

# 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 Greece, 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 Greece, 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 Greece, 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)

EMBRC Greece consists of a single node, the Institute of Marine Biology Biotechnology and Aquaculture (IMBBC) of the Hellenic Centre for Marine Research (HCMR) in Crete, Greece. The facilities are in the premises of *Thalassokosmos*, 17 km east of the city of Heraklion. It is organized in three installations:



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1) Biodiversity & Genomics facility (BIOGEN), with state-of-the-art molecular lab and ecology & taxonomy labs, various technology platforms, e-services and expert advice.

2) Aquaculture facility (AQUALABS), organised as vertical integrated hatchery with pilot- and small-scale experimental rearing facilities linked with wet and dry labs, offices, library, seminar room, etc. The 7 zones of experimental access integrate up-to date technology in fish larviculture and computerised management. The ability to work with early life stages of 18 different species is unique worldwide.

3) Ecosystem access & sampling facility (ECOACCESS), which include a research vessel (PHILIA) with ROV and oceanographic equipment, an inflatable boat, and fully equipped scientific SCUBA diving facility & scientific divers.

### 3.2. Installations offered

EMBRC Greece offered access to three distinct installations:

#### 3.2.1. Biodiversity & Genomics facility (BIOGEN)

- Biological resources: Biobanks (On-site and remote service): DNA collections, Sample series from the Aegean and Ionian seas (since 1989)
- Experimental facilities: Dry labs (On-site and remote service): Molecular biology lab, Ecology and taxonomy lab
- Technology platforms:
  - Bioassays (On-site and remote service): Antibacterial and antioxidant capacity
  - Imaging (On-site and remote service): Micro CT imaging (Skyscan 1172); underwater imaging, optical microscopy
  - Molecular biology and omics (On-site and remote service): Sanger sequencing (ABI3730); MiSeq-Illumina: Library construction and sequencing for amplicons, transcriptomes, ddRAD and small genomes; MinION-Oxford Nanopore: Library construction and sequencing.
  - Structural and chemical analysis (On-site and remote service): Targeted analysis of biomolecules and metabolites (e.g phyto-pigments, hormones, biotoxins, fatty acids) with LC-MS/MS and GC-MS
- E-services:
  - Data analysis tools and software (On-site and remote service): Bioinformatic pipelines for analysis of NGS data (transcriptome and small genome assembly, gene expression profiling, dd-RAD data analysis, DNA metabarcoding of prokaryotes and eukaryotes)
  - Data sets (On-site and remote service): Micro-CT scans and videos; Citizen science data (e.g. COMBER, CIGESMED); LifeWatch Greece e-services and virtual labs (RvLab, MedOBIS vLab etc). This is open to anyone to use, and hence is not specifically an ASSEMBLE Plus service offer.
- Expert advice: Biological sample identification (On-site and remote service): Invertebrate taxonomy (polychaetes, amphipods, decapods, sponges, invasive species)

#### 3.2.2. Aquaculture facility (AQUALABS)

- Experimental facilities: Aquaria and tanks (On-site service): Tanks and labs for experiments on aquafeed testing, fish reproduction and pathology.
- Expert advice on Mediterranean aquaculture (aquaculture, nutrition, diet formulation, reproduction, pathogens)



### 3.2.3. Ecosystem access & sampling facility (ECOACCESS)

- Coastal research vessels (On-site and remote service)
  - R/V Philia, a multidisciplinary research vessel for marine research in the Cretan Sea
  - Inflatable boat for access to the coastal ecosystems of Crete
- SCUBA diving facilities for access to the coastal ecosystems of Crete (Cretan and Libyan Seas). A team of certified divers that can dive on request Users can accompany the divers if appropriately certified. Underwater imaging and sampling available.
- Sampling equipment (On-site and remote service) for sampling on sediment (grabs, box corers, corers, frames), hard substrate (innovative sampling gear 'MANOSS'), and the water column (plankton nets, Niskin bottles, CTDs)
- Species collected upon request (On-site and remote service): Sampling of organisms from coastal habitats around Crete (Cretan and Libyan Seas)

## 4. Applications received

### 4.1. Origin country of applicants

EMBRC Greece has received a total of 34 applications in the nine calls of TNA. Among these, 33 applicants were based in European countries while 1 applicant came from a non-European country (GB).

