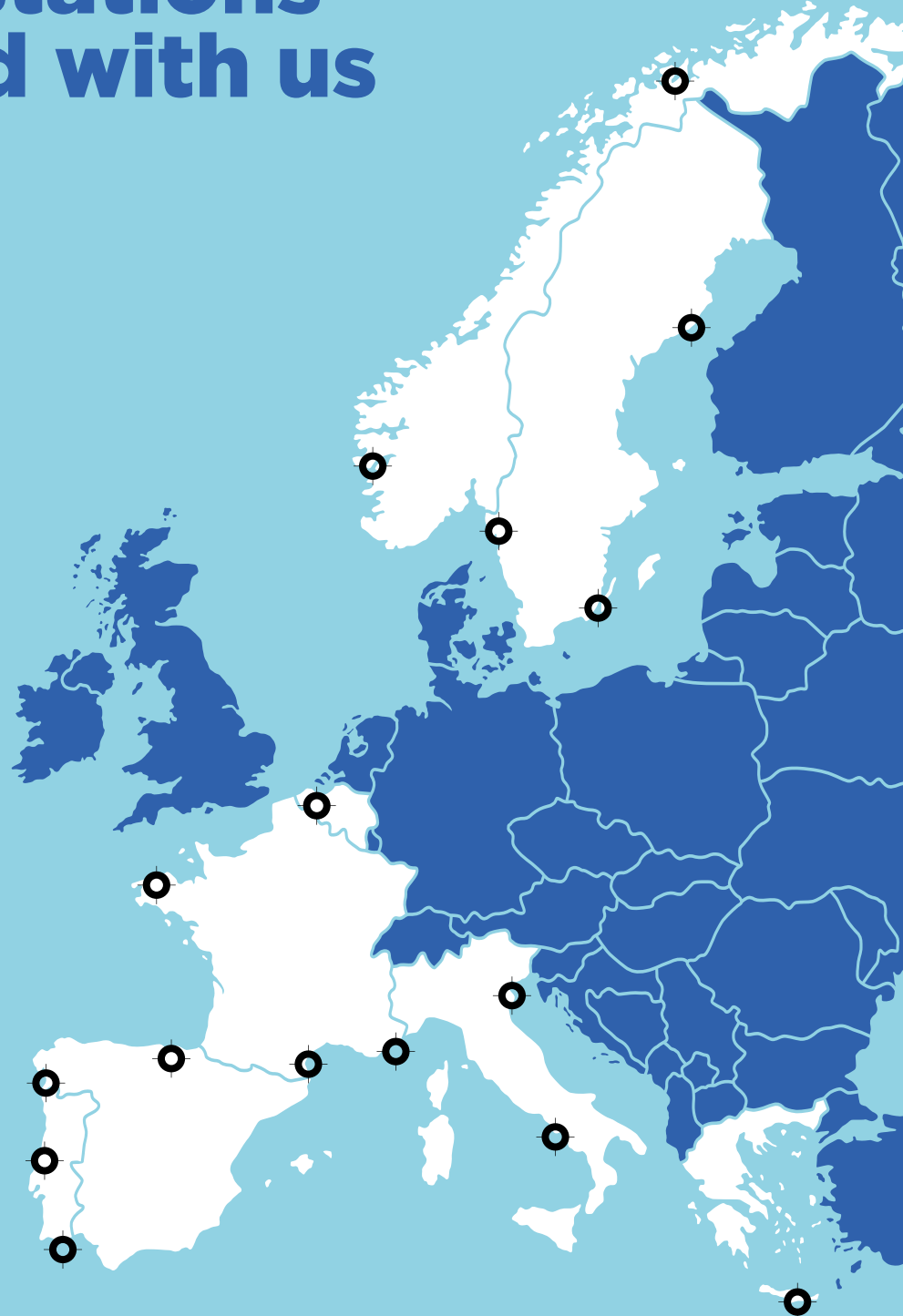


# Marine stations engaged with us

## Marine stations engaged with us

EMO BON brings together decades of marine biodiversity knowledge by connecting independent marine stations into one coordinated network of observatories. This collaboration also benefits the stations who can work with other researchers around the world to pool their data and find answers to their research questions more efficiently.

