

# ASSEMBLE



ASSOCIATION OF EUROPEAN MARINE BIOLOGICAL LABORATORIES EXPANDED

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## Abstract

**This deliverable describes the outcomes of the trans-national access programme (TNA) offered at EMBRC Spain, in terms of: installations available, applications received and user's projects performed (through on-site and / or remote access), users' profile and other stats (country of origin, career profile, type of organization, satisfaction of the services used).**



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## 1. Introduction

Transnational Access in ASSEMBLE Plus is provided to a total of 36 marine stations in 15 countries. In the whole consortium, the stations provide access to a high diversity of marine environments; from the high Arctic (IOPAN) and Antarctic (UKRI-BAS) to the tropics (IUI and NIOZ-CNSI) and the mid-Atlantic ridge (CCMAR and IMAR). Within mainland Europe, access is provided to the Mediterranean, the Atlantic and the Baltic seas. Habitats comprise estuaries (e.g. SZN, ISMAR, CCMAR, AWI, IOPAN, UG), mega-tidal seas (SBR), cold-water coral reefs (KMRS, NUIG, SAMS), brackish seas and sea ice communities (IOPAN, TSZ, ARI, HBS), near-shore deep sea (HCMR, IMEV, NUIG, UGOT, SAMS) and volcanic seeps (high CO<sub>2</sub> – low pH; HCMR, SZN, IMAR). The TA-providing stations (access providers) have modern research laboratories and a wide array of specialized research facilities to support internal and external users. Several of these also have technological backup of nearby university institutions.

This deliverable describes the outcomes of the trans-national access programme (TNA) offered at EMBRC Spain, in terms of: installations available, applications received and user's projects performed (through on-site and / or remote access), users' profile and their stats (country of origin, career profile, type of organization, satisfaction of the services used).

## 2. Objective

This deliverable intends to show the outcomes of the transnational access programme executed at EMBRC Spain, hence contributing to the ASSEMBLE Plus objectives:

- Enhance transnational access to a coordinated set of state-of-the-art European infrastructures for marine biology and ecology;
- Improve service provision by these infrastructures in line with their areas of excellence in marine biology and ecology, with emphasis on developing novel key enabling technologies and data solutions;
- Strengthen complementarity and interoperability within the consortium and with related infrastructures;
- Lay the logistical and strategic foundations to expand the coverage of the European Marine Biological Resource Centre (EMBRC) in both its scope and its geographical distribution and to consolidate its long-term sustainability.

## 3. Outcomes of the Transnational Access programme

### 3.1 Overview of the access provider(s)

The EMBRC-Spain node is integrated as a national RI with two facilities, ECIMAT-UVIGO and PIE-UPV/EHU. It offers research vessels and smaller boats supported by diving for ecosystem access to intertidal rocky/sandy shores, mudflats and estuaries, under historical anthropic pressure (e.g., iron foundry slags, fish populations with prevalence of intersex condition) in combination with pristine

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coastal Nature 2000 areas and natural parks in the Basque Country region and to rocky/sandy shores, mudflats, seagrass & Maerl bed ecosystems in good conservation state in the Rías Baixas upwelling region, an area with a high productivity and frequent blooms of toxic dinoflagellates. It provides access to a range of cultured and non-cultured organisms (microalgae, molluscs, crustaceans, seaweeds, sea grasses, fishes, etc). Specialized research service platforms are available for discovery of bioactive compounds, imaging and “omics”. Aquaria for marine organism maintenance and experimentation are offered at both stations.

### **3.2 Installations offered**

EMBRC Spain offered access to two marine stations with a specific set of installations:

#### **3.2.1 Plentzia Marine Station (PiE-UPV/EHU)**

PiE-UPV/EHU offers access to unique marine ecosystems, marine biological resources, and research platforms to a wide-range of stakeholders. It also offers the knowledge and experience provided by its in-house senior researchers and university departments with more than 60 publications in peer-reviewed journals per year. Within its broad portfolio of services, PiE-UPV/EHU offers access to pristine and anthropogenised estuarine and littoral ecosystems (sandy beaches, mud flats, rocky shores, commercial harbours) (Ecosystem PiE) that can be sampled in situ to further conduct studies at its research platforms (wet and dry labs, Wetlabs PiE) specially designed to conduct ecotoxicological research in regard to exposure to chemical pollutants. This is accompanied by modern biobanking services and collections providing retrospective health assessment possibilities through the “Biscay Bay Environmental Biospecimen Bank” (BBEBB PiE). Besides access to state-of-the-art laboratories and research platforms, with all the equipment necessary to conduct advanced microscopic, biochemical, molecular and analytical chemistry research, the main campus of UPV/EHU is just 15 km away and its research services are fully accessible to users.

