

**SOMA 2024**



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# **SOMA 2024**

**Proceedings of the 25th Symposium  
on Mediterranean Archaeology**

**Mediterranean – History as it once has been**

**Zadar, 25-27 April, 2024**

**Edited by**

**Mladen Pešić, Luka Bratović  
and Doris Kurtov**

**Access Archaeology**





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## About SOMA 2024

This interdisciplinary meeting examined navigation and its relationship to cultural and material heritage, fostering deeper insight into the historical, cultural, and economic contexts of the Mediterranean. The conference emphasized innovative approaches to the conservation and interpretation of cultural heritage, engaging related fields such as art history, numismatics, and epigraphy.

Supported by the Ministry of Culture and Media of the Republic of Croatia, the plenary sessions were held at the Education and Presentation Centre for Underwater Archaeology St. Nicholas, within the International Centre for Underwater Archaeology in Zadar (ICUA Zadar). The event was jointly organized by ICUA Zadar; the General Association for Mediterranean Archaeology (GAMA); the Department of Archaeology at the University of Zadar; the Museum of Ancient Glass in Zadar; and the Archaeological Museum Zadar.

As an established international scientific forum, SOMA brings together archaeologists from across the Mediterranean. Previous conferences have been hosted in Turkey, Italy, Slovenia, Spain, Ireland, Russia, Poland, and the United Kingdom, in cooperation with local partners. Its overarching aim is to promote the exchange of knowledge and ideas on the study, protection, and preservation of Mediterranean cultural heritage.

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*Legislation management and interpretation of cultural  
heritage*

# State management of underwater cultural heritage in Mediterranean waters: the case of the Mazarrón 2 shipwreck

Paloma Sánchez Gómez<sup>1</sup> and Rafael Sabio González<sup>2</sup>

## Abstract

The aim of the paper is to address the management of Spanish underwater cultural heritage by the Spanish Ministry of Culture, within the specific context of the maritime waters of the Mediterranean. To this end, firstly, we will analyse some generalities about its sphere of competence and the management of the National Plan for the Protection of Underwater Archaeological Heritage. Secondly, and as a specific case, the following will be addressed of the project for the extraction and conservation of the Phoenician-period ship called Mazarrón 2 (Region of Murcia, Spain), which is a good example of the collaboration between the Spanish National Administration and one of the seventeenth regional administrations in the country.

**Keywords:** underwater archaeology, Mazarrón 2, Ministry of Culture, Phoenicians

## The management of underwater cultural heritage within the sphere of the Ministry of Culture of Spain

Underwater cultural heritage faces a very particular difficulties, as is the place where it is located: the specific peculiarities of the marine (or aquatic) environment. But not only from a technical point of view, but also from an administrative one. The management of underwater cultural heritage is particularly complex: from identification, to protection, conservation and intervention, to ownership and jurisdiction, at a legal and administrative level.

In Spain, moreover, this context becomes a little more complicated if we consider the territorial organization and the distribution of responsibilities between public administrations. Without going into details, it should be stated that in Spain the jurisdiction of culture<sup>3</sup> are shared between the territorial administrations and the central government, affecting archaeological heritage in particular. It should also be added that the Autonomous Communities, the regional authorities, are responsible for the management of their interior waters and territorial sea, with some exceptions.

On the other hand, Spain, due to its geographical location between two seas, has been a place of passage for civilizations since ancient times. This means that the waters off the Spanish coast, especially on the Mediterranean coast, are home to a large number of shipwrecks and wrecks from all periods. If we leave the Mediterranean area, Spanish Underwater Cultural Heritage (hereinafter UCH) faces another particularity and that is the number of wrecks and shipwrecks of Spanish ships all over the world.

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<sup>3</sup> Articles 148 and 149 of the Spanish Constitution.

Although it is outside the Mediterranean, it exemplifies the difficulty of managing this heritage for the Spanish administration and the need to create specific tools.

### The national plan for the protection of underwater archaeological heritage

The National Plan or National Strategy (hereinafter NP) arose because of Spain's ratification of the 2001 UNESCO Convention for the Protection of the Underwater Cultural Heritage. The approval of this Convention was not easy. It was motivated by the doubts that had come up from the 1982 UN Convention on the Law of the Sea (UNCLOS), a text that establishes the rules governing the maritime traffic, rights and obligations of States over the sea and its resources, widely ratified by 169 countries around the world (with notable absences, such as, for example, Colombia or the United States). This text left out, or did not focus sufficiently on underwater heritage, so the UN Culture section drafted a text that took years to be approved and even longer to enter into force. The Convention was adopted on 3 November 2001 at the 31st session of the UNESCO General Assembly. It did not enter into force until 2009, when it was ratified by 20 countries. This shows the difficulty of ratifying this text, which today has 76 Member States (with notable absences, such as Colombia, the United States and a large number of European countries). And this difficulty stems from the obligations deriving from a text that, in many cases, contravenes some countries' own legislation. Only countries with a long tradition in the management of cultural heritage in general consider the ratification of this Convention as something fundamental and in line with internal procedures for action. Moreover, the research and conservation of this heritage requires a large economic investment, which is not always accessible. It is therefore not possible in many countries to adopt a text that excludes or severely limits the involvement of private companies. Even so, great efforts have been made and we find broad ratification in the Latin American countries group, with 21 countries out of 33, and in the Arab countries<sup>4</sup>.

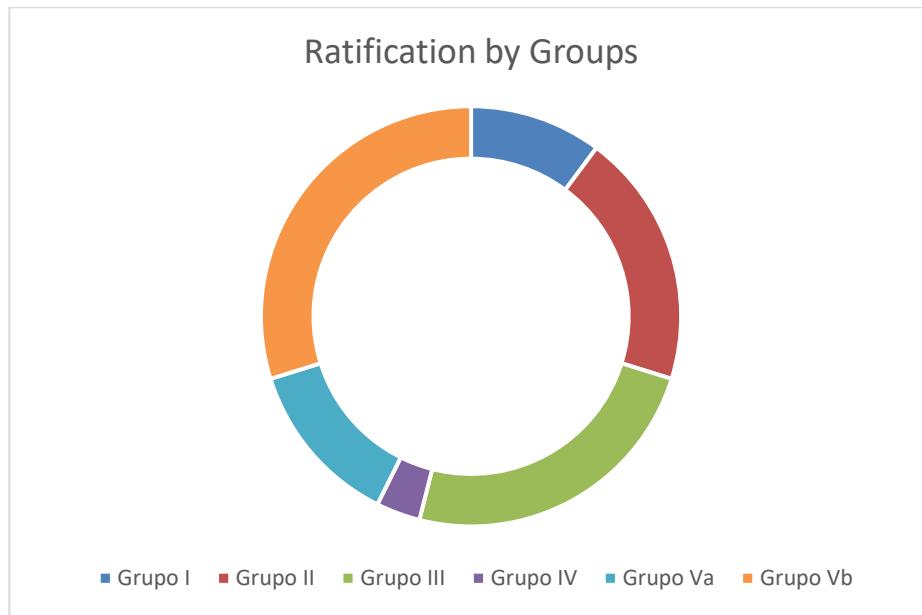


Table 1. Ratifications by Groups

<sup>4</sup> From Group Vb, Arab States, 16 out of 47 have ratified.

