

# D 4.1.3 ON-LINE STAKEHOLDER MEETING (REGIONAL STAKEHOLDER GROUP)

28.10.2020

## UnderwaterMuse Regional Stakeholder Meeting

Zoom Platform, 28 October 2020 h.10.00

Organized by ERPAC/Informest

10.00	Institutional greetings and presentation of the project	<p><b>Sara Polo</b> Department of Culture, Municipality of Grado</p> <p><b>Simonetta Bonomi, Paola Ventura</b> Superintendence of archeology, fine arts and landscape of Friuli Venezia Giulia</p> <p><b>Boris Dijust</b> President, Informest</p> <p><b>Anna Del Bianco</b> Director of ERPAC - Regional Cultural Heritage Body</p>
10.15	UnderwaterMuse: the objectives, the pilot projects and the relationship with the communities and the territory	<p><b>Rita Auriemma</b> Scientific director of the project, Professor at the University of Salento</p> <p><b>Carlo Beltrame,</b> Professor, Ca 'Foscari University, partner of the project</p>
11.00	<p>Round table with stakeholders</p> <p>Interventions on underwater archaeological sites: the actors involved and a shared operational program</p> <p>Moderated by <b>Andrea Doncovio</b> Journalist, head of the editorial board of IMagazine</p>	
12.15	Closing of the works	

## **Participants**

- ERPAC (project LP): Anna Del Bianco (Director), Caterina Simonit
- Informest (Project Management Support to LP): Boris Djust (President), Giulio Scrima, Claudia Pizzinato
- University Cà Foscari - Venezia: Carlo Beltrame, Elisa Costa
- University of Salento - Region Puglia: Rita Auriemma (Scientific manager of the project), Antonella Antonazzo
- Municipality of Grado – Department of Culture: Sara Polo
- SABAP FVG: Simonetta Bonomi, Paola Ventura
- Diving Club Trieste: Enrico Torlo
- Meraki S.r.l.: Marco Marinuzzi

*Moderator: Andrea Doncovio (journalist)*

**Opening of the works:** Anna Del Bianco (ERPAC Director) introduces the event and presents the UnderwaterMuse project (in the following text UM), of which ERPAC is the Leading Body, and specifies that the project activities in the field will take place in Grado (place where Meeting should have been held). He then passes the word to Sara Polo, councillor for Culture of the Municipality of Grado, who brings the greetings of the Municipality, expresses satisfaction with the choice of Grado as a sponsoring body, hopes for new discoveries and hopes that the videos made during the project will be made available of the public also in the new museum of lagoon civilization, as well as in the museum of underwater archaeology. Finally, she remembers the editions of Mare Nostrum (Festival of the Culture of the Sea held in Grado).

Paola Ventura, SABAP FVG, intervenes in place of the superintendent Simonetta Bonomi who will be present later. She talks about the project already begun with the previous superintendent Azzolini and about the one relating to the museum of Grado which has suffered frequent stop and go; she specifies that the excavation materials of the Grado 1 wreck are being revised, which will find forms of enhancement and that underwater archaeology activities have resumed, thanks to the presence of a SABAP operator (Francesco Dossola). Therefore, protection and research activities are being carried out, even at sea.

Boris Djust (president INFORMEST): thanks everyone and in particular Ms. Sanson. He declares great interest in the project, also for his personal passion for the sea, and believes that it is an excellent example of how to effectively use the funds made available by the EU. The growth of the territory through the enhancement of the underwater heritage is desirable. He himself, having followed this project, will be interested in visiting the work sites.

Anna Del Bianco thanks INFORMEST again for its commitment to supporting the operational management of the project, takes the floor again to introduce Prof. Rita Auriemma (UniSalento), whose work she praises. She recalls the role of ERPAC and stresses that the UM is a challenge for the regional body as the procedural difficulties and relations with the bodies responsible for European planning require added value from a management point of view. In thanking the participants, she hopes that the working day will allow the gathering of ideas and proposals to create opportunities for growth in the area.

Andrea Doncovio, chairman of the meeting, immediately passed the floor to Profs. Rita Auriemma and Carlo Beltrame. In addition to the knowledge of this project, today it is possible to see also all stakeholders involved. He gives the floor to Rita Auriemma (UniSalento) scientific manager of the project, and Carlo Beltrame (Ca 'Foscari University - UNIVE, Partner of the project).

Rita Auriemma presents her slides (PPT)

- UM: the objectives, the pilot projects and the relationship with the communities and the territory. A choral enterprise that goes hand in hand with the exhibition "In the sea of intimacy"; she thanks Anna Del Bianco, who relaunched the project despite the difficulties, including the health emergency. The activities conducted during the summer have been a harbinger of excellent results and demonstrate the validity of the objectives put in place.
- What is UM;
- The specific objectives of UM, very challenging: to bring people to heritage and to bring heritage to people;
- The state of the art with respect to the submerged heritage, not brilliant due to a standstill;
- The challenge of UM: the core of the project are the three pilot interventions that aim at the creation of underwater archaeological parks and blue paths or diffused museums / underwater ecomuseums. Feeling one's heritage also leads to protecting it;
- Why UM now? The project fully responds to a new perception of heritage as a common good and therefore to the principles enshrined in the 2001 UNESCO Convention on the Protection of Underwater Cultural Heritage and above all with the 2005 Faro Convention, recently ratified by Italy, on the value of heritage for the society: individuals and communities can draw benefits from heritage for spiritual, social and economic development; heritage is also an economic resource for sustainable development.
- Archaeology and environment, archaeology of "water landscapes": good practices of in situ conservation and its developments;
- Archaeology and environment, in situ conservation and its developments: underwater tourism;
- UM, macro-activity 3: knowledge of the state of the art through a questionnaire administered to stakeholders; development of augmented reality tools and training;

development of WEB GIS - Map of submerged sites that are actually or potentially accessible.

- Analysis of the responses to the questionnaire: status quo of enhancement. The involvement of stakeholders;
- Bringing assets to people: the other goal of the project. The new frontier of virtual reality;
- The portal being implemented;
- Targeted reconnaissance in Puglia for the implementation of the portal;
- Pilot projects: Torre S. Sabina, Resnik, Grado 2 (for the latter, only preliminary activities were conducted, due to COVID);
- Pilot project, for the creation of blue paths in a complex and stratified (“supersite”) site such as Torre S. Sabina;
- Pilot project of the Resnik site for the blue paths and the virtual use of the site;
- Grado 2 pilot project: in situ musealization.
- Report of the important preliminary actions and consultations;
- The configuration: SABAP is in charge of the intervention (in the person of the Superintendent S. Bonomi), implemented by ERPAC with the scientific advice of 3 Universities: Cà Foscari University, Udine, Salento;
- Review of the various options for the physical protection of the site. For Grado, the modular metal grid system was chosen which guarantees not only protection, but also enjoyment;
- Croatian experiences relating to protection and use;
- Sites registered and protected: in Croatia they are many and can be visited;
- Site map with protective cages and examples;
- Map with sites that can be visited;
- Number of visitors (dating back to a few years ago);
- The intervention strategy for the Grado 2 museum. It is hoped that Grado 2 operations will be conducted with the support and collaboration of all the actors involved.

Carlo Beltrame; Elisa Costa (research fellow)

PPT: underwater archaeological reconnaissance in the Venice lagoon and at sea Cà Foscari is involved in the project especially for the construction of a WEB GIS portal that will host the archaeological sites already known, present in the Adriatic, and those being researched. The portal will also be available for PCs and smartphones, but a totem is also being prepared inside the underwater archaeology museum in Caorle. The implementation of the portal requires a field research phase that the Cà Foscari University conducted in the lagoon and in the sea mirror in front of it. These activities have been authorized by the Superintendence of Archaeology, Fine

Arts and Landscape for the Metropolitan Area of Venice and the Provinces of Belluno, Padua and Treviso and by the Superintendency of Archaeology, Fine Arts and Landscape for the Municipality of Venice and the Lagoon. The technical-logistical support was ensured by the Idra company. The Cà Foscari team was made up of research fellows Elisa Costa and Stefano Medas and Cristina Barbiani and Paola Perozzo for the portal. The Sites are recognized on the map, both in the area north of the lagoon and in the sea. The sites of the northern lagoon were substantially already reported in the past by the SABAP, preliminarily dated to the Roman age. Here, dating checks 6 were also carried out with radiometry and to try to create documentation suitable for the portal. So the big challenge was to perform digital photogrammetry in low visibility sites, which was achieved with excellent results. One of these sites is the so-called Molo di Cà Ballarin, a structure of the Roman-imperial age, near the cavana of Cà Ballarin, a support pier dismembered into various elements, useful for mooring in the nearby cistern of the imperial age, already excavated, similar to Venetian wells

More or less in the center of the San Felice canal, near Tre Porti, the work team visited the so-called Roman tower, discovered in 1984, object of amateur publication, created the 3D model and remodeled the interpretation of the function of the structure, which will be announced shortly. Also in this case, a structure was made visible in a water situation that does not exceed 1m of visibility. The multibeam passages were also built and the Roman villa of Lio Piccolo was visited, very close to the cistern and the pier, an extraordinary site, domus of the imperial age with continuity of life up to the sixth century AD, with collapsed materials coming from the edge of the channel. The structure will be subject to excavations over the next year.

At sea, we visited the wreck of the Helmut, a Prussian ship sunk in 1860 in front of the Alberoni beach in a few meters of water; a worse visibility than the lagoon one was found, but the 3D models were nevertheless made. Off the Lido, the team reconnoitered the wreck of the bricks, placed at a depth of 20m, cargo dated preliminarily to the 18th century, site with very low visibility; despite this, the load was documented in its entirety in a few hours of diving. Here, too, a multibeam and subbottom profiler was created to document the environment made up of the so-called tegnue (beach rock).

Some results, albeit limited, were also obtained in the sites of Eraclea 1 and 2, two nineteenth century wrecks, the first investigated by SABAP in the past, the second recently discovered, but in environments with very little visibility, so much so as not to allow execution of any model.

The professor Beltrame then passes the word to Elisa Costa for a first point of the documentation on the Grado 1 wreck.

Elisa Costa proposes some images to provide an idea of what can be achieved with digital techniques and photogrammetry on the basis of archive data. The hull of the Grade 1 wreck was

modeled in every single element and reconstructed on the basis of the excavation plan. This is a 7 way to make a wreck that cannot be visited visible. The same thing was done for the load of amphorae, which will then be integrated with the other missing parts. With the video you can move the amphorae, see their types. The hull was also studied and rebuilt in its original form before the sinking. Also on this model the amphorae will be reinserted.

WEB GIS. It is explained how the portal will work. For each area there are different colors based on the structures that can be visited (museum, wrecks, submerged structures), for each filter there will be a list of the various objects in the area. For each submerged site there will be a file in Italian and English (or Croatian for the Croatian part), with images (including 3D), audio content (bilingual) and video; you will also be able to listen to the audio in Italian and English and you will be able to approach the site with a three-dimensional model of both the wreck and the site. It will thus be possible to identify and interact with the wreck. In some areas it has been possible to insert historical maps, georeference them and make them legible. Filters can divide submerged sites into visible, invisible, visitable and non-visible sites.

A short video is projected to present the virtual reality usable with a 3D viewer at the Caorle Museum, which reproduces the underwater deposit of the wreck of the *Mercure*.

Andrea Doncovio greets the entrance of superintendent Simonetta Bonomi and provides instructions for speaking at the round table.

Simonetta Bonomi apologizes for the delay due to other commitments; he only caught the last part of the last report, which is very interesting, but he cannot comment on the initial part; reminds that the project in which SABAP is also involved concerns the Grado 2 wreck, the subject of research conducted in the past by the Superintendency in collaboration with the universities of Catania and Udine, which led to the highlighting of the surface part of the load and the its cover with metal grids. After the Grade 1 experience, it was decided to use and protect the site through a grate, both for its proximity to the coast and to counter trawling which produces a lot of damage to the archaeological remains on the seabed. Bonomi is sure that the UM project will certainly have important developments and shows some curiosity about the part of the project concerning the implementation of the WEB GIS: will it also contain the previous data, already collected, that SABAP retains in large quantities?

Rita Auriemma responds to the question of the Polo Councillor, specifying that, on the basis of a letter of intent, it is planned to place a location in the museum of Grado with interactive developments of the 2 wrecks of Grado. She adds that all the technologies and methodologies, illustrated by Beltrame and Costa, are part of a protocol of good practices shared by all the partners. The project envisages a scientific approach to be translated into shared language for communities.

Andrea Doncovio questions Paola Ventura by asking a question relating to the compatibility between protection and use, but first asks Rita Auriemma what inputs can be proposed to the stakeholders of Friuli Venezia Giulia. Rita Auriemma responds by hoping for a common path between SABAP, ERPAC and other partners. She therefore hopes for a work table that involves the various actors who can implement a common vision for enhancement, an operational table.

Paola Ventura intervenes on the theme of protection and use. SABAP FVG is implementing a monitoring activity for the remapping of archaeological areas. The UM project could lead to an increase in the capacity to intervene on the territory. With regard to WEB-GIS, Ventura wonders where and by whom it will be managed, if it is linked to the project or to an institution. There is a problem of interoperability between systems; in Veneto and FVG there is already a WEBGIS platform designed for protection; how is interoperability guaranteed and who will manage the GIS? How will the sites be protected? Georeferencing is not always to be taken for granted. He poses the question to Carlo Beltrame and Rita Auriemma.

Rita Auriemma replied that the portal envisages a close synergy with the SABAPs (see ERPACSABAP agreement). The portal will reside within the Cà Foscari server. Regarding interoperability, there is already an agreement between Cà Foscari and the competent SABAP, which provides, in respect of the authorization to publish the data, the implementation of the Risk Card platform, managed by the ISCR and the national Geoportal, managed by the ICA. The regional information system of Puglia SIRPAC / CartApulia is interoperable with the national SiGEC web catalog. Regarding the future of the Portal, best practice should be studied. In Croatia the situation is significantly different, the Ministry manages everything and there is a database of all the hidden assets. It would be desirable for it to work like this in Italy as well, it would be easier for the collaboration between the University and SABAP.

Carlo Beltrame: as regards the sea of Venice, there is an agreement with SABAP regarding access to the archive and reconnaissance. An agreement is being finalized with the Polo Museale for the location of the Portal Totem and to use the portal in the Caorle museum. In Veneto there was no WEB mapping with the positioning of the wrecks, so the GIS is useful to everyone, both to SABAP and to the project. The information present at the moment in the portal does not allow anyone to reach the archaeological sites. There will be subsequent agreements to understand if the Portal can become a tool for direct visits to the site or only for remote knowledge. Paola Ventura as regards the sea of Venice, there is an agreement with SABAP regarding access to the archive and reconnaissance. An agreement is being finalized with the Polo Museale for the location of the Portal Totem and to use the portal in the Caorle museum. In Veneto there was no WEB mapping with the positioning of the wrecks, so the GIS is useful to everyone, both to SABAP and to the project. The information present at the moment in the portal does not allow anyone to



reach the archaeological sites. There will be subsequent agreements to understand if the Portal can become a tool for direct visits to the site or only for remote knowledge.

Enrico Torlo, referent of the Circolo Sommozzatori - CST Trieste, thanks everyone and in particular Rita Auriemma; he wants to make observations and bring his own contribution. First of all, he specifies that diving centers are economic operators, while the club is an association that does teaching, but does not have an economic profile; it also does teaching for children, all with few resources and a lot of passion. Working with schools has led them to accompany the children to visible archaeological sites, such as Muggia, San Bartolomeo and others. They organize summer camps, mini divers with marine biology courses. Underwater archaeology is a new way of teaching and dealing with various disciplines in parallel (geography, science, geology, history). They collaborate with both SABAP FVG and the University of Udine.

Anna Del Bianco speaks again about coordination in Italy, which always suffers from an overlapping of competences: it is difficult to work in synergy because everyone moves, even if in good faith, on their own lines of interest. A project like this could be the subject of a specific capitalization activity. So let's take the best of UM and define a model of forms of integration. The FVG is a relatively small area and interinstitutional dialogue is easier even with regard to the school system and higher education; spaces for teaching are important, even outside schools (sports, learning and emotional fun). New learning activities that combine physical activity, learning, fun. Synergy and involvement are a challenge to be capitalized even for new projects. In Europe, there is more teaching outside of schools, so some challenges posed by the COVID emergency can be taken up to redefine teaching spaces.

Rita Auriemma reassures Torlo by saying that the amateur sports associations have all been involved and considered a very valuable player within the project, in particular the Circolo Sommozzatori Trieste which has a distinguished history. Only for the sake of brevity are in fact defined diving clubs.

Simonetta Bonomi in turn hangs up on Torlo's intervention and wants to make a necessary note: SABAP's underwater reconnaissance activity takes place thanks to two factors: the presence of an underwater technical assistant within the SABAP (Francesco Dossola) the help and support of FIPSAS clubs and volunteers. Without the clubs it would not be possible to operate at sea.

Rita Auriemma specifies that in Puglia some large-scale agreement experiments are being carried out between SABAP and diving (for guided tours, for example, to Egnazia and Bevagna). You would like a thematic and working table to collect suggestions from stakeholders, a sort of "to do list", good practices to follow and / or to indicate; for example, the suggestions of Promoturismo FVG with regard to the strategic aspects of communication would be valuable. You therefore

launch an appeal to receive proposals also in written form, in order to share a common sustainable vision.

Marco Marinuzzi, at the request of his director and as a member of the technical-directive committee of the “Phoenicians Route”, cultural itinerary (confederation that groups public bodies, universities, associations of various kinds, from various European nations), intervenes specifying that the Phoenicians' Route she is very interested in underwater archaeology and if one wishes to carry out an action of positive “contamination”, it could give rise to subsequent investigations and agreements. The Phoenicians' Route is in fact the route of dialogue of the ancient Mediterranean civilizations

Andrea Doncovio at the end of the meeting, greets Caterina Gasparini of Promoturismo FVG, an important local player; she thanks all the participants, specifies that she will continue to give wide visibility to the project also with I-Magazine (free press) distributed in Gorizia and soon also in Trieste. He thanks the Informest technicians and the ERPAC press office.

