A SOCIAL AND PARTICIPATORY UNDERWATER CULTURAL HERITAGE. PUBLIC-PRIVATE COLLABORATION FOR THE ENHANCEMENT OF THE UNDERWATER HERITAGE OF ALGECIRAS (SPAIN)

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ABSTRACT

Underwater Cultural Heritage (UCH) is increasingly required to have a social return beyond the cultural aspect, seeking a positive impact on the economic and social fabric of a community. On the other hand, the European Union guidelines promote the Blue Growth, and a responsible and sustainable tourism linked to the sea and to UCH. The University of Cadiz (Spain) has work not only on the dissemination of heritage but also on the creation of various products, in collaboration with other public and private stakeholders, capable of generating new avenues and jobs, raising awareness and promoting the protection of UCH at the same time. These activities are focused on the Bay of Algeciras, and developed under the umbrella of two projects: The Interreg TIDE (Atlantic Network for Developing Historical Maritime Tourism) and the Herakles project, which aims to create an underwater archaeological park within the Natural Park of the Strait of Gibraltar.

Keywords: Underwater Cultural Heritage and tourism, Underwater parks, Underwater routes, Social engagement, Bay of Algeciras.

Context: underwater cultural heritage and tourism

The development of diving and associated technology, so important for the evolution of Underwater Archaeology, has also led to an exponential increase in sport diving [1]. As a consequence, the looting and destruction of underwater cultural heritage (UCH) has reached unprecedented levels [2]. Given the difficulties and limitations faced by administrations in the protection and control of the vast UCH, education is an essential measure for its conservation, as stated in the *UNESCO Convention on the Protection of the Underwater Cultural Heritage* (2001). In Spain, the *Green Paper* (2009) shares this position and stresses the need to build a clear and powerful, suggestive and rigorous image of the true nature of the UCH, placing special emphasis on three aspects: knowledge and understanding, citizen participation, and responsible access, recalling that «the participation of fishermen, divers and local inhabitants in the conservation of local sites has proven to be the most effective measure of protection» [3].

Awareness-raising and education encourage the involvement of communities and their active participation in the protection of this heritage, not only because it makes them "guardians of the past", but also because «it has a direct impact on the local economy, fostering sustainable development and reinforcing the idea that preserving heritage has more advantages than passively assisting in its despoilment» [4]. Thus, socio-cultural and economic development is now considered by a growing number of authors as one of the social functions of the UCH and an essential line of work for its preservation, and even for its very definition, especially in developing countries or in socially depressed areas [5]. Tourism has begun to play an important role as a means of enhancement, social return and development.

Moreover, the European agenda for the «Decade of Ocean Sciences for Sustainable Development» 2021-2030 follows the strategy adopted by the European Commission in 2012 based on "Blue Growth", recognising the importance of the seas and oceans as drivers of the European economy. One of the most important sectors in this regard is coastal and maritime tourism.

The blue tourism sector (focused on coastal areas and which may include heritage resources) has been identified as an area of particular potential within the EU Blue Growth Strategy and is the most important tourism sub-sector in Europe [6]. Even with the recession caused by the Covid-19 virus, current policies remain committed to boosting this sector as a driver of economic recovery [7]. The Blue Economy pursues systemic sustainability in which all sectors are connected and interrelated. Thus, blue tourism must always be respectful and sustainable, paying attention to the possible impact not only on heritage but also on the natural and social environment, natural resources and local communities, seeking synergies and coexistence with other sectors.

The potential of UCH for tourism development was already outlined in the 1st Regional Seminar on Underwater Archaeology held in Italy in 1983 and in the ICOMOS *International Charter on the Protection and Management of Underwater Cultural Heritage* (1996). It is now recognized both by UNESCO [8] and by the European Commission which, in its *Communication on a European strategy for more growth and jobs in coastal and maritime tourism* (2014), invites Member States to develop tourism based on cultural heritage and underwater archaeological parks.

In Spain, tourism in coastal areas has changed its policies in recent years, considering the experiences related to the UCH as an important ally when it comes to diversifying the tourist offer and breaking with the seasonality that characterizes the model based on the sun and beach binomial. This has led many national and local development and management plans to consider the UCH as another tourism resource [9].

