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News

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EMSO ERIC Newsletter No. 5 - April, 2024

News



EMSO ERIC 3RD CALL FOR PHYSICAL ACCESS IS NOW OPEN!

We are delighted to announce that the EMSO ERIC 3rd Call for Physical Access is now open! This is an incredible opportunity for **external users**, from scientists to research engineers and SMEs to have access to the **EMSO's world-class facilities** and their **high-quality instrumented platforms** in the **open ocean** to carry out **research, testing activities**, and the **installation of various cutting-edge devices**, like sensors, instruments, and systems.

Seven facilities are available, with two located in the Atlantic Ocean and five in the Mediterranean Sea. Starting this year, the applicants can also benefit from the possibility of having physical access and/or support from more than one facility to carry out their testing or projects.

Specifically, each Regional Facilities' team offers valuable **training** and **co-development** to users interested in learning specialized techniques/methodologies and developing new products, taking advantage of years of experience gathered at EMSO

Facilities' labs. The facilities' instruments offer **customized data collection**, which is an invaluable resource for researchers.

We encourage scientists, researchers and all those are interested in realizing new procedures and experiments to take this opportunity and join EMSO Physical Access. The Call will be open until the end of the year: the evaluation of project proposals will be performed every two months, and the selected ones will be funded.

After the success of last year's call, EMSO decided to increase the **2024 budget** for funding the selected projects. The overall economic support for this promising service amounts now to **€120.000** and will be distributed to the selected projects among the six cut-off dates, with the expectation to fund a minimum of seven projects, resulting in up to €15.000 per project. Funding consists of Facility Access Units (days of usage) and economic support for operations, travel, shipping, and consumables.

To know more about the whole offer, the application procedures and deadlines, visit our Physical Access page [here](#).

Next deadline to submit project proposals is June 30th!

Authors: Sara Pero and Simo Cusi. EMSO ERIC

emso
ERIC

EMSO
Proudly announces
#DiveInEMSO
Its 2024 first social media
campaign

Every week our posts will spotlight EMSO's goals and the
invaluable support of its Observatories located across Europe

Introducing our social media campaign #DiveInEMSO

We are thrilled to announce the social media campaign #DiveInEMSO. This campaign will focus on showcasing the **unique features** of the **EMSO consortium** and its network of **Regional Facilities**. Every two weeks, we will get a closer look at each EMSO Research Facility, and will share information about the activities performed by our infrastructure such as the provision of **deep-sea high-quality data**, the development of **new technology** for sensors and underwater communication, but also

about **offshore operations**, and the activities to promote **innovation** and **knowledge-sharing**.

We aim to raise awareness about our work and contribution to advancing ocean research in Europe, inspiring young researchers, students, and anyone interested in the environmental and marine domain to join our community!

Learn more about our story and mission [here](#) and keep posted on the EMSO ERIC social media channels:

[X](#)
[LinkedIn](#)
[Facebook](#)

Updates from the EMSO Regional Facilities



NorEMSO Outreach Event: Advancing Marine Observations in the Nordic Seas

NorEMSO recently hosted its outreach event as part of **One Ocean Week** in Bergen, Norway, focusing on the advancement of marine observations in the Nordic Seas.

The morning started with a friendly atmosphere as participants gathered for breakfast and networking with NorEMSO representatives. Ilker Fer, who leads the infrastructure set the stage with an insightful **introduction to NorEMSO** and its integration within EMSO ERIC, followed by presentations from the consortium highlighting the diverse infrastructure components integral to NorEMSO's operations. Attendees were given a firsthand look at the **instruments** utilized in the NorEMSO infrastructure through **demonstrations**.

