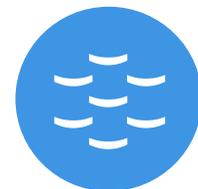
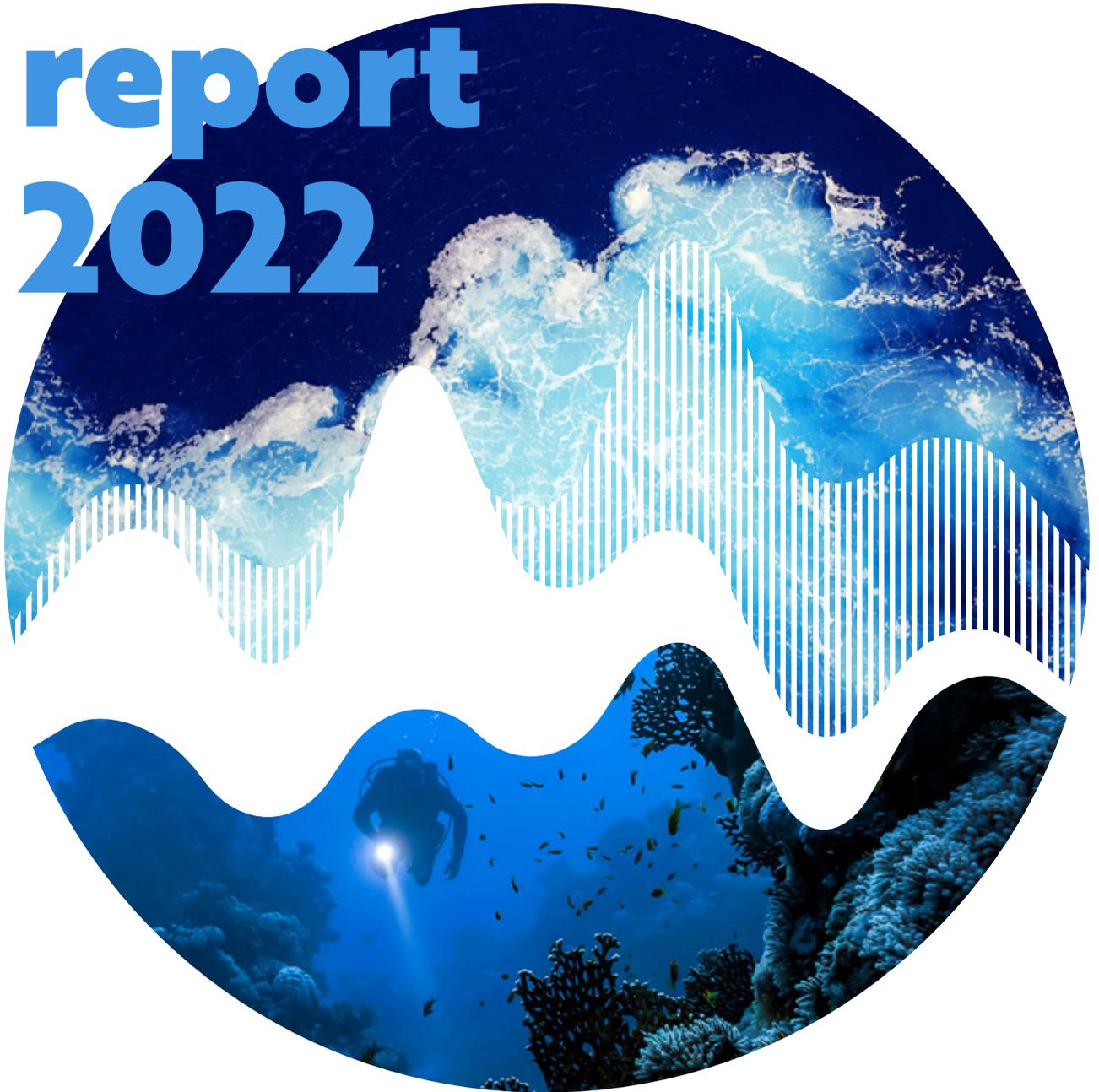


Annual report 2022



EMBRC
EUROPEAN
MARINE
BIOLOGICAL
RESOURCE
CENTRE



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A message from our Executive Director

Our oceans – and the creatures that call them home – are under threat. **Oceans are vital to all life on earth: they cover over 70% of our planet, produce around 50% of Earth's oxygen and absorb 25% of our CO2 emissions.**

Yet, pollution, overfishing and climate change are pushing our seas to the brink: millions of tons of plastic enter our seas each year, we're witnessing unprecedented biodiversity loss and experts believe the Black Sea could soon become the first major sea devoid of life.

Over 3 billion people around the world (over a third of the world's population) depend on marine biodiversity for their livelihoods. As the impacts of climate change continue to worsen, our marine world and its resources become ever more important. Understanding marine life through research and innovation is critical in protecting and sustainably managing oceans.

EMBRC's story began in 2008 when we became part of the European Strategy Forum on Research Infrastructures (ESFRI) roadmap and accepted the challenge of being the only research infrastructure (RI) dedicated to marine biology. We wanted to support the scientific community in developing new model organisms for fundamental and applied research. We developed new technologies using molecular biology and genomic approaches to propel the marine science sector forward and have now launched a centralised biodiversity omics observatory (EMO BON: European Marine Omics Biodiversity Network). These initiatives help scientists better understand global marine biodiversity, including their response to stressors like climate change and pollution. The sector was once seen as the study

of coral reefs and dolphins. Today, this highly respected science makes significant contributions to biological and ecological research such as the discovery of green fluorescent proteins (GFPs) which help scientists detect harmful substances in the environment, better understand diseases and create new treatments.

EMBRC has launched a prototype observatory to increase the biological component of ocean observation, developed experimental facilities and technologies, and engaged in marine policy and regulation.

« We remain focused on encouraging innovation in marine science, pushing the frontiers of marine biology, supporting the sustainable use of marine resources and contributing to the UN's Sustainable Development Goals.»

Our work covers a broad range of societal applications from disease monitoring and cancer research to understanding the potential environmental impacts of floating solar panels and how these can be mitigated.

We're excited for the future of marine research. We believe that, by working together, research communities around Europe can use our expertise to overcome the environmental and economic challenges societies face today. We're grateful for everything our partners have achieved over the last 15 years and are determined to play our part in tackling the challenges ahead and creating a brighter future for the billions of people who rely on our ocean.

Nicolas Pade,

Executive Director, European Marine Biological Resource Centre (EMBRC)

A research infrastructure (RI) is an organisation that enables the research community to use specific facilities, resources and services in order to accelerate scientific achievements and address global challenges.



A message from our Chair

As one of the world's leading research infrastructures (RIs), EMBRC plays a pivotal role in advancing global marine research and promoting the sustainable use of marine resources. Collaboration is at the heart of what we do, with even more countries soon to join the nine already in our cohesive network of European RIs.

Together, we facilitate access to a critical mass of resources and expertise to foster excellence in research, promote knowledge sharing, allow access to cutting-edge technologies and reinforce best practice. Our strategic coverage of European coastal seas translates into better services to help the scientific community investigate the complexities of marine ecosystems.

RIs are at the core of the knowledge triangle of research, education and innovation in Europe. They have a fundamental impact on common EU strategies, such as the essential system-based changes outlined in the European Green Deal, Farm to Fork and Common Fisheries Policies and Blue Growth. These changes will unlock the blue bioeconomy's potential to ensure a just socioeconomic transition towards sustainable production systems. The current terrestrial production systems are unsustainable and we know marine production can be more efficient. The transition towards blue food and production systems must align with the socioeconomic transition and the EU Mission to «Restore our Ocean and Waters 2030» through research, innovation, citizen engagement and blue investments. Through our commitment to Open Science and collaboration

among researchers, EMBRC promotes multidisciplinary approaches that contribute to these European policy priorities and enable evidence-based decision-making. This supports the European economy's move to phase out greenhouse gas emissions and protect its natural capital.

Bringing together diverse stakeholders – such as researchers, policymakers, and industry partners – accelerates scientific and technological advancements in a way that catalyses societal and economic development. As a result, EMBRC's vision is not only driving scientific progress but also contributing to the implementation of European policies.

The importance of covering unrepresented seas, like the Black Sea and the Atlantic, cannot be understated as we continue to widen our country membership and collaborate internationally. As we all face global challenges, such as climate change and biodiversity loss, understanding the full spectrum of European waters will be pivotal to finding the solution.

« Through our commitment to Open Science and collaboration among researchers, EMBRC supports the European economy's move to phase out greenhouse gas emissions and protect its natural capital. »

Adelino Canario

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

Advancing Ocean Science

1/3

of the world's population live within 100km of the coast

NICOLAS PADE
Marine biologist,
Executive Director, EMBRC

A third of the world's population (2.4 billion people*) live within 100km of the coast and many more visit on holiday. But our oceans do much more than just provide us with a beautiful view when we relax on the beach. Covering around 70% of the planet's surface, our oceans make life on Earth possible. The habitats beneath the waves and the marine life within them provide us with the food we eat, absorb excess heat and carbon and play an important role in our weather patterns.

But decades of pollution and overexploitation have pushed these systems to breaking point and people all around the world are starting to feel the consequences. Worryingly, we still don't fully understand the consequences of the changes we have triggered. Our limited understanding of the ocean and marine biodiversity significantly restricts our ability to prepare, mitigate and adapt.

Despite promises and efforts to protect the environment, it continues to degrade. Global carbon dioxide emissions are increasing every year and fossil fuel emissions hit a record high of 36.6 billion tonnes in 2022, according to the Global Carbon Project**. We can already feel it in the Western world: seasons are changing, prices are increasing and, on our winter holidays, there's less snow on the mountain. For the developing world, climate-related changes are catastrophic: people's homes, farms and livelihoods are being obliterated by rising sea levels, crippling drought and more frequent and powerful storms. We all depend on the resources from a healthy ocean and, without them, wealth and technological advances won't save us.

EMBRC is working to ensure our research and innovation communities have the right facilities and conditions to increase our marine knowledge and work towards sustainable solutions for society. From northern Norway to tropical Israel, EMBRC provides researchers with access to marine ecosystems and biodiversity across all European seas. Our advanced experimental facilities allow scientists to study a broad



range of organisms – from microscopic bacteria to sharks and other megafauna – in all European habitats. Together with colleagues from the marine observation community, we're pushing for a sustainable marine observation system with advanced biological parameters. For example, as Europe's first coordinated long-term observatory studying the part genes play in biodiversity, EMO BON (European Marine Omics Biodiversity Observation) is helping to overcome climate-related challenges and promote the sustainable use of marine resources.

Monitoring ocean environments through biological observation, and learning from the data gathered, should be a scientific priority. And we cannot work in silos because understanding marine ecosystems is a global science: actions on one side of the planet have repercussions on another.

This is why, through EMO BON, EMBRC is heavily involved in the United Nations Decade of Ocean Science and engaging with scientists from all over the world, coordinating our efforts, sharing standards and data and enhancing marine science capacities.

But data alone is not enough. Ultimately, our knowledge and understanding must be used to inform politicians, develop solid policies, and take decisive action to build a better, more sustainable tomorrow.

*NASA, <https://science.nasa.gov/earth-science/oceanography/living-ocean/>

** Carbon Brief, <https://www.carbonbrief.org/analysis-global-co2-emissions-from-fossil-fuels-hit-record-high-in-2022/>

15 years

“EMBRC’s vibrant community of marine researchers share their knowledge, cutting-edge science and facilities to advance excellence in marine research across Europe.”

EMBRC has a rich history dating back to the 1870s when marine stations were created in Europe to enable scientists to study marine life wherever they were based. Scientists would hop from one station to another, collecting samples and undertaking experiments at each one.

But this network of marine stations isn’t consigned to history. Many still exist today, providing a hub for a vibrant community of marine researchers dedicated to getting to the bottom of our ocean’s many mysteries. By helping researchers bridge the gap between individual marine stations around the European coastline, EMBRC facilitates stronger collaboration and co-operation between scientists.

EMBRC’s concept originated in 2000 with the aim of reducing knowledge fragmentation, fostering stronger relationships between institutions and reaching scientific excellence by establishing a collaborative network of marine experts around Europe.

Sharing resources, cutting-edge approaches and facilities enable European marine scientists to study unique coastal ecosystems and marine organisms across a range of locations, advancing marine science collectively.

Our history

2008

EMBRC becomes part of the European Strategy Forum on Research Infrastructures (ESFRI) roadmap. The ESFRI acts as an incubator for pan-European research infrastructures for better scientific development and stronger international outreach.

2010

The EU Commission funds the preparatory phase during which the plans for the infrastructure, including financing, staffing and scientific strategies were developed.

2013

EMBRC becomes part of the European Strategy Forum on Research Infrastructures (ESFRI) roadmap. The ESFRI acts as an incubator for pan-European research infrastructures for better scientific development and stronger international outreach.

2013

Memorandum of understanding is signed by France, Portugal, Greece, Italy and Israel to establish EMBRC beyond the project. EMBRC begins negotiations to establish the organisation as a European Research Infrastructure Consortium (ERIC).

2014

The United Kingdom, Spain, Belgium and Norway join as the first EMBRC signatories. Implementation phase begins and the states involved work together to build EMBRC’s infrastructure.

2015

EMBRC headquarters are established in Paris, France. Illaria Nardello is appointed as EMBRC’s first Executive Director and manages the organisation between 2015 and 2019.

2016

EMBRC outlines its constitution (the statutes of EMBRC) and a description of the mission, activities and facilities which are essential for the operation of its infrastructure.

In 2017, EMBRC’s business plan is formally adopted.

2018

The EU Commission grants EMBRC ERIC status (20 February). EMBRC is designated an ESFRI Landmark (a ‘pan-European hub of scientific excellence’ that pushes the boundaries of science and innovation) and becomes fully operational as such.

2019

EMBRC appoints Nicolas Pade as its second Executive Director, succeeding Illaria Nardello.

2021

The United Kingdom leaves the EU following the Brexit referendum. EMBRC launches the European Marine Omics Biodiversity Observation Network (EMO BON) to enhance the European contribution to global observation efforts and provide digital access to marine biodiversity. The initiative is endorsed by the United Nations Decade of Ocean Science for Sustainable Development (2021-2030).

2022

Sweden joins EMBRC. EMBRC launches the EU MARCO-BOLO (Marine Coastal Biodiversity Long-term Observations) project which it coordinates with the aim of improving marine biodiversity observation and enabling science-based decision-making.