However, it is important to remember that, although the framework offered by European policies in relation to blue tourism is based on responsibility and systemic sustainability, and that, although important benefits can be found in this UCH-tourism tandem, there are also potential risks to consider in this relationship, such as the generation or perpetuation of extractive models; the proliferation of low-quality employment; the distortion of cultural values; the loss of historical rigor; the displacement of culturally related groups; and the commodification, degradation or loss of both tangible and intangible heritage, to cite a few examples [10].

The Nautical and Underwater Archaeology line of the University of Cadiz and its transfer strategy

Considering the current growing demand for this type of tourist experiences and the opportunity for social return of the scientific knowledge they offer, but without losing sight of the potential risks mentioned, the Line of Nautical and Underwater Archaeology of the University of Cadiz has developed a strategy for a more effective and efficient transference of knowledge. The objective is

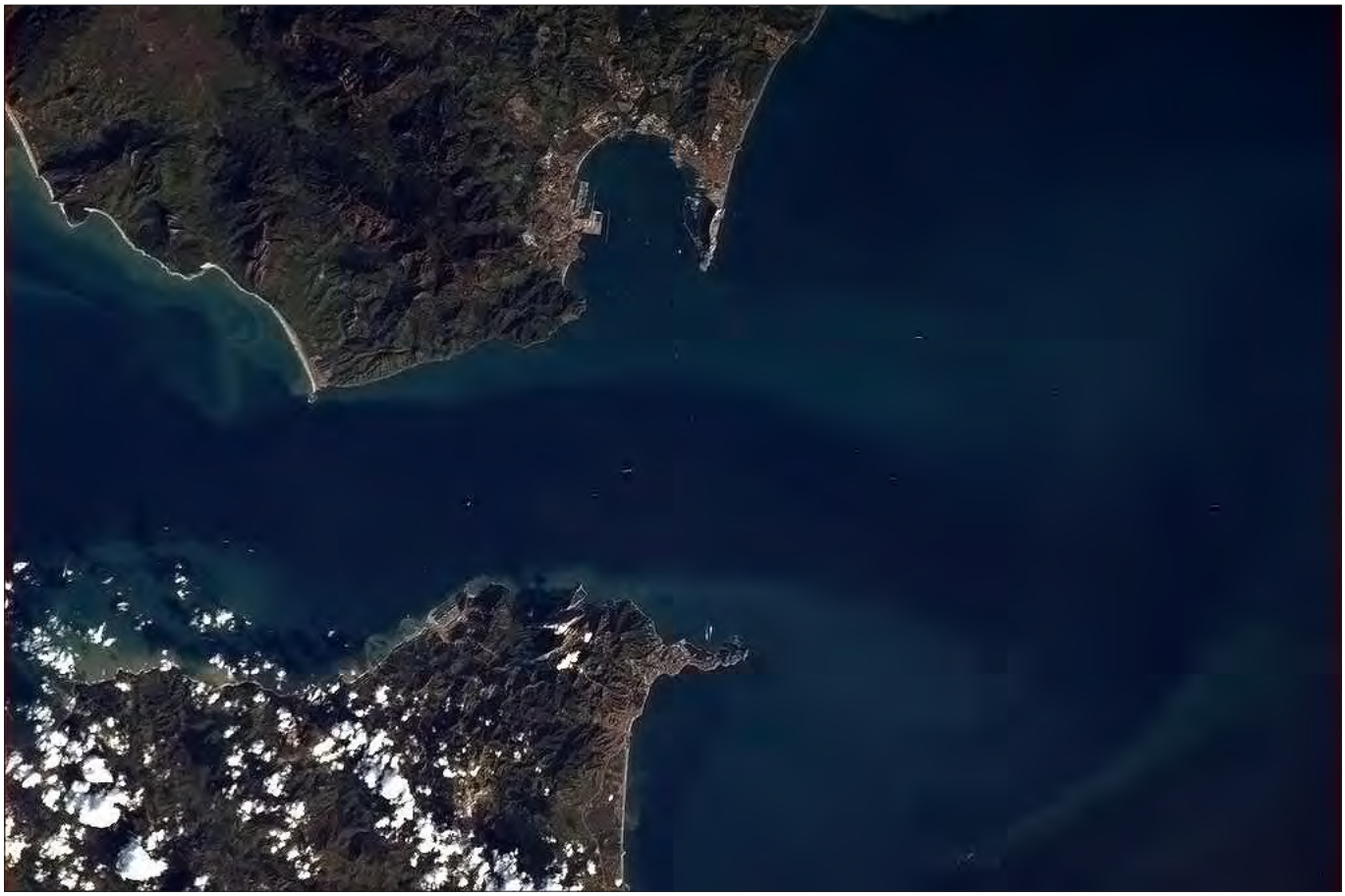

Fig. 1 - ***Strait of Gibraltar and bay of Algeciras (ph. Chris Hadfield).***

to work with the local agents involved in the generation of sustainable and responsible dissemination resources which can then be inserted into a tourist circuit, not by the Line itself, but by these same agents. This means listening to local needs, researching heritage resources and evaluating the most appropriate options according to their nature and state, creating tailor-made dissemination resources and accompanying the agents during the implementation process, carrying out regular monitoring of these experiences, with the aim of guaranteeing their sustainability.

In order not only to create one-off experiences but also to generate a real impact on the social, economic and cultural fabric of a locality, most of the Linea's activity is focusing on the same geographical area: The Bay of Algeciras (fig. 1). The area suffers from one of the highest unemployment rates in Spain, and continues to base much of its activity on the sun and beach tourism model (high impact and low return). On the other hand, it is a problem area for drug trafficking, and the fight against it is one of the municipalities' top economic priorities. Finally, port activity, which has developed greatly over the last 40 years, and which has made Algeciras the second most important port in terms of the number of containers in Europe, is also a threat to the conservation of its cultural heritage, with the loss of old port and anchorage areas and, possibly, the wrecks associated.

However, this Bay, located in the south of the Iberian Peninsula, together with the Strait of Gibraltar, is a meeting point of extraordinary historical, maritime, archaeological and natural interest, between the Atlantic Ocean and the Mediterranean Sea; between Europe and Africa and between Europe and America. The Bay of Algeciras has been a privileged space for nautical and port activity since prehistoric times, as shown by the material evidence found in the archaeological sites in the surrounding area: from prehistoric shelters, Phoenician, Roman and medieval settlements, to the Bay as the scene of warfare throughout the modern era. This is an opportunity to propose a development model based on the cultural values of the area, and its maritime and underwater heritage.