Spain was one of the first countries to ratify the Convention, in 2005. From that moment on, a commission was set up to draft the National Plan, which was approved at the Historical Heritage Council<sup>5</sup> held in Cartagena (Murcia) in October 2007, and subsequently approved by the Council of Ministers. The basis for the National Plan was the *Decalogue of measures for the protection of underwater archaeological heritage*.



Figure 1. National Plan cover, with the picture of Mazarrón 2 shipwreck.

From there, a Technical Coordination Commission was created, consisting of representatives of the Autonomous Communities, the Armada, the Civil Guard<sup>6</sup>, the Ministry of Culture and experts in underwater archaeology. It agreed on the creation of a Working Group for the drafting of the Plan,

<sup>5</sup> This is a coordinating body between the National Administration and the Autonomous Communities, for consensual decision-making in matters of historical heritage. It meets twice a year in plenary session.

<sup>6</sup> Civil Guard is one of the national police that exist in Spain. It is the more specialized task force, with a specific group to fight against illicit trafficking of cultural goods and another specific group about underwater activities.

which culminated in the publication of the *Green Book for the National Plan for the Protection of Underwater Cultural Heritage* in 2011. Finally, the drafting and publication of the text of the NP took place in 2015 (Figure 1).

### ***Objectives and basic lines. Structure***

The National Plan was based on the *Decalogue*. Work continued on these initial points until the Plan was put into operation. That has been the turning point in the management of underwater cultural heritage in Spain. The fundamental aim is to become the main tool for coordination between public administrations.

The basic lines that constitutes the Plan are those subscribed to in the *Decalogue of measures for the protection of underwater archaeological heritage*:

1. *Documentation and inventory*: underwater archaeological mapping throughout the country.
2. Creation of an Integrated *Geographic Information System* for Underwater Cultural Heritage (GIS).
3. Commitment by all Public Administrations to declare the most emblematic underwater archaeological areas of our coastline as *Cultural Interest Assets* (or BIC<sup>7</sup> in Spanish)
4. *Physical and legal protection*: development of a surveillance programme in coordination with the State Security Forces to prevent the looting and destruction of UCH sites.
5. *Training and capacity building*: it is essential to promote training plans in Underwater Archaeological Heritage. To this end, the ARQVA in Cartagena should become a national and international reference training centre in the medium term.
6. *Sufficiency of resources*: adequate budget allocations are needed for the Underwater Archaeology Centres in order to have sufficient human and material resources.
7. *Coordination*: an Interdepartmental Commission will be created to coordinate actions in both the territorial sea and the continental shelf, including the Ministries of the Interior, Defence, Transport and the Ecological Transition.
8. Drawing up an action protocol for *port infrastructure* works.
9. Two *agreements*: the Ministry of Culture and the Ministry of Defence will work together to protect the UCH; and, on the other hand, the Ministry of Culture and the Ministry of Foreign Affairs will collaborate to defend Spanish interests in third country or international waters.
10. *Dissemination-awareness-raising*: an effective policy of awareness-raising, dissemination and revaluation of the UCH needs to be developed.

In many cases, these lines have been maintained, strengthened and given substance. At other points, it has been more complicated to develop them, but always with the aim of continuing to work in this direction.

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<sup>7</sup> Bien de Interés Cultural (Cultural Interest Asset): the highest level of protection for Spanish historical heritage assets.

In addition to this Decalogue, two main objectives are set that involve great difficulty and need to be organised: the protection of underwater heritage in Spanish jurisdictional waters and the protection of Spanish underwater heritage in third country or international waters. These two premises give rise to legal, competence and ownership issues within and outside Spain, which make the management of underwater heritage one of the most exciting and complex issues that can be dealt with within the field of culture.

### ***Green Paper and development of the National Plan text***

A Green Paper is a tool that sets out the guidelines for action and protocols to be followed in a specific area. This document is the agreed commitment of all the institutions involved and the Autonomous Communities to develop programmes for the documentation, conservation, intervention and dissemination of underwater heritage, as well as its legal protection. All of this, following the provisions of the Annex to the UNESCO Convention on Underwater Cultural Heritage. It also points out the importance of training future generations of archaeologists and specialists. The Green Paper of the National Plan for the Protection of Underwater Cultural Heritage was presented to the Historical Heritage Council meeting in Mallorca on 16 and 17 July 2009, where it was approved.

It is structured according to the points stipulates in the Decalogue, to which it proposes specific actions, possible variables and short-term objectives. It is a document that has been found to be very useful, although it needs updating and a more specific definition in some areas. At the end of the text there are proposals for priority action made up of 32 points and structured in 8 thematic blocks, ranging from the provision of infrastructure to the institutions responsible for management and intervention in underwater cultural heritage, to dissemination and monitoring. These are starting points which, although ambitious, mark out essential lines of action. Currently, like the whole text, it is under revision, although we can affirm that many of these objectives have been fulfilled and/or are under development. It is available on the website of the Ministry of Culture, both in Spanish and English<sup>8</sup>.

### ***Establishment of the Scientific Monitoring Commission and the Interdepartmental Commission***

The National Plan includes the creation of an Interdepartmental Commission which is articulated within the need for coordination.

#### *"6. Interdepartmental coordination commission.*

*The Government, at the initiative of the Ministry of Culture, shall set up within three months an interdepartmental Commission for the coordination of actions in the territorial sea or continental shelf carried out by the competent Ministries so that these activities always take into account the protection of Underwater Cultural Heritage".*

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<sup>8</sup> Versión en español: <https://www.cultura.gob.es/dam/jcr:efac46e1-09d0-4abd-8d76-e42868c5b129/green-paper--national-plan-for-the-protection-of-u.pdf>.

