THE UNDERWATERMUSE PROJECT: A HERITAGE FOR ALL

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ABSTRACT

The international project UnderwaterMuse - *Immersive Underwater Museum Experience for a wider inclusion* (https://www.italy-croatia.eu/web/underwatermuse, https://www.facebook.com/Project-UnderwaterMuse-106106884192806), funded under the Interreg Italy-Croatia 2014-2020 Program (Priority Axis 3 "Environment and Cultural Heritage" - Specific Objective 3.1 "Make natural and cultural heritage a leverage for sustainable and more balanced territorial development"), saw, as Lead partner, ERPAC - Regional Body for Cultural Heritage of the Autonomous Region of Friuli Venezia Giulia and, as partners, the Ca' Foscari University of Venice, the Public Institution for Coordination and Development of Split - Dalmatia County RERA S.D., the Municipality of Kastela (Croatia) and the Puglia Region - Department of Tourism, Economy of Culture and Valorisation of the Territory . The project aimed to enhance and make accessible the huge submerged heritage of the affected areas, otherwise invisible or reserved for a few, through the creation of submerged archaeological parks / paths and the narrative and communicative use of virtual reality. The activities carried out have implemented widespread actions to raise awareness and involve local actors, as well as training diving guides, also for increased accessibility. A public, geo-referenced web portal was created for the virtual exploration of submerged archaeological sites through voice and text information, images and animations. The core of the project, however, was the development of a methodological protocol for the enhancement of the underwater heritage, through pilot interventions aimed at transforming the sites into parks or underwater archaeological trails or making them usable through the narrative and communicative use of virtual and augmented reality and other multimedia tools. The various experiences have produced a breviary of good practices (Auriemma 2023, Toolkit) for shared management models of accessible heritage, which fully complies with the principles and guidelines of the *UNESCO Convention on the protection of submerged heritage* (2001, L. 157/2009) and above all of the *Faro Convention* (2005) ratified by Italy on 23 September 2020: heritage as a common good, fundamental for the cultural, social and economic development of individuals and communities. The Toolkit offers the roadmap, declined on the various sites affected by the interventions, for the development of a management and operational framework that involves all the interested parties in a participatory process, through Thematic Tables and Service Conferences; the steps include a Program Agreement, the identification of the Managing Authority and the various roles and tasks, the scientific plan for the enhancement of the site, the shared planning and construction of the park and / or the blue paths, the economic and communication.

Keywords: underwater cultural heritage, UnderwaterMuse project, enhancement, UNESCO Convention 2001, Faro Convention 2005.

1. The UnderwaterMuse project's finalities

The UnderwaterMuse Project, financed by the Interreg Italy-Croatia Cross-Border Cooperation Programme, was launched under the supervision of the Regional Institute for Cultural Heritage of the Autonomous Region of Friuli Venezia Giulia - ERPAC, Lead Partner, together with Ca' Foscari University of Venice and the Puglia Region - Department of Tourism, Economy of Culture and Community Enhancement (Italian partners), the Public Institution RERA S.D. for the Coordination and Development of Split-Dalmatia County and the City of Kaštela (Croatian partners). The project had a duration of three and a half years (January 1, 2019 - June 30, 2022), with the aim of enhancing and promoting the underwater archaeological heritage of the regions involved, through the full engagement of local communities, for it to become a strategic resource for the sustainable growth of these territories. It had the ambition to make the underwater heritage and landscapes accessible and to turn them from invisible into visible heritage: port areas now below sea level, shipwrecks, underwater stratifications produced by the continuous use of the landing places covered by the project.

How? Through two ways of designing and planning the actions to be put in place:

- *bringing people to the underwater heritage*, through the creation of underwater archaeological

parks/museums or blue trails for direct enjoyment through diving or snorkeling;

- *bringing underwater heritage to people*, through the narrative and communicative use of virtual/augmented reality and digital methodologies for remote/online enjoyment. Through the immersive and emotional approach of virtual reality, this second line of action of the project makes underwater sites accessible to a wider audience, including people with different types of disabilities.

In both ways, we can generate two outcomes: the safeguarding of the heritage itself, guaranteed by the citizens who learn to know it and recognize it as their own, and a strong economic impact deriving from the development of the cultural, environmental and experiential tourist sector.

These goals are based on important principles derived from the 2001 UNESCO Paris Convention on the Protection of Underwater Cultural Heritage (Rule 1: in situ conservation as the first option; Rule 7: public access to underwater cultural heritage in situ should be promoted, except when such access is incompatible with protection and management) and the Faro Convention (Council of Europe Framework Convention on the Value of Cultural Heritage for Society, 27.10.2005). These principles must be mainstreamed into cultural policies as guidelines for the activities 1 to be put in place to *«increase the positive image of underwater archaeology and the involvement of the public in the awareness, the protection and enjoyment of the underwater cultural heritage»* [1]. *«It is necessary to engage, not only from a research perspective, but also as an ethical obligation to the local communities within the environments that archaeologists work. It is important to recognize the different values attached to the project by ourselves as heritage professionals, and the communities as "providers" of knowledge»* [2].