**Closing of the works: 12.30**



# Underwater Archaeological Surveys in Venice Lagoon and Sea

Summer 2020

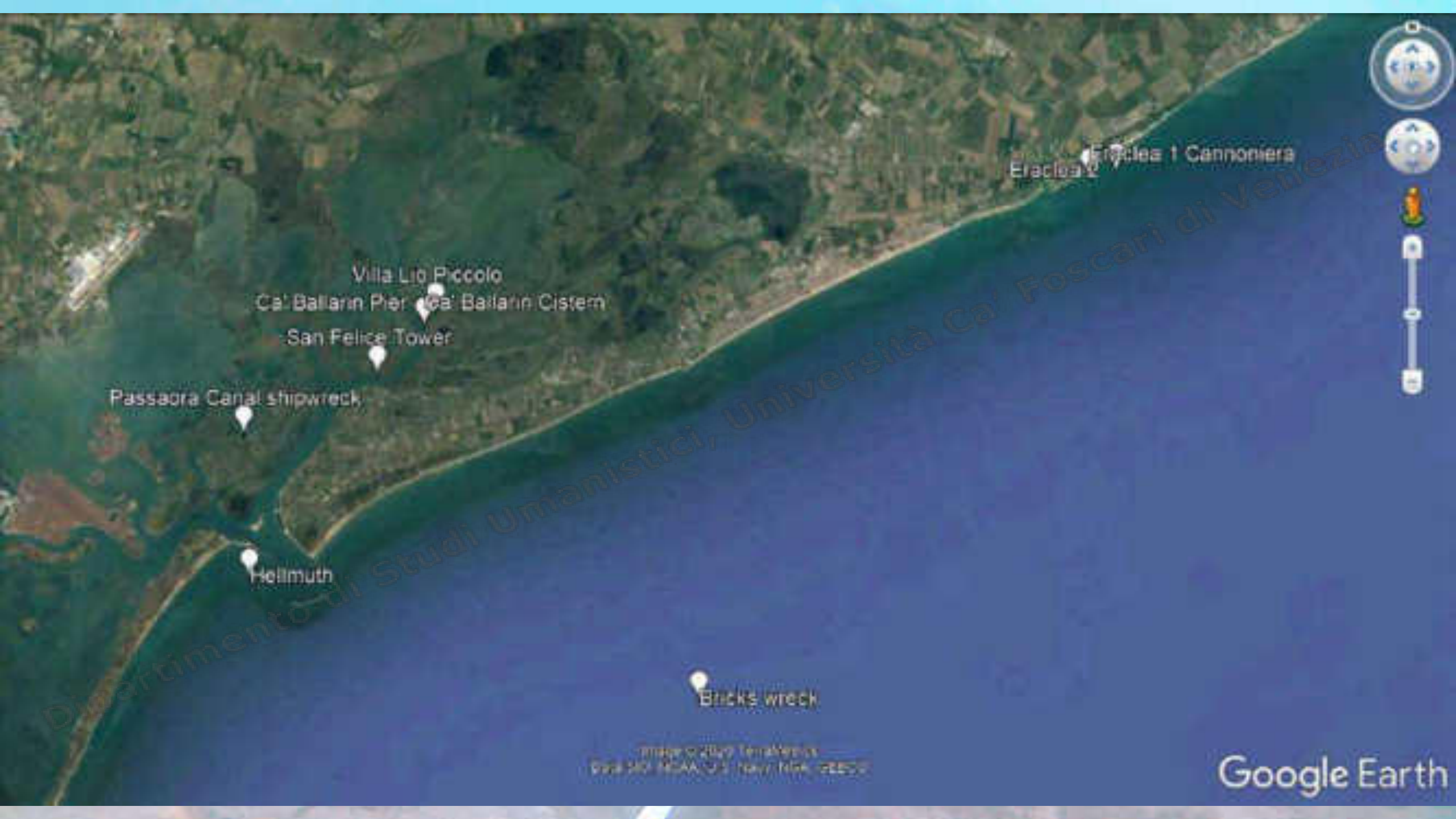
Carlo Beltrame, Elisa Costa, Stefano Medas

Within the project Underwater Muse (interreg Italy-Croatia), the Ca' Foscari University of Venice carried out, with the technical support of IDRA S.r.l. company, an underwater investigation campaign in Venice lagoon and sea, during the months of July and September 2020.

The surveys concerned 8 sites, already known but not longer investigated for many years, and allowed to document them with new technologies (photogrammetry, multibeam, sub-bottom profiler, positioning with GPS and topographic station), to deepen their knowledge and to study their conservation state.

4 sites are located in the lagoon and 4 in the sea.

The works were mostly carried out in extreme conditions, due to the poor underwater visibility and to the strong tide currents.



Villa Lib Piccolo  
Ca' Ballarin Pier  
Ca' Ballarin Cistem  
San Felice Tower

Passadra Canal shipwreck

Hellmuth

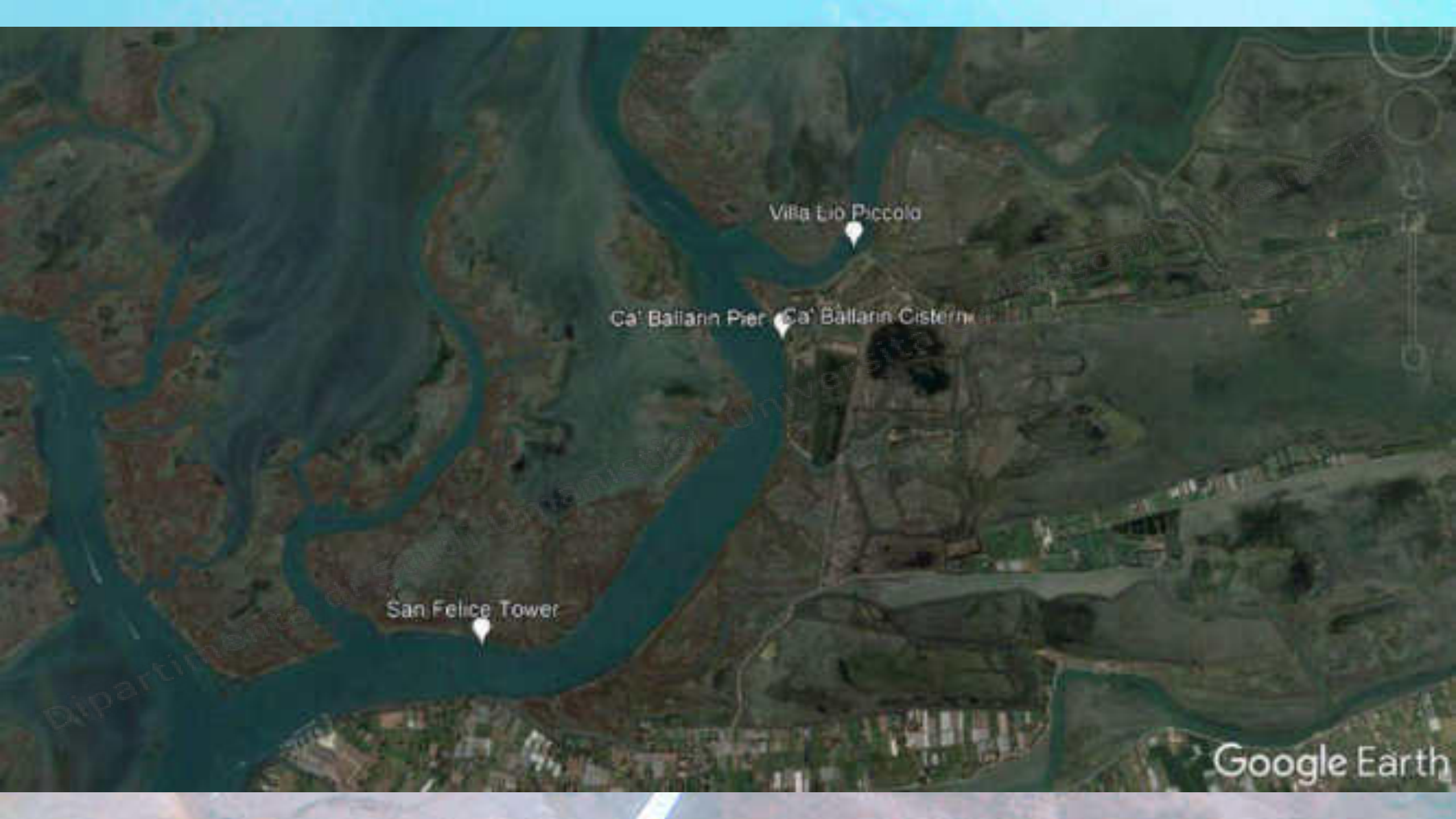
Bricks wreck

Erebus  
Fregata 1 Cannoniera

Dipartimento di Studi Umanistici, Università Ca' Foscari di Venezia

Image © 2007 TerraMetrics  
Data SIO, NOAA, US Navy, NIMA, GEBCO

Google Earth



Villa Eio Piccolo

Ca' Ballarin Pier Ca' Ballarin Cisterna

San Felice Tower

Google Earth

# Ca' Ballarin «pier»

Venice northern lagoon

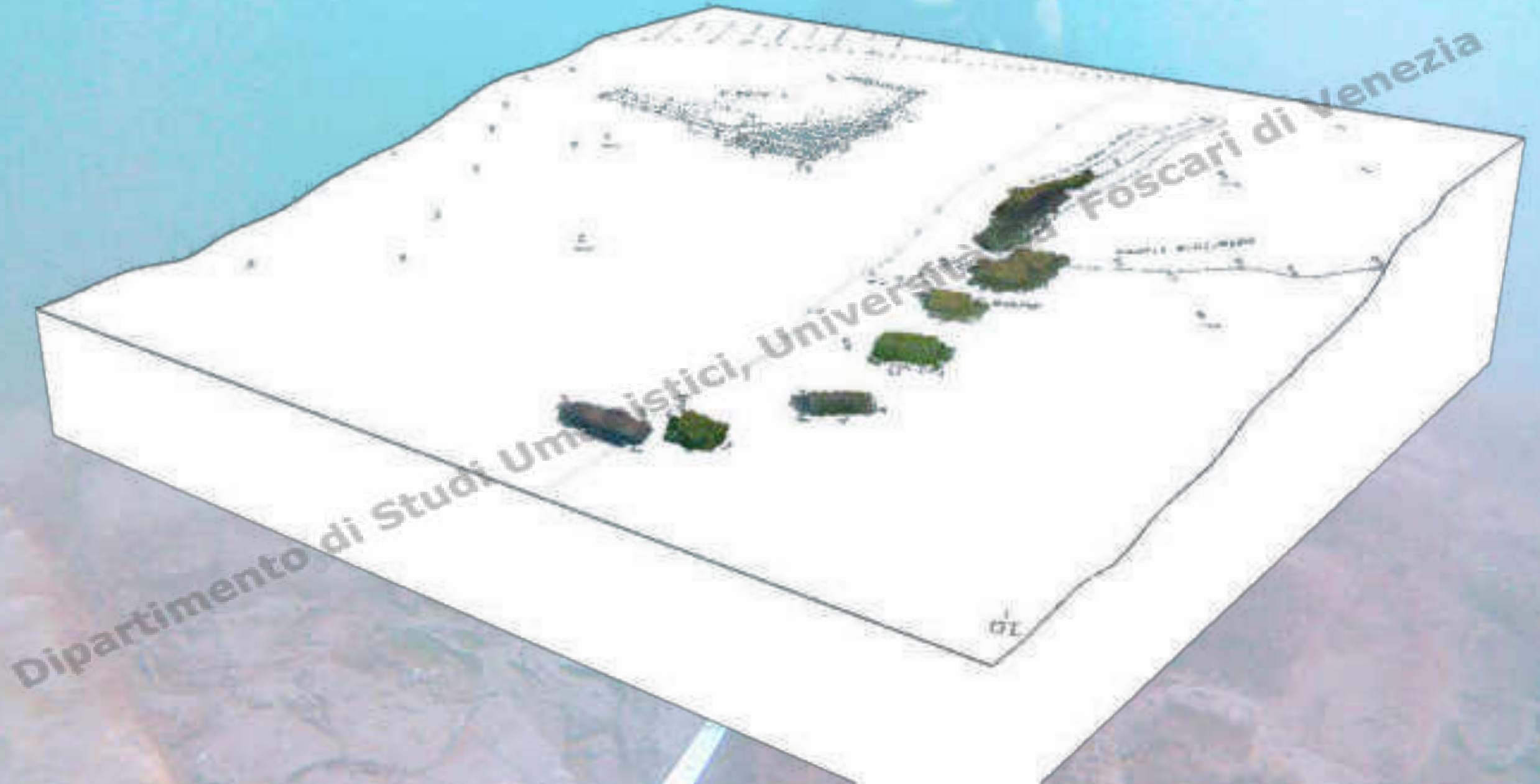
The pier, made by a concrete casting with stones and fragmented into 7 blocks, lies at the depth from -3 to -6 m and is located near a roman cistern, excavated between 2002 and 2003, with which is related. The archaeological site could be date to the 1-2° century AD (the cistern has stopped being used in the III Century AD), but C 14 analysis will soon made to confirm this chronology.

During the 2020 campaign the whole cleaning of the pier and the photogrammetry was carried out. A pile was recovered for analysis. Samples of the concreted were taken. The state of conservation of the site is well. Only the foundation wooden piling are damaged, limited to the portion that emerges from the bottom.



# Ca' Ballarin «pier»

Venice northern lagoon





# San Felice canal «tower»

Venice northern lagoon

Discovered in 1984 at a medium depth of - 4 m and investigated in the following years, the site was interpreted as a tower basement made with Roman bricks, dating back to the Early Roman Imperial Era, as well evidenced also by the fragments of glass and amphorae.

The 2020 campaign allowed to carry out a complete photogrammetry survey of the site, a multibeam and a sub-bottom profiler documentation. The analytical survey allows now to believe that the ruins belonged not to a tower basement but to a different building.

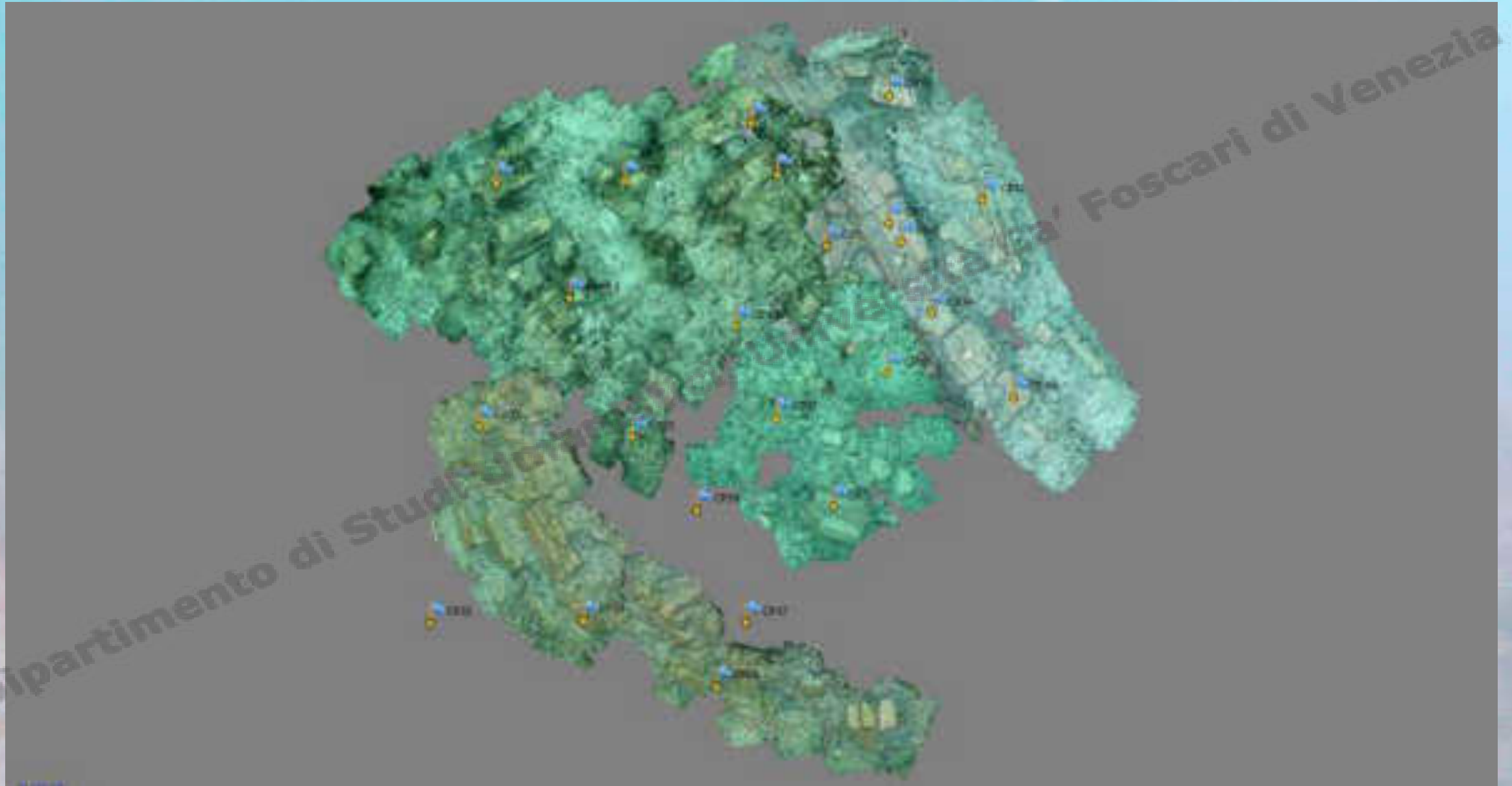
The finds found in situ are confirming the dating in the 1-2° century AD.

Many conservation problems affect the site.