English version: <https://www.cultura.gob.es/dam/jcr:efac46e1-09d0-4abd-8d76-e42868c5b129/green-paper--national-plan-for-the-protection-of-u.pdf>

In addition, the establishment of a Scientific Monitoring Commission for the NP is provided for in the Green Paper (Libro Verde: 99).

#### *H. Monitoring.*

*32. The Ministry of Culture, with the aim of continuously monitoring the achievement of these proposals and, in general, of the principles set out in the Green Paper, will set up a Monitoring Commission for the National Underwater Archaeology Plan.*

Both commissions are tools for cooperation, collaboration and communication between the different administrations involved. They are also mechanisms for the approval and ratification of projects and decisions in the field of underwater heritage. They have proved to be really useful, as they provide information on the actions carried out in this area, as well as on the most conflictive points of concern.

Starting with the Scientific Monitoring Commission. The first meeting took place on 15 June 2010 at the National Museum of Underwater Archaeology ARQVA (hereinafter ARQVA). It is currently chaired by the person in charge of the Directorate General of Cultural Heritage and Fine Arts, Mr. Isaac Sastre de Diego, with the Deputy Director General for the Management and Coordination of Cultural Assets as vice-chair, Ms. María Agúndez Lería. The members are divided between the director of ARQVA, Rafael Sabio González, the heads of the Underwater Archaeology Centres of the Autonomous Communities, Rut Geli for Catalonia, Asunción Fernández for the Community of Valencia and Milagros Alzaga for Andalusia, as well as the heads of AECID, Mr. Santiago Sierra, and three external experts<sup>9</sup>. This Commission meets twice a year, dealing with all matters of interest related to underwater heritage. Its composition is currently under review, in order to give more presence to key institutions such as the Guardia Civil (or Civil Guard) and the Armada, as well as to give more weight to the presence of members of Culture, other sectors involved, such as national archives, and other ministries, such as those related to the environment and climate change.

The Interdepartmental Commission, however, meets once a year. Its purpose is to follow up on the partnership agreements signed within the framework of the NP between different ministries.

#### ***Basic content of the Plan. Point to point***

*Moving forward on the content of the NP, we will make an analysis of the current situation, as well as those items that have been developed and those that require further implementation.*

#### ***Collaboration***

As already mentioned, collaboration between public administrations for this type of heritage is a key point. To this end, collaboration agreements have been signed with several public administrations:

- With the Autonomous Communities: mainly focused on the preparation of underwater archaeological maps, which is generally the jurisdiction of the Autonomous Communities. The National Plan offers collaboration, both in terms of technical and economic resources.

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<sup>9</sup> Currently the experts are: Mariano Aznar Gómez, Carlos de Juan and Rafael Ruiz Manteca.

- With the Ministry of Defence, and in particular the Armada, a key player in the management of the UCH. According to both UNCLOS and the Maritime Navigation Act<sup>10</sup>, State-flag ships are Armada vessels, as well as warships and maritime tombs. Which makes it necessary to have the Armada's authorisation and involvement for research or access of any kind<sup>11</sup>. The Armada, through its Institute of Naval History and its Archives, has a huge amount of documentation on wrecked ships and vessels, as well as specialists and equipment to carry out underwater interventions, to which the professionals of the Armada's Diving Centre are attached.
- With the Ministry of the Interior, aimed mainly at the application of the SIVE programme (Integral System of External Surveillance) to the protection of underwater archaeological heritage. This agreement has given rise to a close relationship of collaboration with different units of the Guardia Civil. With the Central Operational Unit, we work hand in hand when there are criminal indications on underwater heritage. It is the Guardia Civil that has the jurisdiction to act on criminal activities at sea and on the protection of historical heritage, which is why they are a main ally. In addition, the UAS (in their Spanish initials), the Underwater Activities Unit, currently collaborates closely in the verification, inspection and monitoring of sites and casual discoveries of underwater archaeological material, together with the technicians of the Ministry of Culture.
- With the Ministry of Foreign Affairs, European Union and Cooperation. This agreement serves as a framework for establishing permanent collaboration and coordination mechanisms in the area of UCH protection, especially when it is in international waters or in waters subject to the sovereignty or jurisdiction of third countries. The large presence of ships in the territorial waters and continental shelves of different countries requires the action of Spanish diplomacy and the signing of collaboration agreements, in the form of Memorandum of Understanding, with numerous states. Spain currently has agreements of this type on underwater heritage with, for example, Mexico, the US NOAA Agency, Panama and Croatia.

### ***Documentation and inventory and GIS***

This is one of the most complicated items to comply with, due to the division of powers between the State and the Autonomous Communities. Many Autonomous Communities have worked intensively on their underwater archaeological maps, achieving great results. In others, less progress has been made. As far as the National Administration is concerned, two important milestones have been achieved in recent years in terms of the creation of inventories and databases. On the one hand, a database has been created as a result of archival research that gathers information on the wrecks of Spanish state ships sunk all over the world. In addition to a database, it has been translated into a GIS. On the other hand, the sites present in Spanish continental waters and in the Hydrographic Confederations<sup>12</sup> have been documented and inventoried, also in a database and a GIS. Both tools are basic and highly operational. Gradually, progress will be made towards a more complete map of the sites, shipwrecks and submerged infrastructures of Spanish heritage.

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<sup>10</sup> Law 14/2014, of 24 July, on Maritime Navigation.

<sup>12</sup> Administration in charge of the management of rivers.



Figure 2. Campaign of documentation of an archaeological find in Cartagena (Carlos Andrés).

In addition, the Ministry of Culture has launched a project to review and update the data in the archaeological map of the Region of Murcia (Figure 2), through the verification of anomalies detected by multibeam survey and through the inspection of findings made by civil society and reported to administrations. To date, the project is only being applied in the Region of Murcia, as this is where the ARQVA is located, but the Ministry offers its collaboration to all the Autonomous Regions to carry out this work in their territories.

### ***Training and capacity building***

Since the publication of the Plan, numerous training courses have been held, both theoretical and practical, aimed at personnel from the Armada, the Civil Guard, students and archaeologists from all over the world. The last of these courses was the *II Interministerial Course on the Protection of Underwater Cultural Heritage*, held in Cartagena on 27 and 28 June 2023. The course was a success, recognized by all the attendees and speakers, making clear the vocation for collaboration that arises from the implementation of the Plan.