The Project is also coherent with Blue Growth long term Strategy (s3platform.jrc.ec.europa.eu/blue-growth), for which culture is a driver of local and regional economic growth, innovation and social cohesion (EC 2010/C 135/05).

Furthermore, it is in perfect compliance with the Maritime Spatial Planning (MSP) process: *understanding, recognising, and utilising Underwater Cultural Heritage (UCH) as a sensitive asset in the marine space and reconciling its preservation and promotion within the sustainable blue economy perspective is a real challenge* - New study "How to incorporate Underwater Cultural Heritage into Maritime Spatial Planning" | The European Maritime Spatial Planning Platform (europa.eu) [3].

2. UnderwaterMuse specific challenge

From the historical-archaeological point of view, the Adriatic Sea has been an unique basin, for millennia the priority transport link for people living on the seashore. Their transit left numerous traces in the seabed of the areas concerned by these ancient commercial routes, and ruins of landing places, harbors or inhabited villages by the sea remain.

Archaeological sites are an important tourist, economical and historical resource, yet a remarkable gap in the protection of underwater archaeological sites still exists.

Numerous sites along the Adriatic coasts are currently neglected and subject to constant destructions, illegal depredation, natural or anthropic destructive actions (trawling, modern harbour facilities, etc.).

The challenge of UnderwaterMuse – a unique example and a real challenge in the Adriatic area – is to implement joint strategies for the development of consistent and sustainable plans that can fill this gap and reduce the lack of accessibility and of knowledge, fully in line with the principles of the 2001 UNESCO Convention [4]. This is about going beyond the protection of natural and cultural heritage: heritage must be conceived as a productive economic activity with new solutions for long-term economic and social prosperity, while developing new tourist attractions, diversifying activities in protected areas, providing local communities with employment opportunities in the local labour market and productive fabric, and introducing new participatory management models through stakeholder involvement. Practices differ greatly between the two countries, although they have often worked together in this field. A starting point, a unique experience in Italy, are the underwater parks (since 2002) of Baia and Gaiola (Naples), which have a long experience in protection policies, but only in recent years have they been refining concrete protection and development strategies [5]. The Sicily Region, which has a *Soprintendenza del Mare* (Superintendency of the Sea), has also favored the implementation of numerous archaeological routes and the publication of scientific and informative materials on and related to underwater tourism [6].

In Croatia, underwater archaeological sites are more developed: parks have been created thanks to site

enhancement projects through modular protective cages and diving centers authorized by the Croatian Ministry that bring tourists to the sites, greatly increasing cultural tourism [7]. Some promising new experiences, based on broader involvement of local people, are now being tested, such as the *Straton Project*: in situ preservation and enhancement without cages [8]. The objectives of UnderwaterMuse have been to turn the sites of the project into underwater archaeological parks or ecomuseums through innovative and/or experimental methodologies and techniques, reducing the loss of important cultural assets, providing an economic fallout by promoting them as cultural tourism destinations, engaging local communities in long-term stewardship and animation of cultural landscapes, promoting creative partnerships between tourism and cultural actors, public decision makers, creative and cultural industries, citizen associations, and facilitating information exchange.

However, acting only at the national/regional level is negative as it leads to a variety of regulatory and programmatic efforts towards what is actually a single common and shared resource, the Adriatic Sea.

UnderwaterMuse has tried to overcome this fragmentation in cultural heritage policy with cooperation, pooling together resources, exchanging knowledge, sharing practices and working to guarantee accessibility towards natural-cultural sites offering replicable solutions, engaging skilled professionals towards transmitting cultural heritage values, motivating people to acquire the knowledge to transform the silent past of a society in a captivating narration.

The underwater archaeological sites selected for the pilot actions – Torre Santa Sabina, Grado 2, Resnik/Siculi – and the other actions (Venice Lagoon, Porto Cesareo, Cesine, etc.) – are highly diverse: we were confronted with both single contexts (the amphorae cargo of the Grado 2 wreck, for example) and multilayered and complex sites/seascapes, with numerous and heterogeneous testimonies sometimes not easy to be interpreted and hardly visible. The latest have been our best opportunity to share methodologies and models.

An immersive VR/AR approach has made the project's underwater sites accessible to a wider audience, including people with different types of disabilities and of different ages (especially children and the elderly), mainstreaming creative thinking and innovative ideas into enhancement of traditional cultural content.