In 2023, EMO BON was made up of 16 observatories in 8 different countries, and thousands of samples were collected during the year. This year, EMBRC updated the EMO BON Standard Operating Procedures (SOPs) to improve the collection of FAIR data, published its framework and promoted the network of observatories through several conferences and webinars.



Learn more about EMO BON

# EMO BON in numbers

8

participating countries

19

partner institutes

16

observatory stations



6

water column sampling campaigns

(Feb, Apr, Jun, Aug, Oct, Dec 2023)

+6

soft substrate sampling campaigns

microorganisms (Feb, Apr, Jun, Aug, Oct, Dec 2023), meiobenthos (Apr, Jun, Oct 2023) and macrobenthos (Apr, Oct 2023)

## Samples collected:

387 water column

103 soft substrate

56 hard substrate

7

Horizon Europe projects which EMO BON is part of (MARCO BOLO, eDANAqua-Plan, BlueRemediomics, EOSC-Future, FAIR-EASE, Blue-Cloud 2026, DTO-BioFlow)

## Standard Operating Procedures (SOPs)

EMO BON's standardised Operating Procedures (SOPs) have been developed to help observatories across the network avoid biases and produce comparable and interoperable results. By promoting best practices and minimising variability, SOPs ensure researchers are generating robust, reliable and credible data, and ensure the sustainability of scientific advancement.



# our impact

*Science-based decision-making  
for a sustainable future*





# Reaching 30x30: the political impacts of marine data

## GERT VERREET

Political Advisor, Department of Economy, Science and Innovation, Flemish Government and member of EMBRC General Assembly

Science-backed decision-making is essential if we are to reach global sustainability goals: if you want to preserve and foster marine biodiversity, you need a good understanding of the system and how it will be affected by different pressures. Policy frameworks can't be black and white (e.g. distinguished only by an area being 'protected' or 'not protected') because quality protection requires us to see and understand what is actually happening, even if it is complicated.

But science is not fixed knowledge. It is an evolving process of discovery.

***Science is constantly challenging itself as we keep learning more, which can make the important relationship with policymakers a complex one.***

Evidence-based policy needs efforts from both sides and from the intermediaries who can help translate current understanding and knowledge into useful policy options.

Quite a number of organisations in Europe have a role to ensure that the marine science world can make decision-makers aware of what exists that might benefit them - for instance, policymakers cannot ask for the information they need if they're not aware of the capabilities of RIs - but it's also important for policymakers to be clear about what science they need. It's a two-way street, and even more:

***With the current strong European drive to boost the sustainable use of marine resources, the dialogue also needs to involve other stakeholders, such as the public and industry.***

EMBRC's work demonstrates that we can use data to generate enormous amounts of leverage towards achieving a range of societal benefits. The infrastructure is at a critical juncture in helping the marine biodiversity monitoring world move forward, through its ocean observation capacities and a refocusing of its broad service catalogue as well as how it can facilitate FAIR data. Biological research is also required to meet evolving regulations, such as those around sharing the benefits of genetic resources.

Both scientific research and policymaking are not linear or predictable processes. The scientific community should, however, always be ready to provide the relevant pieces of information that can make a difference.



# The fourth industrial revolution: the rise of marine data

*EMBRC's vision is to strengthen the connection between academia, policymakers, and industry through data-driven decision-making. Our new industrial engagement strategy will help us achieve this.*

**MERY PIÑA**  
Industry Liaison Officer,  
EMBRC Headquarters

*We can't reach global sustainability goals without science-based decisions. And the essential building block propping up science? Data.*

We're living through the fourth industrial revolution: a time when marine biodiversity data is reshaping our approach to the ocean, and teaching us more than ever before about the world under the sea. This information is used by policymakers as well as industry sectors: energy, fisheries, aquaculture, tourism, biotech, and bioprospecting to name a few.

Industry's view of the sea is changing. Our private sector partners are increasingly interested in renewable energy, reducing plastic, and offsetting emissions through blue carbon, not to mention the explosion in demand for offshore wind and boost in the use of marine products for food, animal feed, nutraceuticals, and cosmetics. Because everyone benefits from protecting marine ecosystems and using their resources sustainably.