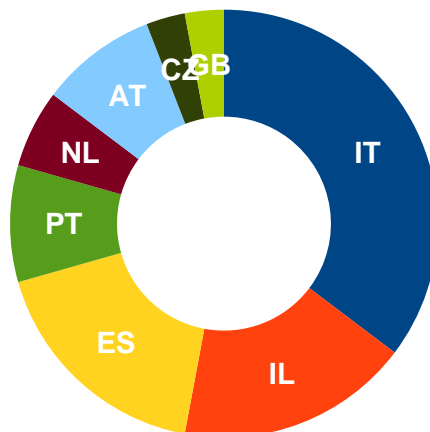


Figure 1. Applications received by EMBRC Greece by country

### 4.2. Applicants profile

#### 4.2.1. Home institution type

All applicants were based in academic institutes (universities: 64.7%; research organizations: 32.3%; other: 2.9%).

#### 4.2.2. Career status

The most recurring career profile of the applicants was post-doctoral researchers (35.3%), followed by senior researchers (29.4%), PhD students (17.6%), early carrier scientists (11.8%) and technicians (5.9%).





## 5. User hosted and their stats

### 5.1. *Projects completed*

Overall, EMBRC Greece hosted 21 projects for a total of 30 users. Twenty projects were carried out on-site, and one in remote access. The latter included seasonal zooplankton collection, during a year, so it was not possible to be carried out on site. For 3 other project part of the service was carried out remotely after the departure of the user. The list of projects completed at *EMBRC Greece* is available in "[Appendix 1 – List of user-projects completed](#)" further below.

### 5.2. *Installations used*

The installations used were BIOGEN (18 projects – 50 units (user\_group.Week)), AQUALABS (1 project – 4 units (user\_group.Week)), and ECOACCESS (14 projects – 58 user.group dive.Day and 6 user.group boat.Day)).

### 5.3. *User satisfaction*

Overall, users have positively evaluated the services offered (Very good: 47.8%; Good: 39.1%). In general, comments from the users were very positive: "I really appreciate the help of the scientific diving staff, and also the support provided by the research staff of the genetic and benthos laboratories", "The overall quality of the service was excellent".

### 5.4. *Projects not completed or cancelled*

Thirteen of the projects that passed scientific evaluation did not take place. The reasons for that were:

- the applicant decided not to come
- the applicant changed institution in the meantime and this made the project not transnational anymore
- the access provider could not provide the service requested
- the access provider could not accommodate the users due to time shortage and unclear picture of the remaining TNA budget (this applied for several projects approved in the last call).

It should be noted that due to the COVID pandemic, many projects had to be postponed for later and this created bottleneck in the ability of the provider to accommodate the users.



## 6. Use of resources

Beneficiary / Linked Third Party	PM	short name of the installation(s)	explanations of tasks
<i>HCMR-IMBBC</i>	2.07	<i>BIOGEN</i>	Administrative support to users regarding communication, preparation of contract and other documents, and reimbursement.
<i>HCMR-IMBBC</i>	0.12	<i>AQUALABS</i>	Administrative support to users regarding communication, preparation of contract and other documents, and reimbursement.
<i>HCMR-IMBBC</i>	2.07	<i>ECOACCESS</i>	Scientific and administrative support to users regarding organization of diving activities and access to ecosystem, communication, preparation of contract and other documents, and reimbursement.

It should be noted that in the Grant Agreement we had foreseen 2PM for supporting the use of the ECOACCESS installation (actual cost). However, there was much higher demand for the ECOACCESS, specifically for diving activities, as well as for the BIOGEN installation and little demand for the AQUALSBS installation.

In total, 4.26 PMs were charged as actual cost to the budget of the TNA, of which 2.85 PMs were used for direct administrative support of the users (communication, preparation of contracts etc) by the Liaison Officer and the Project Coordinator, (Senior Researcher and Research Director, respectively), and 1.41 PMs were used for supporting the organization of the scuba diving activities (Assistant Researcher-head of the facility and chief technician in charge of the facility).