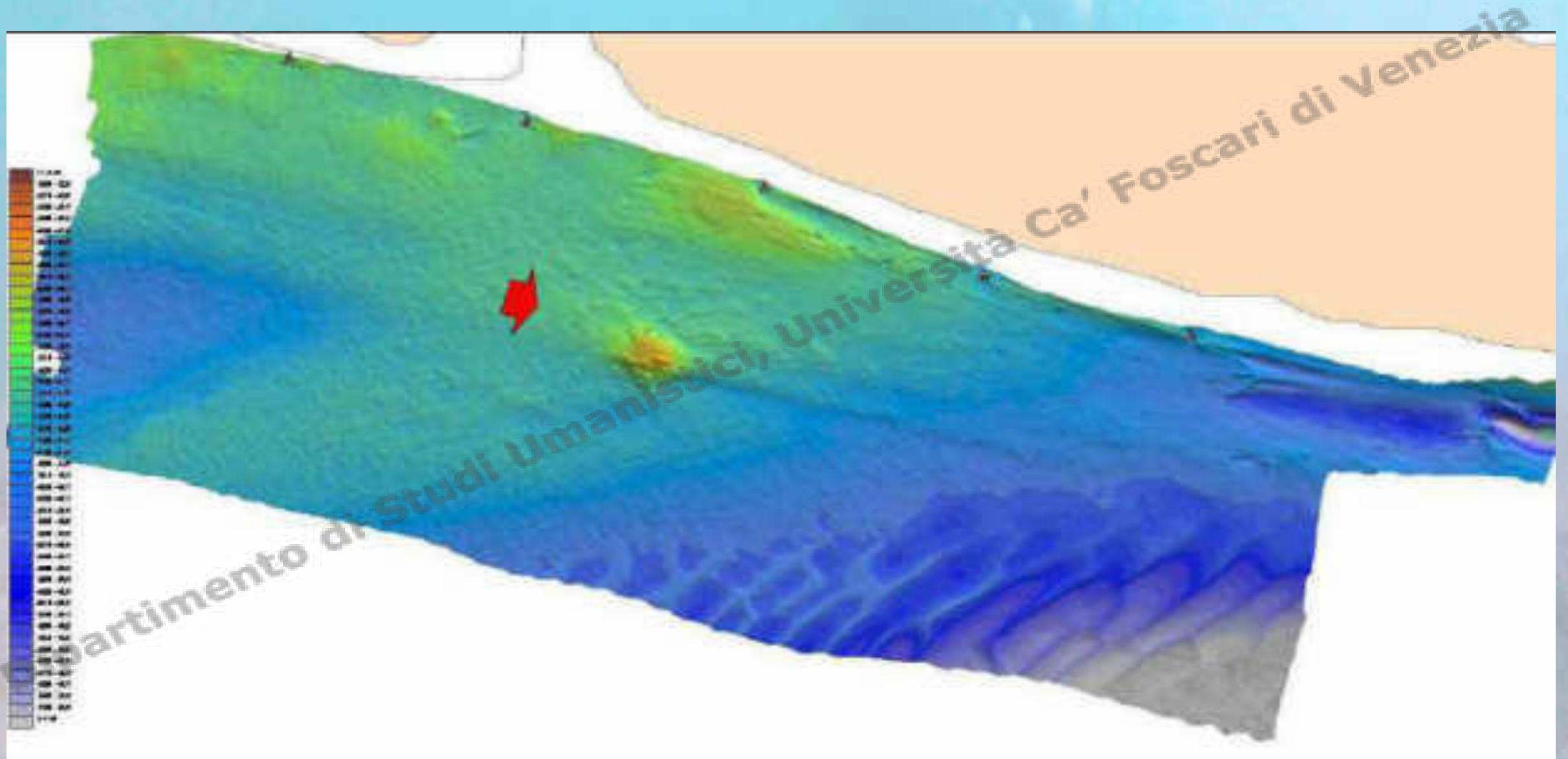
# San Felice canal «tower»

Venice northern lagoon



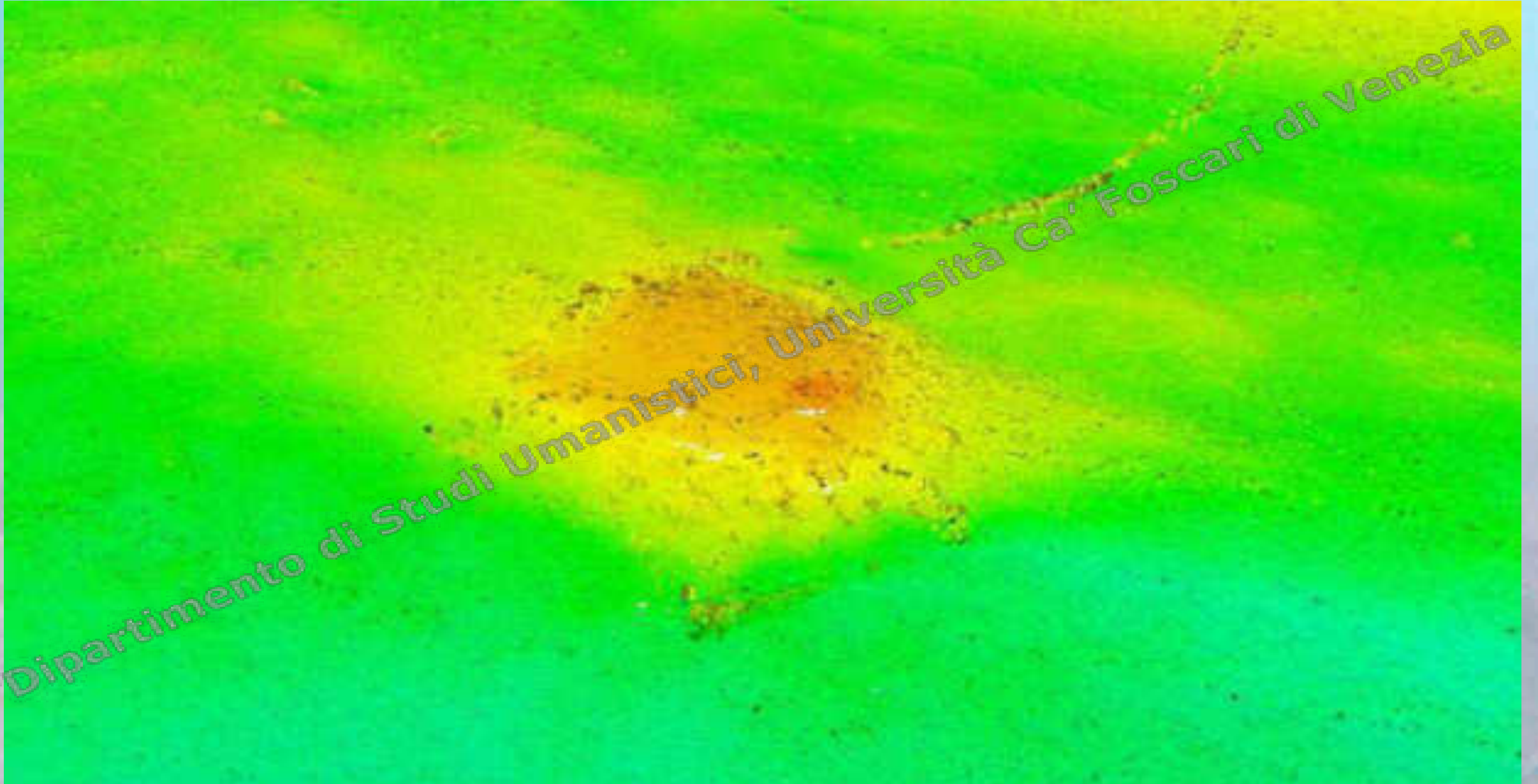
# San Felice canal «tower»

Venice northern lagoon



# San Felice canal «tower»

Venice northern lagoon



## Rigà canal «villa»

Venice northern lagoon

Discovered at the end of Eighties of last century and partially investigated in the first decade of 2000, the site lies at a depth from -1,5 to - 4 m and consists of the rests of a large and rich Roman dwelling, with wall paintings, dated back to the I-II Century AD with a possible continuity till the 6° century AD.

The 2020 survey allowed to identify the northern wall of the building, more than 30 m long, a big plinth made of half-sesquipedale bricks, where the foundation laying has been identified, and a big downfall of finds related with the collapse of the building, up to -10 m of depth in the canal. C 14 samples have been taken.

Many conservation problems affect the site.



# Passaora canal, small wreck of an early medieval flat bottomed boat

Venice northern lagoon

Discovered in 2004 at a depth of - 3 m in the Passaora canal, near the Sant'Erasmus island, the wreck consists in a just over 2 square meters part of the bottom and 5 floor timbers. After the documentation, the wreck was protected by means of geotextile and sandbags.

The wreck has not be found during the survey 2020, probably because hidden under a muddy layer recently formed. In the center of the canal, however, traces of a Roman embankment, also already investigated in 2004, was found.



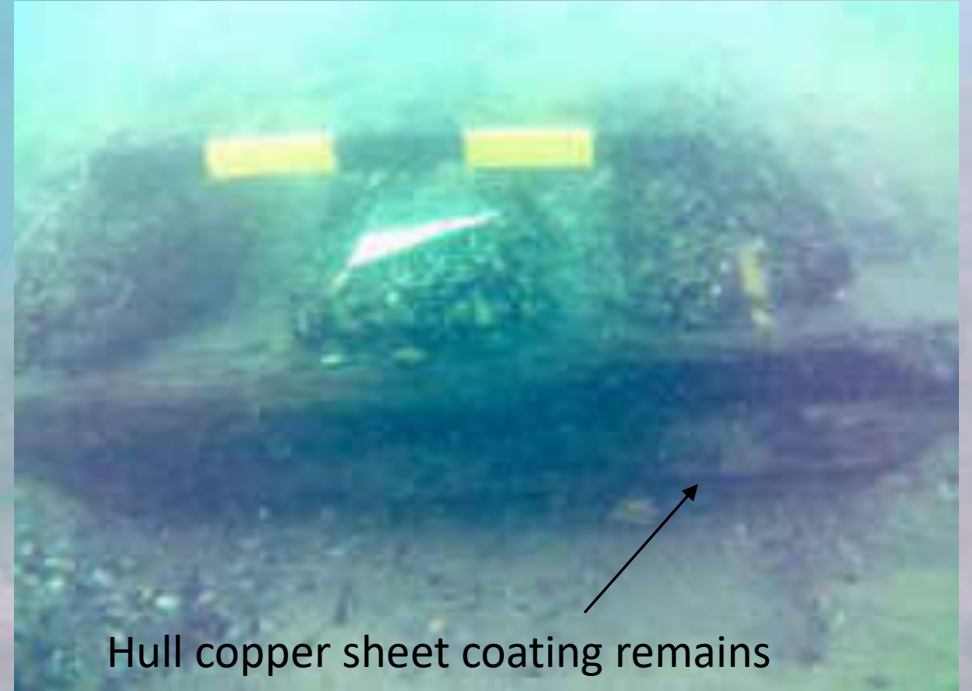
# Hellmuth Wreck off the Lido – San Nicolò

Sea of Venice

The wreck, known for at least 20 years, lies at a depth of – 5 m in the sea bottom off the Lido island, covered by a thin layer of sand. It is probably identifiable with the Prussian brig «Hellmuth», sunk the 19 November 1860 during the attempt to enter the Lido inlet with heavy seas.

The 2020 survey allowed to identify the wreck and to document it with pictures and videos. Two main sections of the wreck are preserved, flattened on the sea bottom.

The wreck, periodically covered and uncovered by sand, is exposed to the dynamic motion of the waves and to the attack of *teredo navalis*.



Hull copper sheet coating remains

# Hellmuth Wreck off the Lido – San Nicolò

Sea of Venice



Dipartimento di Studi Umanistici, Università Ca' Foscari di Venezia



# The «bricks» wreck

Sea of Venice

The wreck was discovered in the mid-Eighties of last century 7 nautical miles off the Lido inlet, at the depth of -20 m. It consists in a 16 x 8 m mound of two size bricks, partly still arranged as they were in the hold, which rises one meter from the sea bottom. A brief investigation carried out by the Soprintendenza Archeologia del Veneto in 1997 allowed to identify few remains of the hull and some artifacts that date back the shipwreck in the XVIIIth Century.

With the 2020 survey the wreck has been documented by means of multibeam, sub-bottom profiler and photogrammetry. Dating through the study of the bricks is in progress.

The state of conservation is good.



# The «bricks» wreck

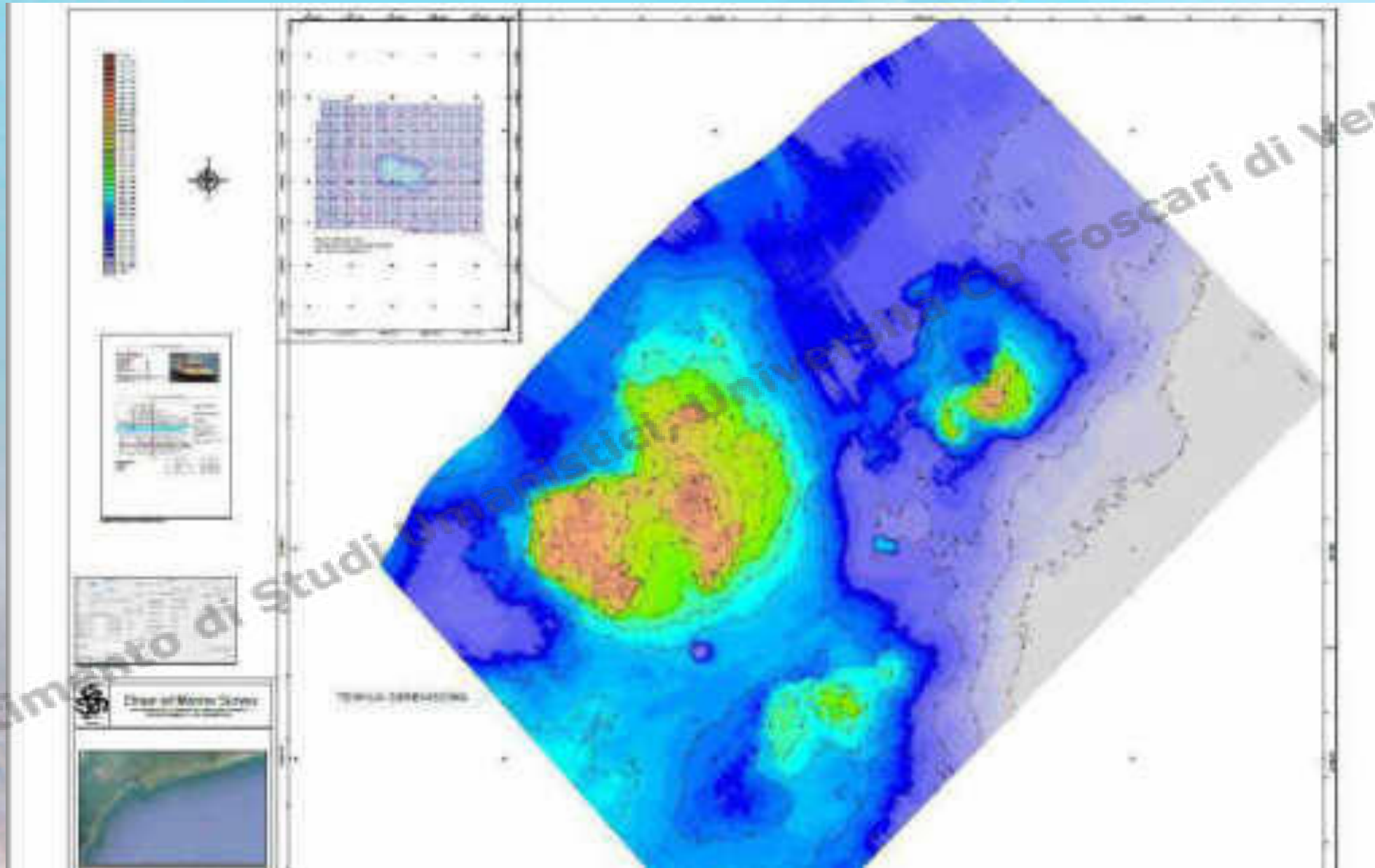
Sea of Venice



Dipartimento di Studi Universitari, Università Ca' Foscari di Venezia

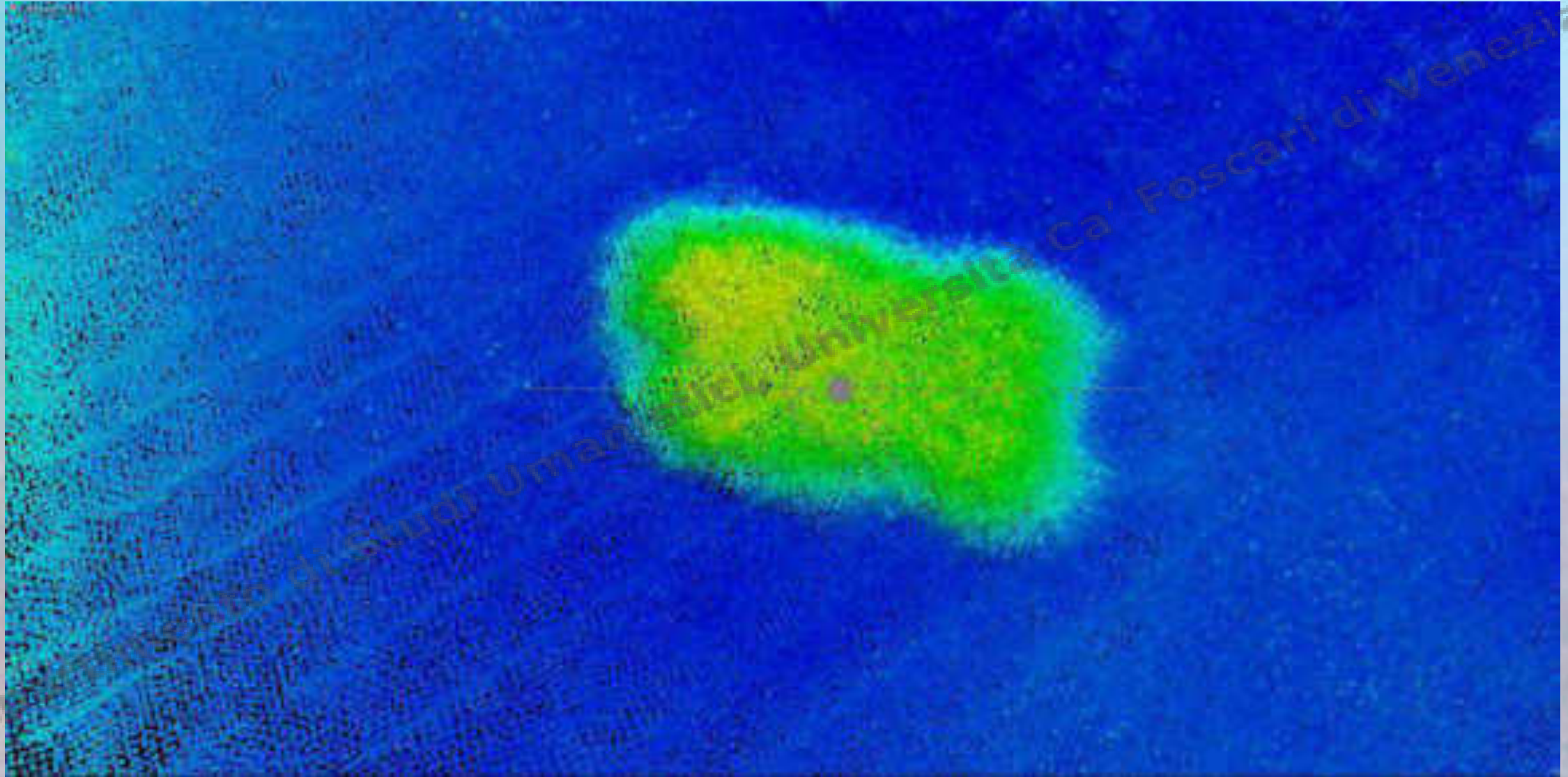
# The «bricks» wreck

Sea of Venice



# The «bricks» wreck

Sea of Venice



# The Eraclea 1 and 2 wreck

Sea of Eraclea

The two wrecks lie in 4-6 meters of depth in front of the seashore south of Eraclea. Both shipwreck have been dated to the end of the 18th century and the beginning of the 19th thanks to the copper sheet that cover the hull. The construction of the shipwrecks is very similar: they measure around 35 meters and present an heavy construction.

They extrude from the bottom and they are covered by a layer of sandy sediment and algae.

The visibility is around 2 meters for Eraclea 1 and only 20-30 cm for Eraclea 2 because it is near the outlet of a lagoon and the bottom is represented by mud.

The state of conservation is good.