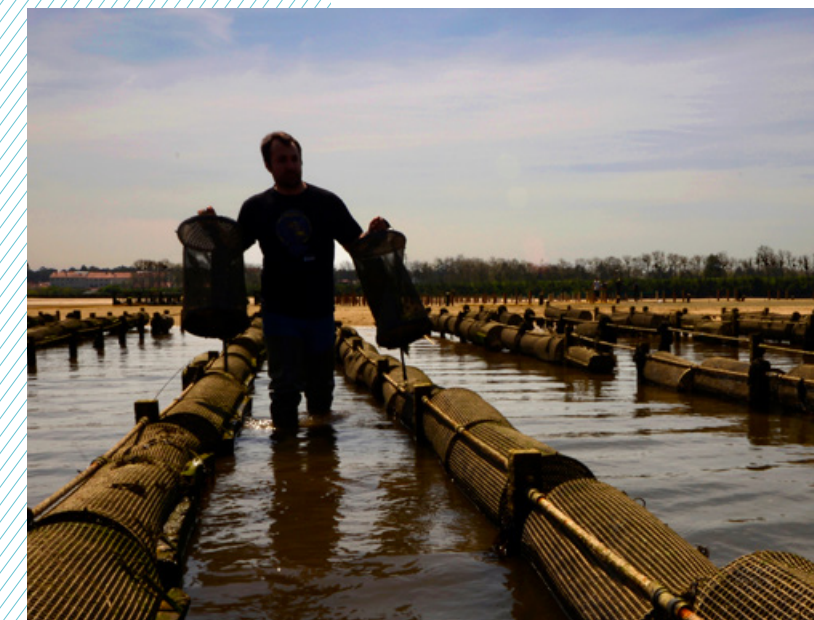
Blue data helps organisations overcome challenges, decrease risks, improve efficiency, and reduce costs. For example, aquaculture sensors provide data to help farmers reduce waste, keep tanks in optimum condition, and minimise disease risk as they work towards a circular model and reduce environmental impact through their processes.

**EMBRC's vision is to strengthen the connection between academia, policymakers, and industry through data-driven decision-making.** Our new industrial engagement strategy will help us achieve this. Facilitating access to technological platforms, biological materials, and blue data empowers government bodies and the private sector to make the best evidence-based decisions.

More and more, scientists don't just want the answer to a specific biological question – they want new ways of solving these problems. In their quest for answers, **our research infrastructure is helping industries push the limits of emerging technologies through co-development and prototype testing.**

We're also working on a dedicated industrial webpage and new catalogue that will be better tailored for private sector needs – whether they work in aquaculture, bioprospecting, integration and data analysis, or sensors for marine observation tools. We are also working to automate the processing of genomics data and bioinformatics tools to speed up how quickly large and complex datasets can be analysed and made available.

The private sector is a powerful player for change, but they can't drive meaningful societal change without blue data. Together, we can accelerate progress towards a sustainable blue economy.





# Storytelling for a sustainable future

*Science is still a black box to most people but communication can bring clarity. If we're serious about giving a voice to science for a better future, this is a challenge we can no longer ignore.*

**ANABELLE CHAUMUN,**  
Communications Manager,  
EMBRC Headquarters

**Our planet has been sustained by the ocean's vitality for millions of years: providing us with wonder, recreation, goods, services, livelihoods, and a stable climate. But our economic patterns and social behaviours have pushed our planet's biggest ecosystem to crisis point, degrading its natural properties.**

Science's standing in public debate has grown and it's now recognised as key to restoring ecosystem health. The media and political influencers may have discredited this topic during the pandemic, but this coverage also elevated science in news reporting, social media and political discourse more than ever. Now climate change – alongside public health, plastic pollution, and food insecurity – is high up the agenda. The scientific community has pushed the frontiers of research to meet these challenges but it's not just down to them to preserve the planet. Driving transformation isn't easy. It requires structural change which, itself, must be supported by strong communication.

***A powerful tool for cultural change, communication accelerates momentum and influences world views and habits for a fairer and more sustainable future.***

\*Wolton, Dominique, "Communication, a major scientific and political stake of the 21st century", L'Année sociologique



Faced with huge societal shifts and individuals' changing needs, we craft stories that share knowledge, shift perceptions, and facilitate new, better behaviours: contributing to our evolving mindsets and norms. Communication's social and human element is its greatest strength. It has the power to inform, question, and inspire people's thoughts and actions. As sociologist D. Wolton\*, specialised in political communication says, communication touches on the mental infrastructures of individuals and communities. It's as important in the 21st century as science, education, health, and defence.