2023-2030

Throughout the rest of the UNESCO Ocean Decade, EMBRC will continue to drive technological development and expand its research efforts to support marine biological research and the sustainable use of resources.

Boosting ocean progress in 2022

422
of services available

144
144 scientists using EMBRC research services

199
service requests

1
new country joined EMBRC

52 %
of access to EMBRC services was funded by the TNA (Transnational Access) programme

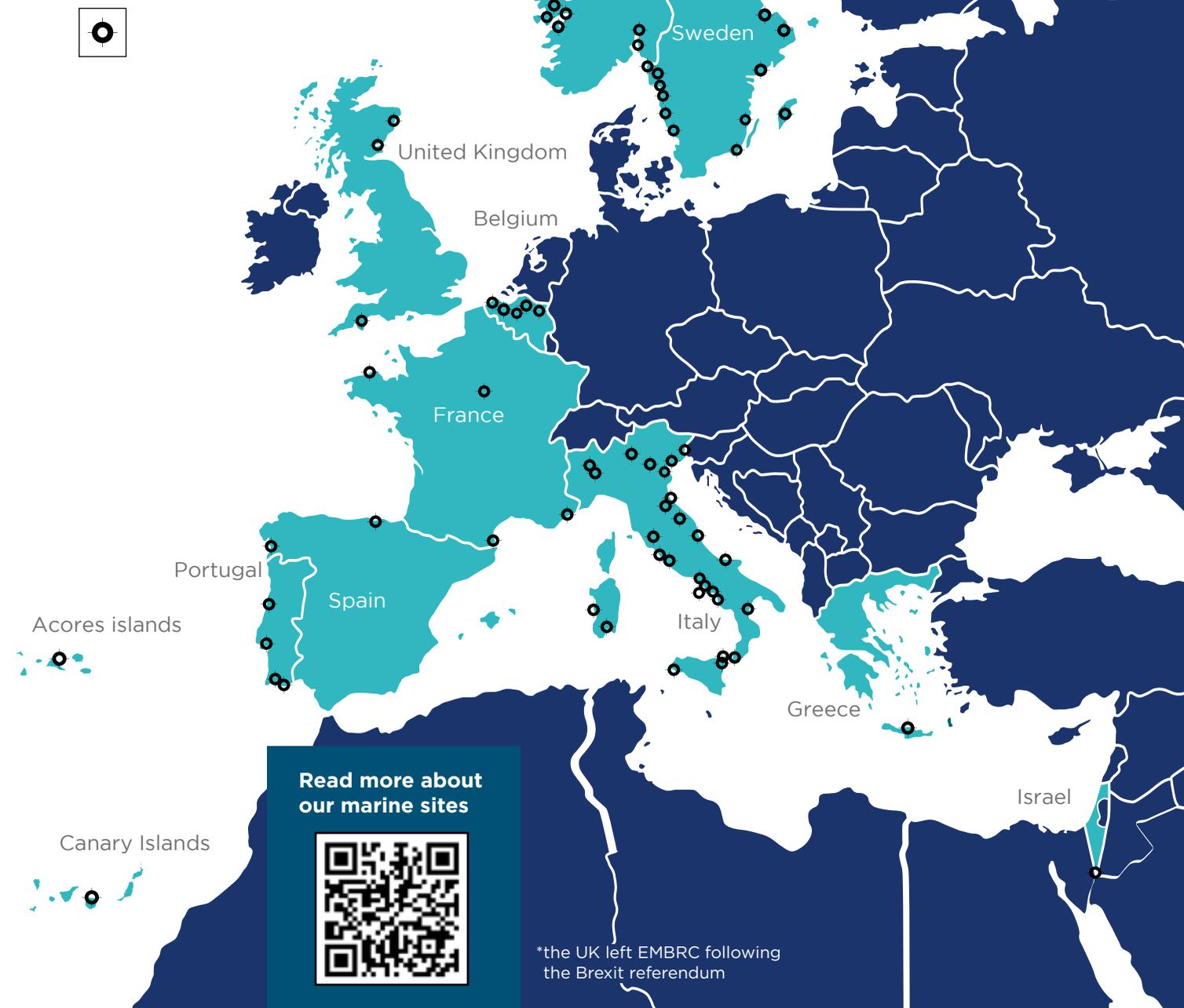
11
ongoing European projects

1
European project is coordinated by EMBRC

119
publications citing EMBRC

10
member countries involved in EMBRC*

74
EMBRC marine sites



How European research infrastructures are key to Open Science and capacity building

« Today, Open Science infrastructures provide the vital foundation and pillars of sustainable science. »



ANNE-EMMANUELLE KERVELLA
International Relations
Officer EMBRC

Open Science Infrastructures are essential in tackling current global issues; especially the climate, environment and biodiversity crisis.

The COVID crisis showed us how critical Open Science (OS) is in overcoming global crises. We saw how research infrastructures (RIs) could accelerate the quality, reproducibility, and impact of scientific research. There was no time to lose and

the fast, global response to COVID was only possible because global researchers shared their practices, methods, and findings in an Open Science paradigm.

The policy systems promoting these transnational collaborations were integral to the rapid sequencing of the virus, data sharing and tracking of viral strains.

Today, Open Science infrastructures provide the vital foundation and pillars of sustainable science. This originated several decades ago when OS was institutionalised to enable scientific practice to adapt to the fast-moving digital era – and all the risks, challenges and opportunities that came with it – and increase science’s societal impact. In November 2021, UNESCO took a novel approach: pledging science should become a common good with shared values, principles and standards and more transparent, collaborative, and inclusive practices. They aimed to democratise science and reduce global inequalities in access to scientific development.



Europe’s research infrastructures are key to this novel approach. Community-led and impact driven, their political support provides stakeholders with sustainable and inclusive practices which allow for capacity-building and creating solutions in partnership with less technologically developed countries.

Two recent international agreements – the Kunming Montreal Global Biodiversity Framework and the UN High Seas Treaty – underlined the significance of scientific capacity-building, technology transfer and cooperation in the protection of global biodiversity.

The consistent production of knowledge with reproducible practices requires sustained investments in open facilities. Open science infrastructures should foster regional collaborations and embrace international participation of stakeholders from other countries in the development of co-constructed solutions.

RIs should become platforms where the needs of the Global South can meet with the technological investments of the Global North to find suitable solutions to global challenges.

How EMBRC is meeting the UN's Sustainable Development Goals

EMBRC's work to accelerate knowledge of marine biodiversity through ocean exploration and research is underpinned by our commitment to meet the UN's Sustainable Development Goals (SDGs).

Sustainable use of natural resources, biodiversity conservation, healthy oceans and ecosystems are some of the basic pillars for the development of the next decades. Global food security, quality nutrition, pristine environments, healthy populations and the reduction of climate change impact all depend upon them.

Research into all aspects of marine ecosystems and their resources is key to discovering the solutions to these challenges. In particular, the European Commission and the United Nations (sponsor of the UN Decade for Ocean Sciences, 2021-2030) have formally identified biodiversity loss, ocean pollution, sustainable use of marine resources and climate change as priority research subjects.

Addressing these issues requires substantial and concerted approaches to develop and increase the availability of science activities and research infrastructures as well as forging connections with industries, policymakers, industries and civil society. As a participant of the UN Decade for Ocean Sciences, EMBRC has several activities and research projects focused on facing these challenges.

EMBRC aims to meet the following Sustainable Development Goals:



Zero Hunger

By preserving marine ecosystems and resources, and supporting sustainable fish, shellfish and algae aquaculture projects, EMBRC is ensuring food security for people around the world.

Good Health and Well-being

EMBRC's work to advance infectious disease studies and efforts to keep our oceans healthy are key in providing quality food sources for a growing population.

Quality Education

EMBRC's Marine Training and Education Unit facilitates learning for current and future generations of Blue workers.

Gender Equality

EMBRC promotes gender equality in all our research and activities.

Affordable and Clean Energy

EMBRC's research will ensure we understand the environmental impact of renewable energy structures (offshore wind, floating solar panels,...) and the opportunities they provide for encouraging marine biodiversity.

Partnerships for the Goals

EMBRC fosters collaborations between stakeholders across Europe and beyond. Its UN Ocean Decade activities also actively promote capacity building initiatives.

Life Below Water

Everything EMBRC does through its marine observation and research contributes to the conservation and sustainable use of our precious marine resources.

Climate Action

EMBRC works towards increased natural resource efficiency, preservation and restoration of blue carbon habitats and species.

Responsible Consumption and Production

EMBRC's facilities and expertise help industry stakeholders measure and reduce the environmental impact of marine food production.

Industry, Innovation and Infrastructure

EMBRC's extensive infrastructure advances research and promotes innovation in the sustainable use of marine resources (e.g. aquaculture) and the development of green products.

Increasing accessibility in marine research

144

scientists

+41% compared to 2021 have used EMBRC services to advance their marine research

« We enable researchers to access a range of marine organisms from a wide variety of ecosystems and habitats across Europe. »

Supporting researchers across Europe and beyond in 2022

EMBRC helps advance scientific studies into marine biology and ecology through state-of-the-art research services. Specifically, we enable researchers to access a range of marine organisms from a wide variety of ecosystems and habitats across Europe: these could be cultured, reared or collected from the field depending on their research focus.

We can support research and development into new biological and ecological tools, techniques and experimental platforms. Our experimental facilities can cater for scientists performing research both on-site and remotely and our technical staff have a broad range of expertise to support visiting researchers.

Our services are divided into 5 categories

-  Ecosystem access
-  Biological resources
-  Experimental facilities
-  Technology platforms
-  E-services
-  Supporting 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, biotechnology, conservation, environmental monitoring and biodiversity observation.



Find out more about our research services

ACCESSING EMBRC SERVICES

In 2022

199 access requests submitted
(+103% compared to 2021)

114 access requests granted
(+20% compared to 2021)

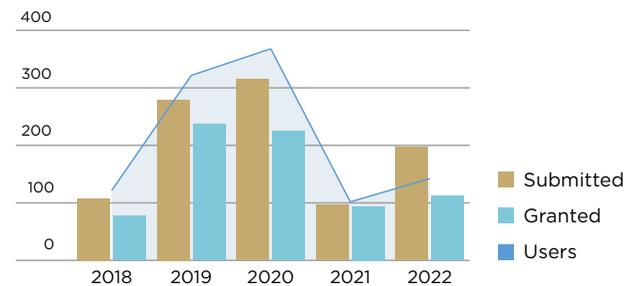
*Requests completed and ongoing
(from 2018 to 2022)

144 users
(+41% compared to 2021)

*Requests involve 1 or more users

From 2018 to 2022

Trends in the access requests over the years



In 2022, access requests for EMBRC services have significantly increased due to the lifting of COVID-19 restrictions. Despite the increased number of users, this is still below the usual annual average of 200 users. To foster access to its sites in future, EMBRC is participating in several INFRA-SERV proposals launched during autumn that, if accepted, will secure funds for several other transnational access opportunities.

The difference between the number of requests submitted and granted of this year is due to the competitive nature of transnational access programmes and the limited funding still available through ASSEMBLE Plus (ending in autumn 2022).

TYPE OF SERVICES

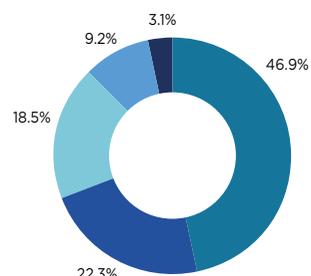
Services used in 2022

47%
technology platforms
(particularly imaging facilities)

22%
experimental facilities
(e.g dry and wet laboratories, aquaria, tanks)

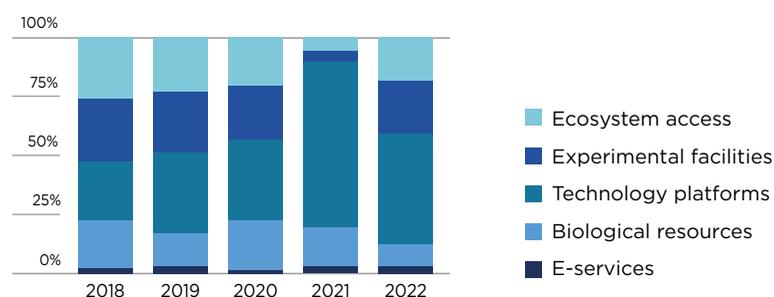
19%
ecosystem access
(e.g coastal research vessels, sampling equipment)

In 2022



From 2018 to 2022

Trends in the use of services over the years



Technological platforms (molecular biology, bioassays, imaging facilities) are consistently the main category of services requested and used. We saw a marked increase in use of these facilities in 2021 as the pandemic made their remote access a more appealing feature compared to other years. Currently, the use of the services seems to have returned to "pre-COVID" levels.

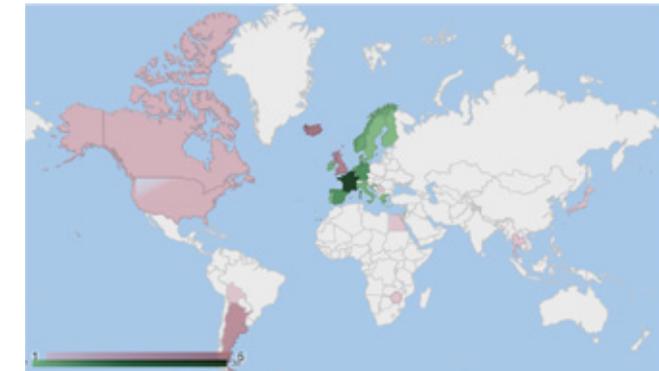
GEOGRAPHIC DISTRIBUTION OF ACCESS REQUESTS

EU countries:

82% of access requests
in particular: France, Belgium, Spain, and Germany

Non-EU countries:

18% of access requests
In particular: Iceland, United Kingdom, Argentina, United States, and Canada



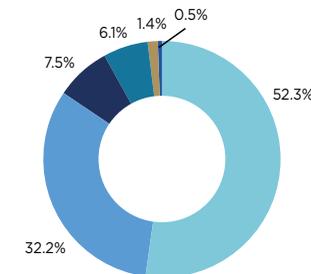
FUNDING TO ACCESS EMBRC SERVICES

52%
came from
TNA programme funds

32%
of researchers
were self-funded

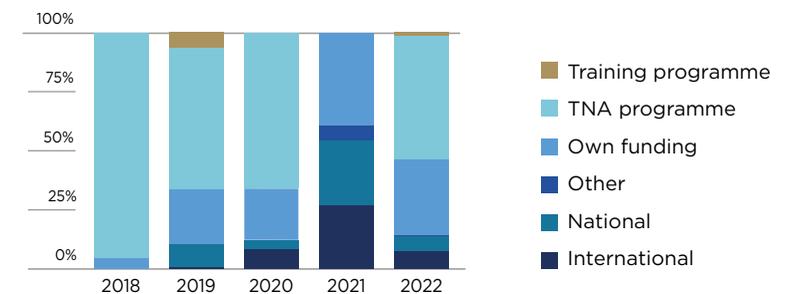
8%
benefited from
international funding

In 2022



From 2018 to 2022

Funding type



The main source of funding to access EMBRC services is predominantly via the TNA (Transnational Access Programme) programmes of H2020 projects. This funding includes a scientific review process by an independent selection panel, which ensures the quality of research. During 2021, COVID restrictions did not allow transnational access. Other main sources of funding include a company's own resources, typically in the private sector, and national access programmes.

