ASSEMBLE

ASSOCIATION OF EUROPEAN MARINE BIOLOGICAL LABORATORIES EXPANDED

Acronym: ASSEMBLE Plus

Title: Association of European Marine Biological Laboratories Expanded

Grant Agreement: 730984

Deliverable D22.1

EMBRC Israel TA assessment report

September 2022

Lead parties for Deliverable: EMBRC Israel
Due date of deliverable: M60
Actual submission date: M60

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GENERAL DATA

Acronym: **ASSEMBLE Plus**

Contract N°: **730984**

Start Date: **1st October 2017**

Duration: **60 months**

Deliverable number	D22.1
Deliverable title	EMBRC Israel TA Assessment report
Submission due date	M60
Actual submission date	M60
WP number & title	WP22 - TA11 Transnational access to EMBRC Israel
WP Lead Beneficiary	HUJI
Participants (names & institutions)	Simon Berkowicz (HUJI-IUI) Gil Koplowitz (HUJI-IUI)

Dissemination Type

Report	☒
Websites, patent filling, etc.	☐
Ethics	☐
Open Research Data Pilot (ORDP)	☐
Demonstrator	☐
Other	☐

Dissemination Level

Public	☒
Confidential, only for members of the consortium (including the Commission Services)	☐

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Document properties

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Version	

Abstract

This deliverable describes the outcomes of the trans-national access programme (TNA) offered at EMBRC Israel, 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_2 – 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.

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2. Objective

This deliverable intends to show the outcomes of the transnational access programme executed at EMBRC Israel, 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

EMBRC Israel is located at the Hebrew University of Jerusalem marine campus called the Interuniversity Institute for Marine Sciences in Eilat (IUI). The IUI, the Israeli Node of the EMBRC, is a research/teaching/training facility of all Israeli universities to promote marine biology and oceanography. The Gulf shows a photic zone (100-150 m deep) with stratified, oligotrophic water and an aphotic zone (200-2500 m depth) where temperature never drops below 20.7°C. The ecosystem exhibits unusually deep winter mixing and spring blooms. The Gulf of Aqaba is home to extensive

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diverse coral reefs with many endemic marine invertebrates and fish. The reef begins at the IUI station seashore and a deep oceanic water body (700 m) can be reached from the Institute's pier within 10 minutes sailing.

3.2 Installations offered

EMBRC Israel offered access to the Interuniversity Institute for Marine Sciences in Eilat with a specific set of installations:

- Laboratories: Access to wet and dry labs, microscopy, molecular facilities for DNA, RNA and protein work, temperature-controlled running seawater tanks for experiments with corals and other organisms.
- Diving: Access to fully equipped dive center for regular air, Nitrox and Trimix dives, regular dives, technical dives, standard regulators and re-breathers.
- Research vessel: A 16 m research vessel can hold 12 people, equipped with oceanographic sampling equipment, current meters, mooring hardware and sediment traps.
- Small boats: two 7 m long skiffs built to carry divers and light operations such as water sampling at single depths, plankton tows, mooring deployments.

4. Applications received

4.1. Origin country of applicants

EMBRC Israel received a total of 60 applications in the nine calls of TNA, with many consisting of 2 co-Users. In total, the applications consisted of a total of 79 potential Users. Among these, 57 applicants were based in European countries, primarily from Italy, France, Germany, Belgium and the Czech Republic, while 22 applicants came from other non-European countries such as the UK, the USA, Australia, Bermuda and the Cayman Islands.

4.2. Applicants profile

4.2.1. Home institution type

Applicants were mostly split between universities: 49% and research organizations 51%. No companies applied.

4.2.2. Career status

The most recurring career profile of the applicant was almost 30% each for PhD students, Post-Doc researchers, and Senior scientists. The remaining 10% were early-career scientists or "other" researcher status.

5. User hosted and their stats

5.1. Projects completed

Overall, EMBRC France has hosted 24 projects for a total of 39 Users. The gender breakdown was 56% male and 44% female. All projects were carried out on-site. There were no requests for remote access.

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The list of projects completed at *EMBRC Israel* is available in "Appendix 1 – List of user-projects completed" further below.