#### **3.2.2 Toralla Marine Science Station (ECIMAT-UVIGO)**

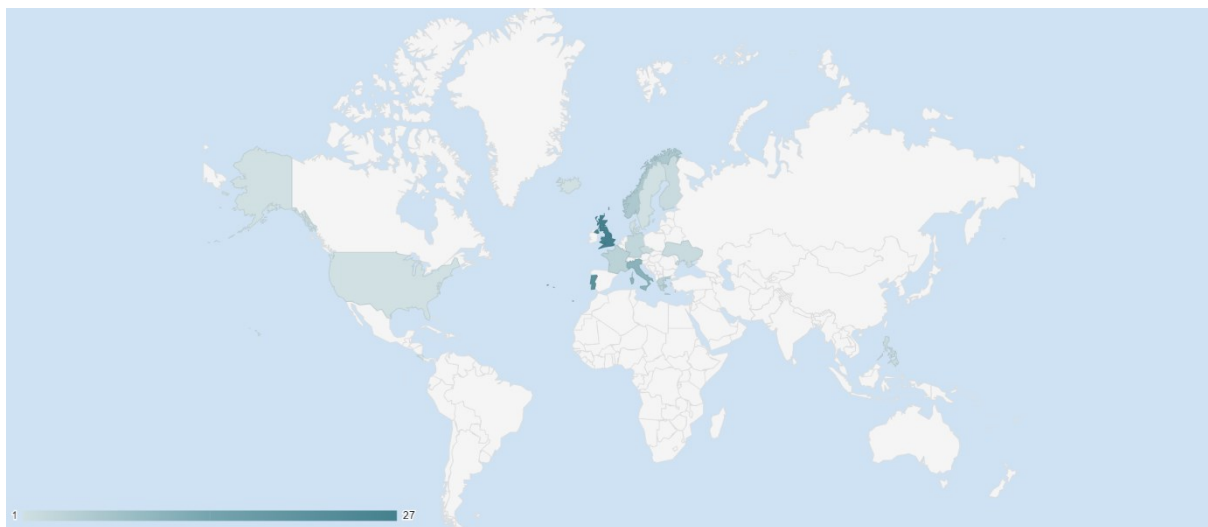
MLABS ECIMAT: ECIMAT has five modular, flexible and functional buildings, in operation since 2006, with state-of-the-art facilities for working with seawater and marine cultures, both on an experimental scale and a pilot scale. ECIMAT is favorably situated at the southern tip of Ría de Vigo (Toralla Island), part of an upwelling system, with privileged access to several types of coastal ecosystems (rocky and sandy intertidal zones, mudflats, pristine coastal areas, estuaries and seagrass maerl bed). ECIMAT offers a broad portfolio of services. Many biological resources can be provided thanks to its experimental facilities for their maintenance, conservation or cultivation. ECIMAT can offer access to different ecosystems, among which are rocky and sandy intertidal zones, mudflats, pristine coastal areas, estuaries and seagrass maerl bed. The station also has technology platforms such as bioassays, HF radar, and imaging tools that facilitate sampling and subsequent data analysis.



## 4. Applications received

### 4.1. *Origin country of applicants*

EMBRC Spain has received a total of 65 applications in the nine calls of TNA. Among these, 58 applicants were based in European countries while 31 applicants came from other non-European countries.



### 4.2. *Applicants profile*

#### 4.2.1. Home institution type

Applicants were mostly based in academic institutes (universities: 59.6%; research organizations: 38.2%) while only 2.2% belong to SME.

#### 4.2.2. Career status

The most recurring career profile of the applicant was PhD student (33.8%), followed by postdoc (32.4%), early career scientist (25.4%), researcher (4.2%) and other (4.2%).

## 5. User hosted and their stats

### 5.1. *Projects completed*

Overall, EMBRC Spain has hosted 48 projects for a total of 66 users. 41 projects were carried out on-site, and 7 in remote access. Of the 20 projects hosted at PiE-UPV/EHU, only 5 of them were carried remotely, 3 of them because the experimental needs required it and 2 of them due to the travel limitations associated to the COVID-19 outbreak. Of the 28 projects completed at ECIMAT-UVIGO, 1 one them was carried out on-site and on-remote to provide more flexibility with the research, and the other two done remotely, one was due to the travel restrictions associated to the COVID-19 outbreak



and the other one because the user only required for some samples to be collected and sent to its home institution.