ON-SITE VS. REMOTE ACCESS

85%
of users have used on-site access

15%
of the services were accessed remotely

HOME INSTITUTION

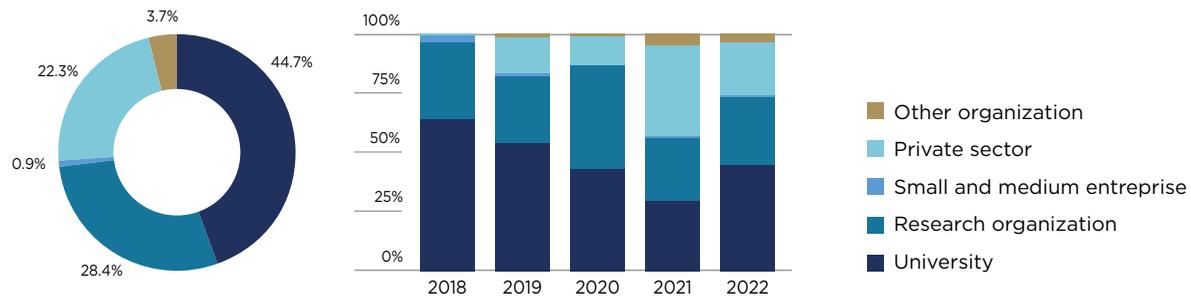
In 2022

73%
of EMBRC users are based in academic institutions (universities and research organisations) in 2022

27%
of EMBRC users came from the industrial sector (private, SMEs) and other institutions in 2022

In 2022

From 2018 to 2022
Type of home institution



Academic users (universities and research organisations) are by far the largest community of EMBRC users. These researchers typically make use of opportunities offered by transnational access programmes within the projects funded in INFRA-SERV calls (such as CORBEL, EMBRIC and ASSEMBLE Plus). This allows them to get free access to the EMBRC's facilities and have hands-on experiments at the marine stations and institutions they visit.

Since 2018, EMBRC has promoted access to its facilities to users from the private sector and from Small and Medium Enterprises, which have increased over the years.

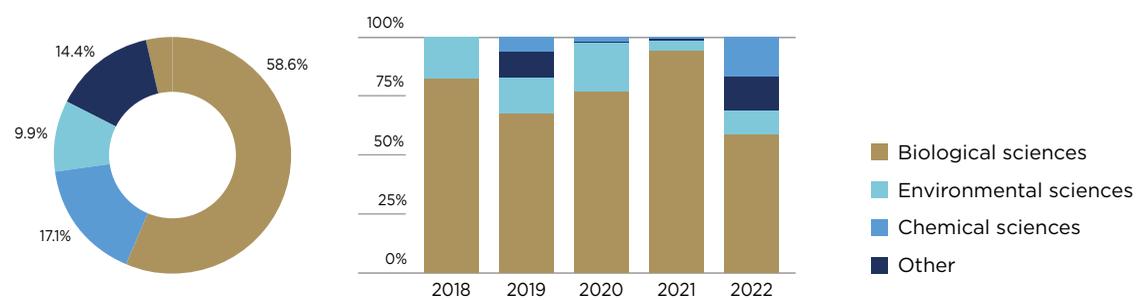
SCIENTIFIC DOMAIN

In 2022

59%
of users came from the domain of biological sciences

In 2022

From 2018 to 2022
Scientific domain



Researchers using EMBRC services are mainly marine scientists from biological and environmental domains. However, researchers from other domains, such as chemistry, health sciences and clinical medicine also access our services. This demonstrates the diversity of our scientific community and how EMBRC is facilitating transdisciplinary studies.

CAREER STAGE

EMBRC provided services to researchers at all career stages.

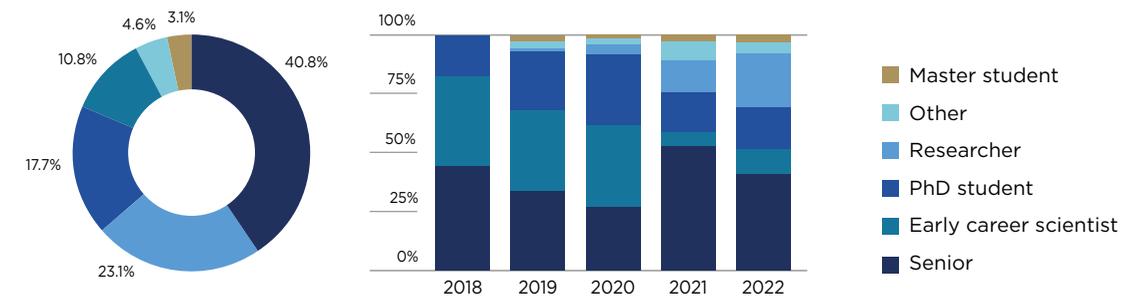
41%
senior scientists

23%
researchers

18%
PhD students

In 2022

From 2018 to 2022
Professional status



EMBRC provides services to researchers at different career stages, predominantly senior scientists and permanent researchers. Early career profiles (Master and PhD students, and early career scientists) hosted at marine stations also make use of facilities, though this trend has decreased slightly over the years. In 2020, EMBRC launched a call with Euromarine, reserved for early marine science professionals.

Offering services to the next generation of marine scientists will always be one of EMBRC's primary aims. This target could be further fostered by INFRASERV-2023 projects (with their relative TNA funding). EMBRC has recently applied to this call and results will be confirmed in mid-2023.

GENDER BALANCE

In 2022

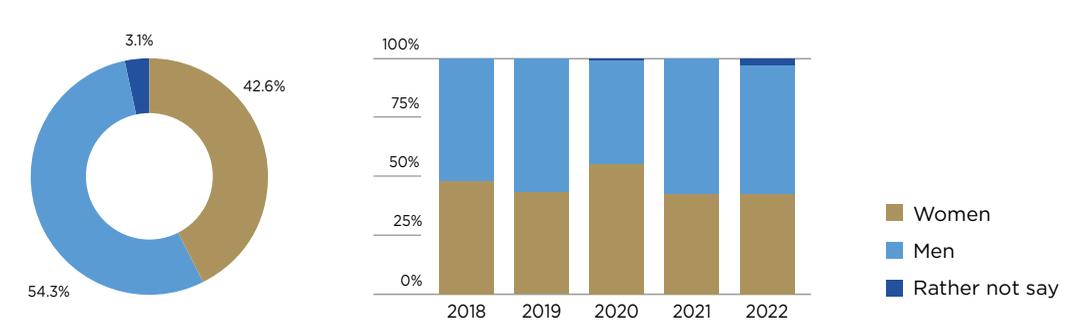
43%
women

54%
men

3%
Rather not say

In 2022

From 2018 to 2022
Gender balance



Success stories



SAMPLING TETRATINELLID SPONGES



Marine site:
Stazione Zoologica Anton Dohrn, Italy

Funding source:
ASSEMBLE Plus

Research focus:
Geodia cydonium, a marine sponge found in the Mediterranean waters around Italy and one of the few shallow water Tetractinellida species. Marine sponges have unique symbiotic relationships with thousands of microbial taxa. Yet, Tetractinellida sponges show remarkable similarities. Is this due to habitat or evolution? Our samples will help answer these questions.

Cristina Díez Vives, Museo Nacional de Ciencias Naturales (Spain) says:

“Thanks to ASSEMBLE Plus, I could access diving gear, a research vessel and tetractinellid samples for my project. My visit was very productive: the scientific team was helpful and we collected valuable samples which will shed light on many of our questions.”



MARINE CATFISH : EVOLUTION OR INVASIVE SPECIES?



Marine site:
Centro Interdisciplinar de Investigação Marinha e Ambiental, Portugal (CIIMAR)

Funding source:
ASSEMBLE Plus

Research focus:
The marine catfish (*Plotosus lineatus*)’s salt-secreting dendritic organ make it unique among teleosts. We profiled the marine catfish’s genome to create the first molecular resource for this organ and gain deeper insights into ion regulation. Our findings will help discover whether several lineages of catfish evolved similar traits or one species invaded various habitats.

Salman Malakpoor, Agricultural Research, Education and Extension Organization (Iran) says:

“I applied for EMBRC access through ASSEMBLE Plus’ transnational access programme. Visiting CIIMAR was a great opportunity. It was easy to apply and helped me address one of the main questions of my study.”



HOW DO MARINE HEATWAVES IMPACT RHODOLITHS ?



Marine site:
Centro de Ciências do Mar, Portugal (CCMAR)

Funding source:
ASSEMBLE Plus

Research focus:
A free-living red algae, Rhodoliths are an important habitat for many marine species. I gained access to CCMAR – a coastal Algarve region with shallow warm-temperate Rhodoliths – to investigate how Phymatolithon lusitanicum are affected by heatwaves and eutrophication using indoor and outdoor mesocosms of the Ramalhete Marine Station.

Our findings will provide valuable insights for climate management and mitigation.

Manuel Vivanco Bercovich, Instituto de Investigaciones Oceanológicas (Mexico) says:

“CCMAR’s scientists and technicians have extensive expertise and were incredibly supportive. Their guidance made this research possible but also enjoyable and rewarding.”

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.



INVESTIGATING ANIMAL BLOOD SYSTEMS



Marine site:
Observatoire Océanologique de Banyuls, France and Stazione Zoologica Anton Dohrn, Italy

Funding source:
ASSEMBLE Plus

Research focus:
My research focuses on the origin, evolution and diversification of blood systems across animals; especially invertebrates. After a long stay in Japan, I reconnected with top marine institutions to collect marine cephalochordates and sea urchins, which are usually difficult to obtain. Access to these samples and collaborating with these institutions will help my project succeed.

Juan Pascual Anaya, University of Málaga (Spain) says:

“I couldn’t be more grateful to ASSEMBLE Plus. Without it, I would not have been able to push forward my projects so quickly and so efficiently!”

Training the marine researchers of the future

EMBRC helps educate the next generation of marine researchers by facilitating access to marine-related training opportunities. In particular, training is provided by the Marine Training and Education Unit which is run by EMBRC Belgium and hosted by the University of Gent.

2022 was a transitional year for the Marine Training and Education Unit: Dr Tim Deprez's departure in June 2022 offered an opportunity to restructure the team. Dr Claudia Delgado became the new Training Coordinator (January 2023), joining the team from UNESCO - IODE, and Dr Luana Monteiro took over the coordination of IMBRSea Erasmus master's programme (September 2022).

Comprehensive, searchable and structured Marine and Ocean Training

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2022 was a transitional year for the Marine Training and Education Unit: Dr Tim Deprez's departure in June 2022 offered an opportunity to restructure the team. Dr Claudia Delgado became the new Training Coordinator (January 2023), joining the team from UNESCO - IODE, and Dr Luana Monteiro took over the coordination of IMBRSea Erasmus master's programme (September 2022).

Comprehensive, searchable and structured Marine and Ocean Training

The Marine Training and Education Unit manages two essential and complementary digital platforms which form the Marine Training & Education Portal. The first, known as «MarineTraining, provides a comprehensive, searchable catalogue of training and (coming soon) internship opportunities worldwide with dedicated sub-

categories based on project or geographical scope. The second is an e-Learning platform known as OceanTraining, which provides the digital learning environment for hosting structured training resources and delivering online and blended training courses.

Through these services, the Marine Training and Education Unit addresses the training needs of several stakeholder levels, specifically:

- Trainees looking for ocean, marine and maritime training opportunities.
- Trainers and Training providers in need of assistance with organising training initiatives (primarily but not exclusively European-focused).
- Stakeholders in search of insights into ocean, marine and maritime training initiatives, including trends and needs within the sector (primarily but not exclusively European-focused).
- Trainees in search of internship opportunities.
- Stakeholders offering internship opportunities.



Despite being a transition year, the MTU actively contributed to 6 ongoing EU-funded projects in 2022:

1. AgroServ:

Integrated SERVICES supporting a sustainable AGROecological transition

Funded by: Horizon Europe

Coordinated by: AnaEE and CNRS

Partners: 70+

Implementation: 1 Sep 2022–31 Aug 2027

Main goal: Boosting research for resilient and sustainable European agriculture and aquaculture systems as well as supporting evidence-based policy-making and agroecological advances.

2. AtlantECO:

Atlantic ECOsystems assessment, forecasting & sustainability

Funded by: Horizon 2020

Coordinated by: Stazione Zoologica Anton Dohrn

Implementation: 1 September 2020–31 Aug 2024.

Main goal: Determining how the Atlantic microbiome affects ocean circulation, plastics, pollutants and other ecosystem stressors and helping establish a sustainable Blue Growth strategy in the Atlantic.

3. DOORS:

Developing an Optimal and Open Research Support for the Black Sea

Funded by: Horizon 2020

Coordinated by: GeoEcoMar

Main goal: Addressing human and climate change impacts on fragile ecosystems, supporting Blue Growth implementation and contributing to a healthy, productive and resilient Black Sea.

4. EOSC-Life:

Providing an open collaborative space for digital biology in Europe

Funded by: Horizon 2020

Coordinated by: European Molecular Biology Laboratory (EMBL)

Main goal: Creating an open, collaborative digital space for European Life Science, Biological and Medical research, which directly addresses key societal challenges and drives the bioeconomy.