Thanks to the involvement of actors such as the Natural Strait Park, the Algeciras City Council, the Port Authority itself, and small local active tourism companies or diving centres (coordinated by the Spanish Federation of Underwater Activities), a network of actions is being developed in which public education, interpretation and heritage protection are the main objectives.

Research. Herakles Project

The core of the Line's transfer strategy is, of course, research. Without research, the communication of underwater cultural heritage is not possible. It is not possible to enhance, activate or boost a cultural resource and put it at the service of society if we do not know what story we can tell and what values we can communicate.

This is the philosophy behind the several projects that we run from the UCA's Nautical and Underwater Archaeology Line. Projects where research serves specific communication objectives and communication follows a process of study and analysis of the research itself.

Among the various projects carried out since 2016, we highlight the Herakles project (FEDER-UCA18-107327). This project, from its inception, has a clear social vocation, it seeks to generate new knowledge about an unknown heritage, and make it available to the agents managing this heritage and the local community.

The project is being developed in the Bay of Algeciras. A wide, deep and safe bay located in a strategic naval crossing point that allowed the development of an intense occupation with clear maritime links. Throughout the history of research, numerous studies have highlighted the importance of this space focusing mainly on three phases: the Ancient times, with 4 urban settlements on its coastal margins; the Medieval Period, becoming the border and point of entry to the Peninsula and the Mediterranean; and the Modern Period, scene of a continuous confrontation by the naval control of the Strait. The Bay of Algeciras stands out in all historical periods due to its maritime importance and its use as a privileged harbor area.

Before the starting of the project, of the approximately 125 archaeological sites of various chronologies known in the area, only 4 were of underwater nature, and only 1 was considered a wreck. The level of knowledge and documentation of the Underwater Cultural Heritage (UCH) under these waters was scarce considering the historical importance that the sea and the nautical activities have played in the Bay.

That is why we proposed a research project with the main objective of register and study various underwater archaeological zones of the Bay. The results are allowing us to analyze and evaluate the maritime history of the bay, while contextualizing the coastal landscape and the port settlements of its surroundings.