# IL RELITTO DI GRADO I RICOSTRUZIONE 3D TRAMITE I DATI D'ARCHIVIO

Dipartimento di Studi Umanistici Università Ca' Foscari di Venezia



**THE GRADO I SHIPWRECK**

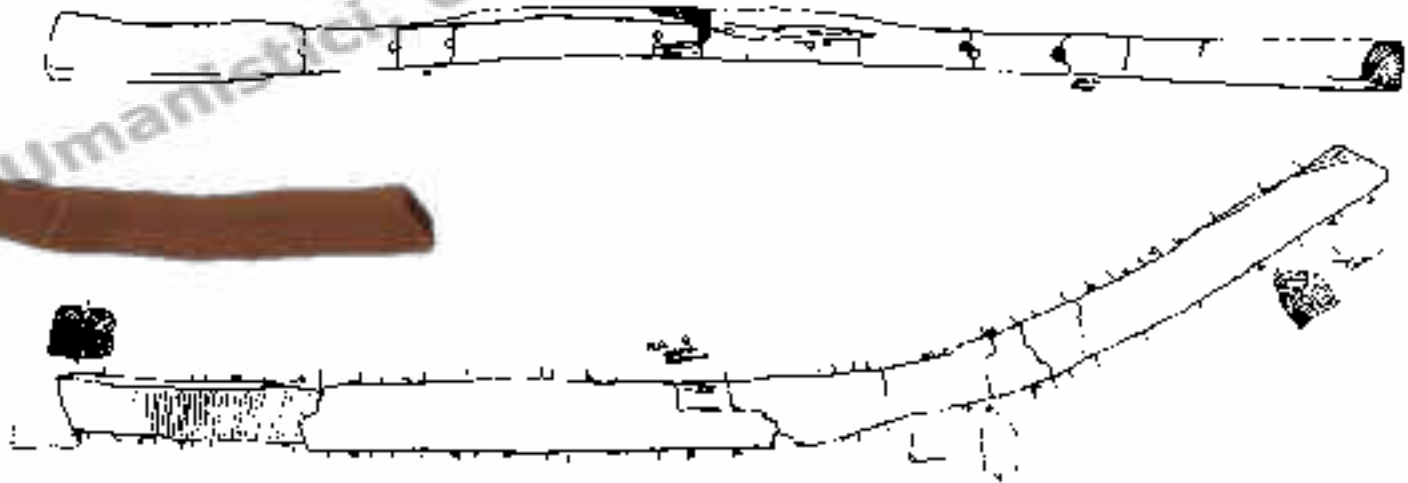


THE GRADO I SHIPWRECK



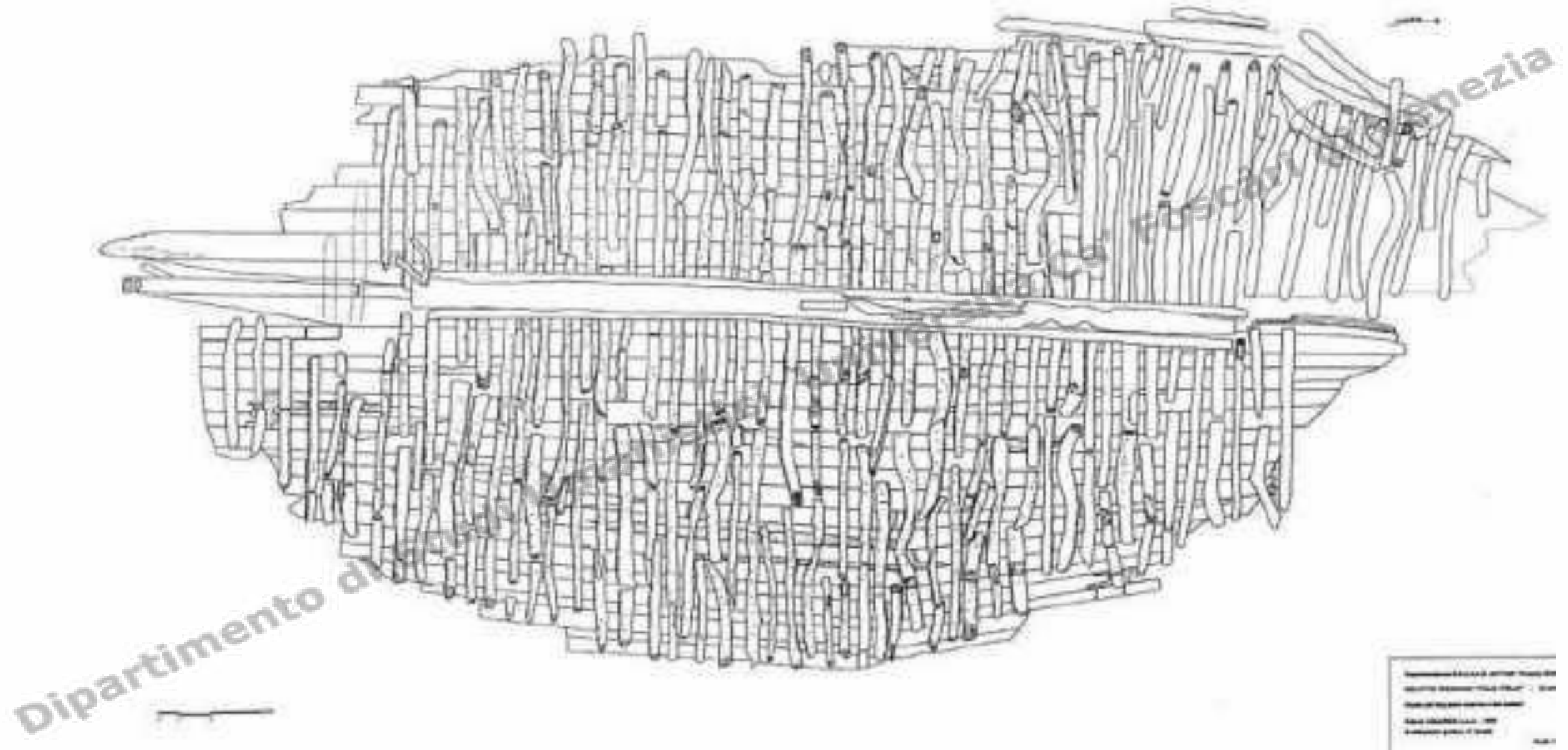


3D reconstruction scale 1:1

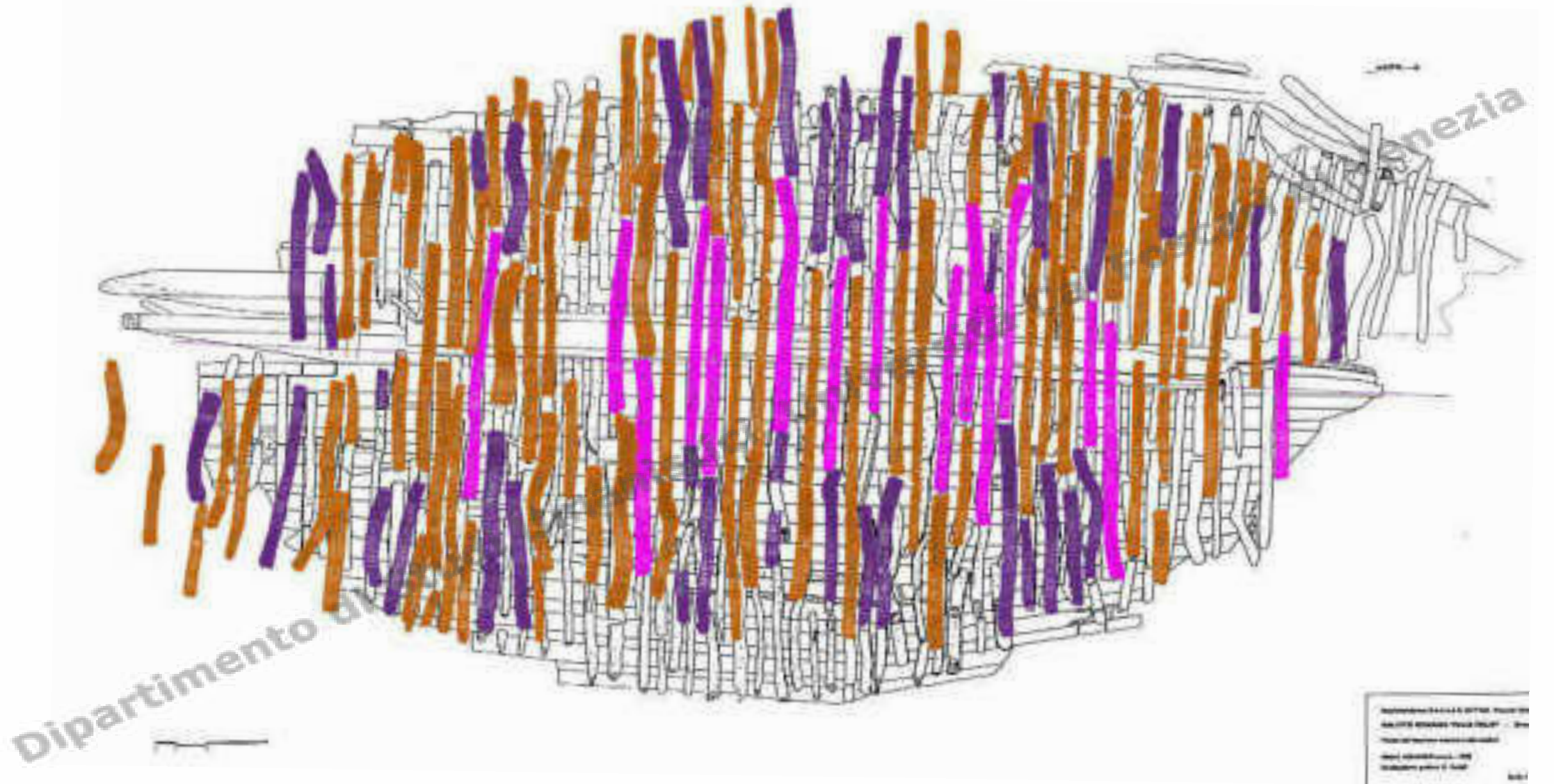


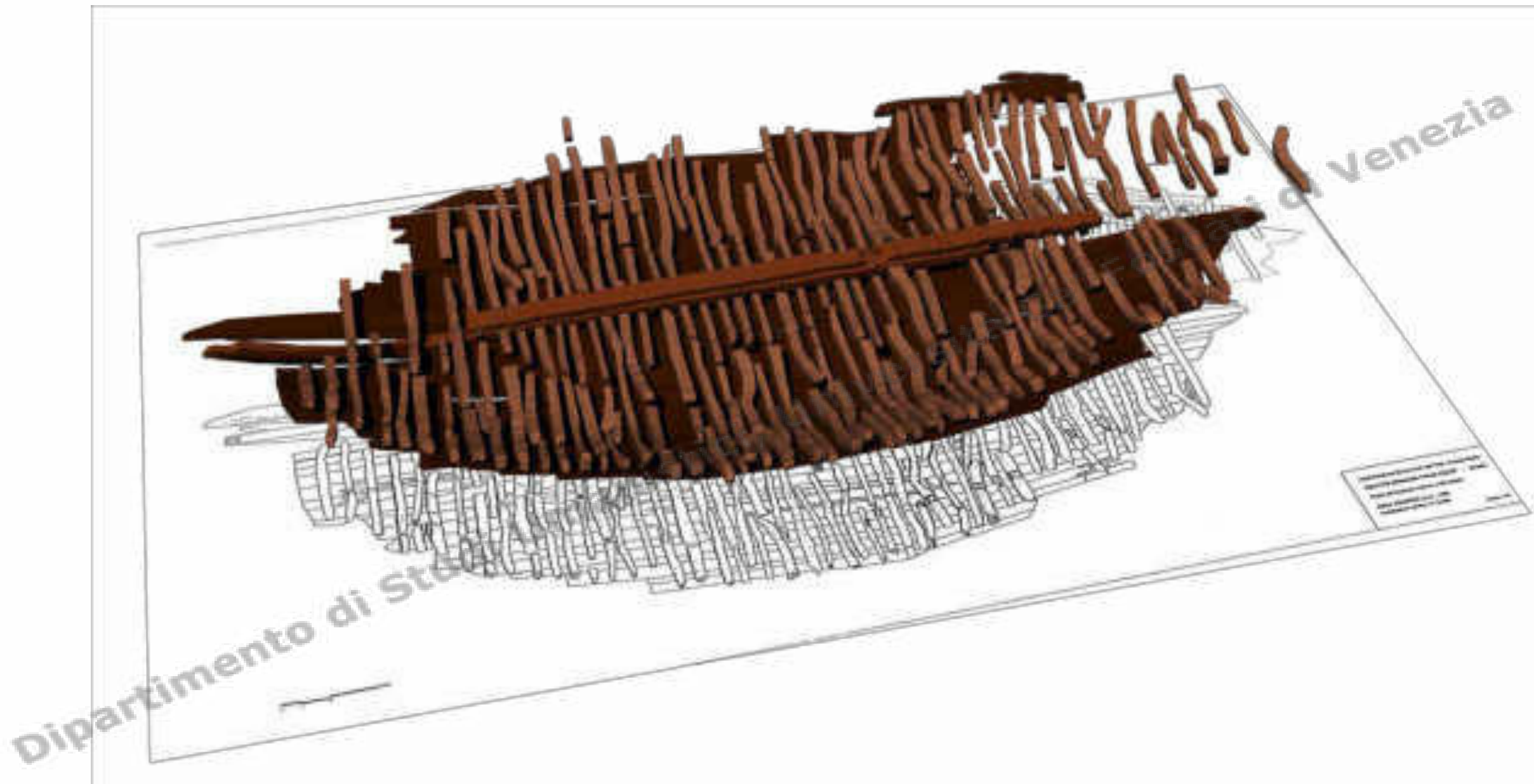
Perspective drawings scale 1:1

# Plan of the site *in situ* - 1999



Plan of the site *in situ* – 1999 with 3D elements

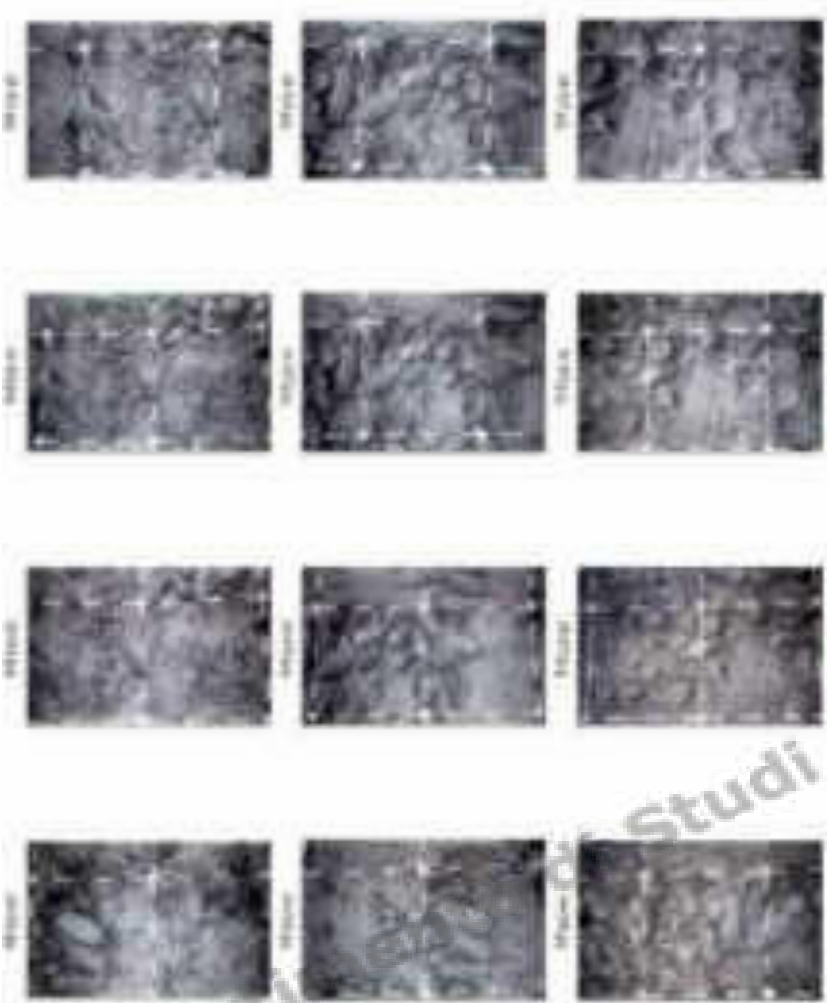






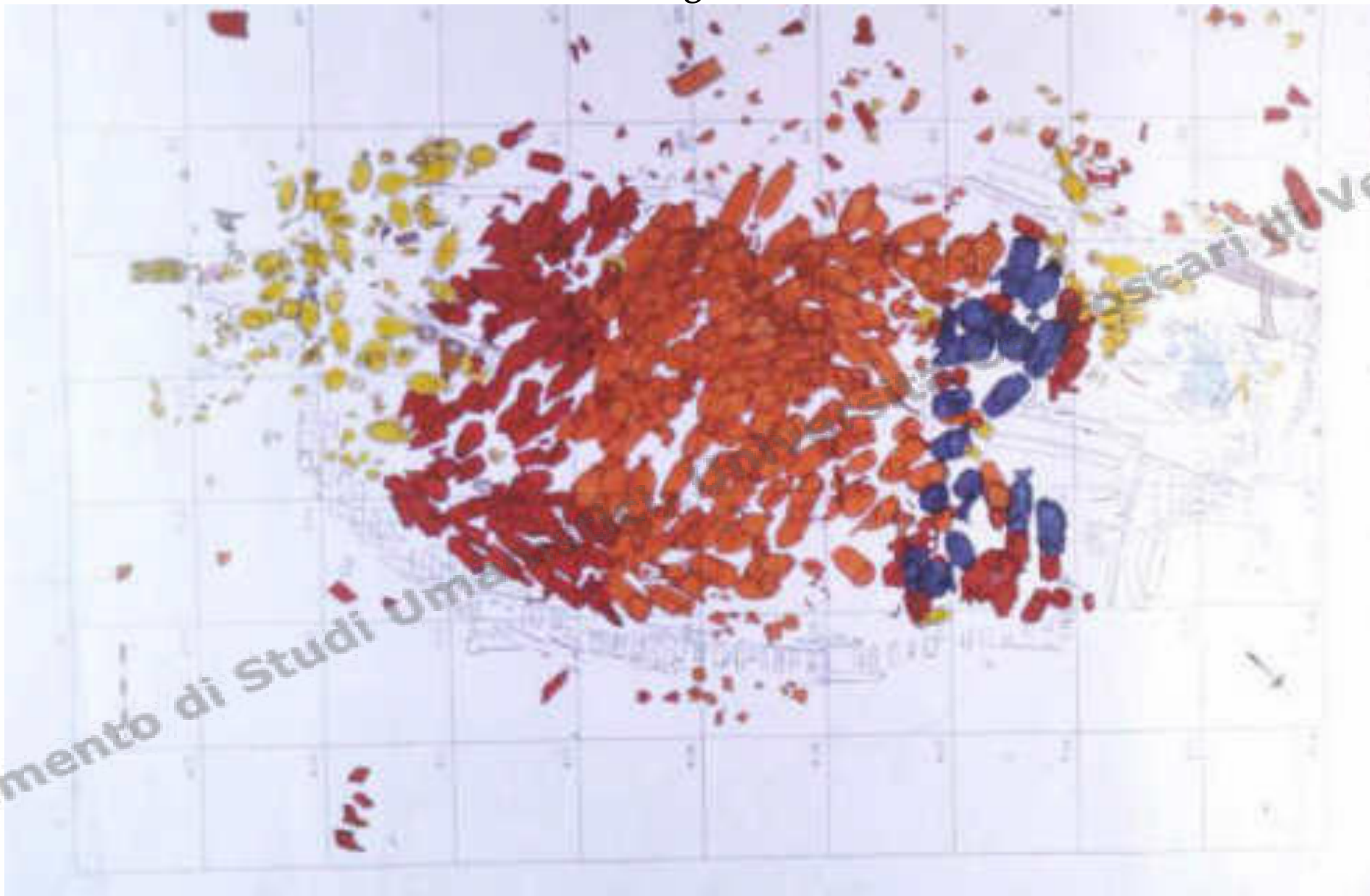
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Some of the analogic images realized for the photomosaic