5. OceanTraining:

a toolbox for digital ocean education

Funded by: ERASMUS+

Coordinated by: Marine Training Unit

Main goal: Developing digital resources to help overcome the challenges faced by international Ocean Science education programmes.

6. SmartWaterUse

Funded by: VLAIO (Flanders, Belgium)

Coordinated by: Flanders' FOOD

Partners: Watercircle, Centexbel, VITO, Universiteit Gent

Main goal: Facilitating collective knowledge transfer, awareness raising and networking around water risks and influencing legislation and regulation.

The IMBRSea Programme

The Marine Training and Education Unit coordinates the International Master of Marine Biological Resources (IMBRSea) Programme.

EMBRC's flagship graduate programme is organised by

11 leading European universities :

- Ghent University (Belgium) - coordinator
- University of the Algarve (Portugal)
- University of Oviedo (Spain)
- Sorbonne University (France)
- University of Western Brittany (France)
- Atlantic Technological University (Ireland)
- University of the Basque Country (Spain)
- Polytechnic University of Marche (Italy)
- University Côte D'Azur (France)
- University of Gothenburg (Sweden)
- University of Bergen (Norway)

The IMBRSea Annual Symposium "Diving into Marine Minds" (4–8 July) and Living Ocean Lab Summer School (19 July–26 August) both returned as in-person events following pandemic restrictions in 2020 and 2021.

70
students of 21 nationalities graduated (2020–2022 cohort)

120
new students of 31 nationalities started their MSc (2022–2024 cohort)

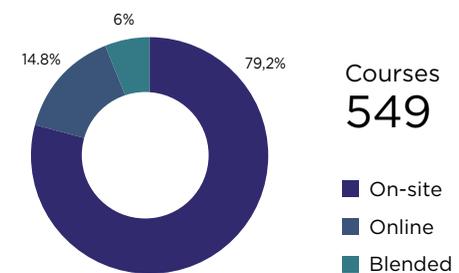
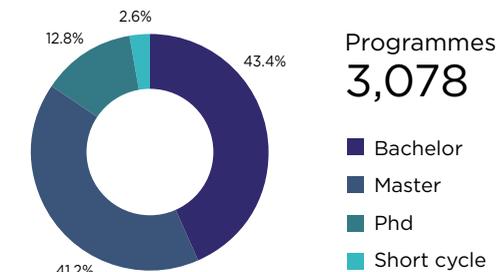
113
students of 36 nationalities moved to their second year (2021–2023 cohort)

To know more about IMBRSea



The Marine Training & Education Unit in 2022

Learning opportunities in Marine Training.eu



Countries
82

Languages
40

Providers
841

Authors
113

Learning opportunities in the world :



Supporting sustainability and innovation through Horizon Europe

“Individually we are one drop. Together we are an ocean.”

Ryunosuke Satoro



ALICE SOCCODATO
Oceanographer, Marine biologist,
Project Manager, EMBRC

Horizon Europe is an EU funding mechanism for research and innovation. Following on from ‘Horizon 2020’ (2014–2020) (H2020), the programme aims to tackle climate change and meet the UN’s Sustainable Development Goals while encouraging competitiveness and growth in the EU.

Decades ago, European countries came together in the spirit of in the spirit of Japanese writer Ryunosuke Satoro’s famous quote: “Individually we are one drop. Together we are an ocean.” This collaboration of stakeholders based on European shared values met economic and legislative needs and also ensured a fair and prosperous future for people and planet.

Throughout history, European countries have been proud of their innovative communities and pioneering research efforts. Horizon Europe aims to maintain and incentivise this ongoing excellence and spur long-term collaborations by funding cutting-edge projects in line with thematic missions and clusters.

Only through the European Union’s framework can we secure enough funding to work together in a consortium—essential for advancing science and societal impact nowadays.

EMBRC has been proud to support innovation and sustainability through its involvement in numerous H2020 and Horizon Europe projects. Horizon Europe is a very competitive programme that only funds excellent projects. Our wide portfolio of active projects demonstrates the quality and skills of the science supported by EMBRC across Europe.



Moving research forward in 2022

EU new projects



BIOcean5D

Marine biodiversity is vital to the health of our planet and its people. Yet, recent ecosystem surveys show how little we know about marine life. Impacted by global (ocean warming, deoxygenation, acidification etc), local (pollutants, population growth, resources exploitation etc) and anthropogenic stressors, these habitats are changing much faster than terrestrial life. Only 13% of the ocean has been left untouched by humans.

The EU-funded BIOcean5D project aims to manage and preserve marine ecosystems by creating knowledge and tools to sustainably measure, understand, value and predict marine biodiversity.

New technologies are making it possible to access and analyse marine life: eDNA/RNA sequencing, automated imaging, acoustics, remote sensing, massive computing power, Artificial Intelligence and complex-system modelling.

Through BIOcean5D, 31 partners from 11 countries, including EMBRC, are helping protection efforts by building a suite of technologies, protocols and models to gain a holistic picture of marine biodiversity – from viruses to mammals and genomes to holobionts – from pre-industrial times to today. This knowledge is key to protection efforts and economic growth.

We enable marine biodiversity assessment and predictions across spatial, temporal and human scales through long-term data series and comparable patterns and methodologies.



The EU-funded FAIR-EASE project focuses on opening gateways between data domains within multidisciplinary projects.

Earth and environmental sciences require huge volumes of data from satellites, in-situ observations, models and experiments. But while these domains are interconnected, current digital architecture can pose data integration challenges when each is created for a specific domain. FAIR-EASE aims to overcome these obstacles by improving observation and modelling components for Earth systems, environment and biodiversity. FAIR-EASE will work closely with user communities, the European Open Science Cloud (EOSC) and research infrastructures.

The project set up a web-based VRE to provide products and services for non-specialist researchers and one system to improve EMO-BON's biodiversity data management. The baseline genomic biodiversity data will form the backbone of research integrating microbial biodiversity into the study of ecosystem services and their sustainability and resilience in the face of climate change.

Our pilot, 'Biodiversity Observation: Marine Omics Observation' will set up a Virtual Research Environment to support non-specialists in their marine biodiversity research.



BlueRemediomics

The EU-funded Blueremediomics project aims to leverage the untapped potential of marine microbial resources. Studying marine microbiomes – one of the fastest growing segments of the blue bioeconomy – is vital to discovering, understanding, protecting and using ocean resources sustainably. Cataloguing marine microbiome data and culture collections enables the development of industrial processes that reduce waste, increase the reuse of natural products and by-products and improve aquaculture processes.

The project will develop innovative approaches to isolate and grow microorganisms as well as an open access platform to integrate and enrich microbiome data to help researchers explore its use in biological products. It will also study society's appetite for biobased solutions and ensure the benefits from any new products, such as medicines, can be accessed and shared in a fair and equitable way.

EMBRC is pushing forward new discoveries by providing marine samples and is actively working on projects around bioresource legislation, use and traceability mechanisms.

Moving research forward in 2022

Ongoing EU projects



The EU-funded AtlantECO project aims to map microbiome data to better understand and manage the health of the Atlantic Ocean. Through three research pillars – microbiomes, the plastisphere and seascape connectivity – it aims to bring experts from Europe, South America and South Africa together and engage with public, industry and policymakers to stimulate responsible behaviour and Blue Growth.

This includes one of the ocean's most pressing challenges: plastic. In 2010, between 4.8 and 12.7 million tons of land-based plastic entered the ocean but over 99% of ocean plastic is missing; fragmented into micro- and nano-plastics. AtlantECO maps the Atlantic's plastic distribution and investigates its sources, microbiome interactions and journey through the food web and deep-sea ecosystems.

The project also quantifies connectivity in the Atlantic Ocean and uses climate models to predict species migration, the transport of pollutants and biohazards such as plastics and their impact on harmful algal blooms and aquaculture. Working closely with the Ocean Health Index (OHI) – a tool to measure countries' performance against the Convention for Biological Diversity and the UN's Sustainable Development Goals – AtlantECO provides new indicators and ocean variables across:

- Climate pumping and blue carbon storage
- Fisheries and food security
- Biodiversity including microbiome-based discoveries
- Transfer of matter and energy across deep ocean life
- Plastic and pollutants.

EMBRC brings expertise in communication and capacity-building activities, as well as augmented observation tools and other new technologies through its partners.



The EU-funded DOORS project brings together expertise and technology from 35 institutions across the Black Sea region to address climate change and human impacts on damaged ecosystems. Experts believe the Black Sea will become the first major sea devoid of life: it has twice as much marine litter as the Mediterranean, suffers from eutrophication – high levels of phosphorus, nitrogen and other plant nutrients – and fish stocks and species diversity are threatened by poor water quality. To prevent this, DOORS is streamlining research and policy and providing state-of-the-art satellite technology to gain a new understanding of the Black Sea. Its solutions and policy approaches could be game changing for local economies: unveiling unparalleled economic opportunities in tourism, technology, fishing, shipbuilding, maritime transport, education, renewables and more. By supporting emerging 'blue growth' sectors, nurturing educational and professional paths and accelerating start-ups, it fosters a new generation of responsible citizens and industry.

EMBRC will be supporting partners around the Black Sea with knowledge, education and training as well as contributing to the harmonisation of sampling methodologies and the sustainability plan underpinning Black Sea Blue Growth.



For European life science research to remain competitive and advance the understanding of life and disease, data and digital services must be findable, accessible, interoperable and reusable (FAIR), whatever the scientific discipline or location. The EU-funded EOSC-Life project brings together the 13 Life Science 'ESFRI' research infrastructures to create an open, digital and collaborative space for biological and medical research.

Through its 'FAIR' data and catalogue of services to enable the management, storage and reuse of data in the European Open Science Cloud (EOSC), the project ensures accessibility across European research communities. EOSC-Life is also implementing interdisciplinary workflows and allowing for co-creation with users through open hackathons and bring-your-own-data events. It is also addressing the critical data policies required by GDPR for human research data.

We bring support through open calls and demonstrators, specific policies on data management (ABS regulations) for biological and medical research, fair protocols and traceability guidance as well as expertise in sustainability practices.



Discover all EU projects where EMBRC is a partner



MARCO-BOLO

STRENGTHENING BIODIVERSITY OBSERVATION IN SUPPORT OF DECISION MAKING



Understanding marine biodiversity decline and restoring ocean health

Marco Bolo (MBO) EU project (1 December 2023 - 30 November 2026) aims to transform marine, coastal and freshwater biodiversity monitoring and management. Biodiversity, though critical for human future, has never been so threatened.

“Changes in the ocean are occurring quickly. It has never been so urgent to tackle challenges around biodiversity data acquisition and use.”

Coordinated by EMBRC, 28 partners from 14 countries have united to demonstrate an enhanced, robust and stakeholder-driven approach to aligning, integrating and delivering biodiversity data and observing capacity. MBO will:

- **Advance the understanding of direct and indirect drivers of coastal and marine biodiversity loss** by studying the intertwined nature of freshwater, coastal and marine realms, which have traditionally been viewed as separate entities. Several case studies from across Europe will be used to provide better biodiversity models.
- **Enhance biodiversity observation capacities** by developing concrete, cost-effective and timely in-situ monitoring technologies. For example, creating standard operating procedures for environmental DNA developing real-time biodiversity monitoring methods such as multi-sensor networks and neural network approaches and connecting them to existing capabilities such as landers and marine observatory platforms. Being able to gather more data will help scientists better study biodiversity indicators and a wide range of pressing issues such as mapping blue carbon benefits or non-indigenous invasive species.
- **Ensure the biodiversity data produced will be easy to find** by those who need them. MBO will establish and oversee a Community of Practice (CoP) of data producers and users to determine stakeholder needs, overcome barriers and ensure the data is fit for supporting decision-making.



MBO will deliver tools, technologies, protocols (including data exchange protocols/workflow) and models to advance the creation of the biological component of the European coastal and marine Earth Observation Infrastructure. Its mapping, monitoring and data access will support integrated ecosystem assessments in Europe and it will align with international standards and best practices via its links to:

INTERNATIONAL ACTIVITIES:

- **Marine Biodiversity Observation Network (MBON):** contributing to marine biodiversity and ecosystem management.
- **Global Ocean Observing System (EuroGOOS/GOOS):** a global system for observing, modelling and analysing ocean data.
- **Ocean Biodiversity Information System (EuroOBIS/OBIS):** global open-access data for marine biodiversity.

THE UN OCEAN DECADE PROGRAMMES:

- **Marine Life 2030:** delivering marine knowledge to those who need it and promoting wellbeing, sustainable development and conservation.
- **Ocean Biomolecular Observing Network (OBON):** understanding marine life through biomolecular analysis.
- **The Ocean Data and Information System (ODIS):** a searchable online catalogue of ocean data, products and services.
- **Ocean Best Practices for the Decade:** supporting ocean stakeholders in securing, equitably sharing and advancing methodological heritage.

EMO BON

European Marine Omics Biodiversity Observation Network

Observing the ocean



Ocean observation is in the spotlight of research, policy and society and biology is an integral part of the ocean. Yet, the capacity for biological observation is not as organised or sophisticated as for the rest of the ocean.

EMBRC decided to fill this gap by creating the European Marine Omics Biodiversity Observation Network (EMO BON): the first centrally coordinated, long-term omics biodiversity observatory in Europe. Using DNA-based techniques allows EMO BON to capture a plethora of biodiversity data, including community composition, temporal trends and response to environmental change.

Connecting independent marine stations

EMO BON is made up of a network of existing long-term marine observatory stations sampling different marine habitats (water column, soft substrates, hard substrates) at regular time intervals. The network effectively links different observatories by organising and standardising their genomics components. For quality and consistency, the samples are then analysed at a central facility. Additionally, rich metadata include rigorous information on the place and time of sampling, the in-situ conditions, the researchers and methods used. Data follow the FAIR (Findable, Accessible, Interoperable, Reusable) principles and, after a short embargo, are released as periodic data publications and through ENA (European Nucleotide Archive), EMODNet (European Marine Observation and Data Network) and EurOBIS (European Ocean Biogeographic Information System).

2022 HIGHLIGHTS

EMO BON increased its observation network with the addition of 3 Swedish stations, including a station in the Baltic Sea.

As part of the EMBRC Community Days (May 2022, Portugal), EMO BON carried out a sampling calibration exercise.

EMO BON is currently part of several Horizon Europe projects tackling biological observation challenges e.g:

- Project FAIR-Ease aims to create Virtual Research Environments for data exploration.
- Project EOSC-Life developed a workflow which enabled them use their data to list species and genes present in the environment. This new tool was presented during the International Master of Science in Marine Biological Resources (IMBRSea) annual symposium.