However, the practical training of Ministry of Culture staff is also of particular importance. Due to the increase in staff in recent years in the Ministry of Culture, with a greater presence of archaeologists, it

was decided to create a group of technicians to be trained in underwater archaeologist. This allows the National Administration to have its own resources, without having to resort to external contracting, which means a more efficient management of public resources. Gradually, a group of six archaeologists is being trained to complement the existing staff. This training is being carried out with the invaluable collaboration of the GEAS<sup>13</sup> of the Guardia Civil.

### ***Sufficiency of resources, Centres for Underwater Archaeology (CAS) and collaboration with the Autonomous Regions***

The Centres for Underwater Archaeology (CAS) do excellent and exemplary work in the protection and management of this heritage. As coordinators of the NP it is our duty to support the work of the CAS.

In this sense, it is worth mentioning the ARQVA, a fundamental pillar in the management of underwater heritage. Great professionals work in its facilities, from the point of view of museum management as well as from the ARQVATec research and restoration centre. Currently, this museum is the main point of dissemination and awareness of underwater cultural heritage, but not only. It is also a research centre, from which they participate in prospecting and excavation campaigns of shipwrecks; it is the reference institution when it comes to issuing technical reports on issues related to the treatment of materials from the underwater environment.

ARQVATec has latest technology equipment for the treatment of submerged materials, recently the Ministry of Culture has acquired a freeze-dryer over 5 meters long and almost two meters in diameter. And when there is none equipment, it is created, such as the computer which was created specifically for the identification and inventory of the coins from the frigate Nuestra Señora de las Mercedes. The aim of this National Plan is to provide ARQVA with the resources to act as the Underwater Archaeology Centre of the National Administration, as the technical-executing arm of interventions in underwater heritage. ARQVA also acts as a support centre for interventions both on sites and directly on submerged cultural assets, when required by other administrations. And let's not forget that it has been recognised as Best Practice by the 2001 Convention in 2021.

### ***Collaboration with Ports***

This section is the weak point of the National Plan. According to Law 16/85 of 25 June 1985 on Spanish Historical Heritage, historical heritage assets, including underwater archaeological sites, within the boundaries of National Ports are the responsibility of the National Administration, in this case, the Ministry of Culture. Article 42 of the same law establishes that any archaeological intervention must be authorised by the competent administration. In the case of National Ports, again by the Ministry of Culture. However, the complexity of the organisation of National Ports and the fact that they are bodies that act autonomously makes it complicated to have protocols for action for all ports: in some cases, we work in collaboration; in others, we do not manage to obtain a response from them.

However, knowing that this is one of the undeveloped aspects of the Plan, it is also one of the strong items to be reinforced and on which to focus the lines of work.

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<sup>13</sup> GEAS are in their Spanish initials: Grupo Especial de Actividades Subacuáticas or Special Force for Underwater Activities.

### ***Outreach-awareness-raising***

Finally, the dissemination and awareness of the National Plan is the most developed and most rewarding section. Through courses, conferences, exhibitions and activities of all kinds, the underwater cultural heritage is disseminated among society, creating the awareness that it is more than the "pirate treasure" that we have seen hundreds of times in the cinema or on television.

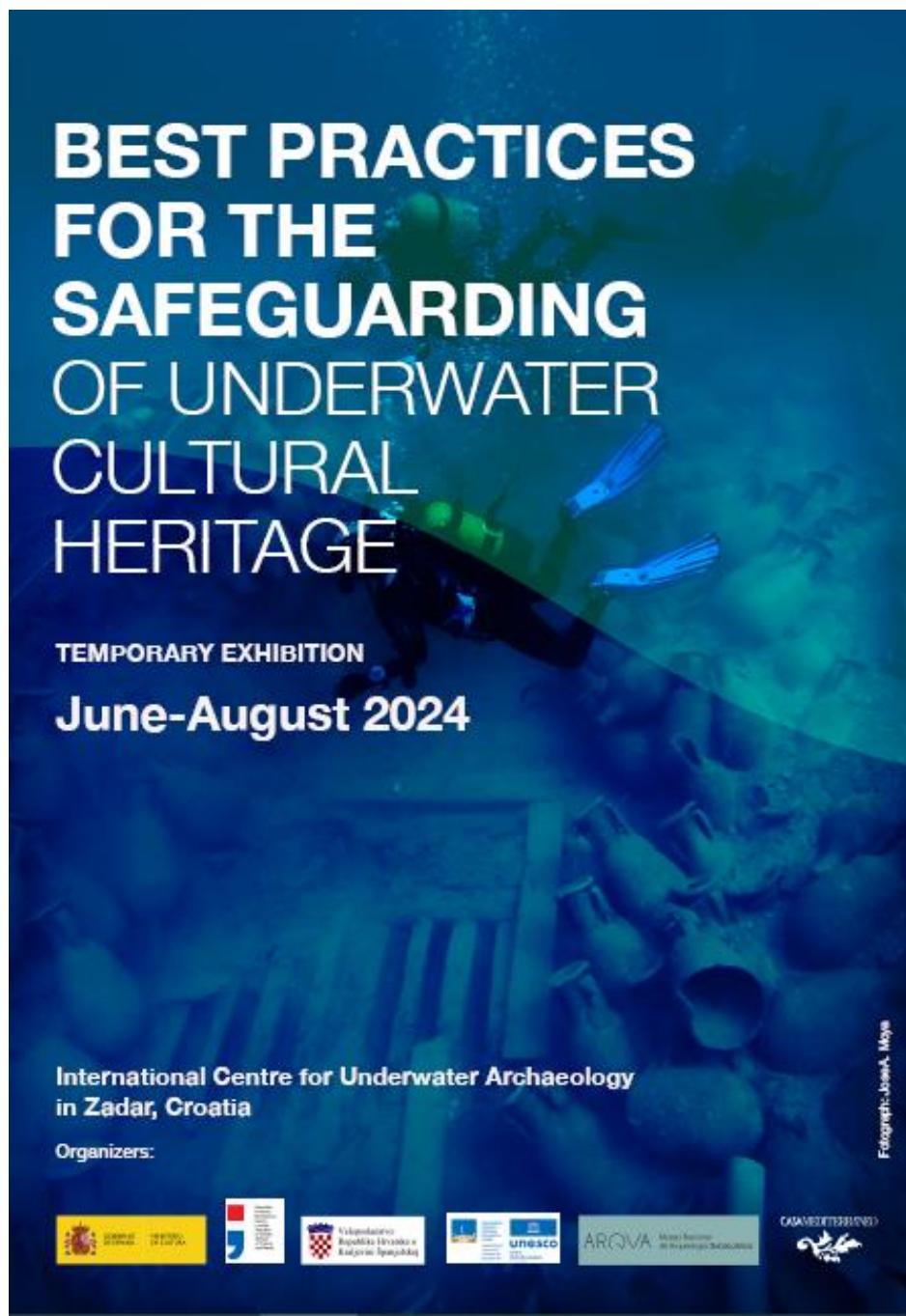


Figure 3. Poster of the exhibition held in ICUA, Zadar (Croatia).