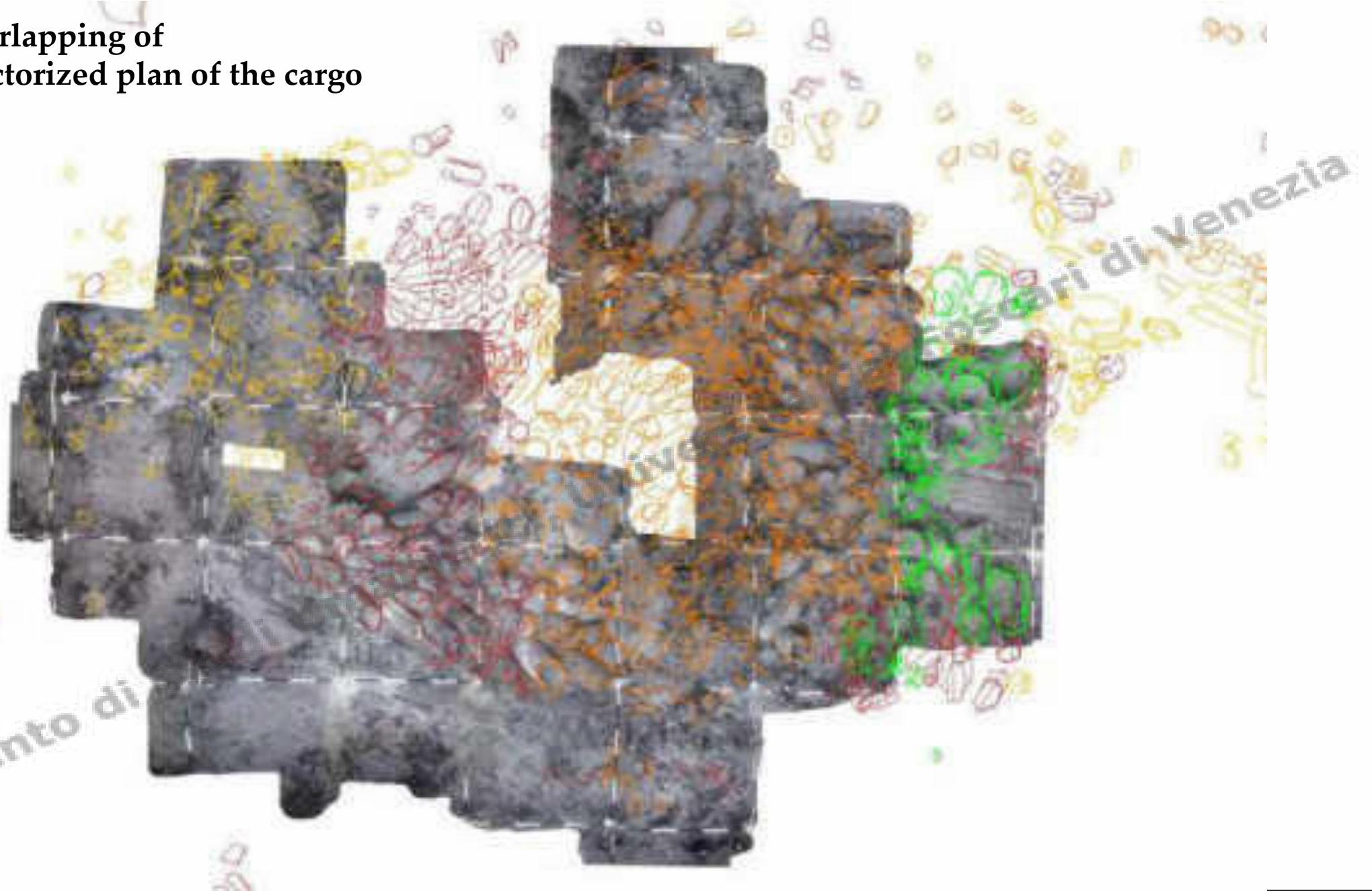


Ortophotos obtained from  
3D photogrammetry

# Plan of the cargo *in situ* - 1994

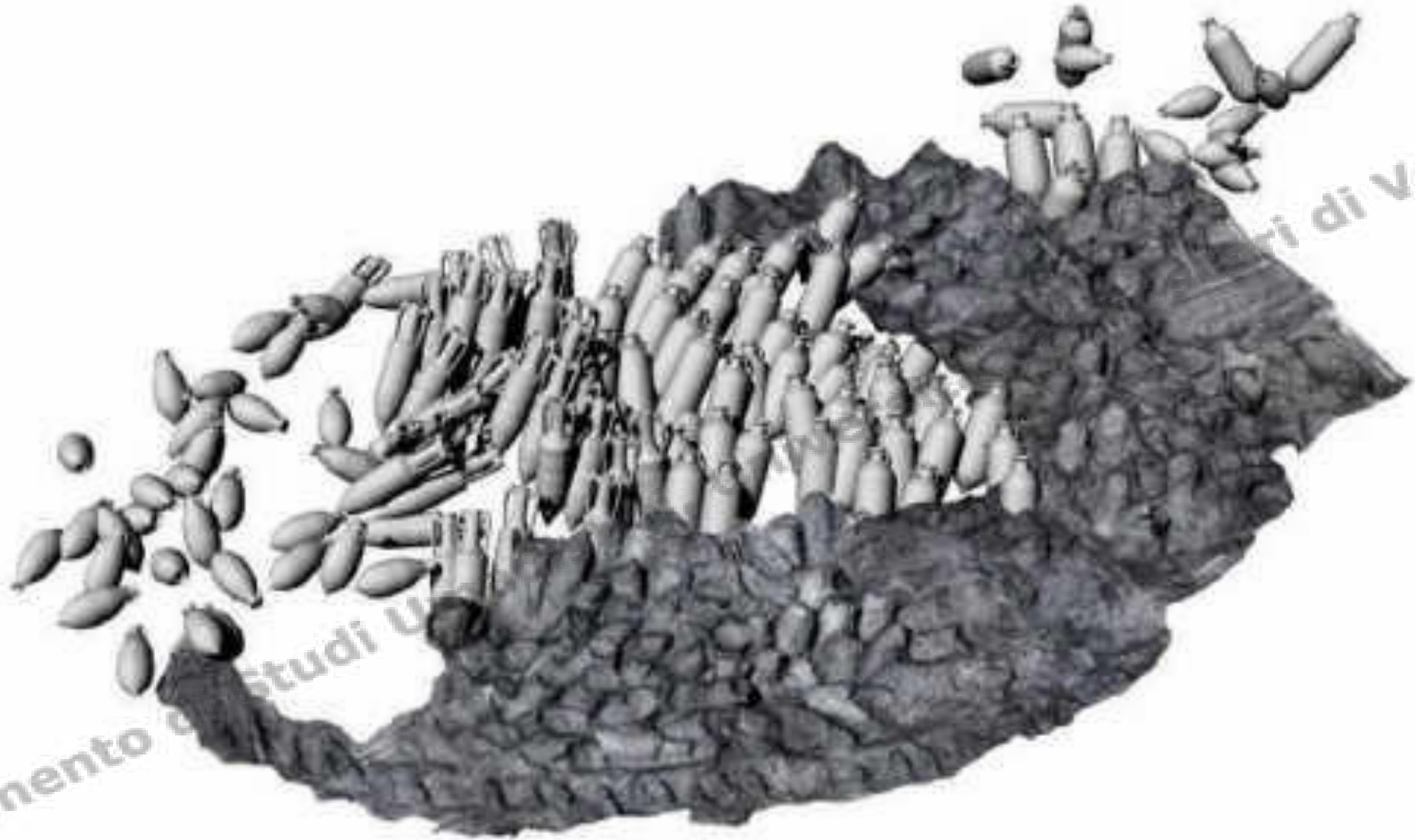


Overlapping of  
ortophoto and vectorized plan of the cargo

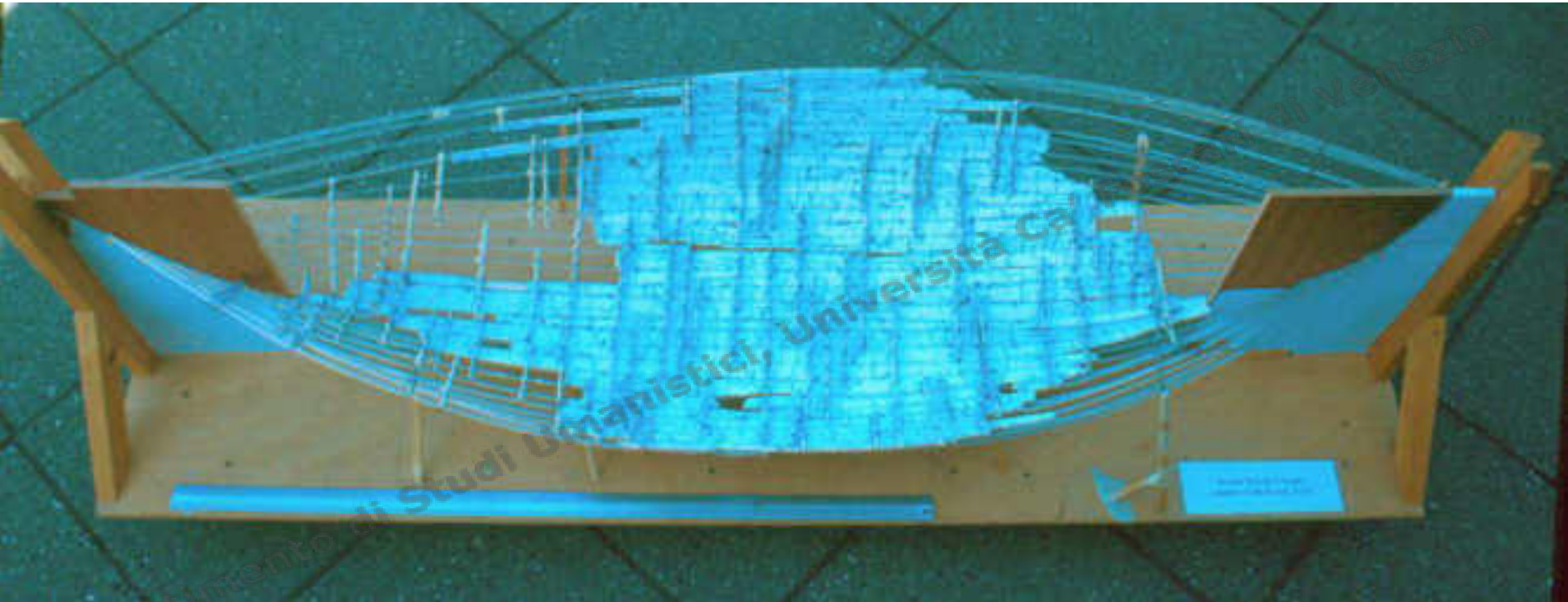




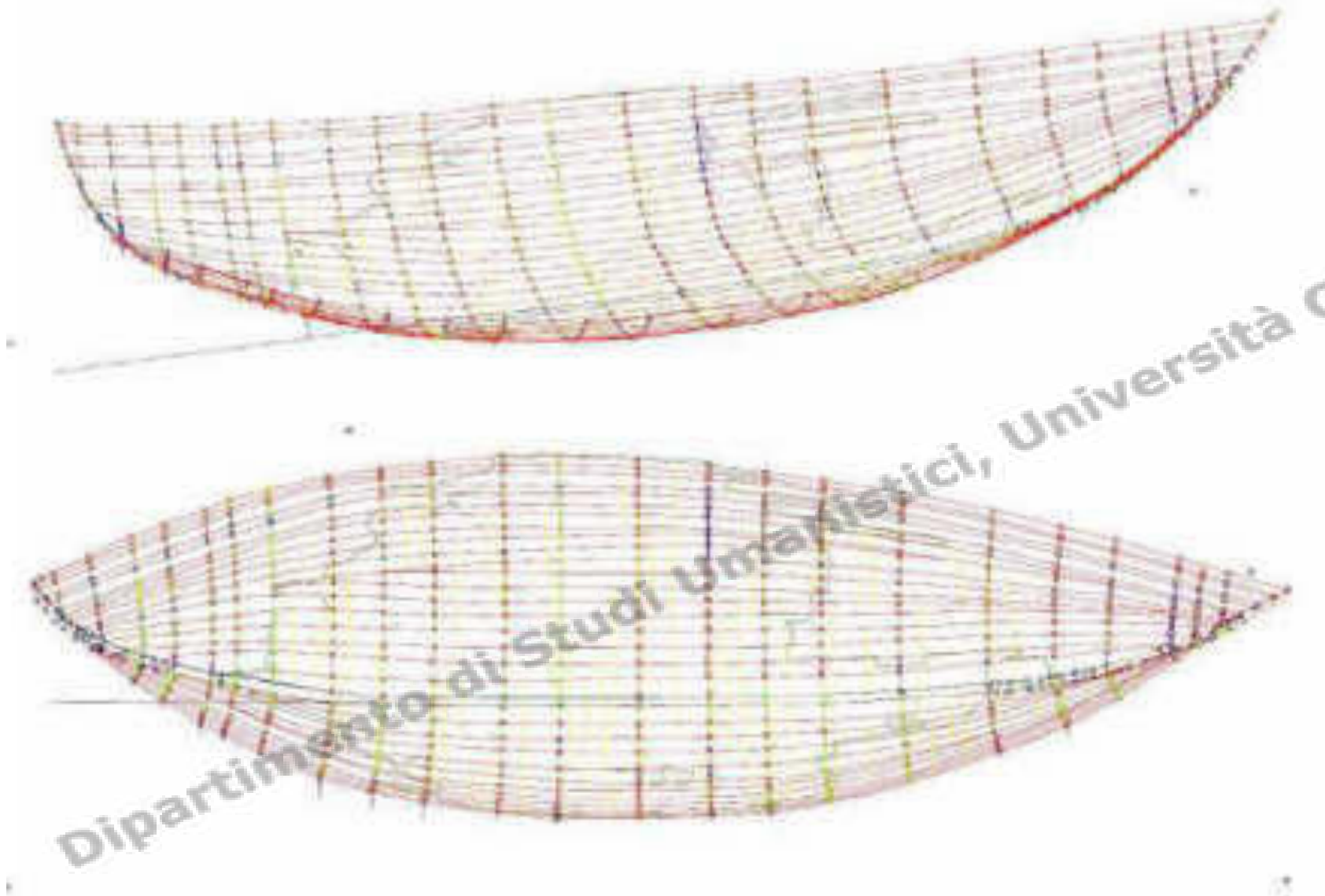
# Integration of the 3d photogrammetric model with the reconstructed amphoras



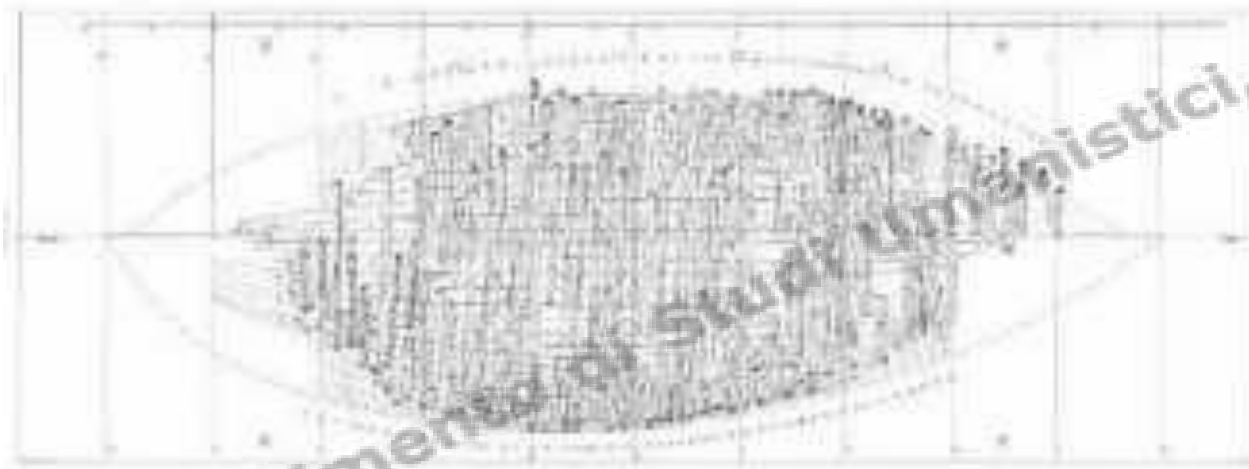
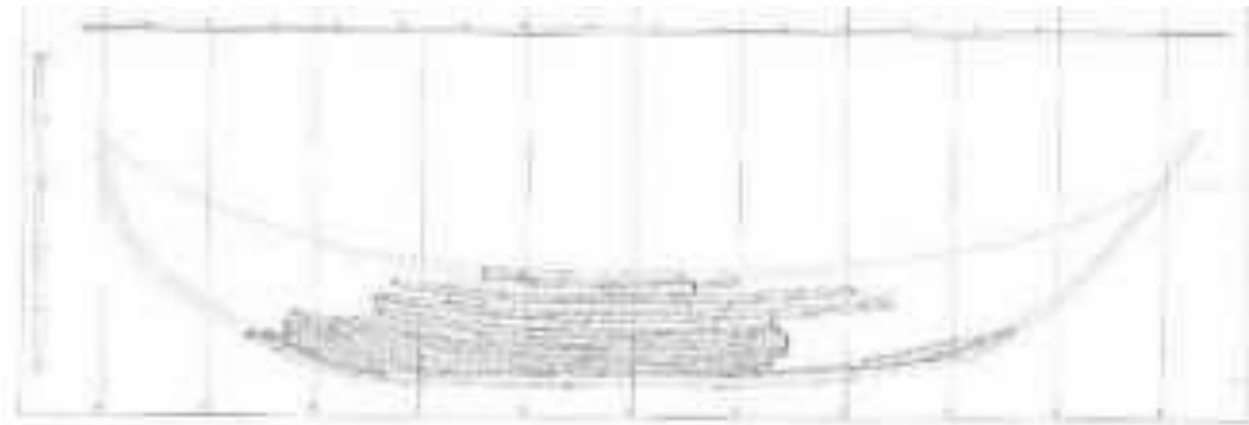
## Cardboard study model