EMO BON became part of the UN Ocean Decade Programme, Ocean Biomolecular Observation Network (OBON) and actively collaborates on biological observation capacity-building.

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.



Read the EMO BON Handbook

Marine stations engaged with us

By connecting independent marine stations, EMO BON brings together decades of marine biodiversity knowledge and experience under one network of observatories.

Meanwhile, the operational stations benefit from centrally coordinated support for long-term biological observation that would be beyond the scope of individual stations. In 2022, EMO BON included 19 observatories at coastal marine stations while expanding it to include omics methodologies, open protocols, and systematic production of Findable, Accessible, Interoperable and Reusable (FAIR) data.



Know more about the marine sites in EMO BON

*Following the Brexit referendum, the UK left EMBRC

EMO BON in numbers

10

participating countries

+8

hard substrate samplings

22

partner institutes



Samples collected:

376 water column
184 soft substrate
72 hard substrate

19

observatory stations

Samples analysed:

81 water column
17 soft substrate
38 hard substrate

6

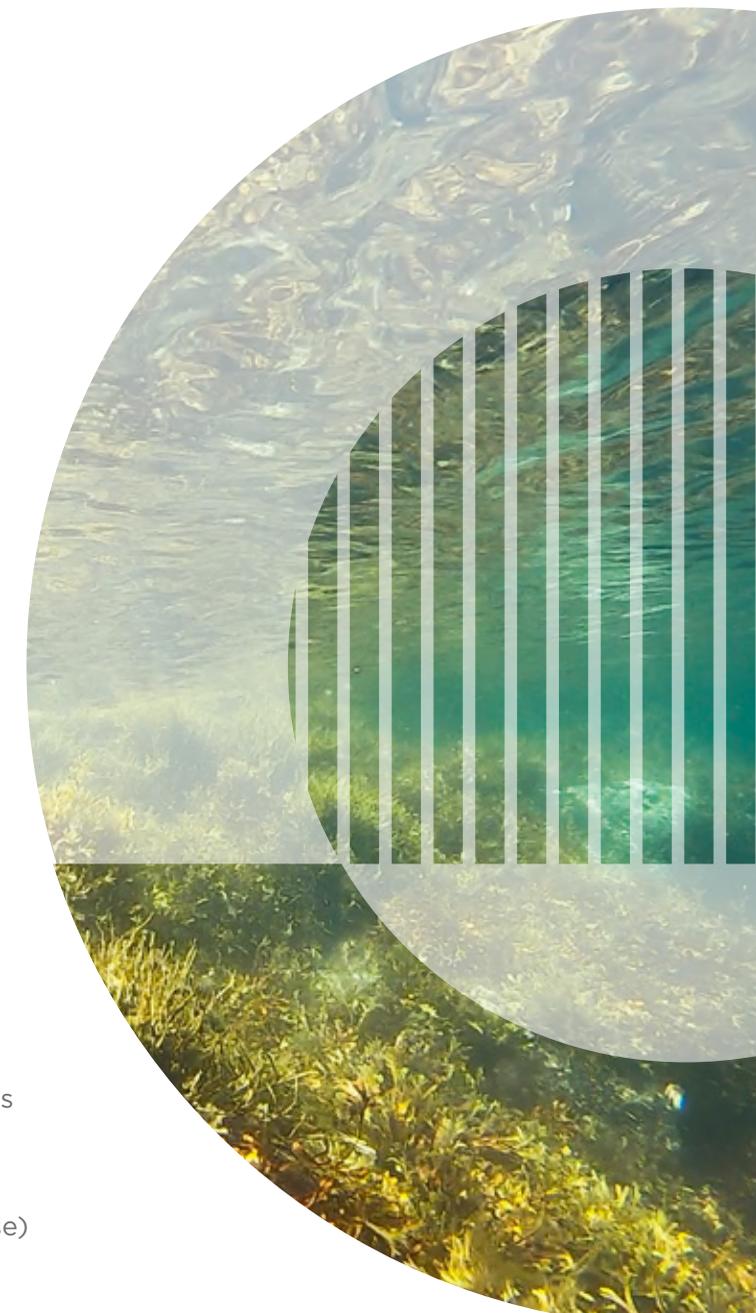
water column sampling campaigns
(Feb, Apr, Jun, Aug, Oct, Dec 2022)

4

Horizon Europe projects in which EMO BON is part of (EOSC-Life, BlueRemediomics, EOSC-Future, FAIR-Ease)

+6

soft substrate sampling campaigns
microorganisms (Feb, Apr, Jun, Aug, Oct, Dec 2022), meiobenthos (Apr, Jun, Oct 2022) and macrobenthos (Apr, Oct 2022)



TREC

Traversing European Coastlines

Understanding human impacts on biodiversity

In 2023 and 2024, the European Molecular Biology Laboratory (EMBL) will embark on the Traversing European Coastlines expedition (TREC) in partnership with EMBRC and the Tara Ocean Foundation.

This two-year expedition will study how coastal ecosystems respond to environmental changes. Data will be collected by sampling the coastline from Norway to Portugal in the first year, followed by the Baltic and Mediterranean seas with the Tara schooner following to sample at sea in 2024.

The project will cover:

- 120 coastal sampling sites
- including 12 EMBRC sites across 46 regions in 22 European countries.

40% of Europe's population live in a coastal region and many societies are defined by their relationship with the marine environment. Yet, we have countless unanswered but important questions about our coastal ecosystems which TREC aims to contribute to. Covering a huge scale – from molecules to communities – the research will focus on 6 topics including: the effects of pollutants; identifying carbon fixation pathways and developing new harnessing strategies; understanding molecular adaptations to climate change; and tracking the spread of antimicrobial resistance in wild populations. EMBRC's marine research stations and organisations have been actively studying the sea and its lifeforms for decades, in some cases centuries, making us an ideal partner to support this ambitious expedition.



List of EMBRC marine sites involved in TREC in 2023

- Roscoff, France
- Oostende, Belgium
- Kristineberg, Sweden
- Bergen, Norway
- Bilbao, Spain
- Vigo, Spain
- Porto, Portugal
- Faro, Portugal

EMBRC and EMBL have collaborated since 2021 and, as a new strategic endeavour, TREC is a great example of the ambitious and groundbreaking research the partners are carrying out across Europe.

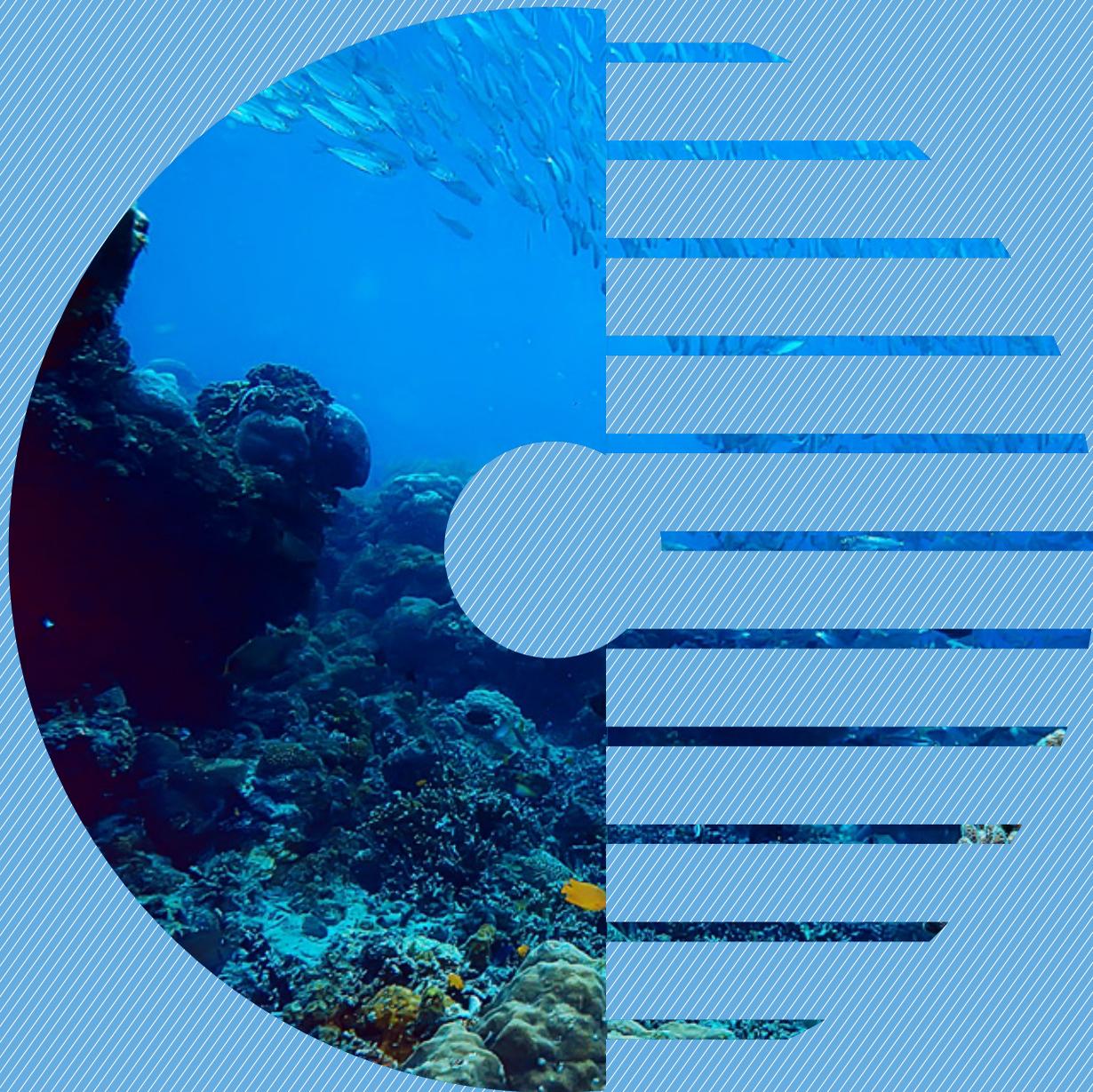
EMBRC is tapping into the finest marine biological research capability and its unmatched knowledge of the marine environment to guide TREC's planning:

providing our marine biology and ecology expertise, access to coastal marine environments, research facilities, lab space, equipment, vessels and highly specialised scientific dive teams to support sampling efforts. We also recognise the importance of bringing ocean literacy to communities so are pleased to support the community empowerment efforts planned by EMBL during their stops.

EMBRC collaborates with prestigious research institutes recognised around the world for their excellence in biological research – and, with more than 50 Nobel prizes, EMBL is a great example of such a partner. EMBRC is proud to support such an exciting project through our world-class marine biology and ecology research capabilities. Bringing together partners like EMBL and EMBRC, with complementary skills and expertise, can create the breeding ground for new ideas and discoveries. Together, we hope our collective abilities will lead to many discoveries and long-lasting collaborations to give new insights into life below the waves.



European highlights



EMBRC HEADQUARTERS, PARIS, FRANCE



EMBRC Days

EMBRC organised its first Community Days at Universidade do Algarve in Faro, Portugal (May 2022). The internal event aimed at stakeholders working in EMBRC's marine stations, which brought together 60 people from 8 countries (France, Spain, Portugal, Italy, Sweden, Norway, Greece and Belgium).

Participants were introduced to key themes through presentations and activities:

- **A history of Research Infrastructures.**
- **Introducing European Marine Omics Biodiversity Observation Network (EMO BON):**
 - EMO BON's observatory stations.
 - Seawater sampling.
- **Explaining traceability in biosamples and culture collections:**
 - Presenting principles and database tools (TRACK) for tracing marine biological resources and generating biological resource "passports".
- **Discussing Access and Benefit Sharing (ABS) in marine genetic research:**
 - EMBRC's KPIs.
 - Using a centralised system for ABS compliance.
 - Improving marine biological resources management based on EMBRC ABS best practices.

The feeling of community created was reinforced through dinners and excursions (e.g. kayaking in Ria Formosa).

Following 2022's success, EMBRC will host another at a different station in 2024.

EMBRC FRANCE



The foundation celebrates 150 years

In 2022, the Station Biologique de Roscoff (founded in 1872) celebrated its 150th anniversary and hosted EMBRC France's General Assembly (13 July). During this event, EMBRC France announced several team changes:

- Alex McDougall (Institut de la Mer de Villefranche) is now Scientific Coordinator at EMBRC France, replacing Bernard Kloareg who has retired.
- Catherine Leblanc replaced Bertrand Meyer in EMBRC-ERIC General Assembly and as Sorbonne Université representative in EMBRC-France governance.
- Bruno Lucas is now CNRS representative in EMBRC Fr, replacing Daniel Boujard who has retired.
- Three new agents have joined the Operational Team: Marion Amalfitano: Access and Quality Officer, Kamilia Latamna: Communications and Business Officer and Rayanna Girault: Administrative Assistant

Project collaborations

In 2022, EMBRC France also participated in four HORIZON INFRA projects :

- **AgroServ coordinated by AnaEE ERIC:** integrated services supporting a sustainable agroecological transition.
- **CanServ coordinated by BBMRI-ERIC:** providing cutting-edge cancer research services across Europe.
- **IMAGINE coordinated by EMBL:** using next generation imaging technologies to examine the structure and function of biological specimens in their natural context.
- **ANERIS coordinated by CSIC:** operational sensing life technologies for marine ecosystems.

EMBRC France also participated in ATLASea : a national funded project using imaging and genomic analysis techniques to provide augmented coastal observations. The project is part of the European Reference Atlas Genome (ERGA) initiative which is affiliated to the Earth Biogenome Project (EBP) and Augmented observatories of the National Biological Resource Center (AO-EMBRC).

European highlights

EMBRC GREECE



25.4 million euro funding awarded to HCMR

HCMR received 25.4 million euros from the Greek National Recovery and Resilience Plan, “Greece 2.0”, to fund Greece’s first research building (300m²) for marine culture collection and microorganism cryopreservation. Expanding and upgrading its infrastructure through this new facility will allow HCMR to provide access to strains from the Eastern Mediterranean Sea. We would like to thank the Roscoff Culture Collection’s Dr. Ian Probert from EMBRC France for helping us draft the plans and providing support through their expertise and advice. The fund will also cover the creation of a seawater pumping and filtration building for Cretaquarium and Aquaculture facilities and a storage and maintenance building for inflatable boats and Remotely Operated Underwater Vehicles (ROVs).