The UCH of the Bay of Algeciras needs to be studied to complete a historical discourse that until now, has taken into account in a preferential way information coming from terrestrial contexts, in a space whose main activity

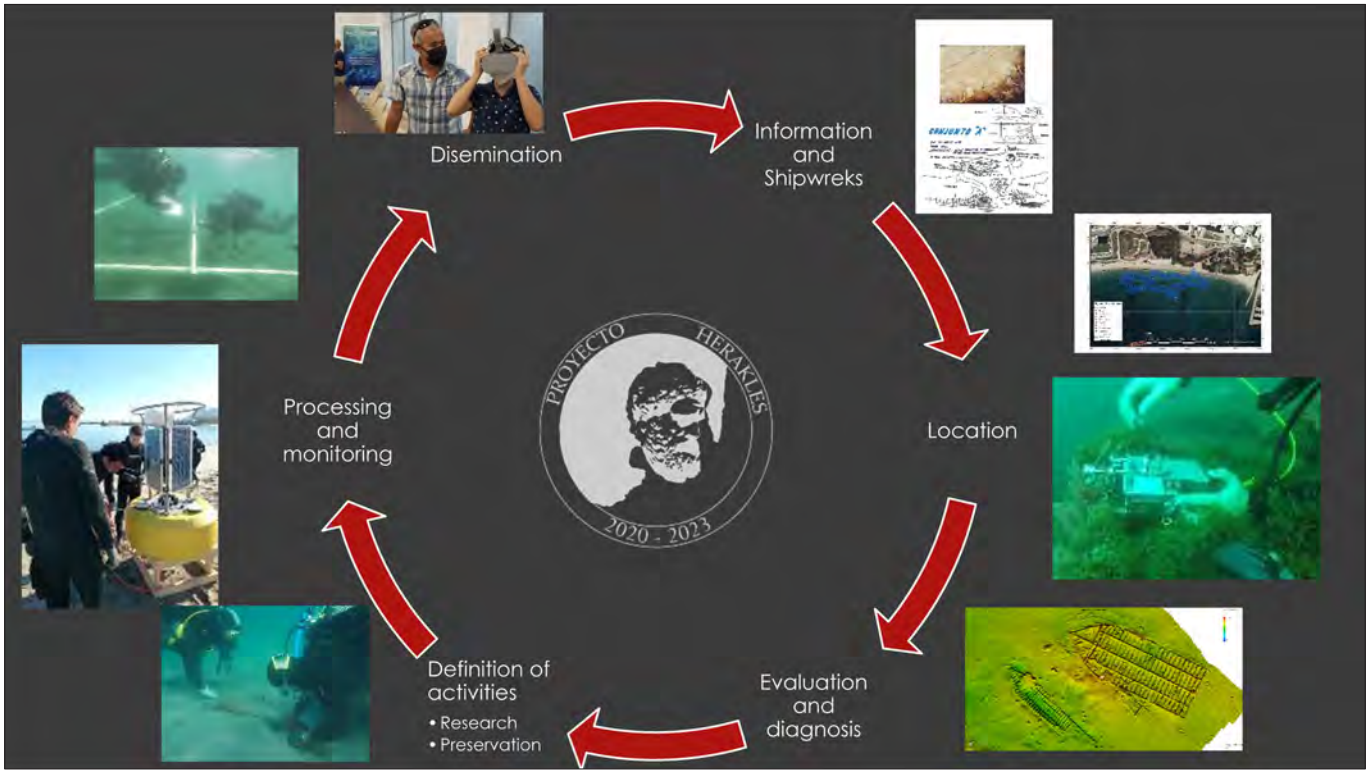

Fig. 2 - ***Methodology (LANYS-UCA).***

and value are maritime. It is a heritage that is also subject to a series of high-impact risks such as port activity (dredging), industrial (works) or tourism (degradation/looting), urban development and the changes that these actions may cause in the marine environment.