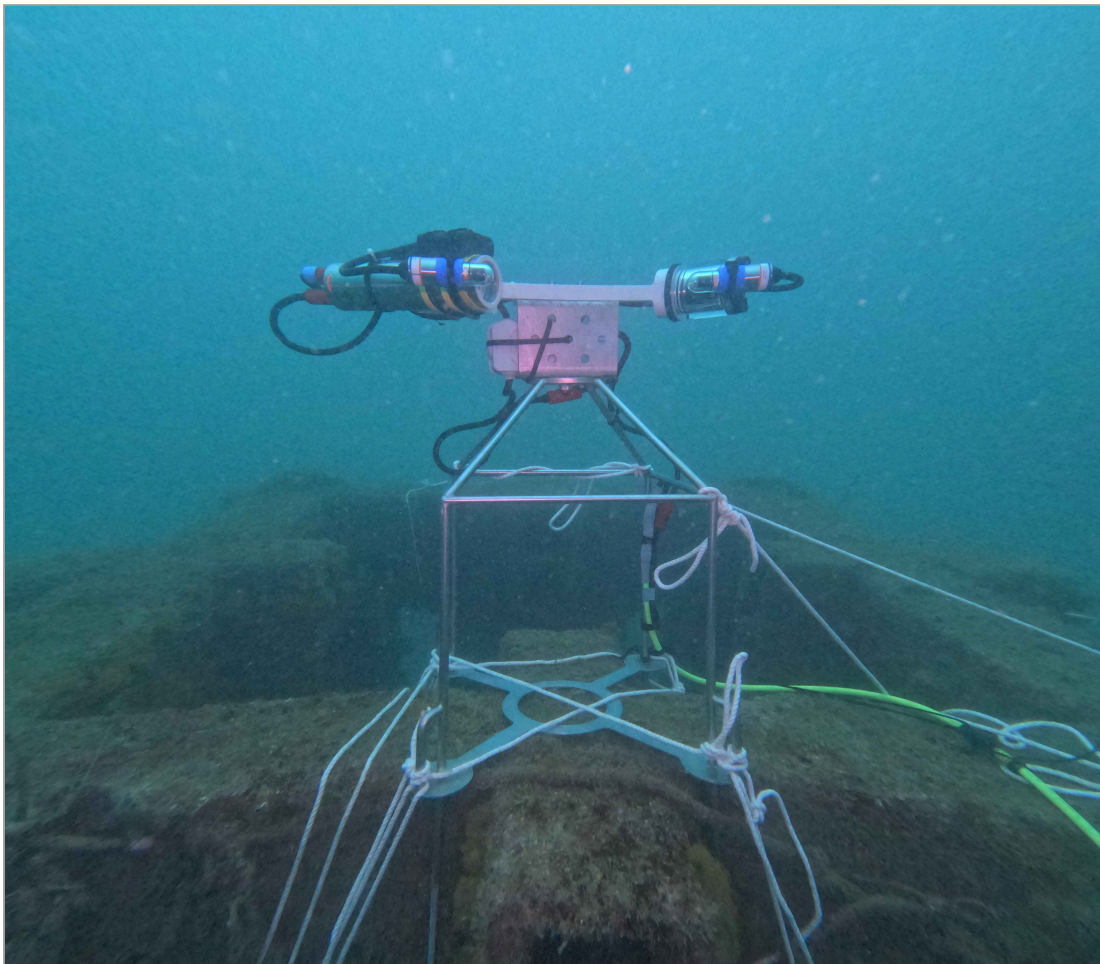
Following a brief introduction, the event welcomed speakers to delve into recent topics. Anders Tengberg from Xylem/Aanderaa Data Instruments, and thus representing industry, delivered a compelling discourse on the importance of **collaboration** between **industry** and **academia** in advancing **marine observation initiatives**. Erika Giorgi, a PhD candidate at University of Bergen (UoB), shared her research journey and insights into her thesis on observing circulation patterns at depth of the Nordic Seas, offering valuable perspectives from the academic realm.



The event finished in a preview of the **EMSO Mohn documentary** titled "**Immersive**" curated by Thibaut Barreyre, a former NorEMSO task lead and UoB employee, and Rohan Thomas, a filmmaker from Beyond Index Films. The documentary provided a fascinating glimpse into the exploration of **hydrothermal vents** in the **deep-sea oceans**, underscoring the significance of marine observation endeavours in unravelling the mysteries of the marine environment.