ISO certification secured

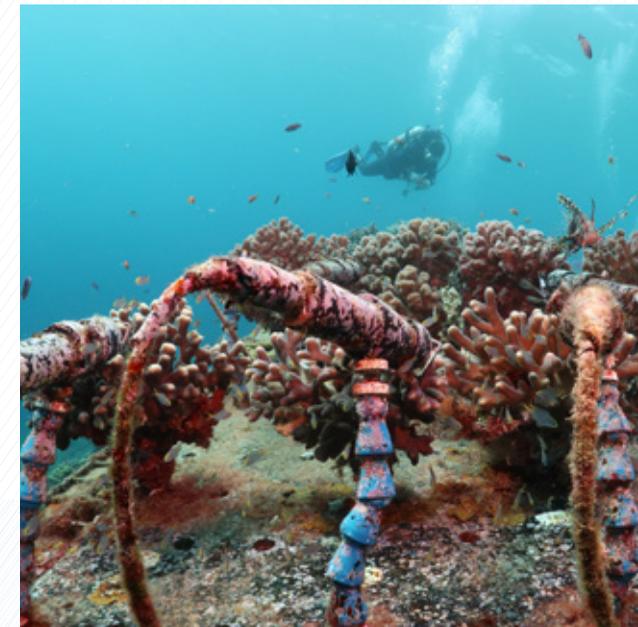
The IMBBC-HCMR’s sequencing facility was certified with ISO 9001:2005. The service provides standardised workflows for:

- Illumina MiSeq: including sequencing of amplicons, whole genomes, transcriptomes, DNA and RNA extraction, library construction and Quality Control (QC).
- Oxford Nanopore MinION: including whole genome sequencing by ligation library, amplicon sequencing, DNA extraction, library construction and QC, basecalling and run report.
- Capillary Sanger: sequencing and genotyping (microsatellites) by capillary electrophoresis.

Dedicated eDNA lab established at IMBBC

A dedicated environmental DNA (eDNA) laboratory has now been established at the Institute of Marine Biology, Biotechnology and Aquacultures (IMBBC) at the Hellenic Centre for Marine Research (HCMR). The lab, which has been set up to enable biodiversity assessment through eDNA metabarcoding, is equipped to analyse environmental samples (e.g. air, stool etc) as well as those which only have trace DNA (including marine samples such as seawater and sediment). The lab’s facilities and processes follow incredibly high standards of cleanliness to prevent any contamination – either of individual specimens or between different samples. Supervised by Dr Panagiotis Kasapidis, the eDNA laboratory’s services will be available to HCMR as well as external users.

EMBRC ISRAEL



World-first real-time coral health monitoring station

The world’s first real-time coral health monitoring station – and the first of a strategic network of marine observatories in the Gulf of Aqaba and the Red Sea – has been established at the Interuniversity Institute for Marine Sciences (IUI). By collecting multiple data streams in an open-access online database, the project will allow researchers from around the world to study environmental impacts on the health and functioning of coral. The monitoring station is capable of recording a wide range of parameters (air and water temperature, wind conditions, intensity and coral physiological performance). It also allows researchers to observe and capture real-time conditions on reef-fish activity, diversity and coral pigmentation via an underwater camera feed.

Ongoing collaboration with USAID

Thanks to the United States Agency for International Development (USAID) Middle-East Regional Cooperation grant (MERC), we’re continuing to foster collaboration between the Interuniversity Institute for Marine Sciences (IUI) and the Marine Science Station Institute in Jordan. Together, the two institutes are working to measure the impact of environmental stressors and local disturbances on coral and seagrass in the Gulf of Aqaba. This unique body of water is home to some of the world’s richest coral and seagrass habitats, which provide a vital source of food and income to local communities. As parallel studies on the combined impact of disturbances on these coastal ecosystems are rare, the researchers are also leading important research into the harm caused by local disturbances (such as pollution, cargo ships and eutrophication) from coastal development and an increasing population. Seagrass and corals provide refuge for many species so these studies will give vital insights into how to protect these delicate ecosystems from global warming and acidification.

New affiliation with Ecole Polytechnique Fédérale in Lausanne (EPFL)

The IUI is now affiliated with the Transnational Red Sea Center of the Ecole Polytechnique Fédérale in Lausanne (EPFL), Switzerland. Founded by Professor Anders Meibom (EPFL) and Professor Maoz Fine (IUI), the Center was established in 2019 to support scientific efforts to preserve the Red Sea’s unique coral reef ecosystems. The institution was created as a neutral scientific organisation that could bridge science and diplomacy and provide global opportunities to facilitate cooperation between researchers and regional authorities. Its core mission is to strengthen measures that aim to protect the Red Sea’s unique coral reef ecosystems by gathering research data, monitoring and developing new scientific tools and sharing all findings through a central open database.

European highlights

EMBRC ITALY



Making EMBRC Italy the country's most important marine research hub

The EMBRC Italy Joint Research Unit (JRU) was successful in its application for the Call for Projects for the Creation and Improvement of Research Infrastructures. This Call took place under the Recovery & Resilience Plan with 'Project EMBRC-UP'. The project aims to make EMBRC Italy the most important national hub for scientific and technological marine research by:

- Strengthening new and unique research departments e.g. Stazione Zoologica Anton Dohrn (SZN)'s marine biotechnology department.
- Meeting Italy's need for new technological platforms e.g. Autonomous Underwater Vehicles (AUVs), scientific vessels and bathyscaphe.
- Strengthening existing platforms by extending the work potential of research projects such as the bioinformatics centre which analyses marine metadata.
- And improving the Italian marine research infrastructure network.

Marine bioprospecting with Horizon Europe

EMBRC Italy participated in the Horizon Europe EUREMAP (European Research Infrastructures for Marine Bioprospecting) project. This initiative aims to consolidate and develop services for marine bioprospecting via the delivery of pipelines that aim to:

- Increase interoperability and synergies between the research infrastructures involved (EMBRC, EU-Openscreen ERIC and ELIXIR).
- Improve the discovery of novel compounds.
- Link available/novel services from genomics, green chemistry, marine natural compounds and data management thematic areas into cross-RI pipelines.
- And validate all work via ad hoc demonstrator projects.

EMBRC Italy is also currently involved in preparing similar projects and has further plans that will be submitted in 2023.

Governance changes to support a growing consortium

In 2022, EMBRC Italy also decided to make several governance changes. These radical updates are being made to help the organisation better respond to the management and infrastructure needs of such a large consortium:

- A replacement will be identified to replace the previous Coordinator who has moved to another position.
- A new Liaison Officer role has been created.
- A dedicated full-time Project Manager (also a new role) has been selected.
- A hub-and-spoke infrastructure model will be adopted at national level to better coordinate all partners. Each thematic spoke in the portfolio (e.g. bioprospecting, ecosystem access, ecotoxicology) will have a Spoke Coordinator. This model will be managed by Stazione Zoologica Anton Dohrn (SZN) governance hub.

EMBRC NORWAY



New Norwegian marine sites participate in EMO BON

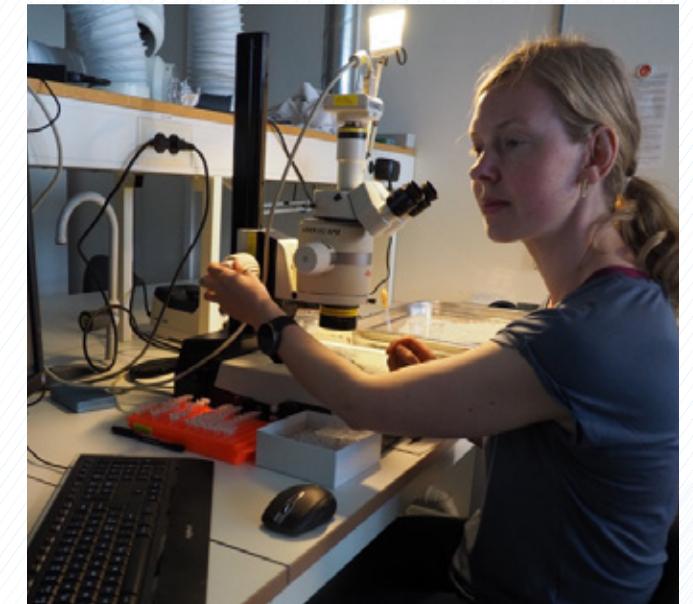
EMBRC Norway is participating in EMBRC's EMO BON project with two marine sites: the Arctic University of Norway and University of Bergen. There are also plans to include another three sites: the Norwegian Institute of Marine Research, University of Oslo and the Norwegian University of Science and Technology. The research will contribute to EMO BON's efforts to strengthen marine observation efforts in Europe and around the world by filling marine biodiversity observation gaps and providing new insights into genetics. Samples are collected and processed every two months and data will be published in an open-access format, according to FAIR principles (Findability, Accessibility, Interoperability, and Reusability).

Copepod collaborations

NTNU Centre of Fisheries and Aquaculture (SeaLab) is a research infrastructure operated by the Faculty of Natural Science which provides flexible state-of-the-art research facilities for marine and freshwater organisms. One of its key deliverables to EMBRC is its permanent culture of the marine copepod *Calanus finmarchicus* and accompanying experimental work facilities.

NTNU SeaLab hosted a visiting researcher from the Norwegian Polar Institute to conduct experiments with *Calanus glacialis*. Based on a pilot experiment, copepods from 3 locations across European waters were transported to the facility, acclimated to 3 different temperatures (1-11°C) and monitored. NTNU SeaLab is continuing to develop its lab facilities to:

- Use copepods as model organisms to analyse the impact of climate change and other stressors at lower levels of the marine food chain.
- Establish a complimentary permanent culture of *Calanus helgolandicus*.
- Continue developing logistics around accommodating species from other locations for short-term experiments.



European highlights

EMBRC PORTUGAL



EMBRC Portugal showcases its services during the UN Oceans Conference

EMBRC Portugal had the exciting opportunity to showcase its services at the «One Sustainable Ocean, Ocean Science & Business2Sea» event. This notable session took place during the UN Oceans Conference (Lisbon, 27 June–1 July 2022) with four partner members representing EMBRC Portugal at a dedicated stand. The EMBRC Portugal team spoke with numerous visitors from various sectors including industry, government, academia and the general public. Our presence, like the event itself, was aligned with the UN's Sustainable Development Goal 14: Life Below Water, through an exploration of the future of the ocean, sustainability, the circular economy and the innovative measures being made to further conservation efforts in Portugal and around the world.

EMBRC Portugal restructured

In 2022, EMBRC completed the technological restructure that had begun in 2017. Funded by National and European structural funds, this venture aimed to significantly improve EMBRC Portugal's infrastructure in a way that would effectively promote excellence in research, training and knowledge transfer. The main focus of the investment was upgrading and adapting buildings, upgrading technological platforms, acquiring state-of-the-art instruments and hiring more support staff. In 2022, we finalised the last of the restructuring work; namely, the experimental aquaria facility at the Experimental Laboratory for Aquatic Organisms (LEOA) and the photobioreactor park at the Algarve Centre of Marine Sciences (CCMAR). We're looking forward to seeing how our researchers can benefit from these improved facilities, platforms and infrastructure.

Suite of new awareness raising tools

In 2022, EMBRC Portugal successfully wrapped up its Horizon 2020-funded 'RI-VIS' project to boost the visibility of European research infrastructures (RIs) among diverse communities. The project brought together 13 partners from 12 RIs specialising in biomedical, social and environmental sciences. Working with CCMAR-Algarve, EMBRC played a pivotal role in developing a comprehensive suite of tools to improve the visibility of RIs in Europe and beyond, including:

- Communication Toolkit for Research Infrastructures: a collection of user-friendly tools, guidelines and resources to integrate into communications strategies.
- Social Media & Marketing: a training series for communicators working in RIs, including eight sessions tailored to the unique needs of European RIs.
- Communication Guidelines for European Infrastructures: two whitepapers developed to foster engagement with African and Latin American stakeholders respectively.

EMBRC SPAIN



The Spanish Bank of Algae joins EMBRC-Spain

Since its foundation, EMBRC Spain has been represented by Plentzia Marine Station, University of the Basque Country (UPV/EHU) and Marine Science Station of Torolla of the Marine Research Centre, University of Vigo (UVigo). Now, the Spanish Bank of Algae of the University of Las Palmas de Gran Canaria (BEA-ULPGC) has also joined. A signing event took place (8 April) in the presence of:

- Lluís Serra, Rector, ULPGC
- Eva Ferreira, Rector, UPV/EHU
- M^{re} Belén Rubio, Vice-Rector for Research, UVigo
- Nicolas Pade, Executive Director, EMBRC.
- Directors of BEA and CIM-UVigo
- Deputy Director, PiE-UPV/EHU
- EMBRC Spain representatives
- The media

This signing event represents the culmination of the 'Network for the coordination and strategic positioning of the Spanish Node of EMBRC' project, financed by the Spanish Government and extends EMBRC Spain's portfolio of research services to include marine biotechnology: a key EU strategic political objective. By facilitating access to the Canary Islands' subtropical marine ecosystems, this collaboration with BEA enables EMBRC to improve global collaboration opportunities with researchers across various disciplines.

Two research projects include EMO BON

EMBRC's EMO-BON initiative has helped secure two new research projects to increase the national network's sustainability. PiE-UPV/EHU was successful in the Spanish Ministry of Science and Education's special call for "Environmental and Digital Transitions" projects. The HOBE "lighthouse of the One Health observatory: environmental characterisation of the Plentzia Bay" project, launched in December 2022, will boost efforts of the four-year Horizon EU 'BLUEDAPT' project. The team will study Plentzia Bay as a One Health Marine Laboratory to investigate land-to-sea transitions and the effect of climate change on marine biodiversity. Holistic research methods will include chemical analysis, taxonomy, health biomarkers, metagenome, economic and habitat use parameters with a special emphasis on the dynamics of pathogens posing risks to humans, such as Vibrio, and the antibiotic and drug-resistant gene transfer among organisms.