The main objective of this project is, therefore, the documentation, research and enhancement of the UCH of the Bay of Algeciras. For this, we have intended to address three research problems:

- Anchorages and nautical activity in the Bay of Algeciras from a diachronic perspective. We understand the Bay as a space for exchange and maritime trade. These activities left their mark through archaeological evidence in anchorage or wreck contexts.
- Identification and evaluation of urban, industrial or climate change threats for the conservation of this heritage.
- Values of use and awareness of the Underwater Archaeological Heritage of the Bay of Algeciras. To this end, a pioneering pilot project is being carried out in Andalusia for the creation of an archaeological site that can be accessed through an underwater archaeological park in the Getares area. This objective is implemented through the transference plan described later.

We believe that these three sections are necessary and will allow not only a significant advance in research, but also in the protection, citizen awareness and generation of a sustainable tourism resource.

Our methodology is based on involving local community since the research phase until the dissemination activities. Local communities have the historical knowledge of shipwrecks, findings, changes on the shore shape, ancient fisheries techniques, diving points of interests, and a lot of personal experiences living onshore that give us this anthropological approach to a maritime way of life. Crossing this information with the archive, museum and known shipwrecks information we are starting to record and document new sites that were unknown to science and public administration. It is also during this phase were local community give us support with ships, diving gear (when it is needed), and local stakeholders provide us with help with some installations to base our research activities. Their growing interest on the results is building better research on the project.

Our methodology is circular, we start on the society, and we finish on that only to start again (fig. 2).

Non-intrusive techniques are being used to generate the maximum of archaeological information with the minimum impact on the sites preservation. This

methodology includes the application of graphic documentation techniques based on photogrammetry, video, 360º video, detailed photographs, etc., and the use specific geophysical methods such as the Sub Bottom Profiler (in our case a standard SES-2000), the Multibeam Sounder (Kongsberg EM 2040) or a Magnetometer (SeaSPY2 from Marine Magnetics).

With the data collected by means of these instruments, we ask specific questions to each of the intervened sites, mainly to find out chronology, typology, construction system, extension, marine environment in which it is located and state of conservation.

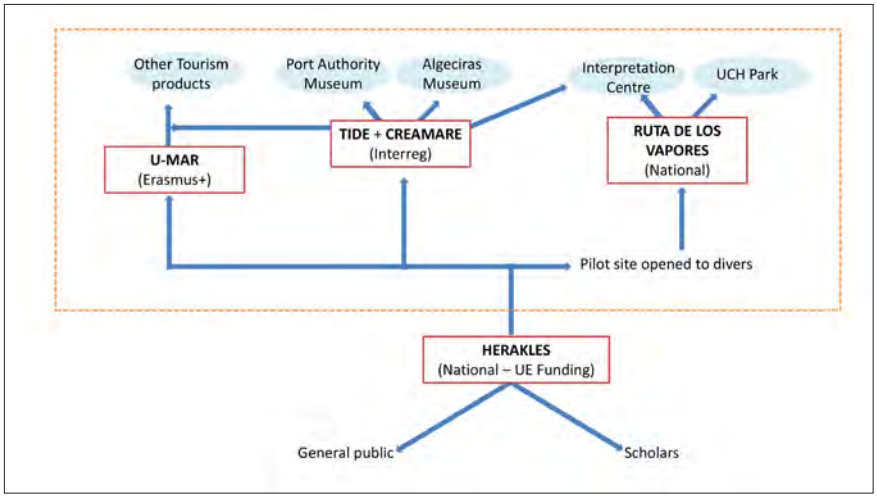

Fig. 3 - *Transfer Strategy (LANYS-UCA).*

All the information is archived in a series of worksheets that are subsequently digitized and the data registered in a geographic information system.

Thanks to this method we have been able to locate, to date, about 150 underwater archaeological sites. The vast majority are located at a depth of less than 10 meters and in beach environments or port accesses, which means that they are subject to considerable anthropic pressure.

We have carried out detailed documentation of 27 shipwrecks dating from the 5th century BC to the 20th century. We could highlight the wreck of *El Timoncillo I*, a merchant ship of Punic chronology carrying amphorae of regional typology dated around the 5th century BC; the wreck of *Ancolote I*, another Roman merchant ship from the 2nd century AD; or wrecks of medieval or modern chronology, very interesting in their naval construction, such as *Puente Mayorga III*, *Rinconcillo VIII* or *Puente Mayorga IV*.