ARQVA, through its exhibitions and dissemination activities, is the main supporter of this line of action. Exhibitions such as *Science versus Looting*, in 2018, or the exhibition on Nuestra Fragata de las Mercedes held at the National Archaeological Museum in Madrid in 2015<sup>14</sup>. In 2023, the international project on the frigate Nuestra Señora de las Mercedes was launched, in collaboration with Uruguay, Chile, Bolivia and Mexico, which will culminate in 2025, *Nuestra Señora de las Mercedes. A common history* (Sabio et alii 2024)<sup>15</sup>.

And not only through these activities. Through its publications it disseminates aspects related to underwater heritage, such as the *Cuadernos de Arqueología Marítima*, which were published between the 1990s and the first decade of the 2000s. Or the new NANS, *Noticiario sobre Arqueología Náutica y Subacuática* (Nautical and Underwater Archaeology Newsletter), which brings together contributions from experts on subjects related to underwater archaeology (Sabio and Ramírez 2022).

The Deputy Directorate for the Management and Coordination of Cultural Assets also works actively to disseminate underwater archaeological heritage through a responsible approach to heritage, which values the work of recovery and research, as well as its protection against looting and treasure hunters. The exhibition on *La Flota de Nueva España: the search for Nuestra Señora del Juncal*<sup>16</sup>, which took place at the Archivo General de Indias in Seville between 2021 and 2022, and at the Museo de América in 2022. This exhibition, the most visited at the Archivo de Indias, was held in collaboration with AECID, AC/E and the Mexican INAH, as well as with the collaboration and loan of pieces from numerous Spanish museums. Other projects to raise the visibility of the UCH in the international level, such as the exhibition of *Good Practices of Underwater Cultural Heritage of the 2001 Convention* at the ICUA in Zadar, Croatia, between June and August 2024<sup>17</sup> (Figure 3).

Courses, international congresses and meetings complete a range of activities to disseminate and raise awareness of this heritage. Currently, one of the objectives of the plan is to disseminate Spanish underwater heritage beyond our borders. Thus, the Ministry of Culture is participating in international forums, such as the *Congress on the Spanish Armada* held in Sligo (Ireland) in May 2023. Or the organisation of the *Western Europe and North America Regional Meeting of the 2001 Convention* held in June 2024 in Madrid.

We believe that the NP has paid off in terms of social awareness in Spain. This can be seen in the numerous notifications received by the public administrations regarding the presence of cultural property in the marine environment, from recreational divers and private individuals. In this regard, the work done by organisations such as the GEAS with private diving centres should be highlighted. For this reason, it is a priority to achieve this level of awareness outside Spain. And we are on the right track.

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<sup>14</sup> *The last voyage of the frigate Mercedes. A cultural treasure recovered*, <https://www.man.es/man/exposicion/exposiciones-temporales/historico/2011-2020/2014/nsmercedes.html>. English version: <https://www.man.es/man/en/exposicion/exposiciones-temporales/historico/2011-2020/2014/nsmercedes.html>

<sup>15</sup> Our Lady of Mercy. Una historia en común (English version): <https://www.cultura.gob.es/mnarqua/en/actividades/exposiciones-temporales/historico-exposiciones-temporales/2023/exposicion-mercedes-historia-comun.html>

<sup>16</sup> Spanish version: <https://www.cultura.gob.es/cultura/areas/patrimonio/mc/patrimonio-subacuatico/actuaciones/juncal.html>

<sup>17</sup> <https://www.icua.hr/en/article/opening-of-the-exhibition-best-practices-for-the-safeguarding-of-underwater-cultural-heritage/611>

We cannot fail to mention the Good Practice projects recognised by the 2001 Convention, of which Spain has six of the twelve projects included. This recognition involves the promotion of a series of research and dissemination projects to show society the value of underwater heritage.

### ***Conclusions: review and options for improvement***

Throughout the text, the specific points on which the National Plan for the Protection of Underwater Cultural Heritage focuses have been described. Its creation and implementation has been outlined, based on all the organisations and administrations working on it. It has been a turning point, has been praised by the Secretariat of the 2001 Convention and has served and continues to serve as a reference for similar documents in European and Latin American countries.

But it is not perfect. We know where it is lacking, where there is room for improvement and where it has been left out or poorly drawn. The National Plans must be living and dynamic documents, not static and fixed. They must adapt to legislative changes and, above all, to changes in the paradigm of underwater heritage. Spain's position, as a State administration, and the resources currently dedicated to this heritage are many and this must be reflected in the National Plan. For this reason, its text and implementation tools, such as the Monitoring Commission, are currently under review.

Most of what was defined as priority lines of action in the Green Paper thirteen years ago are still in place. And new ones have been created. Among them, the following should be highlighted:

- To strengthen ARQVA's role as the National Administration's Underwater Archaeology Centre, as a support centre for interventions and actions in underwater heritage throughout the country and beyond. For this, technical and human resources are mainly necessary.
- Strengthen the relationship with other National Administration bodies, such as the State Ports and the Hydrographic Confederations.
- Promote the development of underwater archaeological maps and the creation of inventories.
- Generate own resources within the administration itself, in order to reduce dependence on private institutions and personnel.
- Create protocols for action in underwater interventions that, following the Annex to the Convention, ensure the presence of all the necessary professionals to guarantee quality projects.
- To protect underwater heritage beyond the maritime heritage, that which is present in inland waters, through specific action protocols, interventions and monitored follow-up for the periods in which it emerges and in which it is submerged.

These objectives are not new, they are present throughout the text, from beginning to end. Currently, the Ministry of Culture has more resources for the implementation of the Plan. Resources that are not merely economic, but also in terms of personnel dedicated to underwater heritage. This has made it possible to apply the competences that the legislation grants to the State Administration.

But underwater heritage cannot be seen as limited areas for intervention. Its universal character, its presence in an environment that knows no borders, means that collaboration continues to be the main line of defence and protection of heritage. And the National Plan is the main ally.