Partners developed and enriched the '*UnderwaterMuseMap*', an innovative promotional GIS tool created for widing research results to the community and promoting underwater sites with accessibility standards (see below). The '*UnderwaterMuseMap*', within which different regions stand to benefit from an efficient ICT tool and sustainable tourist offer, is promoted at transnational, national and local level, in the Adriatic and beyond, guaranteeing its sustainability and transferability during and after its implementation.

Repeatability in different areas is assured by the different typology of underwater sites chosen and the particular context of reference. The exploitation of the sites to their full-scale protection, reintegrating them into the local economy as a living and viable economic tourist activity. At the same time, new demand of cultural heritage usage is arising by young generations born in the information and globalization age.

3. Methodological approach

3.1. *Research methodology*

UnderwateMuse pilot actions applied on those sample areas a methodological and technological protocol based on *research/knowledge, documentation/cataloging, conservation/restoration, enhancement/communication/accessibility* chain, using traditional and innovative tools, such as the holistic/contextual/diachronic/transdisciplinary vision of the *global archeology of landscapes*, in this case coastal and underwater or, better, *seascapes*.

Landscape archaeology or geoarchaeology is *"a coherent sub-discipline of human ecology, neither a form of natural science nor a form of archeology, but an integrated way of understanding humans in dynamic landscapes"* [9]: the primary objective of this systemic vision is being able to tell the story of social groups in changing landscapes, capture their discontinuities, formative processes and identity characteristics.

In this framework dictated by *seascapes archeology*, the contribution of different techniques and innovative technologies was crucial; methodologies and tools shared and used in the various pilot projects were Areal mapping (topographic survey; UAV/drone ortophoto and photogrammetry), Underwater survey (direct/auto-optic; metal detector; Multibeam; Side Scan Sonar; Sub bottom profiler; ROV; underwater photogrammetry; video-photo documentation), Excavations (stratigraphic excavation and documentation; finds recovery; sampling, flotation and sieving; archeometric analyses; archaeozoological and palaeobotanical analyses; washing, consolidation and restoration of recovered

materials, etc.), GIS implementation (UnderwaterMuse portal; interoperability with CartApulia-Puglia regional cultural heritage GIS; SIGECweb/VIR-National MiC digital archives; SiRPaC FVG - Geographic Information System of the Cultural Heritage of Friuli Venezia Giulia; etc.), Data/metadata implementation and elaboration (cataloging; archaeaological materials study; spatial and regressive analysis; periodization and interpretation of sites and historical events).

New digital technologies must be considered, not only as an instrument for obtaining 3D models, but as a research method for survey, documentation, research and dissemination. Digital and virtual data represent a powerful source of information for analysing and studying archaeological sites, especially when the site itself is hardly accessible.

Concerning the photogrammetric survey performed using UAS, it was possible to document the sites and their immediate surroundings thanks to the generation of metric products (orthophotos, digital surface models, and 3D models) obtained via photogrammetric techniques based on SfM (Structure from Motion) algorithms. This was done for the various sites investigated along the Adriatic and Ionian coasts of Salento, allowing for a general overview and subsequent study of specific structures and deposits [10].

3.2. *Dry diving methodology and VR/AR applications*

The gained experience shows that the actual multi-image digital photogrammetry is an excellent solution to obtain a three-dimensional model of the underwater archaeological sites. In addition to the importance of a virtual artefact for scientific investigation, this kind of representation of an archaeological site has been used to create a virtual reality promoting knowledge of underwater cultural heritage to a wide public. The creation of the 3D model also allows those who cannot or do not want to dive to use an application that perfectly simulates a virtual dive on the site [11].

To recreate the virtual reality of the archaeological sites, Unreal 4 Engine software has been used, a cross-platform developed by Epic Games (fig. 1a-b).

This kind of interface can be upload on a web site to allow the fruition by the public and can be used with 3d visors (Oculus Quest 2, for example), to create multimedia designed stations in museum, as in Caorle (fig. 2). The ability to create immersive experiences to be implemented in museum's environments allows to share knowledge about sites and the past, as it happened also in Kaštela, Port Cesareo and Castromediano Museums (fig. 3).

Fig. 1a-b - ***Virtual navigation on Grado 2 shipwreck (elaboration/ ph. Ca' Foscari University - E. Costa).***

Fig. 2 - ***Caorle Museum. Multimedia station (ph. Ca' Foscari University).***

Fig. 3 - *Porto Cesareo, Torre Chianca exhibition - immersive experience with Oculus Quest2 (ph. Salento University).*

4. Field activities and application of shared methodologies: pilot projects, surveys, cataloguing/ webgis

The interdisciplinary partnership from 4 different regions carried on pilot actions focusing on transform sites with a strong potential as experience-based tourist destinations testing a sustainable tourist offer in areas less interested by major tourist flows.