The list of projects completed at EMBRC Spain is available in "[Appendix 1 – List of user-projects completed](#)" further below.

### 5.2. Installations used

In the case of PiE-UPV/EHU the installations used the most were the wet laboratories, followed by the access to the ecosystems and the culture collections. In the case of ECIMAT-UVIGO, all the installations are grouped as wet laboratories, so no distinction could be done.

### 5.3. User satisfaction

Overall, users have positively evaluated the services offered (Very good: 90%; Good: 10%). In general, comments from the users were very positive, praising both the services and facilities at both institutions, as well as positively evaluating the support received both before and during the research stay. Many of the users also highlighted the unique opportunity that the ASSEMBLE Plus TNA programme was for them, commenting on how, without its funding, it would have been impossible for them to conduct their research.

### 5.4. Projects not completed or cancelled

The main reasons for the projects not being completed or cancelled were changes in the research plans of the users, not availability of the marine resources object of study for the time period when the access was planned, and because of the travel restrictions due to the COVID-19 outbreak caused changed in the planned dates for conducting that were no longer suitable for the users.

## 6. Use of resources

*Please include information on how many of the Person Months (PM) reported in the use of resources linked to the financial statements have been used to provide access and explain for which task (e.g. scientific or administrative support to users, etc.). What is useful here is how many PMs have been paid directly from the project and what they did, and how many PM estimated have been devoted to running the project but without charging it.*

| Beneficiary / Linked Third Party | PM | short name of the installation(s) | explanations of tasks  |
|----------------------------------|----|-----------------------------------|--|
| ECIMAT-UVIGO                     | 2  | MLABS ECIMAT                      | For the specific case of ECIMAT-UVIGO 2 PMs were requested in the project proposal and were included in the financial statements. That time of the |





|             |   |  |   |
|-------------|---|--|---|
|             |   |  | <p>personnel hired was dedicated to the administrative support of the users, dealing with all the tasks related to the planning and organization of the users' accesses. Considering the number of hosted projects at that institution, it is estimated that approximately 4 PM of an access officer were dedicated to the administrative support of the users, with only the 2 PM mentioned above being included in the financial statements. In addition, it is estimated that approximately 5 PM of the ECIMAT personnel was dedicated to provide scientific support during the duration of the TNAs</p> |
| PiE-UPV/EHU | 2 | Ecosystem access and biological resources;<br>Tissue biobank | For the specific case of PiE-UPV/EHU, 2 PMs were allocated in the project proposal and included in the financial statements. Finally, it is estimated that approximately a total of 4PMs have been necessary to provide access, that is, 2PMs more than originally foreseen.  |



|  |  |  |   |
|--|--|--|---|
|  |  |  | <p>Most of the effort, approximately 3.5 PMs, was dedicated for ecosystem access and biological resources to provide scientific support to users, both, on-site and on-remote, and to a lesser extend administrative support for Nagoya Protocol compliance measures. The remaining effort, was devoted for tissue biobank issues (culture collection and samples).</p> |
|--|--|--|---|

## 7. Conclusion

Overall, the TNA programme was very positive for the two institutions of the Spanish node, although different lessons were learnt as result of the different way in which they are functioning. On the one hand, ECIMAT-UVIGO was already established as an institution dedicated to provide services for marine science research both internally and externally. However, the ASSEMBLE Plus project allowed to acquire experience in the hosting of research stays of external users funded through a TNA programme, an experience that was completely new to the institution. In this sense, administrative tasks such as the best way of organizing the visitors travel, or the best method for managing the payment of the expenses had to be revisited and adapted to the University of Vigo’s internal rules, setting the bases for the SOPs that will be used in future TNA programs. In addition, this program also allowed to gain experience in the calculation of the services cost by Unit of Access, a concept that was completely new to the station. Important lessons were also learnt regarding the implementation of the Nagoya Protocol and its compliment for the activities carried at the marine station and the fact that, for guaranteeing an efficient development of the TNAs visits, the best way was to encourage the establishment of collaborations of the external visitors with researchers at the University of Vigo. Through the experience of the projects carried out it was clear that when a TNA project involved a collaboration there was less burden to the functioning of the station and they were better hosted during their stay. These lessons will be taken into account for the development of future TNA programs.