Photos: One Ocean Week / Photographer: Silje Katrine Robinson

Author: *Lucie Mottlova, University of Bergen*



Deployment UVP6 at OBSEA - AIES-ZOO

On February 2024, during the first year of the ANERIS project, **SARTI-UPC researchers** together with researchers from the **Laboratoire d'Océanographie de Villefranche (LOV)** deployed an **Underwater Vision Profiler** at the **OBSEA** observatory. The

Underwater Vision Profiler or UVP (CNRS patent) is designed to study large (>100 μm) **particles** and **zooplankton** simultaneously and to quantify them in a known volume of water. The UVP system makes use of computerized optical technology with custom lighting to acquire digital images of zooplankton IN SITU down to depths of 6000m.

ANERIS project aims to put in place an **automatized data pipeline** for data generated by the Underwater Vision Profiler by deploying two UVP6-LPs on EMSO moorings, one at the **OBSEA** cabled observatory off the Vilanova coast in Spain, and one at the **SmartBay** cabled observatory in Galway Bay, Ireland (not yet deployed). These cabled observatories will generate high frequency images (an image at least every minute) for a scientifically exploitable time series, which will be visualizable in near real-time via a web application.

The UVP collects **in-situ images**, where it counts and sizes all particles larger than $\sim 100\mu\text{m}$, and extracts regions of interest (ROIs) for large particles ($>\sim 1\text{mm}$). The counting, sizing, and image segmentation are done by the instrument itself. This pre-processed data is stored in the application EcoPart ($\sim 25\text{K}$ profiles and $\sim 2\text{K}$ time series samples of marine particles) and the ROIs are sent to EcoTaxa for taxonomic identification. EcoPart structures its information by size and exports depth-resolved particle size spectra. It also retrieves the taxonomic identifications from EcoTaxa to export concentrations for the taxonomically identified particles (including plankton).