## Faro Arm survey of the cardboard study model



## Reconstruction of the hull lines with digitalization of the 2D drawings

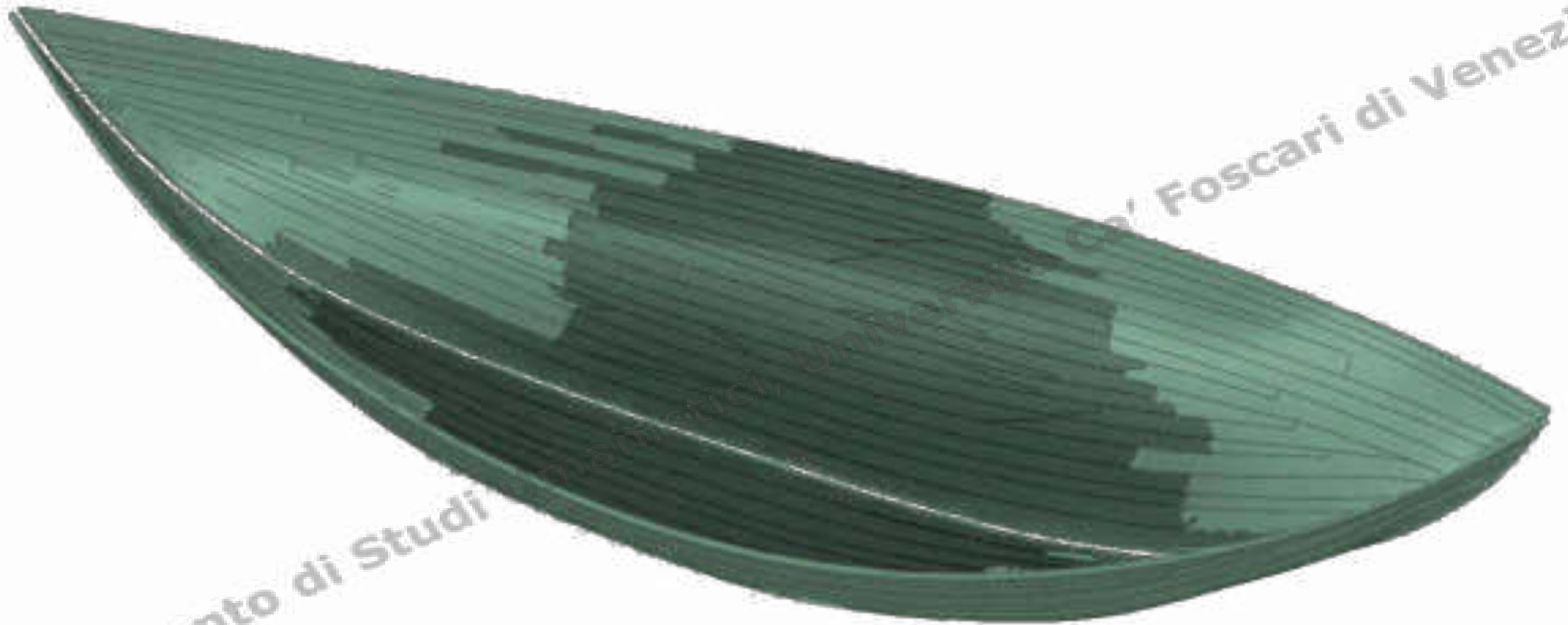


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## Photogrammetric survey of the cardboard study model



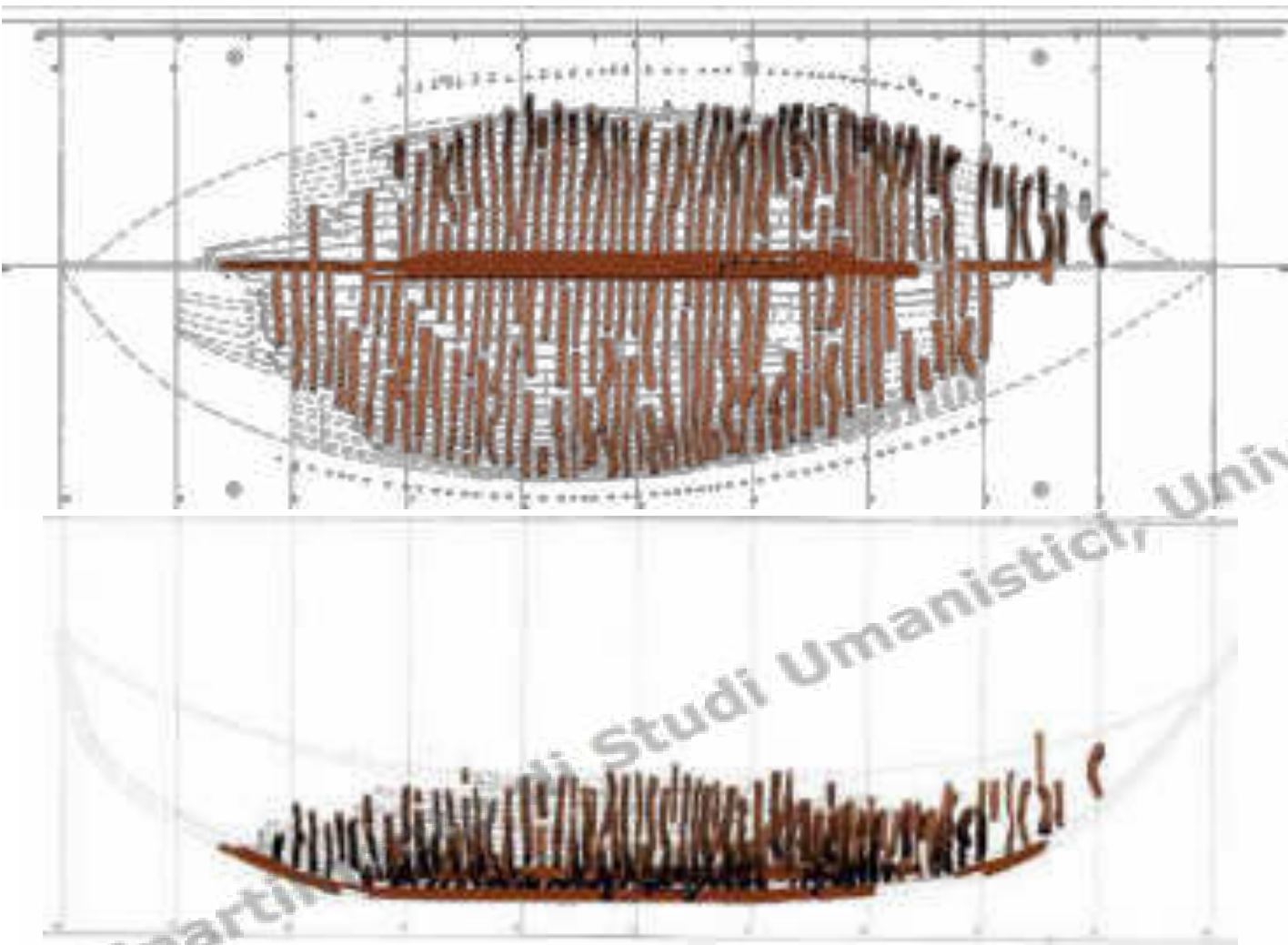
## Reconstruction of the hull and of the planks

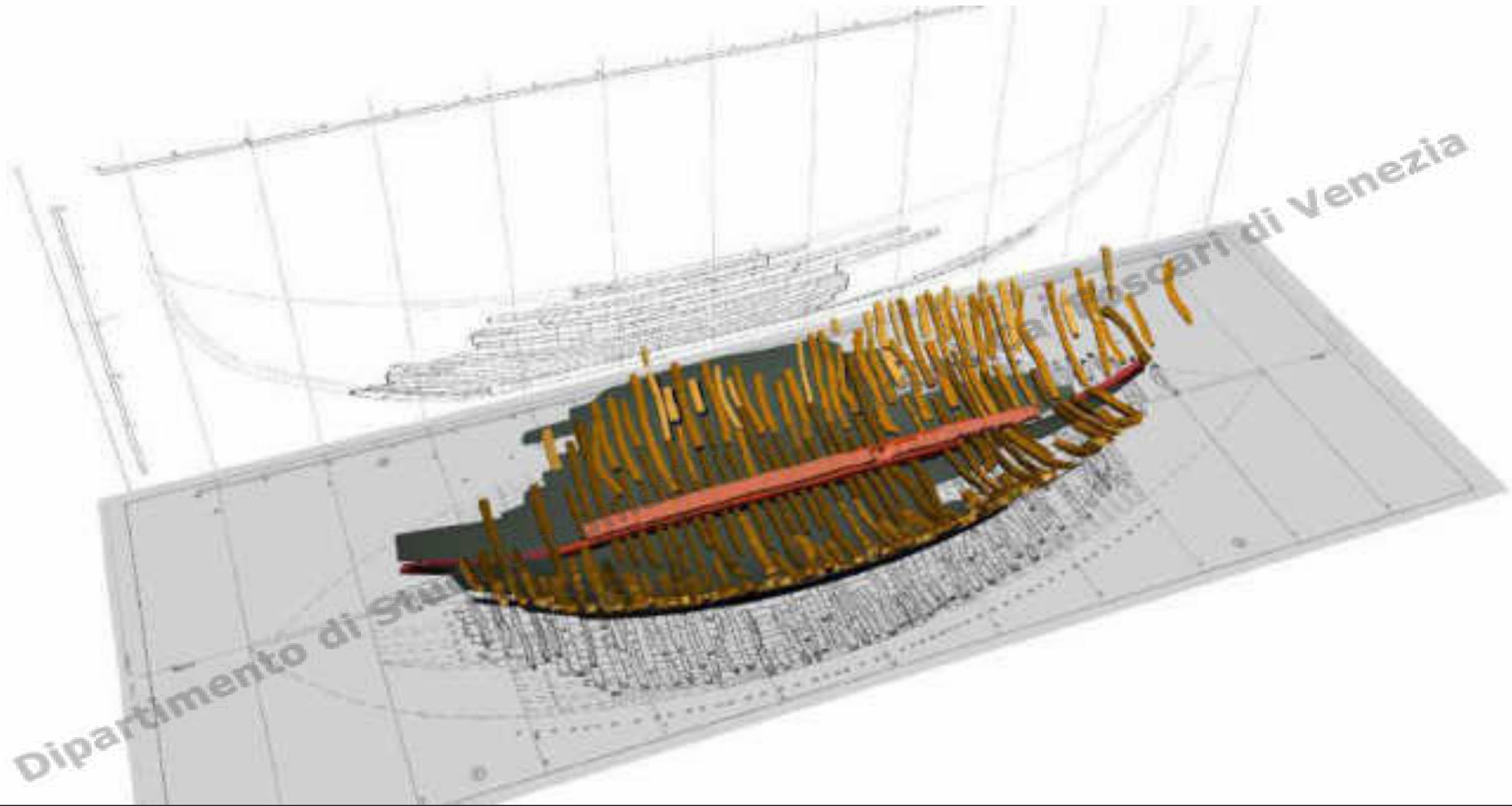


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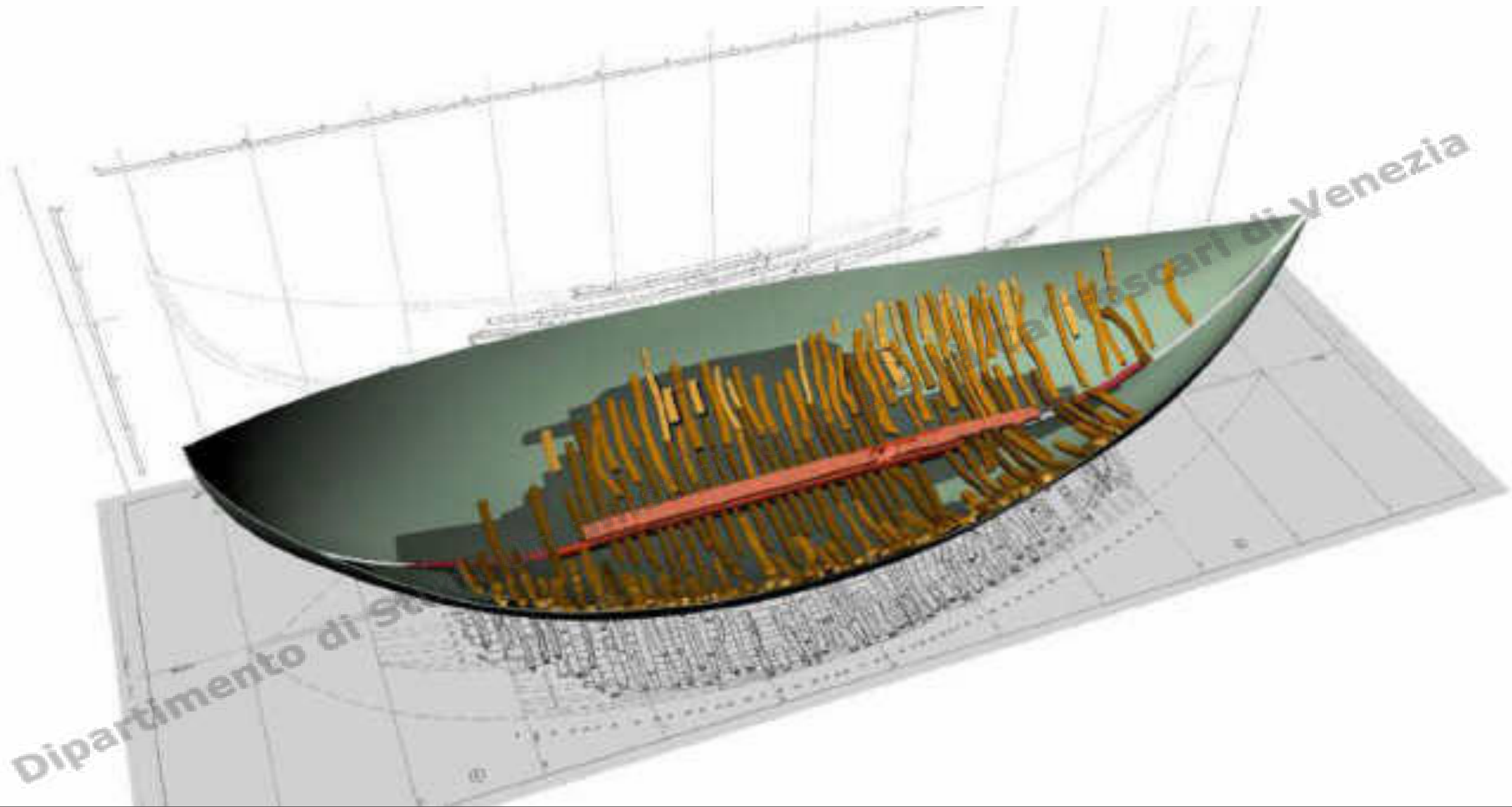
## Rototraslation of the wooden element in the reconstructed hull lines





DATA PROCESSING: THE RECONSTRUCTED SHIPWRECK

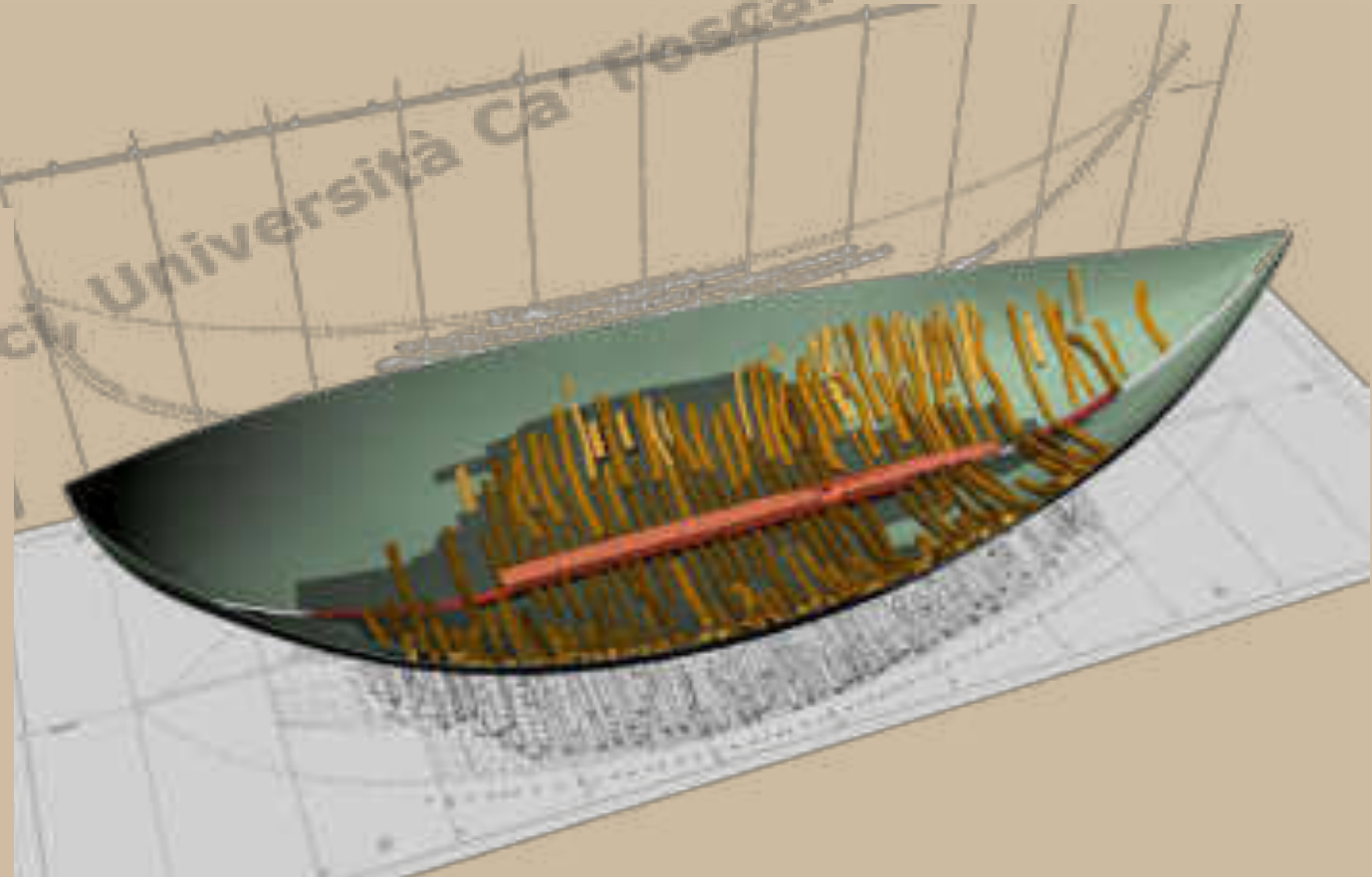




DATA PROCESSING: THE RECONSTRUCTED SHIPWRECK

## Concluding:

- Essential requirement of the recovery of legacy data
- Digital technologies and innovative solution to resolve problems
- New studies and visualization of a site not available and never exposed to the public