On the other hand, PiE-UPV/EHU was not established as an institution strictly dedicated to provide services to marine science researchers, neither internal nor external. So, ASSEMBLE Plus project has been very useful to learn how to meet the external researchers needs in order to achieve their goals;



from lodging and travelling issues, to Nagoya Protocol compliance measures, reimbursement and logistics. This was done without forgetting the specific research requirements of the users that were attended with the help and implication of in house researchers. All this has required the participation and interaction of very different staff (different administrative staff, local researchers and even the Vice-chancellor for research of the University that had to sign every single access contract). We would like to highlight the effort and collaborative spirit shown by all of them, making the TNA possible and smooth without any kind of difficulties except the ones related to the COVID situation. In this regard, we would like to mention that the access delays were more related to external reasons (uncertainty and travelling limitations in home countries) rather than internal, since PiE-UPV/EHU remained always available to external TNA users. Overall, we have the impression that access users were happy with the provided services and experiences, highlighting different collaborations and publications between local researchers and access users. In fact, some users have already began to contact us for repeated experiences, and in most cases this implies collaborations. Nevertheless, this kind of service provision requires an extra effort from the local researchers side and has to be planned well in advance not to interfere with other scheduled research/teaching activities. Very importantly, ASSEMBLE Plus has been the first approach for PiE-UPV/EHU towards costing and pricing research services, and coming to terms with the concept of unit costs that we now use for EMBRC activities

## 8. Appendices

### 8.1. List of user-projects completed at EMBRC Spain

#### PIE/UPV-EHU

- Project title: Anything New InSide? Unveiling potential INvaders among harbours-COMmunities of ascidians towards natural environMEnts (NIS-INCOME). Users: Federica Montesanto (University of Bari "Aldo Moro", IT). Services used: Aquaria and tanks, coastal research vessels, dry laboratories, sampling equipment, and wet laboratories.
- Project title: Biomarker analysis of mussels samples from Northern Atlantic (BioMusselsNAtlantic). Users: Halldor Halldorsson (University of Iceland - Sudurnes, IS). Services used: Culture collections.
- Project title: Calanus MBA: Bioinformatic analysis of Calanus finmarchicus metabolome data (CalanusMBA). Users: Tomasz Ciesielski (Norwegian University of Science and Technology, NO). Services used: Molecular biology and omics.
- Project title: Detecting gene flow between French and Spanish populations of Littorina species: filling the Biscay Bay gap (BISBAYLITGAP). Users: Rui Faria, Catia Monteiro (CIBIO/InBIO, PT). Services used: Ecosystem access, dry laboratories
- Project title: Diversity, distribution and phylogeny of *Acoelomorpha* from the Iberian Peninsula (ACIB). Users: Ulf Jondelius (Swedish Museum of Natural History, SE). Services used: Wet laboratories, imaging and coastal research vessels.
- Project title: Dynamic changes in chemical-derived oxidative stress in circulating cells (DynOxStress). Users: Ketil Hylland (University of Oslo, NO). Services used: Aquaria and tanks, dry laboratories, and Wet laboratories.
- Project title: Effects of marine gas oil on metabolome profile in *Calanus finmarchicus* (MetaCalanomics). Users: Tomasz Ciesielski, Xabier Lecube (Norwegian University of Science and Technology, NO). Services used: Molecular biology and omics.