Research and innovation have always accelerated progress but science is still too locked down in labs. That's where communication comes in. Empowering the science sector to integrate impactful communication makes a difference and we've been investing heavily in this area. EMBRC ran a joint communications campaign to increase awareness of ocean observation through a website, video, articles, testimonials from ocean leaders, social media, and a photo series. This campaign introduced people around the world to the importance of advancing and sharing marine science to tackle societal problems. The campaign had over 26,000 impressions.



# EMBRC's communications in 2023: bridging the gap between science and society

There's plenty of research but sharing it doesn't come without challenges. The sector suffers from a weak interconnection with society. **Science is still a black box to most people but communication can bring clarity. If we're serious about giving a voice to science for a better future, this is a challenge we can no longer ignore.**

We must ensure storytelling resonates and adds value through tailored messages on global issues. Scientific work is so important, but it's critical to break down access barriers to create a better-informed society. Addressing this will take focused efforts that acknowledge communication's role in driving behaviour change, democratising sustainability, and demand significant strategic investment in connecting with all audiences.

With digitisation and social media growth, the online revolution has brought us new ways of interacting and gaining knowledge. But these rapid developments have unleashed torrents of disinformation, and led to public discourse becoming more fragmented and delegitimised. Now, the rise of AI brings advances in the news process but requires close consideration too. We must consider information carefully to separate fact from fiction, and question what to share and how.

Through relatable science-based news, communication specialists can enable a more informed and engaged public conversation that can influence positive economic and societal change at scale. But we cannot turn the tide without narratives changing.

## 1 awareness campaign

to make our work more accessible to scientific communities, international organisations, industry and policymakers:

→ EMBRC, Mercator Ocean International and EU4OceanObs collaborated on an awareness campaign to shine a light on the importance of ocean observation. This campaign was the most viewed topic on our social channels in 2023, and resulted in:

**17,814**

LinkedIn impressions (the impressions on EMBRC's LinkedIn alone were 6 times more than our 2023 average)

**8,629**

Twitter impressions (10 times more than EMBRC's 2023 average)

**1 advert**  
in ECO MAG

## 1 Community Day

→ EMBRC Belgium brought together 50+ participants from its 5 partners at its first Community Day at VLIZ, Ostend



## 1 expedition

→ raising integrating awareness and outreach activities into its programme: TREC (Traversing European Coastlines) by the Tara Foundation and EMBL