## **The ship Mazarrón 2 as an example of collaboration in the state framework**

The project for the extraction and conservation of the Shipwreck Mazarrón 2 is, without a doubt, one of the most active lines of work at present, within the national scope. As well as a good example of coordination of the National Administration with the Autonomous Communities which, from a general point of view, currently receive the majority of the competences in archaeological matters in Spain. The wreck is located in the Autonomous Community of the Region of Murcia, which is the owner of the wreck, responsible for its declaration as an Asset of Cultural Interest and, ultimately, the body with the power to decide where it should be deposited after its extraction. Nevertheless, in an exemplary and uninterrupted manner, this administration has demonstrated a firm will to make decisions in a joint and coordinated manner with the National Administration.

The ship in question consists of a shallow-draught vessel about 8 metres long, which has been dated to between the 7th and 6th centuries BC (Negueruela 2004; Negueruela, 2014; Miñano 2014). Both for the period and the construction technique, it has tended to be associated with Phoenician culture, although it would have been used to move loads over short distances, although it is not ruled out that it belongs to an indigenous culture or that it was made locally by western Phoenicians (Pomey and Rieth 2005; De Juan 2017; De Juan 2023).

The wreck was found in 1994, on the beach of La Isla, in the Murcian municipality of Mazarrón, from which it derives its name. In the same place, in 1988, a team of archaeologists from the then National Museum of Maritime Archaeology and National Centre for Maritime Archaeological Research discovered a vessel of similar characteristics, but in a more partial state of preservation (Negueruela et alii 1995). It was precisely during the work related to the extraction of what was known as the Mazarrón 1 wreck when, in a visual exploration of the surroundings, the remains of this new ship were located. In order to safeguard the unique ensemble, it was decided to protect it with a metallic structure that would facilitate the excavation process of the site, between 1999 and 2001, as well as the conservation of the ship in the medium term (Negueruela 2000).

During the excavation process, an area was detected in which there had possibly been an action of spoliation, partially affecting the stratigraphy that covered the remains of the ship (Negueruela 2004: 233). In contrast, in the rest of the ship, this stratigraphy was completely preserved, revealing a level of *posidonia oceanica* of ancient chronology that evidenced the rapid process of silting up of the wreck, which could justify its good state of preservation. Below the wreck, a coherent group of cargo and associated ship's gear and accoutrements was documented.

The cargo consisted almost entirely of a set of litharge blocks of local origin, which must have been used to transport the vessel at the time it sank. In relation to the belongings associated with the crew, we should mention the presence of ceramic and basketry pieces, very possibly intended for storing the provisions. Outside the ship and also covered by the protective structure, an interesting example of an anchor is revealed, which is among the earliest preserved, already associated with the forms and elements of the types used during the following centuries (Sabio 2024: 43). It would have been composed of two curved pieces of wood which, joined together, would have formed the shank and the two arms. A third piece of wood would pass through the two previous ones, acting as a trap. Both the nails at the end of the arms and the trap would be filled with lead, which would make them easier to sink and at the same time make them sturdy. During the excavation process, all the elements associated with the cargo and belongings would be removed, while the remains of the vessel and the anchor would be kept in situ.

After the end of the excavation campaigns, the ship was protected and the box was closed, and a series of regular inspections were carried out between 2001 and 2005 to evaluate its evolution. In 2008,

coinciding with the inauguration of the new ARQVA, the box was opened and a complete photogrammetry and drawing of the vessel was carried out. From this moment until 2019, the inspections would be more punctual, with periodic inspections being recovered from that year onwards until the present day.

In order to define the perspectives on the treatment to be given to the remains of the ship Mazarrón 2 in the long term, the Ministry of Culture would plan the organisation at ARQVA of the so-called International Meeting of Experts on the extraction and conservation of the wreck Mazarrón 2 (hereinafter RIE). These would take place in May 2022, with the attendance of many national and international professionals, who would address, after a preliminary session and over five sessions, issues such as ethics and deontology, international projects, Spanish projects, the extraction and conservation of archaeological vessels (Buendía, Pérez and Castillo 2022; Castillo, Pérez and Buendía 2022; Buendía, Castillo, Pérez and Sabio in press).

Among the conclusions reached, it was agreed that the extraction of the wreck was necessary, due to the risk to its conservation posed by changes in the coastal dynamics, together with the effect of the virulent climatic events of the DANA type<sup>18</sup>, which have been witnessed in the area. In relation to the extraction procedure, different alternatives would be shown, ranging from block extraction to fragmentation, the latter under different options. With regard to museum display, the preferred option for the representatives of both the regional and state administrations was the presentation of the group in the ARQVA museum, together with the remains of the Mazarrón 1 wreck, which are already on display there. Finally, emphasis would be placed on the monitoring of the ship both during its treatment and later during its public exhibition. The proceedings of the meeting would be published by the Ministry of Culture in 2023 (Arcos, Castillo and Cantero 2023).

As a result of the RIE, and as a tool for coordinating the work, a working group was set up comprising the Ministry of Culture, the ARQVA museum, the Autonomous Community of the Region of Murcia and a series of external experts. At the same time, a series of preliminary studies were to be carried out on the wreck, mainly aimed at carrying out a new photogrammetric study of the ship's structure, as well as taking samples, both of the wreck and of the environment in which it was found. Part of the conclusions drawn from both studies would allow the precise determination of the extraction system to be used on the wreck.

After various imponderables, the works were finally carried out in May 2023, by means of an agreement established between the Autonomous Community of Murcia and the University of Valencia, with the archaeologist Carlos de Juan in charge of the direction of the works. The Ministry of Culture would also be represented by two ARQVA technicians: the archaeologist Rocío Castillo and the restorer Milagros Buendía. During the two weeks that the intervention lasted, the first few days were devoted to the complex reopening of the box, as well as to the removal of the contributions that had been used to protect the boat (Figure 4). Once the entire structure had been uncovered, photogrammetry of the vessel was carried out. At the same time, tests were carried out with two types of moulds: rigid ones, made of carbon fibre, by Marco Ciabattoni, from the Higher Institute for Conservation and Restoration in Rome; and other soft ones made of silicone, by Luis Carlos Zambrano, from the Museum of Cádiz. Ultimately, ARQVA technicians would carry out the sampling necessary to obtain data on the environment of the wreck and the characterisation of the ship's wood.

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<sup>18</sup> Heavy cold drop storm.



Figure 4. Preliminary studies campaign on the Mazarrón 2 wreck, in May 2023 (José Antonio Moya University of Alicante).