## IL WEB GIS

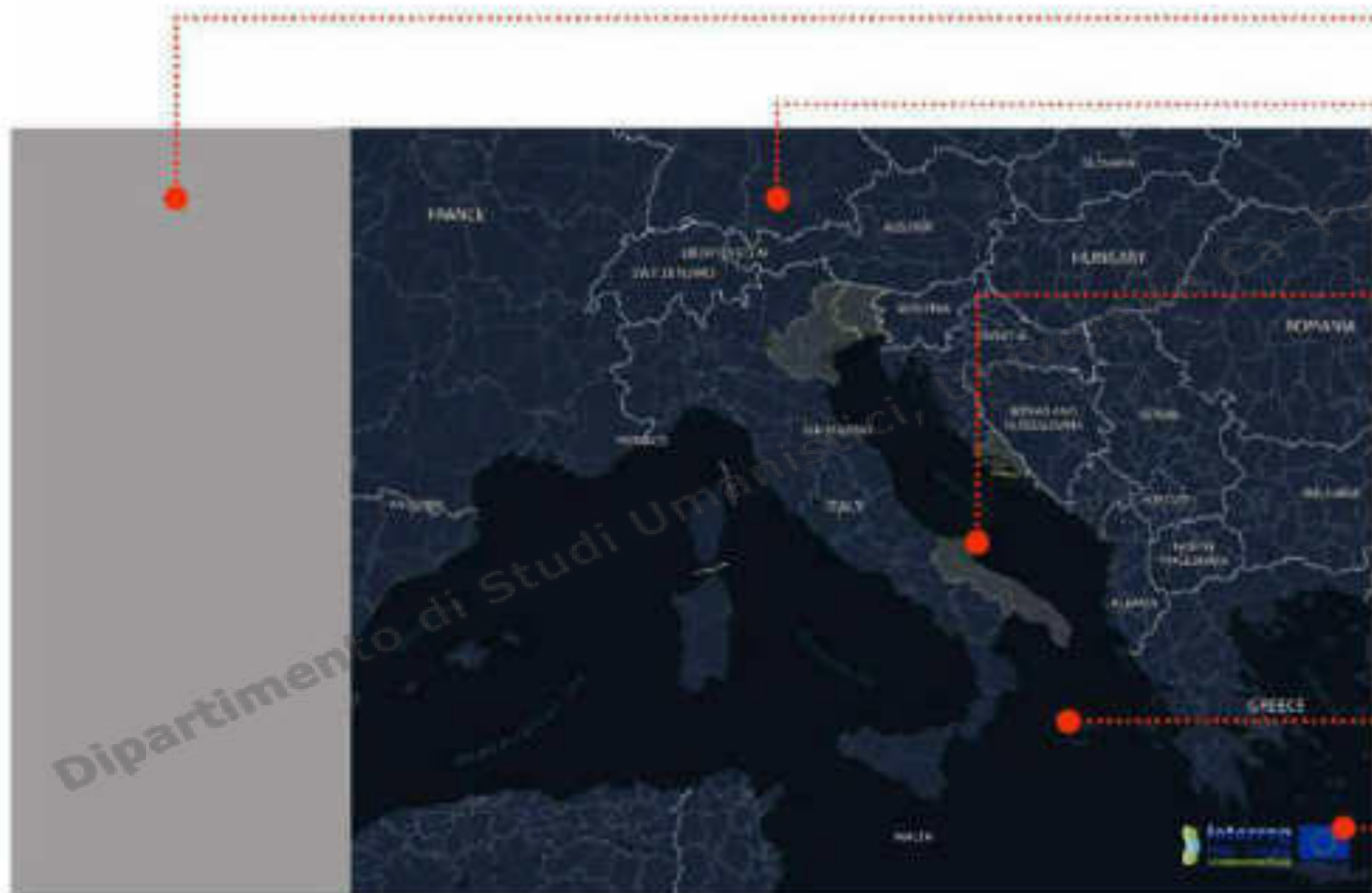
# PER IL PATRIMONIO ARCHEOLOGICO SUBACQUEO

Dipartimento di Studi Umanistici Università Ca' Foscari di Venezia



FUNZIONAMENTO MAPPA WEB INTERATTIVA  
PROGETTO UNDERWATER MUSE

# CARATTERISTICHE MAPPA



Parte sinistra occupata dalla lista dei Luoghi d'interesse

- Mappa personalizzata su Mapbox: colori scuri, scritte bianche, label delle informazioni minime.
- Area di interesse centrata nello schermo.
- Zoom out bloccato a questo livello e pan limitato alle aree interessate (non posso spostarmi e vedere il resto del mondo).

Regioni interessate dal progetto evidenziate rispetto al resto della mappa

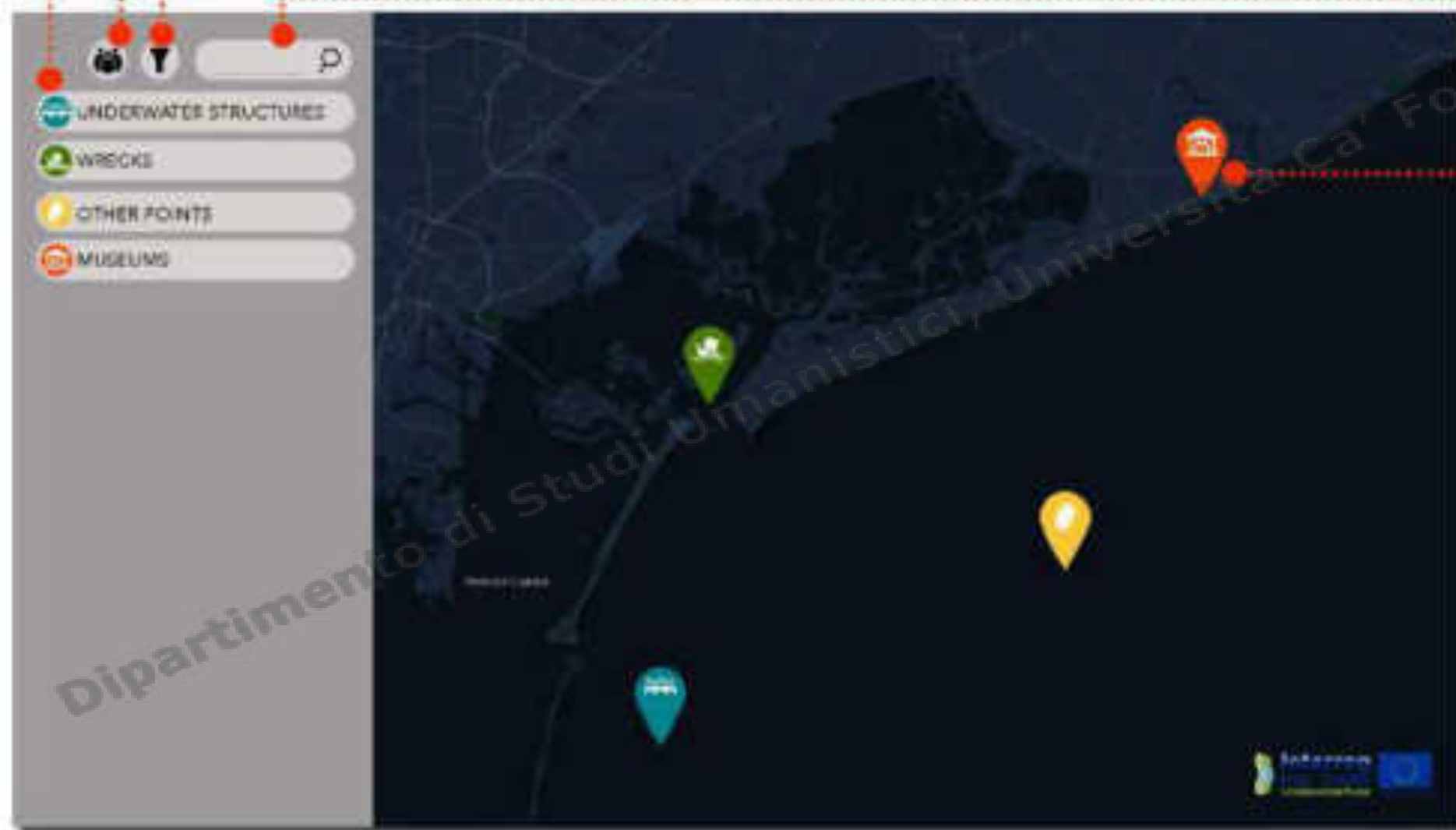


Eventuale visualizzazione dei dati batimetrici (vedi immagine sopra)

Sovrapposizione sulla mappa del logo INTERREG



# BANDA LATERALE



Testi CATEGORIE, cliccabili e quindi espandibili

Tasto PARTNER e PROGETTO, se viene cliccato si visualizzano informazioni, partner e collaboratori del progetto Interreg

Tasto FILTRO, se viene cliccato, filtrano i dati

Tasto CERCA, si può cercare manualmente un sito scrivendo il nome nella stringa

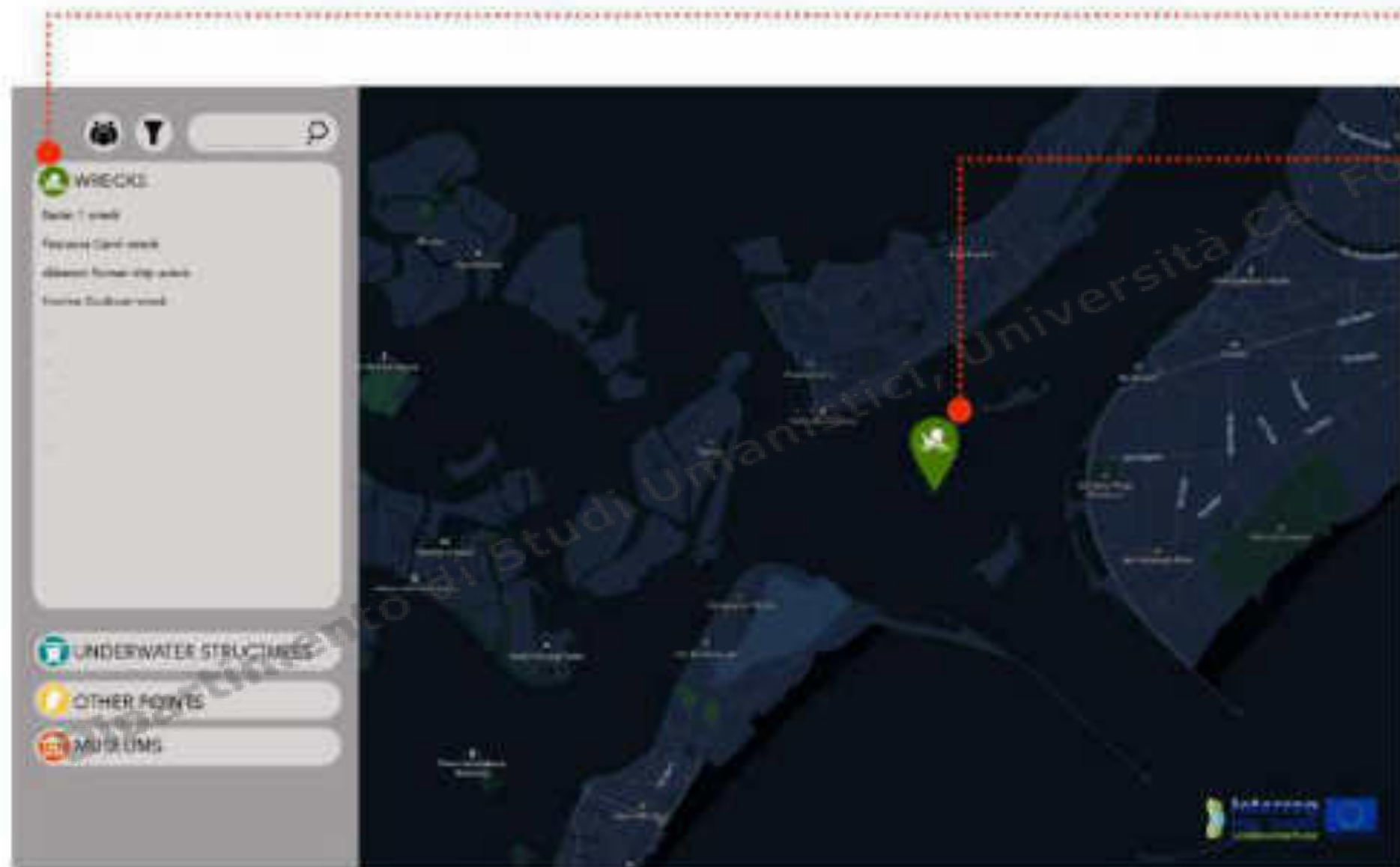
Ogni categoria di luoghi ha un'icona e un colore riconoscibile anche nella mappa, quindi già graficamente si riescono a percepire i differenti tipi di siti.



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# LISTA DEI LUOGHI

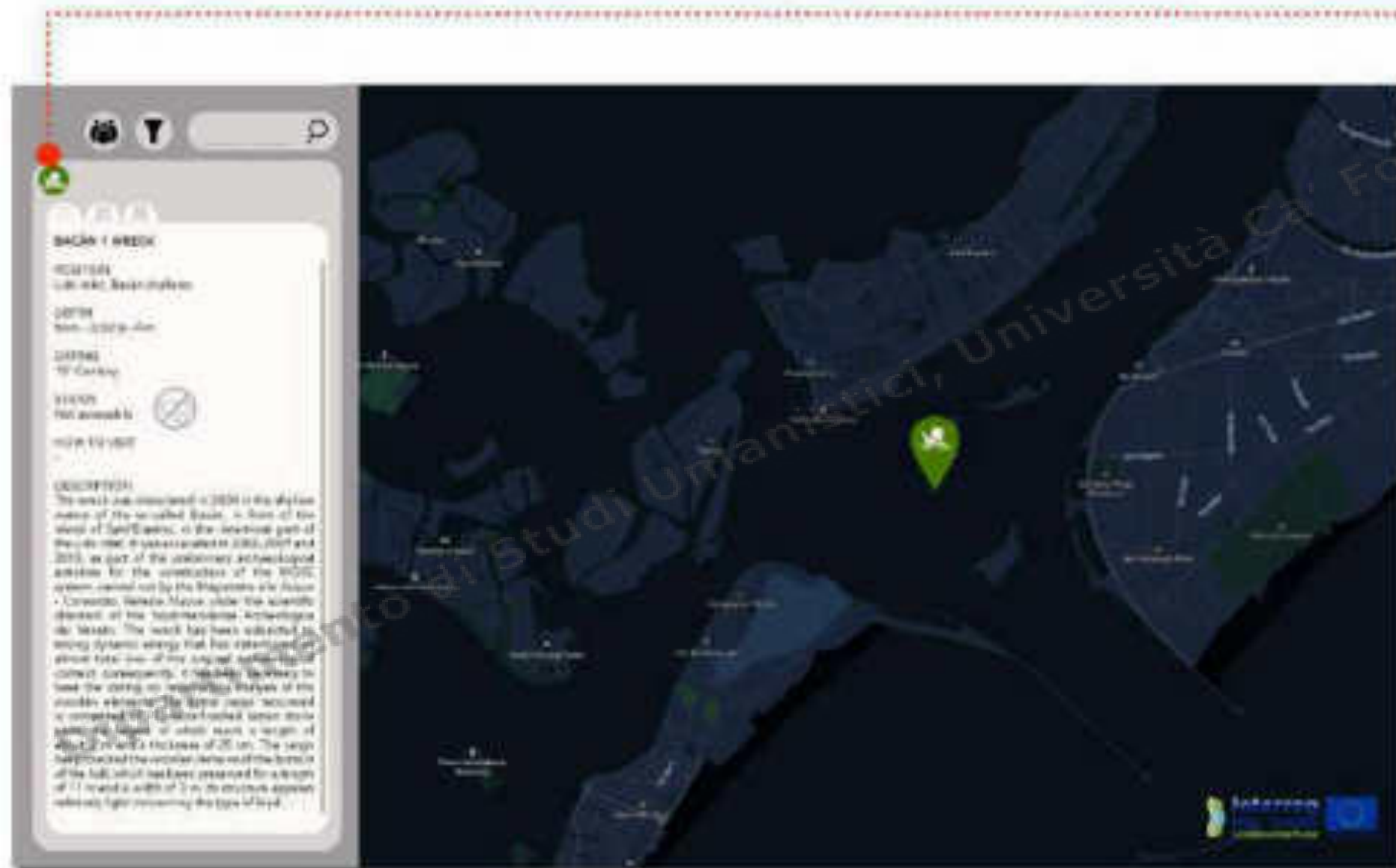


Se clicco una categoria, essa si legge nella lista di luoghi in essa contenuti. Questi sono cliccabili per far compiere la scheda di ciascun luogo.


Inoltre se clicco il tasto sulla sinistra, anche la mappa interagirà mostrando uno zoom sul sito richiesto (pagina successiva).

Viceversa, se clicco un luogo sulla mappa, la banda di sinistra interagirà facendo compiere la lista dei luoghi, in cui quello cliccato sarà evidenziato; e questo punto se clicco il nome comparirà la scheda con informazioni e i contenuti.

# LUOGO ESEMPIO\_TESTO



Se clicco un luogo, compaiono la sua scheda divisa in 3 cartelle:

1.  TESTO con tutte le info scritte che posso avere!

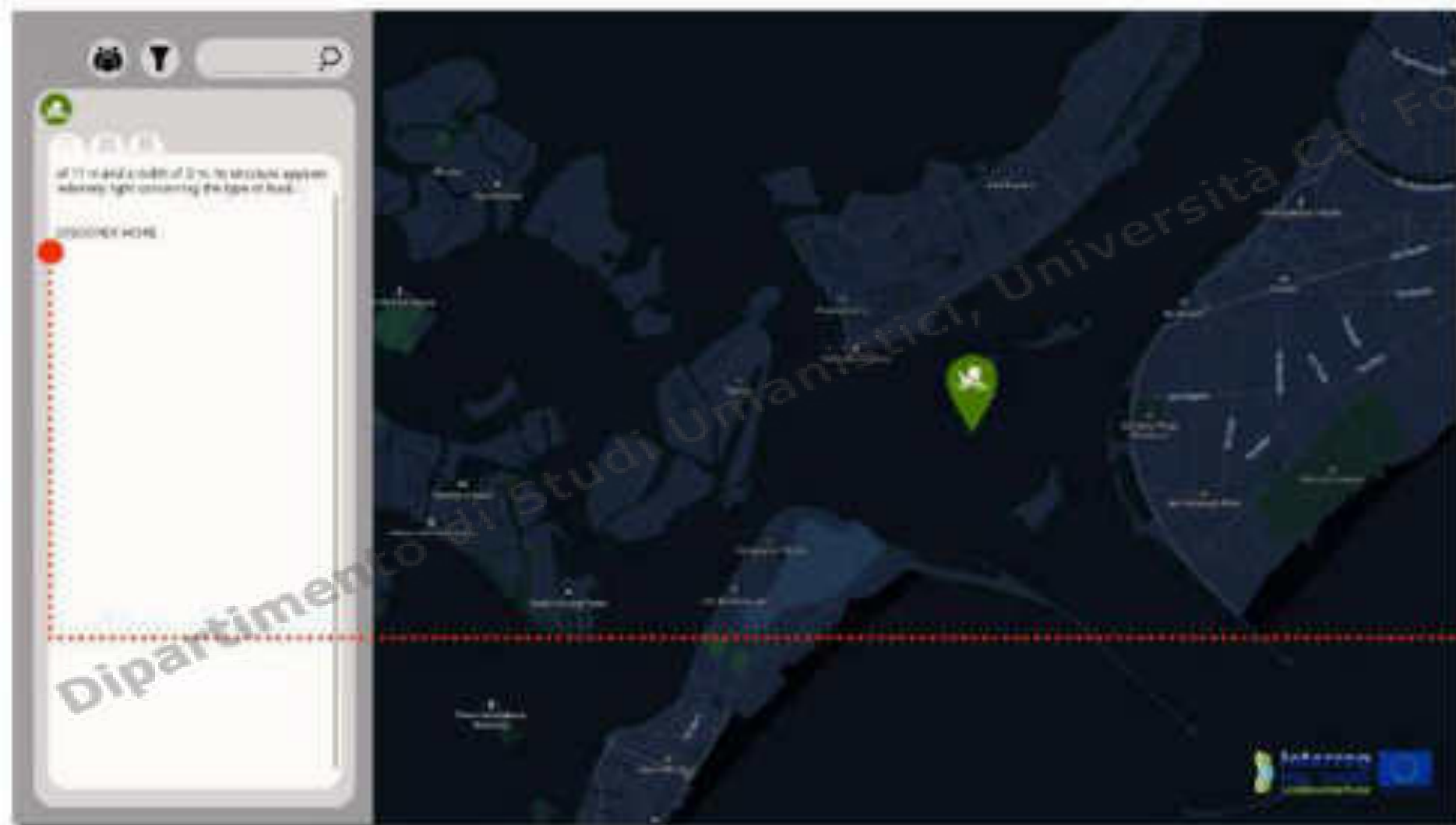
- Posizione
- Profondità
- Datazione
- Status
- Come visitare il sito
- Descrizione in doppia lingua