4.1. *Pilot Project on the shipwreck of Grado 2, FVG* [12]

The activities in Friuli Venezia Giulia focused on the wreck of a Roman merchantship known as Grado 2 (3rd century BC), which lies 7 miles off the coast of Grado and 19 m deep.

The intervention, directed by the Superintendency, was carried out between August and September 2021 by ERPAC, with the scientific collaboration of Ca' Foscari University (Department of Humanities), University of Salento (Department of Cultural Heritage) and University of Udine (Department of Humanities and Cultural Heritage).

The pilot project achieved the *in situ* enhancement of the cargo of amphorae of the wreck, through subsequent working phases: to highlight the entire load, document it accurately, reposition the existing grids and add others, identical and to completely cover it, thus ensuring the protection and accessibility for underwater tourists.

The realization of the 3D model through the photogrammetric survey also allows for those who cannot or do not want to dive themselves to enjoy the site remotely, thanks to an application that perfectly simulates a virtual diving on the site, available both online (https://archeomaritime.wixsite.com/archeomaritimevenice/underwater-muse) and in the museums involved in the project.

4.2. *Pilot Project in Torre S. Sabina, Puglia* [13]

Torre Santa Sabina (Carovigno, Brindisi) in Puglia was chosen for a pilot intervention, due to the quality and variety of the archaeological remains in the bay.

The fruitful synergy between the various involved actors (Puglia Region; Ministry of Culture, through its Offices, such as Superintendency of Archeology, Fine Arts and Landscape of the provinces of Brindisi and Lecce, National Superintendency for the Underwater Cultural Heritage, Central Institute for Restoration; Universities of Salento, Foggia and Bari; University Politecnico of Turin; A. Colucci company; Municipality of Carovigno; Hoteliers Association; A.S.S.O. Association) and the support of the community allowed the achievement of the objectives of the two research and valorisation campaigns 2020–2021.

The interventions were focused on the wreck of the Roman Imperial Age Torre Santa Sabina 1 (late 3rd to early 4th century AD), but other evidence have been explored and identified, so that they will be further "spots" of the underwater trails.

4.3. *Pilot Project in Resnik, Kaštela, Split County*

Excavation and training activities of the pilot project were carried out in the locality of Resnik, ancient *Siculi*, during September 2021 (fig. 4). The research was directed by the University of Zadar, with the participation of the team of Museum of Kaštela; other archaeologists, archaeology students and about twenty members of the Giričić, Rostrum and Spinut diving clubs also collaborated.

Research on the sea bottom confirms the presence of a Neolithic settlement, which has been indicted by previous findings, a late Hellenistic settlement, which shows a presence from the second to the first century B.C. [14], with remains of city walls, roads and wooden poles, and the Roman port (fig. 5a-c).

Fig. 4 - *Resnik/Siculi. Aerial view of the site (ph. Kaštela Museum).*

The results of the research allowed the implementation of an exhaustive tool of knowledge and enjoyment: an immersive AR experience to be used with Oculus or semi-immersive, displayed on monitor, which tells of the evolution of the seascape and the settlement from Neolithic to the Roman Age.

4.4. *Surveys in Veneto*

The Department of Humanities made investigations in Veneto in the Venice lagoon and sea (fig. 6), in collaboration with Superintendency of Archeology, Fine Arts and Landscape for the Metropolitan Area of Venice and the Lagoon and with Idra Srl Company.

The Venice lagoon represents a very interesting case study for the submerged archaeological contexts importance and also for the technical-operational aspects, because it is an "extreme" environment, with strong tidal currents, low underwater visibility and with very sustained boat traffic in certain areas (fig. 7). These conditions make diving particularly demanding and not practicable without adequate experience. In this context, it was

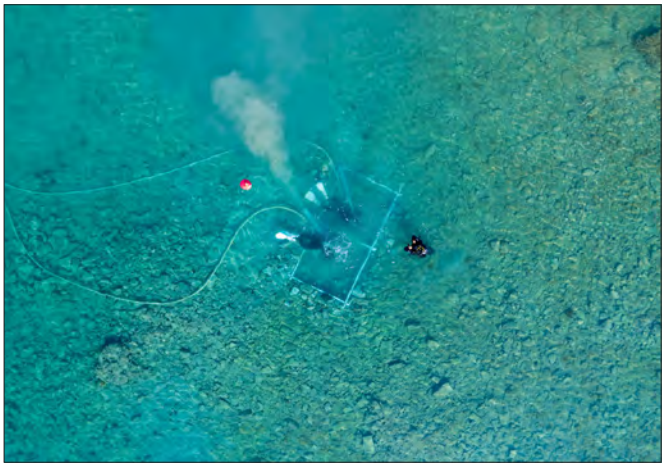

Fig. 5a-c - *Resnik/Siculi. Underwater excavations (ph. Kaštela Museum).*

Fig. 6 - ***Venice lagoon. Investigations of the archaeological sites (ph. Ca' Foscari University).***

possible to test the potential of photogrammetric survey and digital technology for site documentation, which provided excellent results, making visible what remains basically "invisible" in its overall dimension (fig. 8).