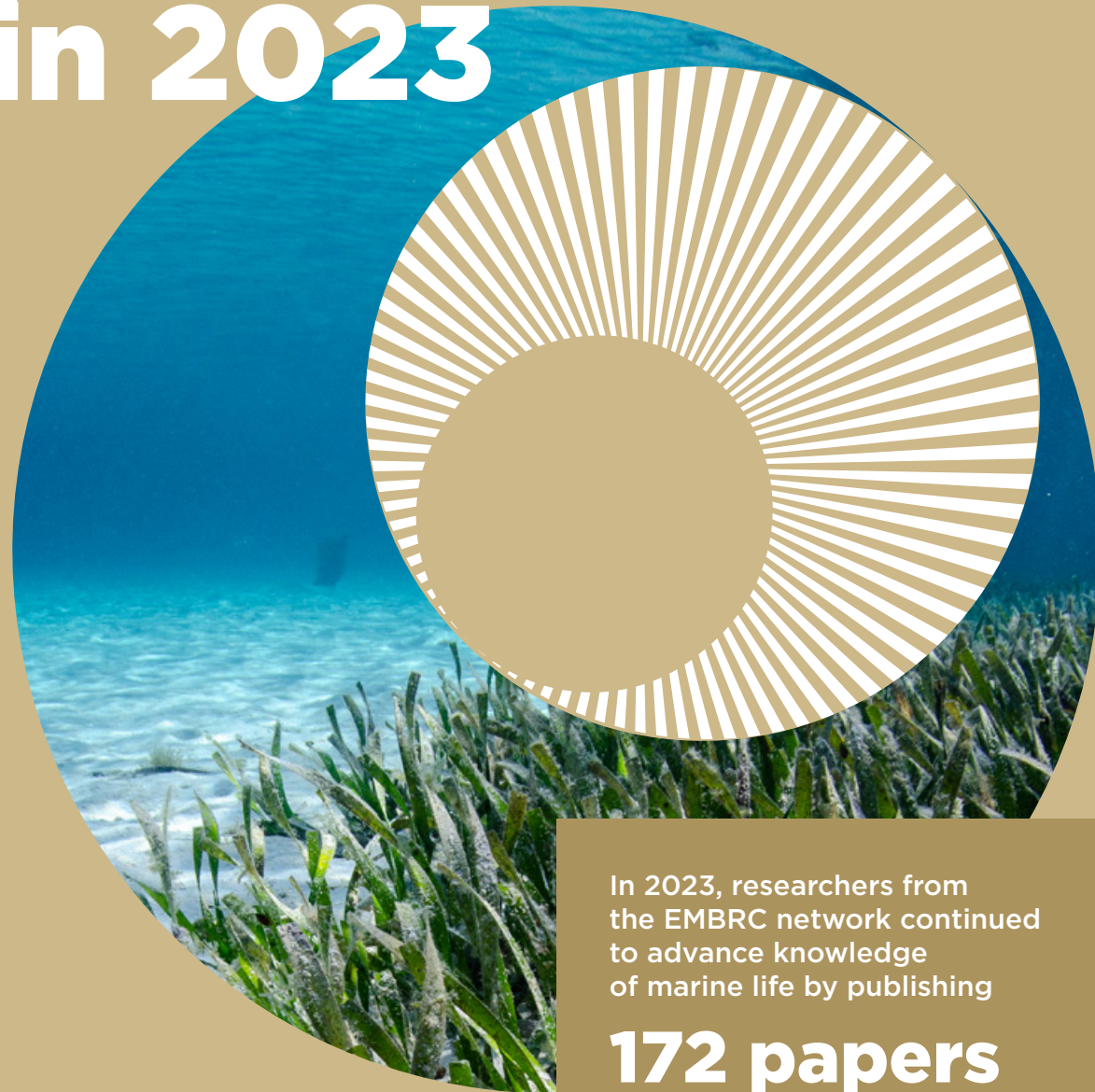
## 10+ events & conferences

→ Attending, promoting and supporting conferences and events such as:

- Presentation on ARMS at the GEO BON Global Conference, Montreal (Christina Pavlouli)
- Plenary talk on communications, ocean advocacy and fighting disinformation at Plentzia Marine Station, Spain (Anabelle Chaumon)
- Promoting the MARCO-BOLO project in the context of the future of ocean observation through Marine Biodiversity Networking Fridays, organised by Marine Biodiversity Observation Network and the Air Centre (Atlantic International Research Centre) (Nicolas Pade)
- Workshop on biodiversity of the Coastal Ocean: Monitoring with Earth Observation (BiCOME) and Biodiversity in the Open Ocean (BOOMS) at the European Space Agency
- Training at the Observatoire d'Océanographie de Villefranche-sur-Mer about how impactful science communications is a game changer in shaping more sustainable societies (Anabelle Chaumon). This was part of the IMBRSea (The International Master of Science in Marine Biological Resources) Master Degree organised by 11 European universities
- Presentation on building a global ocean observation strategy at the European Maritime Days (Nicolas Pade) and booth to promote EMBRC alongside EURO ARGO and EUROFLEETS (Anabelle Chaumon and Mery Piña)
- Webinar on EMO BON and sampling campaigns, protocols, data collection and analysis (Ioulia Santi)
- Presentation on EMBRC-ERIC, EMO BON, what eDNA can and cannot do and the growing capacity for genomic observation in Europe and beyond during a side event at UNESCO HQ (Ioulia Santi and Nicolas Pade) in partnership with Ocean Biodiversity Information System (OBIS) of the IOC's International Oceanographic Data and Information Exchange (IODE) programme
- Sharing how EMO BON is boosting marine biodiversity data collection through our booth at the EMODnet Open Conference (Claudia Delgado, Christina Pavlouli, Mery Piña)
- Event on essential biodiversity and ocean variables at the International Ocean Colour Science Meeting, St. Petersburg, Florida (Alice Soccodato)



# Our publications in 2023



In 2023, researchers from the EMBRC network continued to advance knowledge of marine life by publishing

## 172 papers

in 80 different journals

(source: Web of Science and Open Aire).