Developing the "European Bule Biobank", an Interreg Atlantic Area project

The European Bule Biobank (EBB) was a successful Interreg project which aimed to establish a world-class, centrally curated marine biobank operated by EMBRC. The creation of the EBB ensures practical, long-term coordination of marine biobanks across nations and increases the diversity, quality and value of Marine Biological Resources available to user communities. After its completion in 2021, a budgeted proposal for extra activities to continue the project's legacy was approved. The work, which will continue until July 2023, will be overseen by the University of Vigo and will expand activities across EMBRC's entire geographic scope. Currently, the project has participants from EMBRC Spain, Portugal, France and Norway and further workshops are planned to reach other EMBRC country members.

European highlights

EMBRC BELGIUM



A successful symposium on marine carbon sequestration

The Symposium on Marine Carbon Sequestration which took place on 11 May 2022 was a huge success: 116 attendees came together to discuss opportunities to reduce the global and local causes and consequences of climate change on oceans, seas and estuaries. Through the event, EMBRC Belgium succeeded in bringing international scientific, political, industrial and non-governmental parties together to discuss a range of key issues. This included discussions around the potential of negative emission technologies and the knowledge gap we need to fill as well as the opportunity to inform policy and industry on the sustainable use of marine waters for climate change mitigation, globally and locally. We're looking forward to continuing these conversations to improve outcomes for our marine ecosystems and the people who rely on them.



Four-year funding and two new projects

The Royal Belgian Institute of Natural Sciences (RBINS) was delighted to hear it was successful in the first Belspo ESFRI-FED call. The four-year funding will allow RBINS to increase its contribution to EMBRC Belgium as well as further developing its Artificial Hard Substrate Garden (AHSG) modular installation. This project will facilitate research on how man-made constructions affect the marine environment and habitat restoration.

In addition, two new EMBRC Belgium Joint Development Activity (JDA) projects were launched. These research efforts will, on the one hand, allow scientists to visualise nanoparticles and micro-organisms in small aquatic organisms and, on the other hand, optimise in-situ sampling from Autonomous Reef Monitoring Structures (ARMS) in dynamic coastal environments.

EMBRC SWEDEN



EMBRC Sweden successfully establishes its national network of marine stations

In January 2022, Sweden joined EMBRC. In its first year, the network set up a reliable, effective and collaborative infrastructure to offer access to marine ecosystems, organisms and marine research facilities along the entire Swedish coastline. Sweden's network of marine research stations stretches from its deep near-Atlantic environments in the eastern North Sea to sub-arctic ecosystems in the Northern Baltic Sea. The profound salinity gradient across these regions is unique in Europe so it is important to be able to cover this as well as Sweden's deep benthic and pelagic habitats and shallow environments along the shoreline. The creation of EMBRC Sweden will allow for comprehensive observation and experiments on biological responses to ocean acidification, carbon sequestration, aquaculture and ocean observation.

Three Swedish stations participated in EMO BON

In 2022, Sweden also joined the European Marine Omics Biodiversity Observatory Network (EMO BON) which is implemented and coordinated by EMBRC. By collaborating with this network, Swedish partners are contributing to the world's first marine genetic monitoring programme for biodiversity.

Several institutions participated. The University of Gothenburg continued its genetic monitoring of hard bottom communities in the Kosterhavets National Park on the west coast of Sweden. Linnaeus University sampled the Kalmar Sound in the central Baltic Sea as part of the long-term monitoring programme at the Linnaeus Microbial Observatory. Umeå Marine Sciences Centre sampled the Gulf of Bothnia as part of their regular environmental monitoring programme.



Open science, fair and shared benefits

An overview of EMBRC's ABS compliance

Part of EMBRC's core mission is ensuring the sustainable use of bioresources in scientific activities. This involves supporting the compliance of regulatory frameworks impacting activities and contributing to the simplification discussion where possible.

Access and Benefit Sharing (ABS) is an international framework created under the Nagoya Protocol to the Convention on Biological Diversity. Under this framework, any research using genetic resources – such as plants, animals or microbes – or traditional community knowledge must ensure the benefits are shared in a fair and equitable way with the source countries. Understanding and following this global track and trace system involved many exciting projects and collaborations as we developed the infrastructure.

EMBRC supports ABS compliance in its collections and biobanks through training, centralised due diligence where necessary (e.g. with EMO BON, EMBRC's biodiversity observatory in Europe) and consistent knowledge and practices across its member countries.

We have developed a package of ABS e-tools, webinars and guidelines, which are now being used in collections, biobanks and projects exploring marine resources and producing biodata. One of these tools, TRACE, is a searchable catalogue of marine biological resources. Developed through the European Blue Biobank (EBB) project – funded by the EU's Interreg Atlantic Area programme – the database facilitates due diligence and ABS compliance by including the ABS status of available resources. This initiative paves the way for a safe and secure environment for users and stakeholders involved in the use and transfer of biomaterial and data. The catalogue will be further improved and integrated into EMBRC's approach for traceability across its European network and sustained thanks to partnerships set up with other biological resource centres in 2022.

EMBRC has also embedded ABS within its wider traceability strategy to follow new international frameworks which shape research practices for marine bioresources and EMO-BON's data production.

Putting EMBRC's ABS approach into practice

BlueRemediomics: new benefit sharing solutions for marine genetic resources

BlueRemediomics is one of the few projects addressing the commercial and non-commercial use of marine genetic resources and developing new solutions for benefit sharing. It will explore how marine microbiome data can lead to the discovery and production of high-value, sustainable marine microbiome-based products, processes and services. Through the project, EMBRC is collaborating with ABS and Intellectual Property experts on the adoption of standardised tools for provenance modelling, traceability and establishing clear links between the material and the scientific outputs.

EOSC-Life: collaborating for comprehensive data and access tools

EOSC-Life brings together the 13 research infrastructures in the Health and Food domain of the ESFRI Roadmap to develop an open multi-disciplinary environment where researchers can publish, find and re-use data, tools and services. Drawing upon its ABS and data management expertise, EMBRC helped to develop a comprehensive model for providing data and access tools via the European Open Science Cloud.

Ensuring fairness and equity in ocean science from sampling to data

EMBRC is dedicated to ensuring fairness and equity in the field of ocean science. As such, the organisation is committed to supporting:

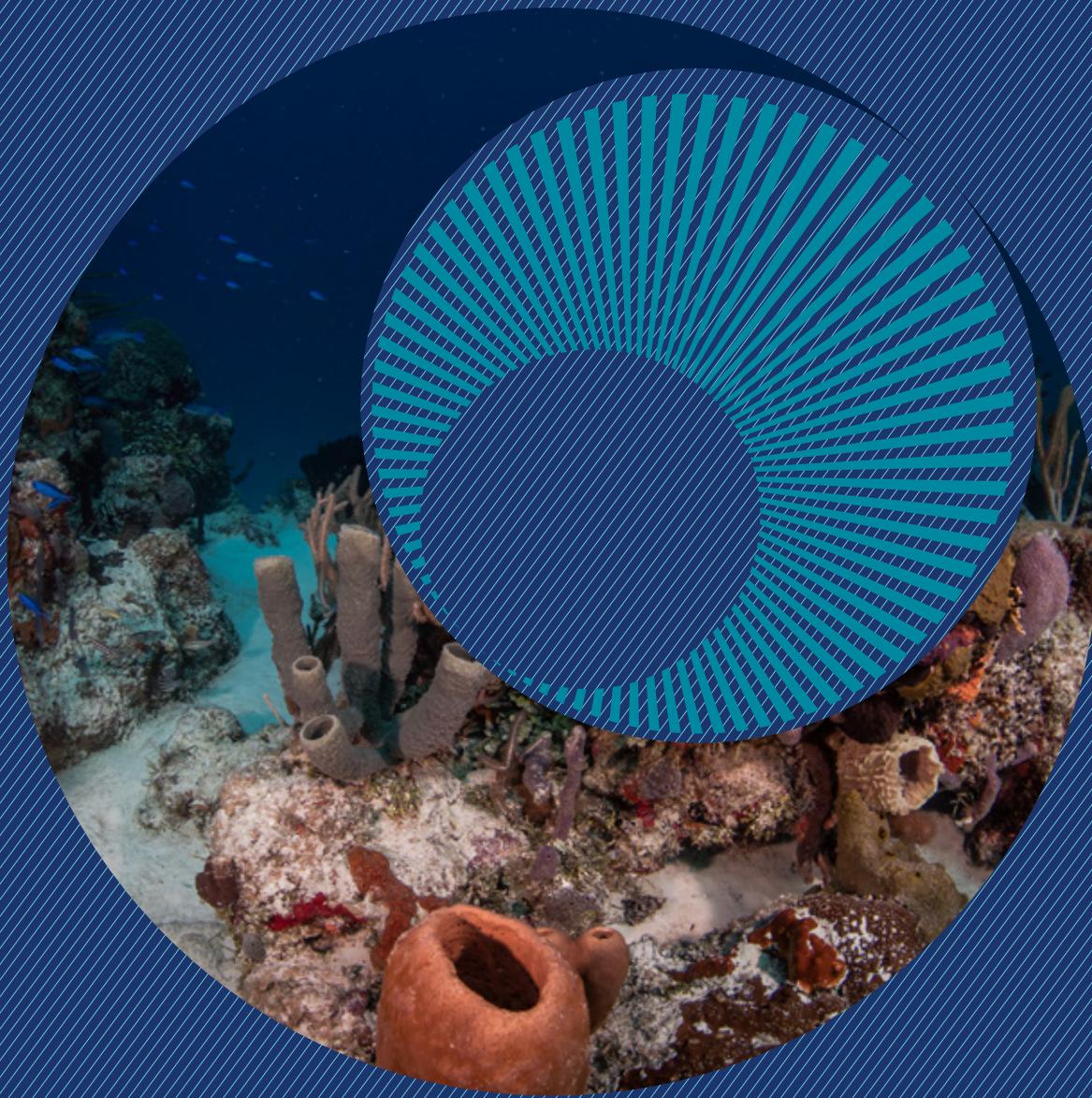
- The FAIR (Findable Accessible Interoperable Reusable) Guiding Principles for sustainable science.
- The rights of custodians of biodiversity: CARE Principles for Indigenous Data Governance (Collective Benefit, Authority to Control, Responsibility and Ethics).
- The fair and equitable sharing of benefit for the use of marine biodiversity in compliance with:
 - UN Convention on Biological Diversity, its Nagoya Protocol on Access and Benefit Sharing and the 2022 COP15 decision on digital sequence information.
 - UN Convention on the Law Of the Sea and its Treaty on conservation and sustainable use of marine biological diversity in the High Seas.

EMBRC's approach supports Open Science and transparency towards countries providing access to marine bioresources under their

sovereignty rights: from the access to the use of bioresources. This chain of traceability allows EMBRC to show nations and policy-makers the outputs of its activities on geolocalised bioresources and data. As well as contributing to benefit sharing, this also increases scientific capacity-building and the impact of the infrastructure.

With EMO-BON's endorsement by the UN Ocean Decade, EMBRC is moving from supporting and enabling European science and European Research Area capacity to joining the global science stakeholders. Ethics, integrity, fairness and equity are instrumental to its openness and contribution to global scientific capacity development. EMO BON has adopted a strategy that moves towards a global open science infrastructure according to the UNESCO Open Science recommendation adopted in November 2021.

Blue data and the bioeconomy



MERY PIÑA

PhD, European research
infrastructure expert

The phrase “data is the new oil” is increasingly problematic because data cannot be traded as widely as oil. One reason for this is quality, as international data standards are far from being set. This leads to huge amounts of data that are not interoperable or reusable and can quickly become obsolete. Yet, data holds huge potential to be used in countless ways to benefit societies and ecosystems.

In this context, EMBRC is positioning itself as a key player for blue data access and coordination in the bioeconomy. In 2021, it created the European Marine Omics Biodiversity Observation Network (EMO BON) initiative. Fully funded by EMBRC, EMO BON is a sustainable, long-term programme working towards globally coordinated marine biodiversity research. From microbial communities to macro-organisms, studies integrate environmental omics approaches and other new technologies.

In order to find the “digital truth”, i.e. data that accurately reproduces reality and allow scientists to make reliable assumptions and predictions, EMBRC is standardising data acquisition protocols, enforcing quality checks among EMO BON partners and sharing its processes (Standard Operating Procedures and Data Management Plan) throughout the UNESCO’s Ocean Best Practices of Intergovernmental Oceanographic Commission.

Accurate, high quality data is relevant for all decision-makers: from researchers to policymakers and private firms as well. As digital data ecosystems all interact with one another, industries need an organised and reliable data house which can be easily analysed by AI for example to allow



them to stay competitive. As described in McKinsey’s recent survey, “AI boosts revenues and profits”.

Through EMO BON, EMBRC hopes to be involved in the fourth industrial revolution by providing data to help aquaculture companies to better integrate ecosystem interactions and improve their aquaculture design for automatised, sustainable and profitable systems. For example, Integrated Multi Tropic Aquaculture (IMTA) farms multiple aquatic species together so the byproduct of one is the input for another: circular economy at its best. The initiative’s novel marine ecosystem services could have several applications for fisheries, such as defining indicators of ecological pressures, water quality monitoring, or changing migratory patterns. EMO BON is helping EMBRC contribute to SDG 7 (Affordable and Clean Energy) by supporting offshore wind farms and floating solar panels in measuring impact.

Thanks to EMO BON’s data, EMBRC can help the marine sector face climate and biodiversity challenges and manage marine resources sustainably.