Moreover, 1 more PM, not charged to the project, was used by the Liaison Officer for direct administrative support to the users. There were also 3 PMs not charged to the project that were used for organizing the TNA access (not direct support to the users).

## 7. Conclusion

### *Experiences gained regarding giving access to users*

The access provider (EMBRC Greece) gained valuable experience on how to better organize the whole process of service provision: selecting services that the provider can reliably provide to the users and are in demand; organizing through the liaison officer, seamless communication between the user and the responsible for each service provision; organizing the whole pipeline of service provision from preparing and signing the contract to providing the service; training the heads of each facility how to deal with the users and deliver services in the frame of strict service provision; testing the ability and the capacity of each facility to deliver services.



### ***Difficulties encountered and overcome***

Some difficulties stemmed from the fact that HCMR-IMBBC is not a strict service provider, so it has not dedicated personnel for service provision. This created difficulties in a few cases, regarding the timely preparation of the contracts and communication with the users, the timely procurement of the consumables the user had requested, and the timely reimbursement of the users. In some cases, difficulties and delays were also due to the users, who were not clear on what type of service /consumables /equipment were requesting or they did not provide the proper documents for the reimbursement. Another difficulty arose from the limited capabilities of the access provider to provide services that were in high demand (i.e. access to the ecosystem through the diving facility). This, in combination with the COVID pandemic, which forced many projects to be postponed for later, created a bottleneck, which resulted in cancelling projects that had been approved, especially in the last TNA call.

Regarding contract preparation, the procedure was hugely facilitated since the mid of the project, where all parties were able to sign the contract digitally. All other difficulties were overcome by the dedication and high level of responsibility and professionalism of HCMR-IMBBC personnel, who did their best to assist the users in successfully completing their projects.

### ***Reflections on collaborations or strict service use in terms of benefits for institute and in-house scientists, future collaborations with users***

HCMR-IMBBC is a research Institute, so strict service provision is not a main activity, especially towards academic users. Within the framework of the ASSEMBLE PLUS TNA, the users were encouraged by the Liaison Officer to seek collaboration if there was common ground with researchers of the access provider, especially in cases where this collaboration could maximize the benefits for the users. On the other hand, the personnel of the access provider was also “trained” in strict service provision, even in cases where there would be conflict of interest between the research activities of the user and the access provider.

Overall, “strict” service provision can be provided if it has some financial benefits for the facility and the researchers involved and does not burden their main research activities. This is easier for facilities/services where technicians are in charge. However, in cases, where researchers are involved, there should be some type of motivation for them (financial or scientific) in order to dedicate time for service provision.

This TNA project allowed several collaborations between users and in-house scientists, which in some cases resulted in common publications. Many collaborations are still further developed and, in some cases, the users sought further collaboration and/or service provision outside ASSEMBLE PLUS TNA.