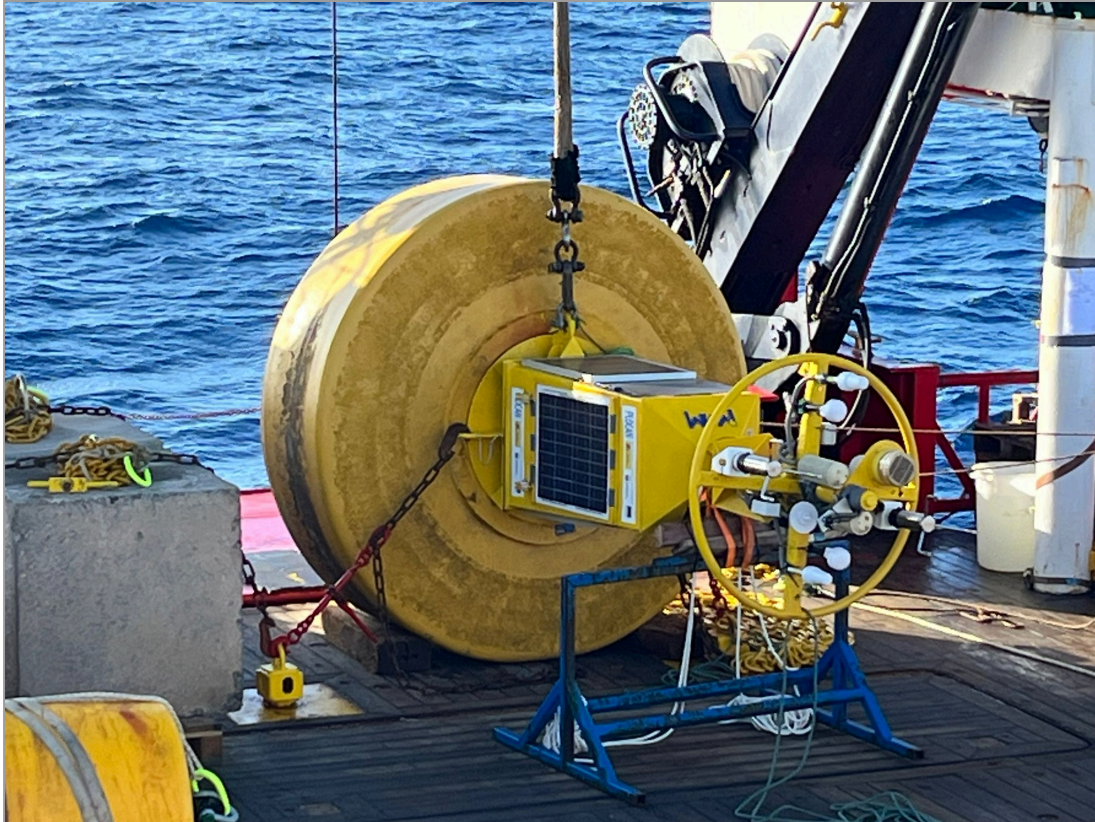


Because of the size of the datasets generated by UVPs on cabled observatories, such as those planned for OBSEA and SmartBay, ANERIS aims to more fully automatize this pipeline by: 1) rewriting and issuing a new version of EcoPart, including basic quality control checks; 2) adding an Application Programming Interface (API) to EcoPart to enable machine-to-machine interactions; 3) training deep learning classifiers to be deployed as a dedicated service for image classification; and 4) defining periodic validation procedures to control the performance of those classifiers in subsets of the data.

During the first year of the ANERIS project, the UVP6 was integrated to OBSEA network, fully tested in a pressure tank at UPC facilities and deployed at 18 meters depth with the LOV researcher's supervision. For this version, a custom UV-C light was designed with the support of Hydroptic company to be efficiently utilized to later better protect the UVP6 camera porthole from biofouling.

Photo 1: UVP6 at OBSEA
Photo 2: UVP6 at UPC
Photo 3. LOV and SARTI team

Author: Matias Carandell, UPC



Oceanographic campaign at ESTOC station boosts scientific research in the Atlantic Ocean

The **ESTOC station** (European Station for Time-Series in the Ocean - Canary Islands), located in the Atlantic Ocean near the Canary Islands, has been the subject of an **oceanographic campaign** carried out by **PLOCAN** and the **ULPGC**. ESTOC is the **national ocean observation node** of **EMSO** (European Multidisciplinary Seafloor and water column Observatory). During this four-day campaign, the teams worked intensively to refurbish and carry out various activities at the ESTOC station and the new **FLUCARO** (Fluxes in the Canary Region) mooring, which consists of sediment traps. On the first day of the campaign, the team installed the necessary instrumentation in the laboratories of the research vessel *Sarmiento de Gamboa*, and secured the components of both moorings on the main deck. Approximately 8000 metres of rope was stowed on winches of the ship's main deck, due to the 3615 meter depth of the anchorage area.

The ESTOC station was redeployed on day two, thanks to the joint efforts of PLOCAN personnel and the crew of *RV Sarmiento de Gamboa*. This was followed by water sampling and filtration at both sites. The **FLUCARO sediment traps** were then scheduled to be anchored at dawn the following day.

On the third day, PLOCAN carried out **sampling** at ESTOC. These samplings provide **valuable data** on pH, pCO₂, microplastics, nutrients, oxygen, salinity and temperature, which will contribute to improve the predictions of **ocean models** used to study **climate** and **ecosystems**. In addition, an underwater vision profiler was attached to the sampler, harvesting images of particulate matter and zooplankton. This sensor, which captures up to 20 images per second in a red light beam, uses **artificial intelligence techniques** based on shape recognition through deep learning to automatically identify and classify the images. The day ended with the successful completion of the **FLUCARO** mooring deployment with sediment traps at 200m, 500m, 1000m and 1600m depth, current meters, and a stand-alone hydrophone at 175m depth that will record **bioacoustic signals** and **ambient noise** for a full year.

On the final day of the campaign, the last physical, chemical and biological samplings were carried out both at ESTOC and at the PLOCAN test site. One of the highlights of the campaign was the acquisition of zooplankton images using the UVP6-HF installed on the CTD/Rosette .

This oceanographic campaign at ESTOC will advance **scientific knowledge** about the **Atlantic Ocean** and its influence on climate and ecosystems. It also demonstrates the commitment of PLOCAN in maintaining one of the longest **time series** in the world, via EMSO ERIC, while ESTOC carbon data is also contributing to ICOS ERIC.

The construction of the Sarmiento de Gamboa was financed by the Ministry of Education and Science, through the European Regional Development Fund (ERDF), which contributed 59.5% of the total cost, the CSIC, with 20.5%, and the Xunta de Galicia, which covered 20% of the expenses.