- Project title: Genotype Environment Interaction in the North Atlantic Mussels Species complex (GERONIMO). Users: Stefano Carboni (Institute of Aquaculture, GB). Services used: Culture collections.
- Project title: Larval rearing and red-spherule cell culture from *Paracentrotus lividus* sea urchins of different colors for spinochrome identification (PigCell). Users: Marie Alberic, Claudio Ferreira (Sorbonne University, FR). Services used: Ecosystem access, aquaria and tanks,
- Project title: Machine Learning Strategy for Microplastic Characterization and Quantification (MPlearning). Users: Vitor Silva (University of Aarhus, DK). Services used: Imaging.
- Project title: Marine connectivity in pink sea fan *Eunicella verrucosa*: implications for their conservation and the designation and management of European MPAs (PSFMC). Users: Kirsty Macleod (University of Exeter, GB). Services used: Biobanks.
- Project title: Marine fungi for the recovery of precious components from electronic waste (MarFUN). Users: Christian Galasso, Clementina Sansone, Michael Tangherlini (SZN, IT). Services used: Ecosystem access, dry labs.
- Project title: Mesocosm experiments to better understand local and global threats to macroalgal communities (MesocAlgae). Users: Alejandro Bernal (MARE - centre MADEIRA, PT). Services used: Ecosystem access,mesocosm.
- Project title: Metabolic Meta-analysis in Metaorganisms adapted to Ocean Acidification (MetMetMetAOA). Users: Laura Núñez Pons, Valerio Mazzella (SZN, IT). Services used: Data analysis tools and software.
- Project title: Microbiome composition of sea urchin *Paracentrotus lividus* from different populations (Mediterranean, Atlantic) (PALIMI). Users: Georgia Tarifa (HCMR-IMBBC, GR). Ecosystem access, dry labs.
- Project title: Microbiome composition of sea urchin *Paracentrotus lividus* from different populations (Mediterranean, Atlantic) in correlation to the seasonal temperatures (PALIMI). Users: Georgia Tarifa (HCMR-IMBBC, GR). Services used: Ecosystem access.
- Project title: Microencapsulated diets for sustainable aquaculture (MIDSA). Users: Camilla Campanati (University of Cambridge, GB). Services used: Aquaria and tanks and wet laboratories.
- Project title: Ribosomal RNA and transcription profiles in gonads of a hermaphroditic teleost species: the gilthead seabream (*Sparus aurata*) (RIBOFILE). Users: Elena Sarropoulou (HCMR-IMBCC, GR). Services used: Molecular biology and omics.
- Project title: Role of invasive species in the transfer of microplastics into the marine food web (VISITOR). Users: Anna Diem (MARE - centre MADEIRA, PT). Services used: Ecosystem access, dry laboratories and wet laboratories.
- Project title: Role of invasive species in the transfer of microplastics to the marine food web (VISITOR). Users: Anna Diem (MARE - centre MADEIRA, PT). Services used: Ecosystem access, dry laboratories and wet laboratories.

## ECIMAT/UVIGO

- Project title: Anti-Fouling defence dynamics Of a foundation Seaweed from high and low latitude populations (AFODS). Users: Mahasweta Saha (Plymouth Marine Lab, GB). Services used: Wet laboratories, organisms collected in the wild, sampling equipment, coastal research vessels and aquaria and tanks.
- Project title: Assessing the recent introduction of an ecologically dominant non-indigenous ascidian in Europe (RECIPE). Users: Jamie Hudson, Marc Rius (University of Southampton, GB). Services used: Wet laboratories, organisms collected in the wild, sampling equipment, coastal research vessels and aquaria and tanks.
- Project title: Assessment of The Ecosafety of Nanomaterials using Sea urchin gamete and embryo Assays (ATENSA). Users: Maria Consiglia Esposito (SZN, IT). Services used: Wet laboratories, dry laboratories, organisms collected in the wild, imaging, and aquaria and tanks.