## 8. Appendice

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

- Project title: GREECYST: Evolutionary history and molecular species discrimination of Cystoseira. Users: João Neiva, Rita Jacinto (CCMAR, Portugal). Services used: Access to ecosystem
- Project title: Digepolfish: Digestibility study of diets containing increasing levels of honey bee pollen in meagre (*Argyrosomus regius*) and evaluation of immunological response of fish). Users: Valentina Panettieri (Università degli Studi di Napoli Federico II, Italy). Services used: Tanks and Aquaria, dry labs.
- Project title: seagrass1: Impact of *Halphila stipulacea* on the availability of benthic diatoms as a food source for a commercially important deposit feeder in a native and invasive habitat. Users: Kimani Kitson-Walters, Anna Maitz (CNSI, St. Eustatius). Services used: Access to ecosystem, dry labs
- Project title: Sparafish: Biodiversity and population connectivity of sparid fish parasites in the Mediterranean Sea. Users: Simona Georgieva (University of Valenci, Spain). Services used: Biobanks, dry labs.
- Project title: MEDINVADE: Traits, invasion and Mediterranean fish communities. Users: Shahar Malamud, Shahar Chaikin (Tel Aviv University, Israel). Services used: Access to ecosystem, dry labs.
- Project title: INFO: Distribution patterns and ecology of (invasive) benthic foraminifera in shallow-water habitats of Crete. Users: Annekatrin Enge (University of Vienna, Austria). Services used: Access to ecosystem, dry labs, organisms collected in the wild.
- Project title: ASC-DISC: Invasive and cryptic ascidians: discovery and integrative taxonomy. Users: Federica Montesanto (University of Bari "Aldo Moro", Italy). Services used: Access to ecosystem, dry labs, organisms collected in the wild.
- Project title: SEMIOTIC: Study on the Epiphytic Microbial communities associated with synTopic seagrasses: the native *Posidonia oceanica* (L.) Delil and the invasive *Halophila stipulacea* (Forsk.) Aschers. Users: Luciana Migliore, Chiara Conte (Tor Vergata University of Rome, Italy). Services used: Access to ecosystem, dry labs, technology platforms.
- Project title: LOCADTSRESS: Local adaptation in habitats under anthropogenic stress. Users: Katerina Vasileiadou, Cibele G. Sotero Caio (Charles University of Prague, Czech Republic). Services used: Access to ecosystem, dry labs.
- Project title: CRE-INV: Crypticism in the marine realm: DNA barcode-based outlook into selected invertebrate taxa of the Eastern Mediterranean. Users: Pedro Vieira, Marco Teixeira (University of Minho, Portugal). Services used: Access to ecosystem, organisms collected in the wild, dry labs, technology platforms.
- Project title: SpondylOmics: Spondylus multiOmics: bridging biomineralization and archaeology. Users: Jorune Sakalauskaite (University of Turin, Italy). Services used: Access to ecosystem, organisms collected in the wild dry labs, technology platforms.
- Project title: SPO-ISL: No sponge is an island, or is it? Users: Liron Goren, Tal Idal (Tel Aviv University, Israel). Services used: Access to ecosystem, organisms collected in the wild ,dry labs.
- Project title: UMBRAL: Responses of benthic marine vegetation to stress: critical transitions, resilience, and management opportunities. Users: Xavier Buñuel Moreno (Universitat de Barcelona, Spain), Mario Minguito Frutos (Blanes Centre for Advanced Studies, Spain). Services used: Access to ecosystem, dry labs.
- Project title: Morphological and molecular taxonomy of deep sea east Mediterranean infaunal Polychaeta . Users: Valeria Hana Farberova (University of Haifa, Israel). Services used: Dry labs, expert advice.
- Project title: DiatoMetaRestage: Diatom resting stage as source of secondary metabolites. Users: Valeria Di Dato (SZN Napoli, Italy). Services used: Dry labs, technology platforms.
- Project title: CALPORT: A preliminary assessment of the population structure and trophic ecology of the invasive portunids *Callinectes sapidus* and *Portunus segnis* coexisting in coastal habitats of Crete (Greece). Users: Giorgio Mancinelli (University of Salento, Italy). Services used: Access to ecosystem, organisms collected in the wild, dry labs.



- Project title: HaloBen2: Comparing Taxonomic and Functional Composition and Diversity of Macrobenthic Invertebrates associated with *H. stipulacea* in its native and invaded range: Does an invader support native biodiversity? Usres: Kimani Kitson-Walters (Caribbean Netherlands Science Institute, St Eustatius). Services used: Access to ecosystem, dry labs.
- Project title: SHINE: Assessing trophic and microbiome SHifts in Mediterranean fish INvaders: a comparison between native and Exotic ranges. Users: Emanuela Fanelli (Polytechnic University of Marche, Italy), Ernesto Azzuro (CNR - IRBIM, Ancona, Italy). Services used: Access to ecosystem, organisms collected in the wild, dry labs.
- Project title: IsoMed: Mapping the spatial distributions of stable isotope compositions in ecosystems of the Mediterranean Sea. Usres: Sarah Magozzi (SZN, Fano, Italy). Services used: Access to ecosystem.
- Project title: DROP: Diversity of bacteRial communities assOciated with sPonges from wild populations and in coupling with fish aquaculture systems. Users: Carmen Rizzo (SZN, Messina, Italy). Services used: Dry labs, technology platforms.
- Project title: SLRMETAB-DB: Improving eukaryotic plankton reference sequence databases using Synthetic Long Read metabarcoding library construction. Users: Gianpaolo Zampicinini (SZN, Napoli, Italy). Services used: Dry labs, technology platforms.