In relation to sampling, the analysis of the environment would be divided into two parallel tasks: on the one hand, Nuria Guasch, from the University of Barcelona, would be entrusted with the analysis of the sediment and the geological substratum. At the same time, Teresa Doménech, from the Polytechnic University of Valencia, would be responsible for the analysis of the aqueous medium (Doménech et alii 2024). As far as the characterisation of the wood was concerned, it would end up falling to the team led by Juan Ignacio Fernández-Golfin Seco, from the Consejo Superior de Investigaciones Científicas (Spanish National Research Council). In parallel to this work, José Luis Casabán reprocessed the photogrammetry carried out in 2008 (Casabán 2008).

The extraction project, drafted by Carlos de Juan, would follow on from the previous studies and would be completed in late 2023. In the project, it was finally decided to extract the ship in fragments. This would be based on the multiple fractures that could be documented in its structure during the photogrammetry work carried out in May 2023. After their detailed analysis, a mapping of those fissures that best suited the configuration of the total of 22 fragments in which the extraction of the ship is planned (Figure 5) would be generated. Similarly, and after considering the data obtained from the previous test on the structure of the ship, it was decided to use the rigid carbon fibre moulds proposed by Marco Ciabattoni for the extraction of the stem, the sternpost and the longitudinal centre of the wreck (keel, cockpit and rigging strakes). At the same time, the frames, together with the remains of the bindings, will be extracted by means of a resin bandage formwork.

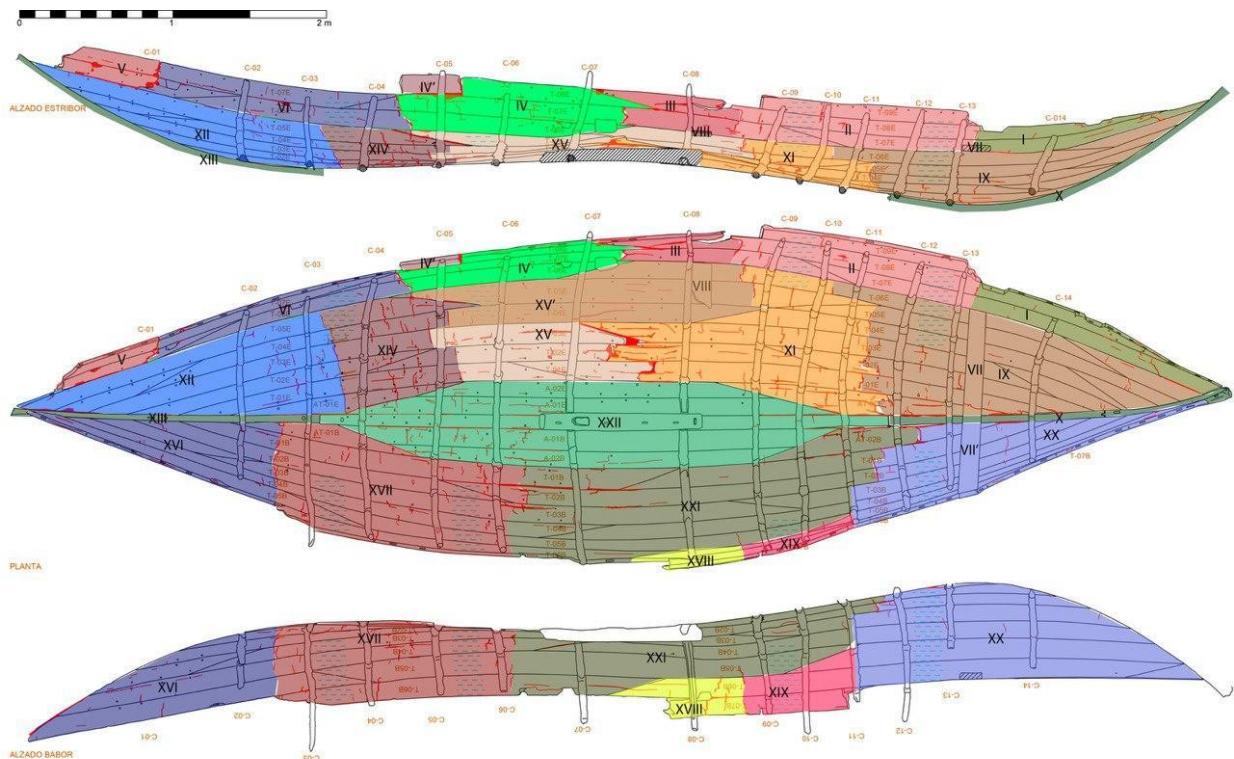


Figure 5. Mapping of the fragments in which the Mazarrón 2 wreck is to be extracted (Carlos de Juan University of Valencia).

In parallel to the drafting of the extraction project, the team from the University of Valencia and the management of ARQVA began to coordinate with the aim of defining the needs derived from the conservation treatment of the ship in the facilities of the latter institution, and more specifically in the laboratories of its headquarters in the Cabezo Beaza industrial estate: ARQVAtec (Figure 6). An imponderable derived from the extraction system adopted would be the possibility of subjecting the remains of the ship to a freeze-drying treatment. The limited capacity of the ARQVA freeze-dryer, together with its obsolescence, led to the decision by the Directorate General for Cultural Heritage and Fine Arts of the Ministry of Culture to invite tenders for the design and construction of a new one, through the Ministry's Department of Cultural Infrastructure and Equipment. The timeframe for the freeze-drying of the ship, after its extraction, exceeds two years, which allows for the execution of this ambitious project, which will provide ARQVA with one of the most modern and highest capacity archaeological freeze-drying equipment in the world.



Figure 6. General view of the ARQVAtec restoration laboratory (Lorenzo Plana ARQVA Photographic Archive).

Other issues of more immediate resolution, but also subject to their necessary provision in a shorter period of time, would be the adaptation of ARQVAtec's facilities and equipment to the arrival of the ship, as well as the necessary supply of the necessary products or the presence of support personnel for specific tasks during the treatment. With regard to equipment, the Deputy Directorate General for the Management and Coordination of Cultural Heritage of the Ministry of Culture has managed the acquisition of a new filtering system for the tanks in which the ship will be desalinated and impregnated during the first phases of its treatment. Likewise, the Deputy Directorate General of State Museums has been in charge of adapting the tanks to the new filtering system, as well as the acquisition of a new loader that will allow the handling of the frames through which the fragments of the wreck will be introduced into the aforementioned tanks. As far as the products or human resources are concerned, the Deputy Directorate General for the Management and Coordination of Cultural Heritage, with funds from the National Plan, is developing the tender for a project that will allow the external contracting of a company capable of satisfying both needs simultaneously, for the total number of years that the treatment of the ship will last.