## EMBRC's top papers

10 particularly insightful papers for the scientific community – which demonstrate the use of cutting-edge technologies to advance ocean observation, climate change dynamics and the positive use of model organisms in different research domains – were:

- 1 The sea spider *Pycnogonum littorale* overturns the paradigm of the absence of axial regeneration in molting animals, **Proceedings Of The National Academy Of Sciences Of The United States Of America**
- 2 A tight interaction between the native seagrass *Cymodocea nodosa* and the exotic *Halophila stipulacea* in the Aegean Sea highlights seagrass holobiont variations, **Plants-Basel**
- 3 Embryo mechanics cartography: inference of 3D force atlases from fluorescence microscopy, **Nature Methods**
- 4 Conserved meiotic mechanisms in the cnidarian *Clytia hemisphaerica* revealed by *Spo11* knockout, **Science Advances**
- 5 Functional trait responses to different anthropogenic pressures, **Ecological Indicators**
- 6 Loss of POC and DOC on seagrass sediments by hydrodynamics, **Science of the Total Environment**
- 7 Analysis of the *P. lividus* sea urchin genome highlights contrasting trends of genomic and regulatory evolution in deuterostomes, **Cell Genomics**
- 8 Changes in macrofauna bioturbation during repeated heatwaves mediate changes in biogeochemical cycling of nutrients, **Frontiers in Marine Science**
- 9 Copepods' true colors: astaxanthin pigmentation as an indicator of fitness, **Ecosphere**
- 10 Differential clearance rates of microbial phylotypes by four appendicularian species, **Marine Ecology Progress Series**

Journal	Number of papers published
FRONTIERS IN MARINE SCIENCE	5
SCIENCE OF THE TOTAL ENVIRONMENT	4
PLANTA MEDICA	3
ORGANISMS DIVERSITY & EVOLUTION	3
AQUACULTURE	3
TOXINS	2
SCIENTIFIC REPORTS	2
PLANTS-BASEL	2
PEERJ	2
MARINE ENVIRONMENTAL RESEARCH	2



# Governance



EMBRC is a 'distributed research infrastructure' (RI) with 9 member countries and over 70 marine research sites across Europe. Our central headquarters, based in Paris, France, is responsible for the organisation's coordination and centralised management.

## EMBRC General Assembly (GA)

EMBRC is governed by a General Assembly, which is made up of two representatives from each EMBRC member country and is responsible for making decisions about the organisation's strategy, governance and scientific development.

### BELGIUM

**Koen Lefever** (Vice-Chair),  
Belgian Science  
Policy Office (BELSPO)

**Gert Verreet**,  
Departement Economie,  
Wetenschap en Innovatie  
(EWI)

### FRANCE

**Catherine Leblanc**,  
Sorbonne Université (SU)

**Eric Guittet**,  
**Catherine Le Chalony**,  
Ministry of Higher Education,  
Research and Innovation  
(MERI)

### GREECE

**Stylios Kastrinakis**,  
Hellenic Centre for Marine  
Research (HCMR)

**Antonio Magoulas**,  
Hellenic Centre for Marine  
Research (HCMR)

### ISRAEL

**Moshe Ben-Sasson**,  
Ministry of Science,  
Technology and Space  
(MOST)

**Simon Berkowicz**  
(Vice-Chair),  
Interuniversity Institute  
for Marine Sciences (IUI)

### ITALY

**Marco Borra**,  
Stazione Zoologica  
Anton Dohrn (SZN)

**Mauro Bertelletti**,  
Ministry of Scientific  
Research and Education  
(MIUR)

### NORWAY

**Inger Oline Røsvik**,  
Research Council  
of Norway (RCN)

**Amund Maage**,  
University of Bergen (UiB)

### PORTUGAL

**Marta Abrantes**,  
Foundation for Science  
and Technology (FCT)

**Adelino Canário** (Chair),  
Centre of Marine  
Sciences (CCMAR)

### SPAIN

**Inmaculada Figueroa Rojas**,  
Ministry of Economy and  
Competitiveness (MINECO)

**José Manuel García Estevez**,  
University of Vigo (UVIGO)

### SWEDEN

**Ulf Jonsell**,  
Swedish Research Council

**Gunilla Rosenqvist**,  
Uppsala University

## EMBRC Secretariat

Nicolas Pade, Executive Director, is EMBRC's executive and legal representative. He leads EMBRC's Secretariat, which is responsible for the organisation's general management and administration.