Among the most significant sites under investigation were the so-called "tower" in the San Felice canal, a massive basement made of bricks, and the remains of a "pier" located in the same canal at Ca' Ballarin.

Finally, at sea, off the coast of Venice, the so-called "Wreck of the Bricks" was investigated, located 20 meters deep, a large amount of bricks from a cargo probably dated to the late Medieval period, and three shipwrecks dated to the nineteenth century, two off the coast of Eraclea and one near the shore of S. Nicoletto, on the Lido of Venice.

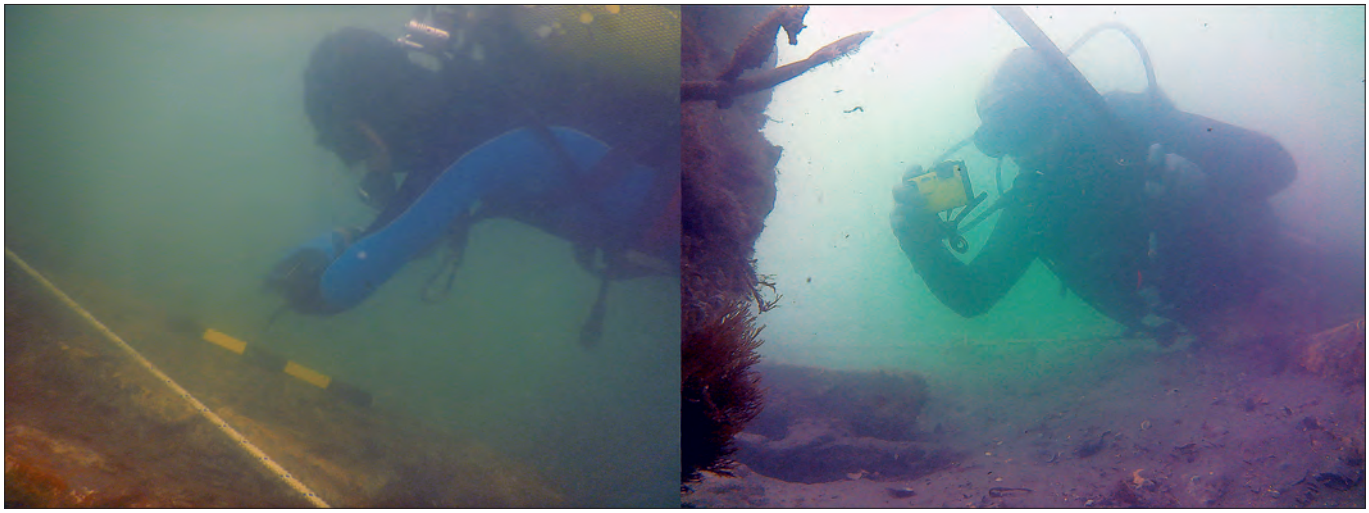

Fig. 7 - ***Venice lagoon. The poor visibility (ph. Ca' Foscari University).***

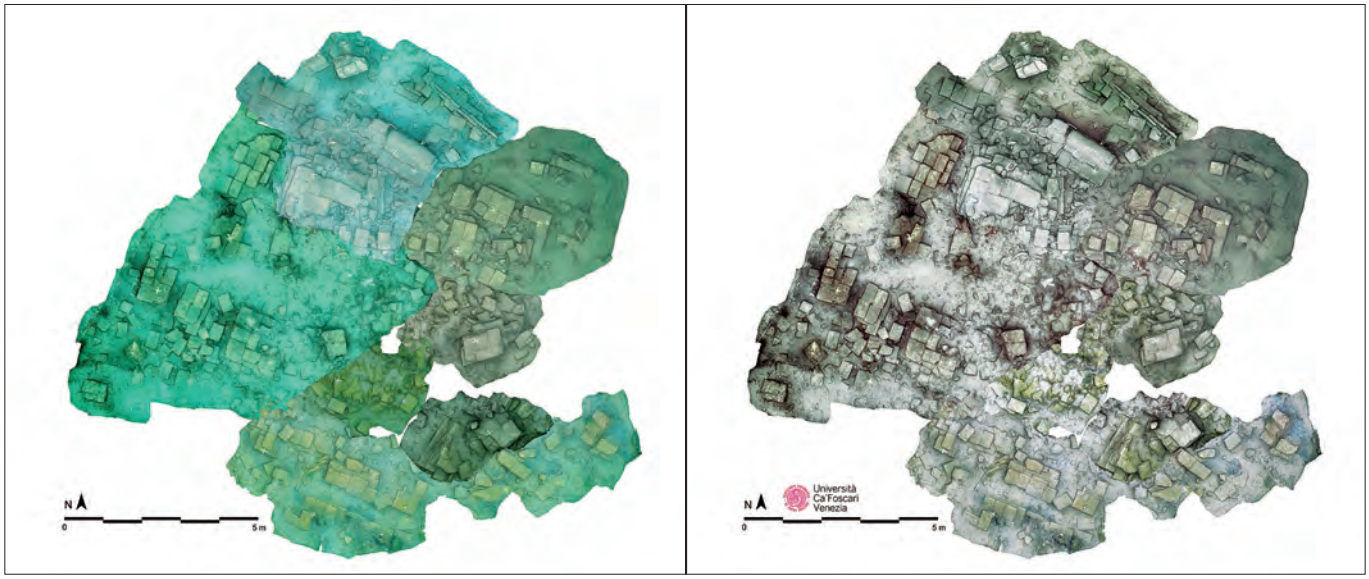

Fig. 8 - ***Wreck of the Bricks. 3D model (elaboration Ca' Foscari University - E. Costa).***

Some of the underwater sites investigated during the project (Bricks shipwreck and Grado 2) have been processed into precise and attractive 3D models that form the basis for Virtual Reality environments (Real Time Render technology). This technology enables also very young or old people and people with disability to access the sites (fig. 1a-b). By sharing information between participating museums (Caorle Museum, Grado Museum, Castromediano Museum in Lecce, Ribezzo Museum in Brindisi, Carovigno Castle Museum, etc.) virtual tours of each other's site will be accessible, virtually travelling also to the most distant underwater sites.

4.5. *Surveys in Puglia* [15]

Surveys have been carried out in several coastal sites of Puglia in 2020-2021 within the UnderwaterMuse project. The activity conducted in the "Le Cesine" Natural Reserve, on the Adriatic Sea, led to the identification of a large port complex probably from the Augustan or Early-Imperial period.

On the Ionian Sea, furthermore, in Porto Cesareo Marine Protected Area, new evidence has been added to the numerous ones already know.