The archaeological research concerning these wrecks is to be published [11], but the most interesting aspect of this volume is the wide diachrony and typological variety offered by the UCH in the Bay of Algeciras. This not only highlights its historical importance, but also allows us to communicate to society a broad, varied, and complex history based on universal values that allow us to reflect on highly topical issues such as migrations, the evolution of cultures or the effects of climate change.

Transfer strategy

The transfer strategy of the Nautical and Underwater Archaeology Line of the University of Cadiz pursues the social return of the cultural capital generated through archaeological research thanks to the Herakles project. The Line maintains a long-term strategy in the Bay of Algeciras, concentrating and combining different research projects linked to transfer, with the aim of generating a real impact on the social, economic and cultural fabric, offering knowledge, tools and opportunities not only for the development of products but also for the reinforcement of the city's maritime identity and the creation of a differentiated brand based on it. The convergence of these projects has a multiplier effect in terms of impact, transfer and visibility (fig 3).

The research projects dedicated to transfer that are currently active are the following:

- Ruta de los vapores: Project funded by the Algeciras Technological Campus Foundation in 2019 to assess the feasibility of generating underwater cultural routes in shipwrecks in the Strait of Gibraltar Natural Park.
- TIDE: Interreg aimed at the creation of responsible and sustainable tourism products based on maritime and underwater heritage, especially through new technologies.
- CREAMARE: Interreg aimed at the development of digital products linked to maritime and underwater cultural heritage, specifically a video game.
- U-MAR: Erasmus+ aimed at training agents interested in the development of responsible and sustainable tourism products related to underwater cultural heritage.
- HERAKLES: As seen, this research project also includes a section dedicated to transfer, which aims to create a series of visitable routes for divers on wrecks in the Strait of Gibraltar Natural Park.

All these projects are combined in a complementary way through a planned strategy and the involvement of local community and actors such as the Museum of Algeciras, the Technological Campus Foundation, the Strait Natural Park, the Algeciras City Council, the Port Authority, and small local companies of active tourism or diving centers (coordinated by the Spanish Federation of Underwater Activities) is essential in their development. Understanding the potential of cultural capital, addressing the needs of the local community and overseeing the process of transfer and transformation are basic pillars to achieve a real impact on the city.

In this respect, it is important to note that all these projects approach transfer from a research perspective, and therefore involve specific studies, for example, on modelling for the calculation of carrying capacity, on the assessment of natural and anthropogenic risks to heritage, on the definition of diver profiles and other audience studies, or on the development of new technologies and applications.

The strategy focuses on three different and complementary directions (fig. 3):

a) The creation of an underwater archaeological park within the Natural Park of the Strait of Gibraltar, which will allow not only to protect but also to learn about the natural and cultural heritage jointly and in relation to the landscape. The first step was the pilot opening of one of the routes (which took place during the summer of 2022) and it is meant to be progressively expanded up to 5 more wrecks in the next year.

b) The creation of content for the interpretation center of the Strait's Natural Park as well as for other museums in the city, with the aim of bringing to non-diving citizens this heritage as well. In this sense, several experiences linked to new technologies and dry dive practices are being developed.

c) Complementary training not only for diving centers and divers but also for all those agents who are part of this process or who may be part of it in the future, with the aim of ensuring that this type of activities is conceived, designed, managed and promoted always following the principles of responsibility and sustainability. To this end, a toolkit has already been published and a training course for interested agents is being developed through Erasmus + U-Mar project.

Results. Tourism Toolkit for European Maritime and Underwater Cultural Heritage

This guide is the result of a research process that includes an exhaustive bibliographic study and the analysis of more than a hundred case studies related to tourism products linked to maritime and underwater heritage, developed within the TIDE project partners and through a doctoral thesis developed at the University of Cadiz [12]. The aim of this research was to create a methodological framework that would allow all TIDE partners to work under the same parameters when developing their pilot projects, and to generate a set of tools that could be useful, in turn, for other agents [13].

Creation of underwater routes

These routes, aimed at non-professional divers, are signposted with museographic elements on the seabed, guided and preceded by educational training to raise awareness among divers.

For the design of the routes, the threats to which the heritage is exposed have been analysed, both regarding the environment and anthropic impact. To this end, different variables were considered such as marine dynamics, temperature, salinity, pollution of the water, state of conservation of the materials, etc. In the same way, a profile that corresponds to the average diver in the area was developed in order to be able to adopt the necessary precautionary measures and adapt the training to their needs.