The phases following the extraction of the boat by the University of Valencia team and its transfer to ARQVAtec will therefore consist of its gradual desalination and impregnation in polyethylene glycol (PEG) for approximately 2-3 years. After that, the whole will undergo freeze-drying treatment. Once all these operations have been completed, the owner of the object, the Autonomous Community of the Region of Murcia, will have to decide on its final destination. In the case of ARQVA, the renovation of its museographic discourse will have to be studied in order to contemplate the integration of the Mazarrón 2 ship. The ideas being considered in this respect are its inclusion in the current permanent exhibition rooms, if not the creation of a new space specifically for the exhibition of the ensemble, made up of the two Mazarrón ships (Roldán and Sabio 2023). In any case, the process to achieve this final objective is still a long one, and the joint efforts of the administrations involved must be focused on the success of the phases linked to the extraction and treatment of the ensemble.

## Bibliography

AA.VV. 2011. *Green Book for the Protection of Underwater Archaeological Heritage*. Madrid: Ministerio de Cultura y Deporte.

AA.VV. 2015. *Plan Nacional para la Protección del Patrimonio Arqueológico Subacuático*. Madrid: Ministerio de Cultura y Deporte.

Arcos, M., Castillo, R. and Cantero, C. 2023. *Actas de la Reunión Internacional de Expertos sobre la extracción y conservación del pecio Mazarrón 2*. Madrid: Ministerio de Cultura.

Aznar Gómez, M.J. 2004. *La Protección Internacional del Patrimonio Cultural Subacuático con especial referencia al caso de España*. Valencia: Tirant Lo Blanch.

Buendía, M., Castillo, R., Pérez, S. and Sabio, R. (in press). La gestión de un proyecto integral de investigación, extracción y conservación, in *X Congreso Internacional de Estudios Fenicios y Púnicos*. Ibiza: Govern Illes Balears.

Buendía, M., Pérez, S. and Castillo, R. 2022. International Meeting of Experts on the extraction and conservation of the ship Mazarrón 2 (Playa de la Isla, Mazarrón, Murcia, Spain)". *WOAM Newsletter* 62: 6-12.

Casabán, J.L. 2023. Resultados preliminares del reprocesado del modelo fotogramétrico del pecio Mazarrón 2 (2008): secciones, plano de formas y análisis hidrostático. *NANS*, año 1(10).

Castillo, R., Pérez, S. and Buendía, M. 2022. Reunión Internacional de Expertos sobre la extracción y conservación del barco Mazarrón 2 (Playa de la Isla, Mazarrón, Murcia, España). *NANS*, año 0(5).

De Juan, C. 2017. Los pecios de Mazarrón y la familia arquitectónica ibérica. Los ejemplos más antiguos de la arquitectura naval indígena en la Península Ibérica, in M. Martínez Alcalde, J.M. García Cano, J. Blánquez Pérez and A. Iniesta Sanmartín. (eds.) *Mazarrón II: contexto, viabilidad y perspectivas del barco B-2 de la bahía de Mazarrón: en homenaje a Julio Mas García* (2013): 229-251. Madrid: UAM Ediciones.

De Juan, C. 2023. Hacia la recuperación de un pecio amenazado, in *XXIX Jornadas de Patrimonio Cultural*: 27-34. Murcia: Región de Murcia.

Doménech, M.T., Guasch, N., Álvarez, C., Castillo, R., Pérez, S., Buendía, M. 2024. Study of the Geological Context of the 7th–6th Century BC Phoenician Era Shipwreck “Mazarrón 2” (Murcia, Spain). *Minerals* 2024, 14: 778.

Miñano, A.I. 2014. El barco 2 de Mazarrón, in *La fragata Nuestra Señora de las Mercedes. Recovered underwater heritage* [Microsite], viewed 23 March 2023, <<http://www.culturaydeporte.gob.es/fragatamercedes/dam/jcr:8af3ffff-0e26-426f-8d34-d4e5b2d273cc/barco-mazarron-2.pdf>>

Negueruela, I. 2000. Protection of shipwrecks: The experience of the Spanish National Maritime Archaeological Museum, in M. Hassan, N. Grimal, D. Nakashima (eds.) *Underwater Archaeology and Coastal Management. Focus on Alexandria*: 111-116. París: UNESCO.

Negueruela, I. 2004. Hacia la comprensión de la construcción naval fenicia según el barco “Mazarrón-2” del siglo VII a.C., in V. Peña, C. G. Wagner and A. Mederos (eds.) *La navegación fenicia. Tecnología naval y derroteros*: 227-278. Madrid: Centro de Estudios Fenicios.

Negueruela, I. 2014. The Phoenician Ships of Mazarrón, in J. Aruz, S.B. Graff, Y. Rakic (eds.) *Assyria to Iberia at the Dawn of the Classical Age*: 243-245. New York: The Metropolitan Museum of Art.

Negueruela, I. et al. 1995. Seventh-century BC Phoenician vessel discovered at Playa de la Isla, Mazarrón, Spain. *International Journal of Nautical Archaeology* 24: 189–197.

Pomey, P. and Rieth, E. 2005. *L'archéologie navale*. Paris: Errance.

Portela Vázquez, E. 2011. La Convención de UNESCO para la Protección del Patrimonio Cultural Subacuático. Principios Generales. *Cuadernos de Derecho Transnacional* 3(2): 317-337.

Roldán, M. and Sabio, R. 2023. Mazarrón 2: La Reunión Internacional de Expertos como derrotero para un dilema museístico, in M. Arcos, R. Castillo y C. Cantero (coords.) *Actas de la Reunión Internacional de Expertos sobre la extracción y conservación del pecio Mazarrón 2*: 9-11. Madrid: Ministerio de Cultura.

Sabio, R. 2024. La arqueología subacuática. Una visión desde el Museo Nacional de Arqueología Subacuática, in Víctor Bello (ed.) *La historia naufragada. Estudios sobre arqueología subacuática*: 15-68. Tenerife: Mercurio.

Sabio, R. and Ramírez, A. 2022. Noticiario de Arqueología Náutica y Subacuática. *NANS* 0(1).

Sabio, R. et al. 2024. Una historia en común: una exposición itinerante entre España y América. *NANS* 2(4).

*UNESCO Convention on the Protection of the Underwater Cultural Heritage*. 2001.

*United Nations Convention on the Law of the Sea*. 1982.