- Project title: Cryopreservation of sperm and larvae of the marine annelid *Platynereis dumerilii* (CRYOPLATY). Users: Luis Alberto Bezares Calderón. Services used: Imaging, dry laboratories, wet laboratories, organisms collected in the wild.
- Project title: Evolution of Ascidians under Ocean Warming and Ocean Acidification (Ascend). Users: Tiago Repolho, Rui Afonso Bairrão da Rosa, Jose Ricardo Paula (University of Lisbon, PT). Services used: Coastal research vessels.
- Project title: Exploring marine connectivity in the pink sea fan, *Eunicella verrucosa* (EverCon1). Users: Jamie Stevens, Kirsty Louise Macleod (University of Exeter, GB). Services used: Coastal research vessels, scientific diving, and dry laboratories.
- Project title: Genotoxicity and ECotoxicity of PLASTics and AdditiveS on marine larvae (GECOPLAST). Users: Maria Oliviero, Simona Schiavo (University of Naples "Parthenope", IT). Services used: Imaging.
- Project title: Illuminating adaptive divergence through hybrid zones in *Littorina saxatilis* (HybrdSnail). Users: Francesca Raffini, Meghan Wharton, Sean R Stankowski (The University of Sheffield, GB). Services used: Aquaria and tanks, dry laboratories, imaging and coastal research vessels.
- Project title: Insights from hybrid zones: testing for habitat choice, divergent selection and genomic architecture in *Littorina saxatilis* adaptive divergence (LsHCDSGA). Users: Francesca Raffini, Meghan Wharton (The University of Sheffield, GB). Services used: Culture collections, and imaging.
- Project title: Intercalibration experiment to improve settlement of the Pullet carpet shell (*Venerupis corrugata*) (SetPull). Users: Hervé Leroy, Vincent Bebing (Novostrea Bretagne, FR). Services used: Aquaria and tanks, dry laboratories, organisms collected in the wild, and wet laboratories.
- Project title: Is fine-scale, local adaptation linked to thermal stress physiology? A test using in-situ transplant experiments (IN-SITU-THERM). Users: Christopher Dwane, Rodrigo Lorenzo (University of Plymouth, GB). Services used: Bioassays, imaging, molecular biology and omics, structural and chemical analysis.
- Project title: Lab-on-a-chip for in situ toxic phytoplankton identification and quantification (LOCISTPIQ). Users: Vítor Magalhães (Universidade do Minho, PT). Services used: imaging, culture collections.
- Project title: Mitochondrial mechanisms of hypoxia tolerance in marine bivalves (MitoBOX). Users: Inna Sokolova (University of Rostock, DE). Service used: coastal research vessels, organisms collected in the wild, aquaria and tanks.
- Project title: Molecular characterization of a Cyclooxygenase synthesizing animal-like prostaglandins in the diatom specie *Skeletonema marinoi* (Diatom COX-1). Users: Valeria Di Dat (SZN, IT). Services used: Culture collections.
- Project title: Monitoring macrozoobenthic communities: ARMS colonization assessment using DNA metabarcoding approaches (DNAsMAR). Users: Barbara Leite (Universidade do Minho Centro de Biologia Molecular e Ambiental, PT). Services used: Coastal research vessels, sampling equipment, scientific diving and wet laboratories.
- Project title: Physiological responses to osmotic stress under a warming scenario: *Carcinus maenas* as model species (ROSW). Users: Gabriela Torres, Noé Espinosa (AWI, DE). Services used: Aquaria and tanks, dry laboratories, marine model organisms, organisms collected in the wild, and wet laboratories.
- Project title: Phytoplankton responses to a climate change scenario in the NW Iberian upwelling system (PhytoChange). Users: Isabel Teixeira (University of Aveiro, PT). Services used: Mesocosms and wet laboratories.
- Project title: Quantifying seabird use of tidal stream environments in the Ria De Vigo, north-western Spain. (Seabirds and Tidal Energy). Users: James Waggitt (Bangor University, GB). Services used: Coastal research vessels.
- Project title: Role of the actin cytoskeleton in the regulation of the fertilization and early stages of development in sea urchin eggs (Fertilization and actin). Users: Luigia Santella (SZN, IT). Services used: Imaging.
- Project title: Scaling-laws in coastal seabird distributions: understanding the relative influence of tidal and meteorological processes. (TIMETBIRD). Users: James Waggitt, Stefanie Krafft (Bangor University, GB). Services used: Coastal research vessels.



- Project title: Seasonality in seabird associations and responses to oceanography in coastal environments (SEASONBIRD). Users: James Waggitt (Bangor University, GB). Services used: Coastal research vessels.
- Project title: Sediment Load And Nutrient Availability In Shaping Sea-Urchin Herbivory Over Macroalgae (SeN-SEA). Users: Alejandro Bernal (MARE - centre MADEIRA, PT). Services used: imaging, aquaria and tanks.
- Project title: Study of turbot (*Scophthalmus maximus*) spermatozoa cryoresistance (SOURCE). Users: Anton Puhovkin, Dmytro Lutsenko (Institute for Problems of Cryobiology and Cryomedicine of NAS of Ukraine, UA).
- Project title: The genetic and evolutionary basis of colour polymorphism in *Littorina fabalis* (GEBCOL). Users: Rui Faria, Miguel Carneiro (CIBIO/InBIO, PT). Services used: Aquaria and tanks, dry laboratories and wet laboratories.
- Project title: The influence of habitat conditions on key ecological processes for marine benthic fauna (HIIC). Users: Catarina Alves, Marisa Gomes (Universidade do Minho Centro de Biologia Molecular e Ambiental, PT). Services used: Coastal research vessels, sampling equipment and scientific diving.
- Project title: The role of *Zostera* meadows in the distribution of demersal and benthopelagic marine animals (ZIFA). Users: Marisa Gomes, Catarina Alves (Universidade do Minho Centro de Biologia Molecular e Ambiental, PT). Services used: Coastal research vessels, sampling equipment, and scientific diving.
- Project title: Toxic Dinoflagellates under a Climate Change Scenario: Variations in Growth, Mortality and Toxin Production. (ToxChange). Users: Jorg Frommlet, (University of Aveiro, PT). Services used: dry laboratories, web laboratories and culture collections.