Fig. 4 - *360° video recording (LANYS-UCA).*

Dry Dive experiences

Several sets of virtual reality goggles were purchased through the TIDE project to be placed in the park's interpretation centre and in the Algeciras Museum. The content of these experiences is based on 360-degree videos enriched with augmented reality and will allow users to visit an underwater excavation. These videos were recorded during the Herakles research campaigns and are being processed for implementation over the coming year (fig. 4).

Buoy for audio and video broadcasting

Underwater audio and video broadcasting of research work during archaeological research campaigns carried out periodically by the Nautical and Underwater Archaeology Line. The equipment has been developed through the Department of Computer Engineering and will allow not only the broadcasting of audio and video from an underwater environment to land, but also the sharing of this broadcast with different educational centres in Spain and with other members and partners of the project outside Spain. It is based on a buoy with an omnidirectional antenna, powered by solar panels, which relays the information collected by five underwater cameras that also incorporate other sensors (fig. 5).

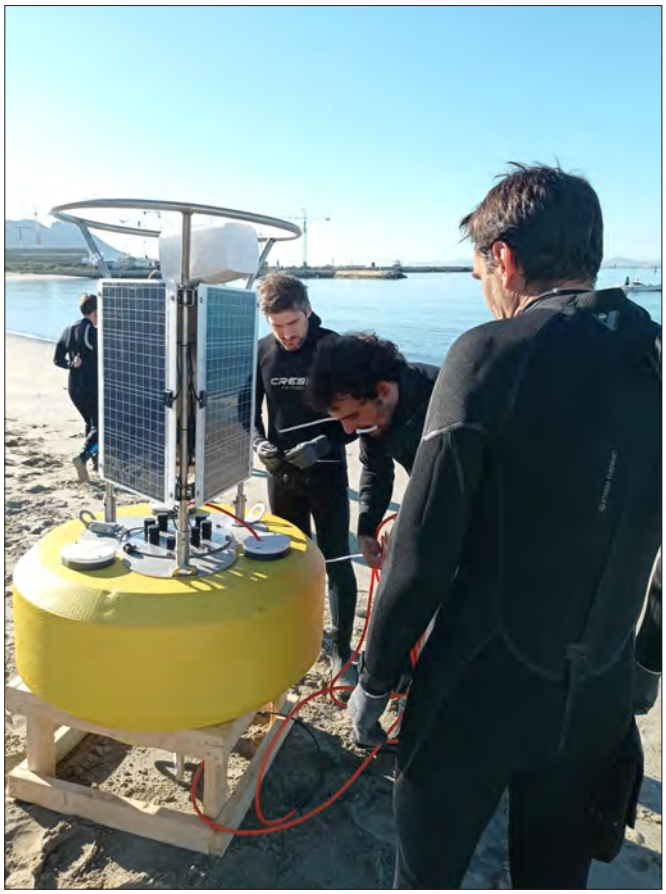

Fig. 5 - ***Streaming Buoy (LANYS-UCA).***

Conclusions

Following the indices of Marqués and Fernández-Pacheco [14] as well as the global impact tree they adapt from Deloitte (2017), the Linea strategy increases the environmental, organizational, economic, relational, social and cultural brand value of the city of Algeciras. On the other hand, the fact of combining different projects in the same space and with the same strategy makes it possible to maximise their visibility, impact and resources, as well as the capitalisation of results.

Of course, this whole process requires a close relationship with the different stakeholders and the local community, without whose collaboration none of this would be possible. Thus, one of the key parts of this process is the development of joint management strategies; a complex process that needs to reconcile very different needs of very different actors. In this case, the fact that the Line, being part of a public institution, does not have financial interests involved facilitates both the process and the possible mediation work when necessary.

Both the European Union guidelines on Blue Growth and the agenda for the Decade of Ocean Science for Sustainable Development, as well as society itself, demand an increasing social return from heritage professionals. Although it is our job to put UCH safeguarding first, to offer a rigorous image and to show that not everything is always possible, an increasing number of professionals are working in this direction, opening sites to the public, bringing dry dive experiences, and finding new and compelling ways to enhance UCH. In this sense, the funding of European research programs and the sharing of the results in all kinds of forums seems fundamental to advance this discipline in a real and sustainable way.

Acknowledgements

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