* Santi I, et al. 2023 ; Front. Mar. Sci. 10:1118120. doi: 10.3389/fmars.2023.1118120

Gender equality in research

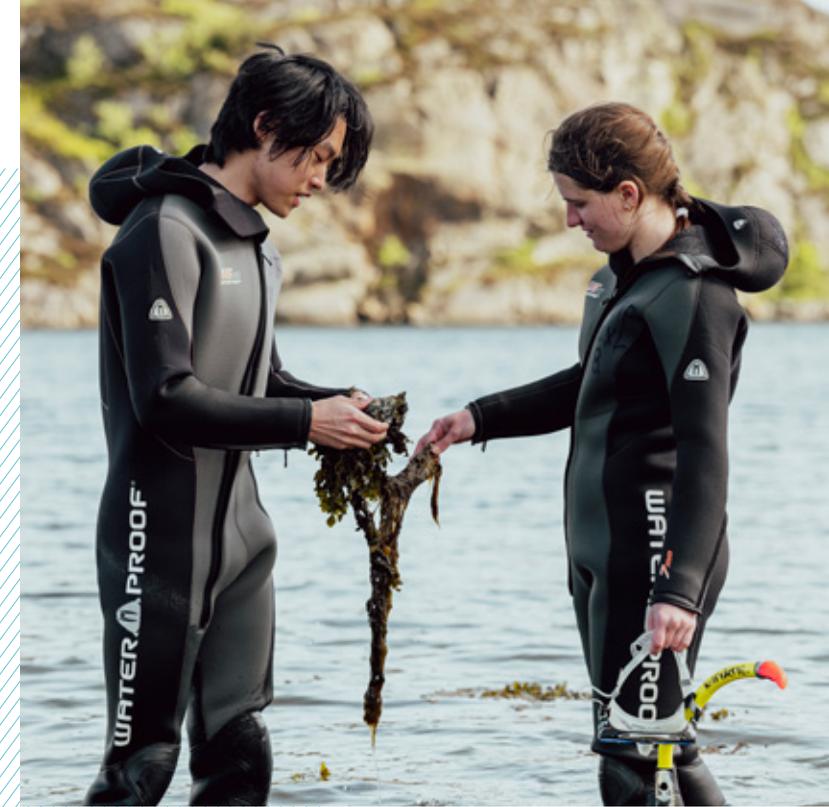
ALEXANDRA VASIC
Chief Administrative
and Financial Officer,

Gender equality is a fundamental value of the European Union. It benefits research by improving its quality and relevance, attracting and retaining more talent, and enabling everyone to maximise their potential.

The European Marine Biological Resource Centre (EMBRC)'s commitment to equality in the workplace is demonstrated through the organisation's Gender Equality Plan (GEP), which was drafted in 2022 and is now available on our website.

This new policy sets out EMBRC principles and commitments on gender equality and provides mechanisms for implementation, monitoring and evaluation of the commitments. The creation of this policy was possible thanks to the involvement of several members of staff and the support of the ERIC Forum working groups (Horizon Europe project) and the EGAE Group, which will provide training to help with the GEP's rollout. We will dedicate resources to ensure the policy's implementation and set KPIs to track our progress and performance against our equality goals.

Through our plan, we aim to ensure EMBRC enables a healthy work-life balance and an organisational culture which respects individuals' needs and social circumstances.



Our framework for a modern, inclusive, and equal opportunity work environment takes into account the issues and barriers that actively discourage or disadvantage certain groups. Through our plan, we aim to ensure the EMBRC enables a healthy work-life balance and an organisational culture which respects individuals' needs and social circumstances. We strive for gender balance across the organisation, its committees, working groups, and governance structure. We ensure all genders are considered equally during recruitment and that they have equal opportunities for career progression once working in the organisation.



Read more about EMBRC's Gender Equality Plan.

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 2022

Membership fees (amounts in euros)

France	€ 103,492
UK	€ 106,985
Italy	€ 91,484
Spain	€ 79,279
Israel	€ 69,517
Belgium	€ 74,777
Norway	€ 93,602
Greece	€ 60,988
Portugal	€ 61,068
Sweden	€ 67,459



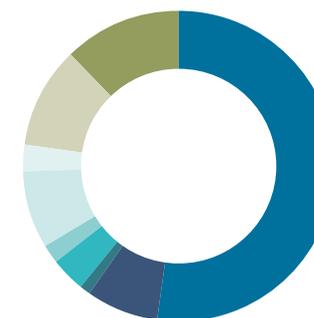
Host premium contribution

Host premium cash France	€ 300,000
Host premium in-kind France	€ 260,000
Project income	€ 113,788
Overheads of finished projects	€ 62,359
Other	€ 480
VAT Refund	€ 3,735
Total contributions	€ 1,549,013

EXPENSE

EMBRC's finances are audited every year according to French law, where the headquarters has its statutory seat. The operational costs for 2022 were distributed as follows:

Type of costs 2022



Human resources	€ 604,783
Travels	€ 84,774
Office management	€ 14,838
Outsourcing & Services	€ 39,797
Printing/Publishing/Dissemination	€ 23,097
Support/sponsoring of external activities	€ 93,771
Other	€ 31,806
Host premium contribution	
Host premium in-kind HR - France	€ 120,000
Host premium in-kind functioning - France	€ 140,000
Total expenses	€ 1,152,865

In 2022, EMBRC costs totalled 1,152,865 euros, half (53%) of which were allocated to human resources (604,783€).

Travel costs increased significantly due to the post-Covid resumption of travel for European projects, as well as the organisation of the EMBRC Days. There is also a significant price increase in travel cost which is causing a substantial increase in travel associated expenses.

Compared to 2021, EMBRC decreased support for external activities. However, this 93,771€; this can be explained by a lower expenditure of EMO BON which should be passed on in 2023.

EXTERNAL FUNDING SOURCES

European project funding is only used to carry out projects in which EMBRC is involved in. In 2022, this funding was as follows:

Projects 2022

ERIC FORUM	
Direct personnel costs	€ 3,446
Other direct costs	€ 318
Total	€ 3,764
RI-VIS	
Direct personnel costs	€ 933
Other direct costs	€ 220
Total	€ 1,153
EOSC-LIFE	
Direct personnel costs	€ 14,329
Other direct costs	€ 617
Total	€ 14,946
ASSEMBLEPLUS	
Direct personnel costs	€ 51,452
Other direct costs	€ 428
Total	€ 51,880

ATLANTECO	
Direct personnel costs	€ 1,388
Other direct costs	€ 0
Total	€ 1,388
DOORS	
Direct personnel costs	€ 11,383
Other direct costs	€ 3,298
Total	€ 14,681
ISIDORE	
Direct personnel costs	€ 2,769
Other direct costs	€ 0
Total	€ 2,769
AGROSERV	
Direct personnel costs	€ 3,287
Other direct costs	€ 593
Total	€ 3,880

AI4LIFE	
Direct personnel costs	€ 1,474
Other direct costs	€ 501
Total	€ 1,975
EOSC FUTURE	
Direct personnel costs	€ 4,710
Other direct costs	€ 0
Total	€ 4,710
BIOCEAN5D	
Direct personnel costs	€ 288
Other direct costs	€ 792
Total	€ 1,080
BLUEREDIOMICS	
Direct personnel costs	€ 570
Other direct costs	€ 153
Total	€ 723

CANSERV	
Direct personnel costs	€ 2,980
Other direct costs	€ 409
Total	€ 3,389
FAIRE EASE	
Direct personnel costs	€ 2,240
Other direct costs	€ 0
Total	€ 2,240
MARCO BOLO	
Direct personnel costs	€ 4,134
Other direct costs	€ 0
Total	€ 4,134
AQUAEXCEL	
Direct personnel costs	€ 0
Other direct costs	€ 1,075
Total	€ 1,075

Governance



EMBRC is a research infrastructure (RI) with 10 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

Bertrand Meyer, Sorbonne Université (SU)

Eric Guittet, 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

Kjell Emil Naas, 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

Alexandra Vasic, Chief Financial and Administrative Officer

David Di Cioccio, Access Officer

Lucie Salvaudon, General Assembly Secretary

Guillaume Duspara, Administrative Assistant

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

Ioulia Santi, Observation Data and Service Development Officer

Anne Emmanuelle Kervella, International Cooperation Officer

Alice Soccodato, Scientific Officer and Project Manager

*Following the Brexit referendum, the UK left EMBRC.

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.

Philippe Cury,
Institut de recherche
pour le développement (IRD)

Felicity Huntingford,
Univeristy of Glasgow

Erik Steinfeld,
Thermo Fisher Scientific

Antonio Villanueva,
BioMar

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.

Alice Soccodato, European Marine
Biological Resource Centre (EMBRC)

Nicolas Pade, European Marine Biological
Resource Centre (EMBR)

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

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

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

Moaz Fine, The Hebrew University
of Jerusalem - Interuniversity Institute
for Marine Sciences (HUJI)

Marco Borra, Stazione Zoologica
Anton Dohrn (SZN)

Tatiana Tsagaraki, UiB University
of Bergen (UiB)

Kim Praebel the Arctic University
of Norway (UiT) (maternity cover)

Deborah Power, Centro de Ciências
do Mar (CCMAR)

Ibon Cancio, Plentzia Marine Station (PiE)

Matthias Obst, University of Gothenburg
(UGOT)

EMO BON Operational Committee

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

Nicolas Pade, EMBRC-ERIC

Ioulia Santi, EMBRC-ERIC

Kim Praebel, The Arctic University of Norway
(UiT - Norway)

Klaas Deneudt, Flanders Marine Institute
(VLIZ - Belgium)

Fabrice Not, Station biologique de Roscoff
(SBR - France)

Bruno Louro, Centro de Ciências do Mar
(CCMAR - Portugal)

Oihane Diaz de Cerio, Plentzia Marine Station
(PiE - Spain)

Raffaella Casotti, Stazione Zoologica Anton
Dohrn (SZN - Italy)

Melanthia Stavroulaki, Hellenic Centre
for Marine Research (HCMR - Greece)

Miquel Frada, Interuniversity Institute
for Marine Sciences (IUI - Israel)

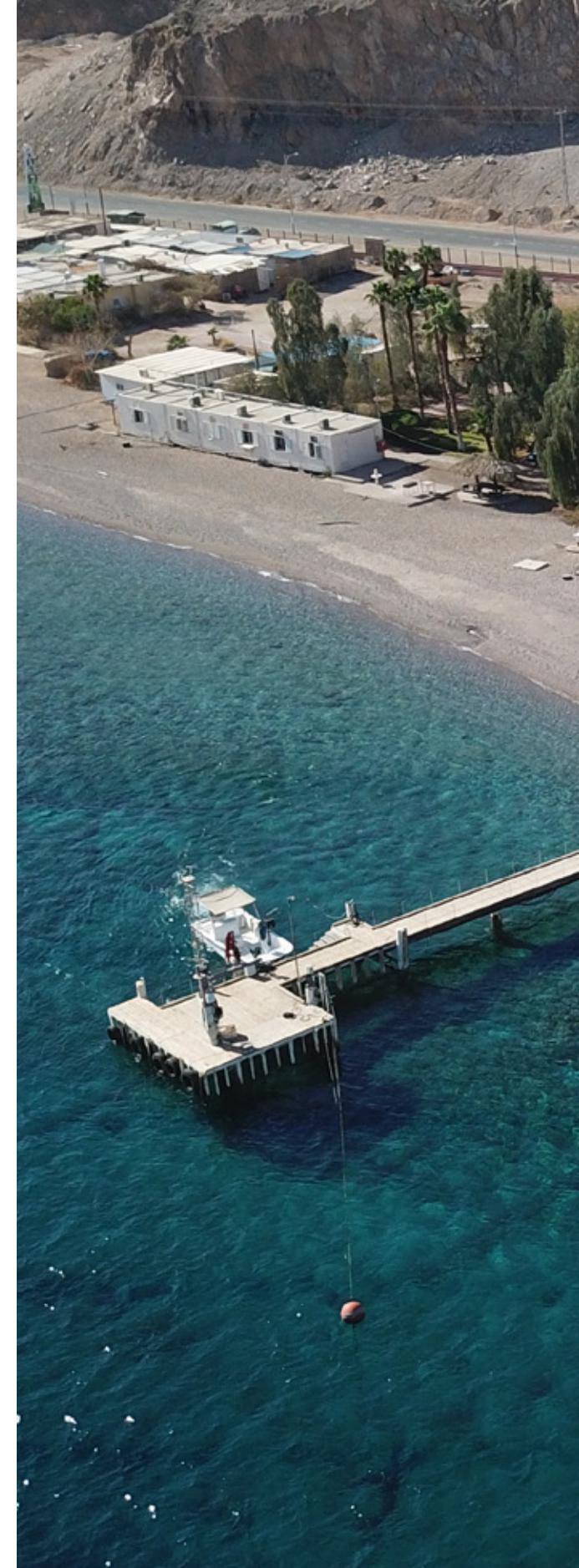
Matthias Obst, University of Gothenburg
(UGot - Sweden)

Katrina Exter, Flanders Marine Institute
(VLIZ - Belgium) (data expertise)

Maria Luisa Chiusano, Stazione Zoologica
Anton Dohrn (SZN - Italy) (data expertise)

Anne Emmanuelle Kervella, EMBRC-ERIC
(Traceability - EMBRC-ERIC)

Arnaud Laroquette,
EMBRC-ERIC (Traceability - EMBRC-ERIC)





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Nico Marin

ECIMAT UVigo, EMBRC Spain,

EMBRC Portugal,

Institute of marine research Norway,

EMBRC Norway,

Plentziako Itsas Estazioa (PIE),

Estación Marina de Plentzia,

EMBRC Spain, EMBRC Israel, EMBRC Sweden,

EMBRC Greece, EMBRC Italy,

EMBRC Belgium, EMBRC France

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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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Communications Manager,

EMBRC Headquarters

Designed by Morgane Goavec,

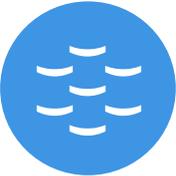
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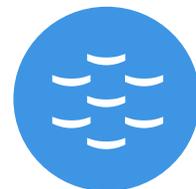
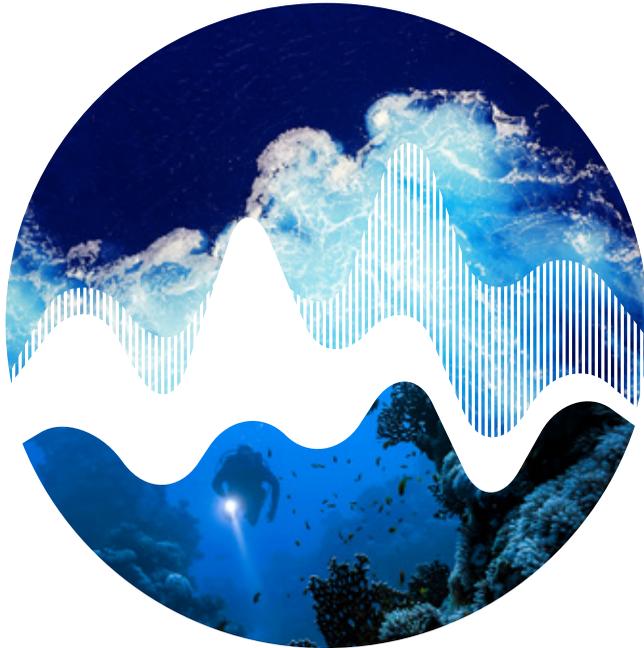
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