Photo: The ESTOC buoy prepared for deployment.

Authors: Eric Delory, Josefina Loustau. PLOCAN

EU Projects



eRImote project: outcomes of the survey on Research Infrastructure use cases

A survey conducted by the **eRImote WP4 team** on Research Infrastructure specific **use cases** reveals crucial insights into the present state and future developments of remote access in **Research Infrastructures (RIs)**.

The outcomes collected will contribute to the creation of a **Green Paper** on best practices for effective remote access management, particularly in the areas of technological support, user engagement, and cybersecurity.

Five representing RIs placed in several ESFRI thematic areas (including Environment, Health and Food, and Physical Sciences and Engineering) were involved, notably **EMSO ERIC, Euro-BiImaging, DESY, INTERACT** and **INSTRUCT ERIC**, to identify drivers and barriers in evolving RIs remote access capabilities.

The survey covered the most relevant aspects of the use cases presented by the RIs involved in the task, and was focused on the following topics:

- 1. Technological support and responsibility**
- 2. Management and feedback mechanisms**
- 3. Access provision and software characteristics**
- 4. Access Request and User Management**
- 5. Training and user engagement**
- 6. Cybersecurity and Data Management**
- 7. Implementation and challenges**
- 8. Expected results from use cases**

Looking at the main insights, the outcomes indicate a strong focus on digital transformation in the **remote access practices**, with huge efforts devoted to enhancing **user engagement** and streamlining workflows.

In particular, common aspects in Remote Access Management emerged, characterised mostly by custom technological solutions tailored to the specific RI needs, adoption of robust user management systems and significant investment on **training** and user support indicating a shift towards more user-centric remote access models.

Furthermore, the majority of the RIs emphasized the development of hybrid and flexible remote access models that cater to varied user needs and RI contexts in order to continue to evolve and adapt digital infrastructures in response to changing user needs and technological advancements. The use of AI tools will affect how to support the user in accessing remotely the RIs facilities and further improve the overall experience.

The survey will be included in the Deliverable 4.2 of eRImote by the end of the project (November 2024).

Authors: Sara Pero, Marco Galeotti, Valentina Tegas. EMSO ERIC



Into the deep

The "Into the Deep" project, funded by the European Union as part of the Erasmus+ program, is a citizen science project in which citizens help researchers to analyze image material to answer scientific questions. It is based on high-resolution images from the deep sea taken during scientific expeditions.

Into The Deep brings the world's deep ocean to your laptop: to teach participants about four distinct marine habitats, and show the impact which human behaviour has on them. After learning about the area, participants are then trained to use a web-based tool called BIIGLE PARTY, to make species observations in the sea floor images.

The UPC, as a partner in this project, has developed the **course "Coastal North-Western Mediterranean (Catalan) Ecosystems"**. This aims at monitoring the underwater performance of artificial reefs. Placement of artificial reefs has been proven to be an effective technology to protect the coastal line and to restore damaged ecosystems. To evaluate the ecosystem productivity and functioning, the monitoring of changes in fish behaviour and population abundances are very important measurements.

Into the Deep Training Event, Vilanova i la Geltrú, Spain

On October 24-26 Into the Deep held a three day training event at UPC in Vilanova i la Geltrú to test the products for the first time. We invited scientists and non-scientists alike to give us constructive feedback on the lessons that we developed and the Bigle Party image analysis tool.

Into the Deep Launch at MARUM, Bremen, Germany

On January 10th, 2024 the Into the Deep Project was presented, at MARUM, where BIIGLE Party has been tested with real time data sets. You can read more about the

launch event [here](#).