5.2. Installations used

The installations used were diving (92 person/days), laboratories (551 person/days), small boat (25.5 user groups/day) and research vessel (9.5 user groups/day).

5.3. User satisfaction

Overall, users positively evaluated the services offered (Very good: 58%; Good: 32%). In general, Users commented that they had excellent access to facilities and excellent service support. The infrastructure was well-suited for their research and the administrative and organizational support was very helpful.

5.4. Projects not completed or cancelled

COVID was the direct reason or subsequent cause for accepted projects to be cancelled. Seven were cancelled as borders had closed and, after 18 months of travel limitations, the Users had completed their degree or research position and were no longer available. One User had a problem with a sample collection permit and sample export permit and was thus cancelled. One User was from Russia and thus could not come due to sanctions by the EC. Calls 8 and 9 had 22 applications with 9 being accepted, but it was difficult to absorb them as the borders in Israel only opened fully in February 2022. As the last day to visit was July 31, the Call 5, 6 and 7 applicants were given priority to carry out their projects during this period. Thus, the access facilities did not have the capacity to handle the Call 8 and 9 applicants, especially as several could only visit during the approximately same dates.

6. Use of resources

Beneficiary	PM	short name of the installation(s)	explanations of tasks
Simon Berkowicz (listed in the Project Effort table but not charged)	2	TA11 transnational access to EMBRC Israel	Admin support to applicants and Users
Simon Berkowicz (not charged)	12	TA11 transnational access to EMBRC Israel	Admin support to applicants and Users
Gil Koplovitz	xx	TA11 transnational access to EMBRC Israel	Scientific support to Users for labs, instrumentation, consumables

7. Conclusion

The TNA programme was an excellent way for scientists and/or their PhD students to access marine ecosystems. There was a considerable amount of time devoted to the Users both in preparation in advance of the visit and after arrival. We adopted having zoom meetings with accepted applicants to discuss their lab and facility needs, as well as to let them speak directly to key individuals that they would need to work with such as the dive master, boat skippers and lab technicians.

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The main difficulties were in obtaining sampling or experimental permits from our Nature Protection Authority because the coral reefs are in a protected fragile zone. There are restrictions in entering the reef region, sampling the reef and also with fish, especially if fish were to be sacrificed. This was largely overcome by twinning the User with a local scientist(s) who already had permits and who supervised the User.

Frequently the Users arrived without the necessary skills and experience for diving, even though they had diving permits. This was overcome by providing divers from the dive center.

Consumables are always an issue as:

-only a limited quantity of consumables could be provided to the User at no cost. Frequently, the User required expensive items and large quantities that could not be covered. This was solved by the User either bringing what they needed with them, or we would purchase the items in advance and be repaid on arrival.

- as Eilat is in the southern periphery, delivery of consumables, chemicals, dry ice, liquid nitrogen can take weeks. Thus, the Users were contacted immediately after acceptance to determine their needs, agree on advance purchases, and coordinate the visit dates to ensure delivery of the needed material prior to User arrival.

The TNA visits led to a number of intentions by Users to collaborate with the local research members, and vice-versa. Some joint publications are expected to arise from the TNA visits.

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8. Appendices

8.1. List of user-projects completed at EMBRC Israel

Projects (and acronyms) appear below alphabetically by title. All Users had access to dry and wet labs, small boats, research vessel, diving center and the coral reef ecosystem.