4.6. *Cataloguing and Portal: UnderwaterMuseMap*

The *UnderwaterMuseMap / web portal*, implemented by the University Ca' Foscari of Venice, public and geo-referenced for the virtual exploration of submerged archaeological sites through voice, text, images and animations, also responds to the need to tell this "invisible" heritage to an ever-increasing number of people.

This WebGIS (i.e. a system that manages, stores, analyzes, maps, and visualizes cultural heritage data on the Web) represents the digital catalog of all the underwater archaeological sites in the regions involved (Friuli Venezia Giulia, Veneto, Puglia, and Split), sites that are already accessible or potentially accessible, designed for experts, divers, tourists, and the general public. The *UnderwaterMuseMap* hosts fact sheets with captivating images, videos, and some 3D models of the underwater sites. The interactive application is available in the museums of the regions involved, starting with the National Museum of Maritime Archaeology in Caorle, dedicated to underwater heritage Thanks to a simple navigation on the digital map (fig. 9a-b), it will finally be possible to access a historical heritage that has so far been beyond the reach of potential audiences.

The map can also be visited at the web site (fig. 10): http://mizar.unive.it/underwatermusemap.

Fig. 9a-b - ***Caorle, National Museum of Maritime Archaeology. The digital workstation of Underwatermuse project (ph. Ca' Foscari University).***

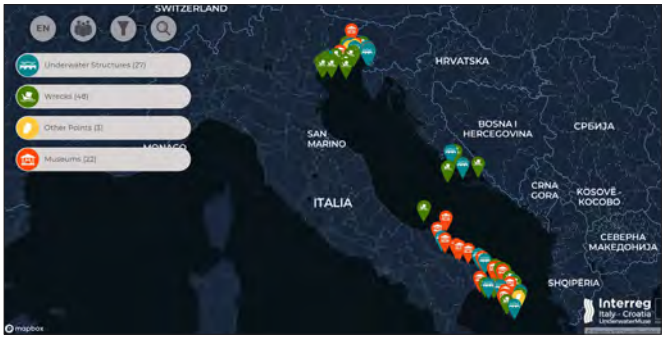

Fig. 10 - ***The UnderwaterMuseMap from the website (ph. Ca' Foscari University).***

5. Increasing awareness through participatory processes

5.1. *Heritage community and target groups' involvement*

Several actions to fully involve stakeholders and meetings regarding the role of new social policies and innovative business models in sustainable tourism (Regional Stakeholder Groups) were implemented during pilot interventions.