**Nicolas Pade**,  
Executive Director

**Lucie Salvaudon**,  
General Assembly Secretary

**Alexandra Vasic**,  
Chief Financial and Administrative Officer

**Guillaume Duspara**,  
Administrative Assistant

**Davide Di Cioccio**,  
Access Officer

**Arnaud Laroquette**,  
Access and Benefit Sharing (ABS)  
Compliance Officer

**Anne Emmanuelle Kervella**,  
International Cooperation Officer

**Ioulia Santi**,  
Observation Data and Service  
Development Officer

**Alice Soccodato**,  
Scientific Officer and Project Manager

**Anabelle Chaumon**,  
Communications Manager

**Mery Piña**,  
Industry Liaison Officer



## The Committee of Nodes

Serving as a link between EMBRC HQ and its national partners, this committee provides advice on development and technical issues and ensures decisions made by the GA are implemented at national level.

**Jan Vanaverbeke**, Royal Belgian Institute of Natural Sciences (RBINS)

**Alice Soccodato**, European Marine Biological Resource Centre (EMBRC)

**Nicolas Pade**, European Marine Biological Resource Centre (EMBRC)

**Alex McDougall**, Institut de la Mer de Villefranche (IMEV)

**Georgios Kotoulas**, Institut of Marine Biology, Biotechnology and Aquaculture (HCMR-IMBBC)

**Raz Tamir**, Israel Oceanographic and Limnological Research (IOLR)

**Donatella Di Pascale**, Stazione Zoologica Anton Dohrn (SZN)

**Tatiana Tsagaraki**, The Arctic University of Norway (UiT)

**Deborah Power**, Centro de Ciências do Mar (CCMAR)

**Ibon Cancio**, Plentzia Marine Station (PiE)

**Matthias Obst**, Kristineberg Marine Research Station (KMRS), University of Gothenburg (UGOT)

## The Science & Innovation Advisory Board

The Science & Innovation Advisory board is made up of industry and academic experts who have been elected by the GA to advise EMBRC on strategic matters.

**Claire Jolly**, OECD

**Katherine Richardson**, University of Copenhagen

**Erik Steinfeldt**, Thermo Fisher Scientific

**Antonio Villanueva**, BioMar

**Emma Heslop**, IOC/UNESCO (GOOS)

## The EMO BON Operational Committee

As EMO BON's governing body, the Operational Committee (OpCo) oversees the project's function and makes operational and developmental decisions. The OpCo is made up of one representative from each EMBRC member country, representatives from EMBRC's Headquarters, the e-infrastructure and traceability working groups and the General Assembly.

**Nicolas Pade**, EMBRC HQ

**Alice Soccodato**, EMBRC HQ

**Jan Vanaverbeke**, Royal Belgian Institute of Natural Sciences (RBINS)

**Georgios Kotoulas**, Institut of Marine Biology, Biotechnology and Aquaculture (HCMR-IMBBC)

**Fabrice Not**, Station biologique de Roscoff (SBR)

**Raffaella Casotti**, Stazione Zoologica Anton Dohrn (SZN)

**Matthias Obst**, Kristineberg Marine Research Station (KMRS), University of Gothenburg (UGOT)

**Oihane Diaz de Cerio**, University of the Basque Country (UPV/EHU)

**Raz Tamir**, Israel Oceanographic and Limnological Research (IOLR)

**Kim Praebel**, The University of Tromsø (UiT) The Arctic University of Norway





# Our funding & finances



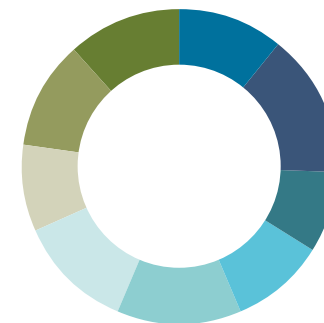
## INCOME

EMBRC is financed by 10 member countries that contribute in two different ways: through cash and in-kind contributions. In 2022, in alignment with the budget voted by the General Assembly, the contributions from the member countries amounted to:

### Membership contributions 2023

#### Membership fees

Belgium	€ 61,939
France	€ 84,773
Greece	€ 47,532
Israel	€ 55,371
Italy	€ 73,107
Norway	€ 69,117
Portugal	€ 49,760
Spain	€ 64,127
Sweden	€ 65,323
<b>Total</b>	<b>€ 571,049</b>