- Project title: Assessing how adaptation and acclimatization influence the skeletal morphology of corals along a depth gradient in the Red Sea (CoralMorph). Users: Gretchen Goodbody-Gringley, Alexander Chequer (Bermuda Institute of Ocean Sciences, BM).
- Project title: Coral Steroids and Gametogenesis: Is there a link? (COSTAR). Users: Karine Kleinhaus (Stony Brook University, US).
- Project title: Creating a DNA reference database to reveal non-indigenous species' cryptic identities (DECRYPT). Users: Eirini Gratsia, Giorgos Chatzigeorgiou (HCMR-IMBBC, GR).
- Project title: Effects of ocean warming and acidification on the interactions between the coral holobiont and microborers (CORALBOUCLE-CLIM). Users: Aline Tribollet, Isabelle Coulon (Institut de Recherche pour le Dèveloppement (IRD), UMR LOCEAN, FR).
- Project title: Elucidating biomineralization in corals using advanced live microscopy (CoralLive). Users: Philippe Laissue (University of Essex, GB).
- Project title: Geochemistry and Microbiology of the Nitrogen Cycle in surface sediments of the Gulf of Aqaba (Eilat), Red Sea (GeMi-N). Users: Angeliki Marietou, (Aarhus University, DK Project title: Gulf of Aqaba Trace Element Ratios in Porefluids (GoATER-iP). Users: Harold Bradbury, Angus Fotherby (replaced Alec Hutchings) (University of Cambridge, GB).
- Project title: Host-parasite networks of the devil firefish's Pterois miles (Bennett) (Actinopterygii: Scorpaenidae): the most successful marine invader (PFire). Users: Simona Georgieva, (Institute of Biodiversity and Ecosystem Research at the Bulgarian Academy of Sciences, BG).
- Project title: How do the alternative photosynthetic electron flows are modulated along a light gradient in the coral Stylophora pistillata? (PhoLiStyl). Users: Stephane Roberty, Félix Véga de Luna, Mattia Pierangelini (University of Liège, BE).
- Project title: Impact of Halophila stipulacea on the availability of benthic diatoms as a food source for benthic feeders in a native and invaded habitats (seagrass1). Users: Kimani Kitson-Walters, Anna Maitz (Caribbean Netherlands Science Institute, NL).
- Project title: Invasion Genomics of Lessepsian migrants (InvasiLess). Users: Panagiotis Kasapidis, Elena Sarropoulou (HCMR-IMBBC, GR).
- Project title: Invasive and cryptic ascidians: discovery and integrative taxonomy (ASC-DISC). Users: Federica Montesanto, Marika Salonna (University of Bari, IT).
- Project title: Mechanisms of Coral Evolutionary Adaptation and Physiological Acclimatization to Extreme Environments. Users: Gretchen Goodbody-Gringley, Alexander Chequer (Central Caribbean Marine Institute, Little Cayman, Cayman Islands).
- Project title: Morpho-Genetic exploration of protistan symbiosis from warm oligotrophic oceanic ecosystems (EukOcean). Users: Sebastien Colin, Ewen Corre (SBR, FR).
- Project title: Nervous System Regeneration and Development in the Solitary Ascidian Polycarpa mytiligera (NC_Reg&Dev). Users: Lucia Manni (Padova University, IT).
- Project title: Photobiology of mesophotic corals (Photo-MoC). Users: Daniel Wangpraseurt, (University of Cambridge, GB).

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- Project title: Predator-prey interactions in the devil lionfish (Pterois miles) (PdPy Pmiles). Users: Ashley Peterson (McGaugh Hall, University of California, US).
- Project title: RAdiolaria Metabolic Budget (RAMB). Users: Iris Rizos (Sorbonne Université, FR).
- Project title: Reactive Oxygen Species in Trichodesmium (ROSTrich). Users: Dirk de Beer, Subhajit Basu (replaced Olivia Metcalf), (Max-Planck Institute for Marine Microbiology, DE).
- Project title: Red Sea Chaetoceros (Chaetoceros). Users: Wiebe Kooistra (SZN, IT).
- Project title: Role of colonizer heterogeneity in degradation of sinking Trichodesmium colonies (HETRIC). Users: Mina Bizic, Danny Ionescu (Leibniz-Institute of Freshwater Ecology and Inland Fisheries – IGB (Forschungsverbund Berlin), DE).
- Project title: Sampling of Trichodesmium colonies in the Red Sea (STCRS). Users: Antonio Colussi (Biology Centre ASCR, CZ).
- Project title: Single-cell orchestration of nitrogen fixation and photosynthesis in Trichodesmium (SinChRoNFix). Users: Meri Eichner, Ondrej Prasil (Czech Academy of Sciences (CAS), CZ).
- Project title: Understanding the coral reef refugium in the Red Sea (CORALREF). Users: Ove Hoegh-Guldberg (University of Queensland, AU).
- Project title: Where the epiphyte microbial community of Halophila stipulacea come from & does it change with time? (Ha.s.M.E.C.). Users: Luciana Migliore, Chiara Conte (University of Rome Tor Vergata, IT).

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