In Resnik, parallel to excavations, attempts to include as many stakeholders as possible have been made since the end of 2019, at the project's presentation in the Vitturi Castle. Local diving clubs participated (in total, 18 divers from diving clubs Giričić, Rostrum and Spinut) through an underwater archaeology course. Apart from amateur divers, archaeology students who had already actively took part in underwater excavations organized by Zadar University and Museum of the Town of Kaštela also participated in the investigations. Divers' education was conducted *in situ*, with introductory lecture on the site and the excavations conducted up to that point both on land and in the sea, lessons on underwater excavations techniques and methodology and drills with archaeological finds to better understand how to recognize them during the excavation. Most of the participants having previous experience in archaeological excavations, successfully acquired new skills, while the beginners were assigned to work with expert archaeologists.

At Torre Santa Sabina, administrations and local community supported the Project with concrete and spontaneous actions: the Carovigno Hoteliers' Association offered room and board to all staff for the entire duration of the excavation campaigns; the Municipality made available spaces for equipment storage and materials laboratory.

The local community followed the work with great participation, visiting the laboratories and asking for information on the Project progress. The research team welcomed visitors to the site on a daily basis, describing in detail the activities underway and the objectives of the project.

Particularly engaging events were organized, between which the *open day* of the excavation (fig. 11a-b) and the *Roads of Sand Festival*, with various musical and theatrical events dedicated to the sea (fig. 12).

In Grado, the diving sport clubs, particularly sensitive to archaeological issues, visited the site and enthusiastically supported the project, also providing a small

Fig. 11a-b - ***Torre S. Sabina, Carovigno (Br) - open day on the site - 25.09.2021 (ph. Salento University - E. Peluso).***

technical support (fig. 13). The municipality of Grado, for its part, supported the project by providing logistical support on land and organizing a promotional event (29 August 2021) to communicate to the citizens what type of operations were taking place in their sea and what could have been the developments.

Lastly, in the Final Event (Lecce-Porto Cesareo, 3-5 June 2022) an International Conference was held, entitled *General States of the bottom-up management of underwater heritage* (3 sessions, 24 lectures, 38 authors, filmed in live streaming via Facebook: https://www.facebook.com/ESACpuglia/ and https://www.facebook.com/Archeo-SubUniSalento/), aimed at a constructive comparison of virtuous examples, which respond to the principles of the Faro Convention: heritage as a common good, fundamental for the cultural, social and economic development of individuals and communities.

Fig. 12 - ***Carovigno Castle - Roads of Sand Festival.***

Fig. 13 - ***Grado. The working team and diving club members on the boat.***

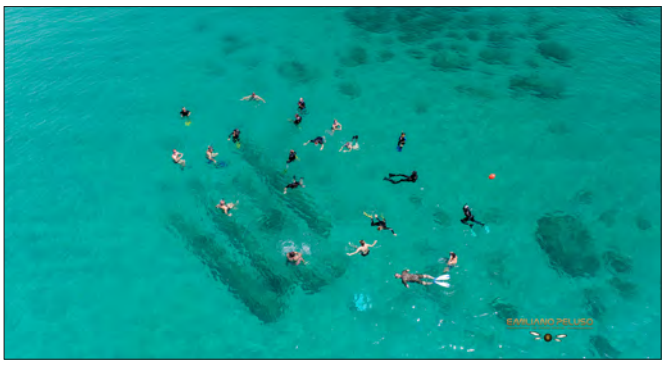

Fig. 14a-b - ***Porto Cesareo MPA (LE). Snorkeling tour of underwater trails (ph. Puglia Region - E. Peluso).***

The same Final Event provided a *snorkeling and walking tour* for the participatory experimentation of underwater trails in Porto Cesareo MPA (fig. 14a-b)

5.2. *Community involvement & cultural tourism offer: the exhibition*

On April 27, 2022, an exhibition dedicated to the results of UnderwaterMuse project was opened in the Museum of the Town of Kaštela, in Vitturi Castle, among the Permanent museum exhibition (fig. 15). The exhibition, titled "*Submerged Siculi*", shows the results of underwater archaeological excavation at the multilayered site Resnik/Siculi conducted as part of the project. Along with the new results, the material found in previous underwater excavations were presented, as well as the material collected by local divers.

5.3. *Community active involvement: online photographic contest*

The online photographic contest on the topic "*Underwater man-made landscapes in the area of the Adriatic Sea*" – which started in July 2021 and ended in February 2022 – aimed at raising awareness about the project among youngsters and their peers (school friends, families), as well as professional underwater photographers, and thus contribute to an overall increase in potential visitors of the Project's underwater pilot locations.