#### Host premium contribution

Host premium cash France	€ 150,000
Host premium in-kind France	€ 165,000
<b>Total</b>	<b>€ 315,000</b>

#### Other categories

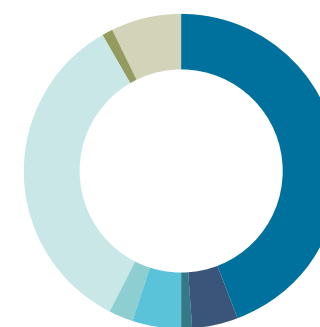
Project income	€ 264,686
Overheads of finished projects	€ 14,771
Other	€ 722
<b>Total</b>	<b>€ 280,179</b>

<b>Total contributions</b>	<b>€ 1,166,228</b>
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## EXPENSES

EMBRC's finances are audited every year according to French law, where its headquarters are based. The operational costs for 2023 were distributed as follows:

### Type of costs 2023



Human resources	€ 880,324
Travels	€ 90,649
Office supplies	€ 25,903
Outsourcing	€ 94,599
Printing/Publishing/Dissemination	€ 51,493
Support/Sponsoring external activities	€ 675,044

#### Host premium contribution

Host premium in-kind HR - France	€ 25,000
Host premium in-kind functioning - France	€ 140,000

<b>Total expenses</b>	<b>€ 1,987,818</b>
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In 2023, HQ staff doubled from 6 to 12, reflecting our increased participation in large numbers of Horizon Europe projects.

EMBRC has significantly increased its support for external activities, in particular by allocating 500,000 to the Joint Development Activity call.

Its in-kind contributions have almost halved, due to less demand for HQ support.



## EXTERNAL FUNDING SOURCES

European project funding is only used to carry out projects EMBRC is involved in. In 2023, this funding was as follows:

### Projects 2023 (in euros)

AGROSERV	15,531	EBB2	29,879
AI4LIFE	1,001	eDNAQUA-PLAN	19,698
ANERIS	5,506	EOSC FUTURE	17,574
ATLANTECO	1,544	EOSC-LIFE	8,403
BIOCEAN5D	21,890	ERIC FORUM	392
BLUECLOUD2026	26,887	FAIRE EASE	1,859
CANSERV	8,679	IMAGINE	4,784
DOORS	4,374	ISIDORE	11,122
DTO-BIOFLOW	8,612	MARCO BOLO	71,271
<b>Total</b>			<b>264,686</b>

## Thank you

On behalf of everyone at EMBRC, we'd like to thank the whole scientific community for supporting and engaging with our work. Pushing the boundaries of marine science requires international collaboration and we're looking forward to continuing to work with you all for many years to come.

We're also grateful to all our funders, partners and collaborators for another successful year. Your support has enabled us to continue our work to support a sustainable Blue Economy by pushing the frontiers of marine science.

### In 2023, EMBRC received funding from

- European Commission through Horizon Europe projects
- INTERREG Atlantic Area programme through the EBB project
- Member contributions:
  - Belgian Science Policy Office (BELSPO), Belgium
  - The Algarve Centre of Marine Sciences (CCMAR), Portugal
  - The Hellenic Centre for Marine Research (HCMR), Greece
  - The Hebrew University of Jerusalem (HUJ), Israel
  - The Stazione Zoologica Anton Dohrn (SZN), Italy
  - University of Gothenburg (UG), Sweden
  - University of Bergen (UiB), Norway
  - University of Las Palmas de Gran Canaria (ULPGC), Spain
  - Sorbonne University (SU), France
  - The Technical University of Valencia (UPV), Spain
  - The University of Vigo (UVIGO), Spain

We'd also like to thank the ESFRI roadmap for recognising the scientific excellence of our work by including us in their portfolio of RIs since 2008 and the European Commission for acknowledging our research infrastructure as a European Research Infrastructure Consortium (ERIC) since 2018.

2023 was an exciting year for EMBRC and we couldn't have done it without our member countries from across Europe. Your support, investment and collaboration has enabled us to continue pushing the frontiers of marine science and observation, and encouraging the sustainable use of marine resources. We're excited to see what 2024 will bring.





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EMBRC is grateful to all the individuals who contributed to this report, including at HQ and country level.

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