In April, 2024, the Into the Deep project was presented at the [Ocean Decade](#) conference in Barcelona, and [EGU](#) in Vienna, Austria. Check out the website to learn more about the project: <https://www.thedeepproject.eu/>

E-learning courses <https://eclass-thedeepproject.eu/>

BIIGLE PARTY Obsea data set

<https://biigle.party/p/b3ce536f-3567-400c-97dc-551051987f84/786471c9-97b4-45b5-ae0d-5ec43186b5f2>



Photo 1. Into the Deep Training Event, Vilanova i la Geltrú, Spain

Photo 2. Screenshot of the user interface. Citizen scientists mark the objects they are looking for with circles and polygons. Photo: Interchange

Author: Ikram Bghiel, UPC



Introducing ENVRINNOV, a new European project that will support the development of new technologies and services for the environment

Launched in January 2024, with a duration of 3 years, the ENVRINNOV project represents a promising endeavour aimed to co-design, test, and validate a **common Innovation Roadmap** for the **European Environmental and Earth System Research Infrastructures (ENVRI) community** to respond to the emerging challenges and needs brought upon the climate crisis, and adequately serve scientific and policy priorities

across all environment domains, proposing new services and technologies for scientists, policy-makers and industrial users.

Effective implementation and monitoring of research-driven environmental policies, along with new technologies and services, are crucial for a timely and concerted approach to adapt and mitigate the effects of the unfolding climate crisis.

The Roadmap will set a promising pathway for the ENVRI community to establish and operate an **ENVRI Innovation Hub (EIH)**, for the future development of new state-of-the-art technologies and services. Furthermore, the project will plan for the timely and realistic implementation of the Roadmap, by also creating and validating with the ENVRI community an **implementation plan**, governance model and **business model** for the EIH, with deep involvement and support from the EMSO ERIC Consortium, who will lead WP6.

To achieve its objectives, the ENVRINNOV consortium brings together ten partners from five European countries that are the following: Cyprus Institute, (coordinator), Forschungszentrum Julich GMBH -FZH (Germany), the Integrated Carbon Observation System- European Research Infrastructure Consortium- ICOS ERIC (Finland), the "Aerosol, Clouds and Trace Gases Research Infrastructure- European Research Infrastructure Consortium" - ACTRIS ERIC (Finland), the European Multi-Disciplinary Seafloor and Water Column Observatory-European Research Infrastructure Consortium - EMSO ERIC (Italy), Helsingin Yliopisto - UHEL (Finland), Centre National de la Recherche Scientifique - CNSRS (France), Commissariat à L'énergie Atomique et aux Énergies Alternatives – CEA (France), Karlsruher Institut fuer Technologie – KIT (Germany) and Helmholtz-Zentrum Fur Umweltforschung GMBH – UFZ (Germany).

This project has received funding from the European Union's Horizon 2023 research and innovation programme under grant agreement no° 101131426.

Learn more [here](#) on the project and EMSO contribution.



AMRIT, the new project will advance the future of European Marine Research Infrastructures

Running from March 2024 to February 2027, Advance Marine Research Infrastructures Together – AMRIT project aims to be a catalyst for **Marine Research Infrastructures** (MRIs) for **development** and **consolidation** throughout Europe, setting a new standard for operational coordination and collaboration in ocean observing.

The lack of cross-coordination among MRIs has been identified as a major hurdle in supporting cutting-edge research and achieving the full potential of European Ocean Observing System (EOOS), the foundation of European ocean knowledge.

AMRIT, with its comprehensive and cooperative approach, aims to dismantle these barriers, promoting the seamless operation of marine observation platforms and the full utilization of sensors, thus propelling their technological advancement, a crucial step towards enhancing the strength and coherence of marine data collection and management.

This project aligns the efforts of 3 ERICs focused on marine observation — EMSO, EURO-ARGO, and ICOS ERICs -, together with MRI projects and key partners, among

which EuroGOOS, WMO, JPI Oceans, to address the critical challenges faced in the realm of ocean observing.

One of the flagship initiatives under AMRIT, to which the EMSO ERIC will contribute, is the creation of the **EOOS Technical Support Center** (EOOS TSC). This centre is envisioned as a lynchpin in integrating the **data value chain** — from early planning to delivery to end-users — ensuring **uniformity and efficiency in data acquisition methodologies** for **Essential Ocean Variables**.

The EOOS TSC, once operational, is expected to be a foundational element in maintaining and advancing EOOS, thus fortifying European ocean observing capabilities for decades to come. The broader impact of AMRIT extends beyond immediate operational enhancements. It is a strategic move that aligns with the European Commission's ambition for shared responsibility in ocean observing and contributes to the realization of the EOOS 2023-2027 Strategy.

Further information on the EMSO contribution and project is available [here](#).

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