Fig. 15 - ***Kaštel Lukšić. The exhibition "Submerged Siculi" in the Museum of the Town of Kaštela.***

Fig. 16 - *Božidar Vukićević photocontest winner photo.*

During the voting period (March 1-10), the contest reached around 550,000 people via Facebook announcement while around 2.000 people reacted with comments, shares or likes on the posts. Finally, the winners of the photo contest were announced on March 16, 2022, respectively Božidar Vukičević (category over 35 years; fig. 16), and Loriana Marović (category under 35 years; figs. 17).

The photo exhibition "*Underwater man-made landscapes*" was firstly presented during the Kaštela museum exhibition, *"Submerged Siculi"* March 27, 2022, in Vitturi Castle/Kaštel Lukšić, and then in the framework of the *UnderwaterMuse* final event in Lecce, Castromediano Museum, June 3, 2022, with participation of the winners of the contest.

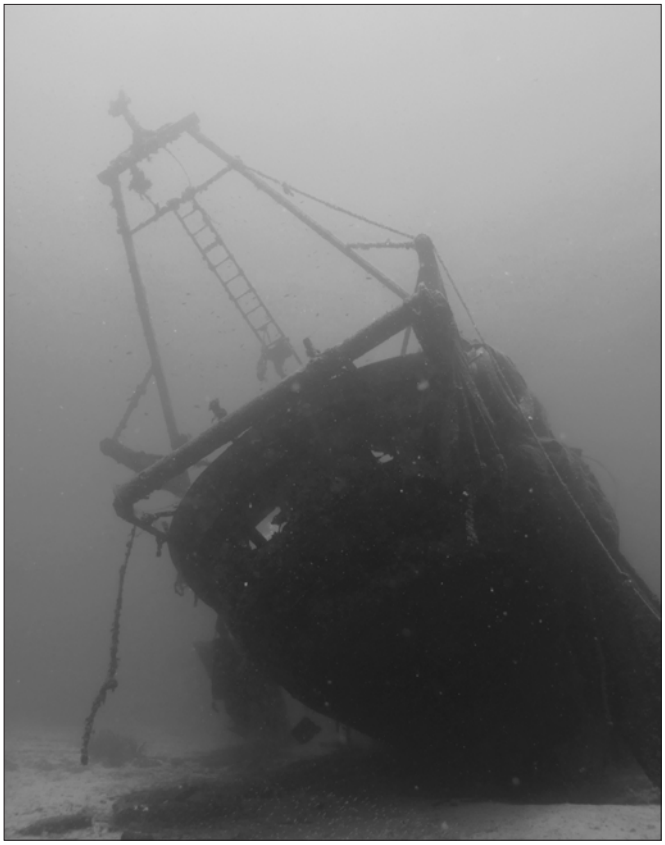

Fig. 17 - *Loriana Marović photocontest winner photo.*

5.4. *Heritage community & stakeholders' specific training*

The first step for the involvement of local main stakeholders, whether they are sport clubs or tourist diving centers, is their training. In Friuli Venezia Giulia Region, with this assumption and following the pilot project of Grado 2, which saw the participation of diving clubs' members during the field activities, a "heritage education" project has been carried out, aimed at making diving members and other possible stakeholders to know both the Grado 2 site and other submerged sites in the Region and to formulate a possible offer to use them through the same clubs. The recipients of this training project were about 25 divers belonging to the sport clubs of the region, diving centers and Marine Protected Area of Miramare. The training included a series of modules:

- a first theoretical workshop, carried out by University professors and professional underwater archaeologists;
- two days of diving on the Grado 2 wreck;
- another three days intended to expand the regional offer, with visits to submerged sites especially near the coast, to be reached both diving and snorkeling, such as

Fig. 18 - *Muggia, P. Sottile (TS). Diving training. Guided visit on archaeological sites for regional diving clubs and centers.*

the small piers of Muggia and other sites in Grado and Marano lagoons (fig. 18).

In Salento, Puglia, a total of 100 hours training course has been carried out in Porto Cesareo MPA (Lecce), aimed at 20 young people, mostly women, under 35, to make them archaeological-naturalistic diving and local tourist guides, including also the achievement of diving license [16].

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Note

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[7] Zmaić 2009; Pešić 2014; Mesić 2008, 2014; see also Koncani Uhač *et al*. 2017.
[8] Dorušić, Ćuk in these Proceedings.
[9] Barker Bintliff 1999, 207.
[10] Rule 1989; Balletti *et al*. 2015; Beltrame, Costa 2017; Costa 2022.
[11] Costa *et al*. 2020.
[12] See Auriemma *et al. Grado 2 case* in these Proceedings.
[13] See Auriemma *et al*., *Puglia: a sea of resources* in these Proceedings.
[14] Babin 2011; Kamenjarin 2016.
[15] See Auriemma *et al*., *Puglia: a sea of resources* in these Proceedings.
[16] See Buccolieri *et al*., *Puglia: a sea of resources* in these Proceedings.