2.  FOTO E VIDEO

3.  AUDIO (lettura del contenuto scritto)

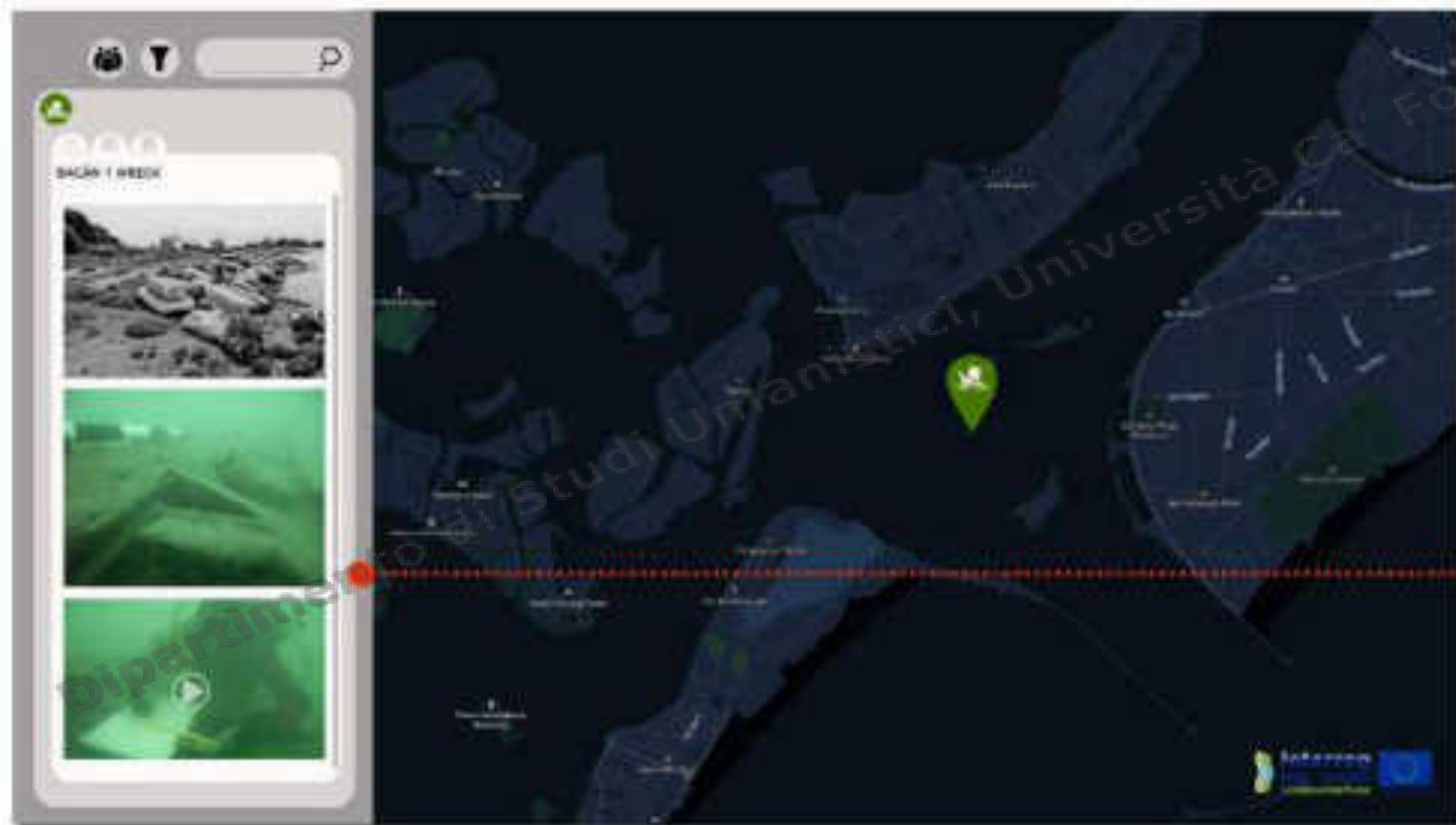


# LUOGO ESEMPIO\_SCOPRI DI PIÙ



Se scendo nella descrizione arrivo alla sezione **DISCOVER MORE**, nella quale troverò tutti i link utili di accessibilità, altri luoghi storicamente collegati e altro...

# LUOGO ESEMPIO\_IMMAGINI E VIDEO



Fosscari di Venezia

Possò fare scroll e visualizzare tutti i contenuti della scheda, comprese immagini e video.

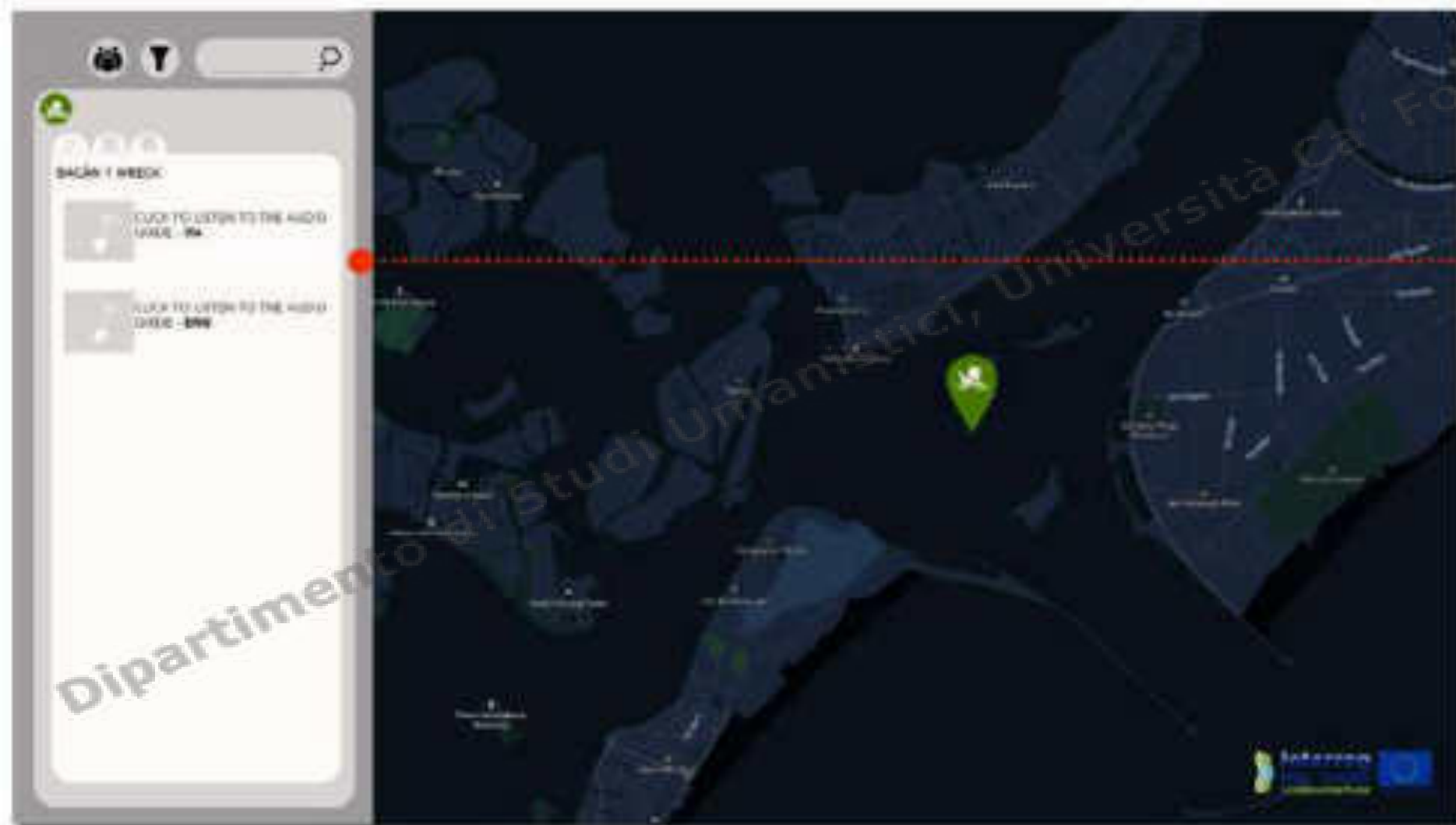
# LUOGO ESEMPIO\_IMMAGINI E VIDEO



Se clicco su un'immagine con un video, vengono mostrati quasi in full screen.

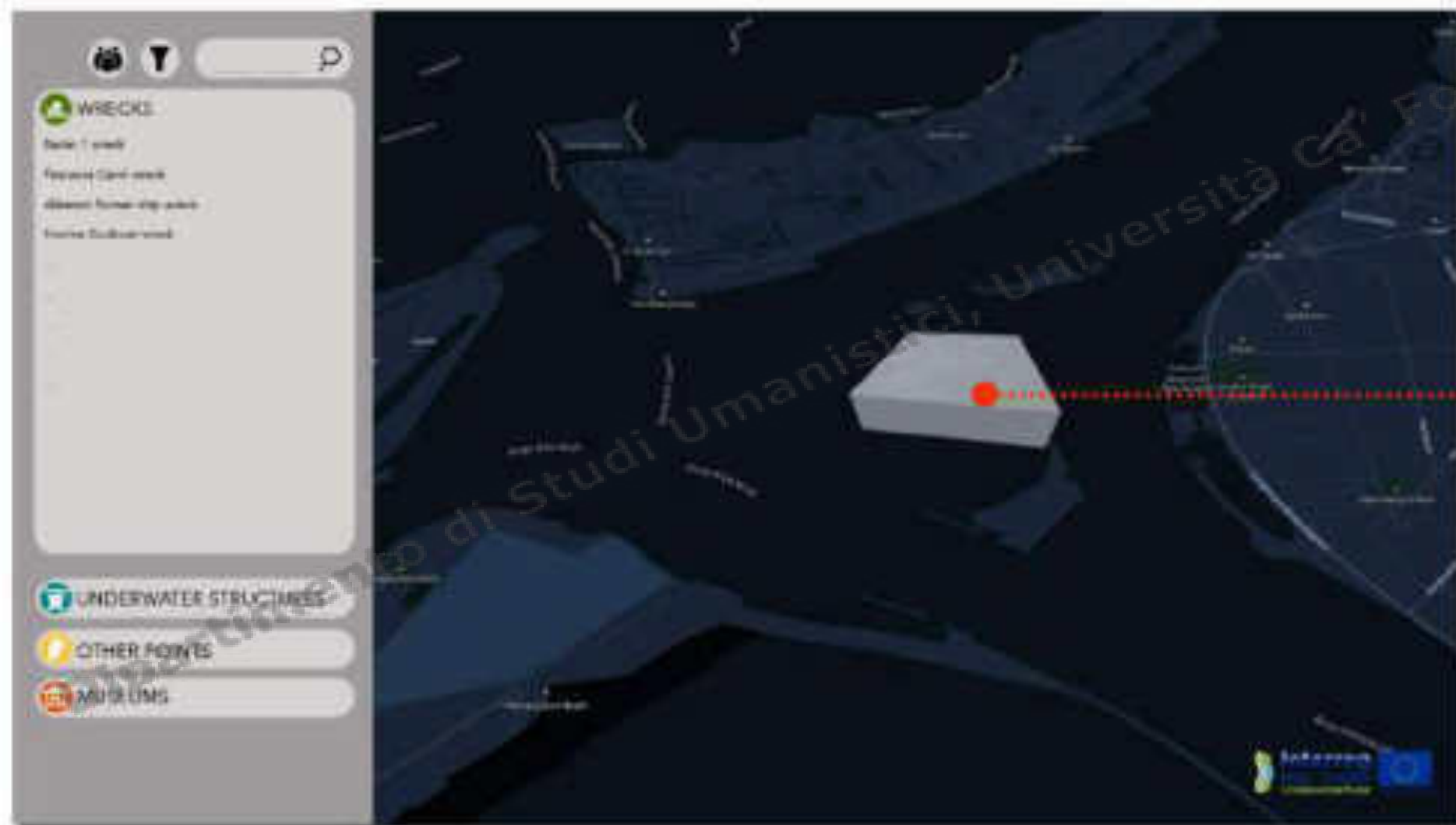
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# LUOGO ESEMPIO\_AUDIO



Posso cliccare sul tasto con la nota musicale per ascoltare la lettura della scheda, nelle due lingue.

# LUOGO ESEMPIO\_3D



Ad un certo livello di zoom, se presente, compare il contenuto in 3D collocato esattamente nella posizione preferenziale.  
L'utente può zoomare e ruotare la mappa per visualizzare il modello tridimensionale.

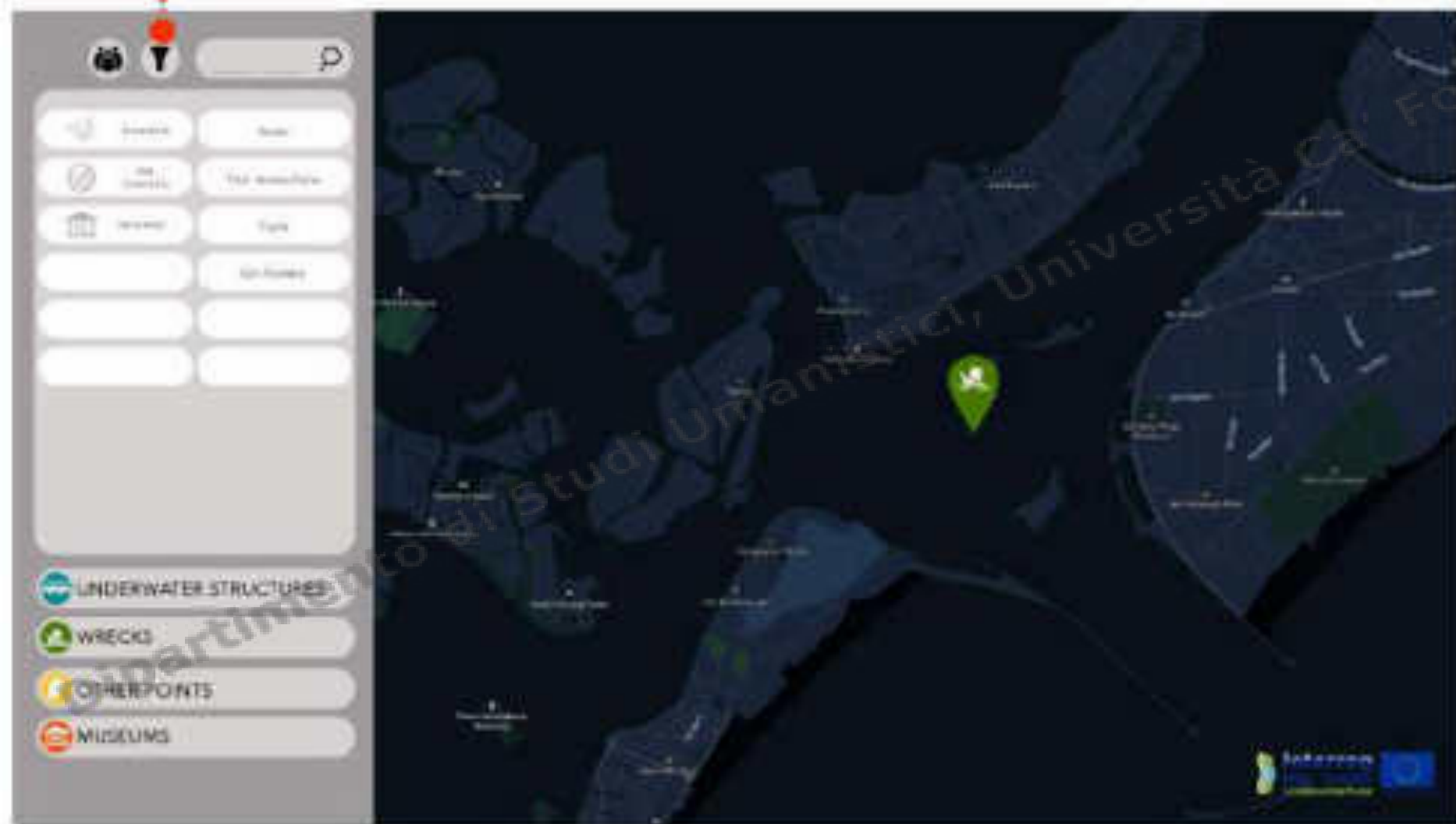
# LUOGO ESEMPIO\_MAPPE STORICHE



Ad un certo livello di zoom, se presenti, compaiono le mappe storiche, ovvero ai luoghi segnalati nelle vicinanze, in sovrapposizione alle mappe georeferenziate.

# FILTRI

Cliccando sul bottone FILTRO, comparirà tutti i filtri che si possono impostare nel ricercare i luoghi.



# PROGETTO E PARTNER

Cliccando il bottone PARTNER e PROGETTO, si visualizzano informazioni, partner e collaborazioni del progetto Intereg.

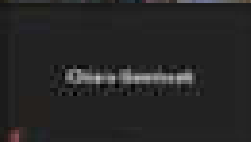
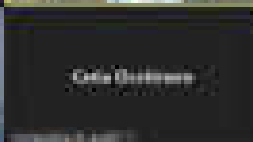
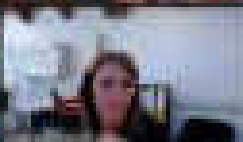
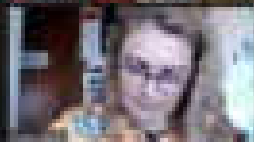
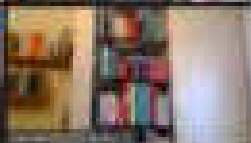
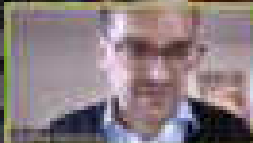
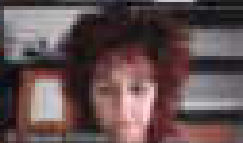
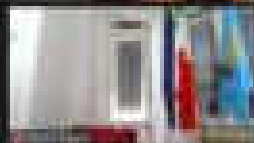
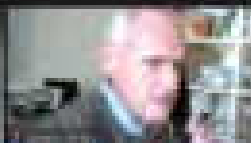
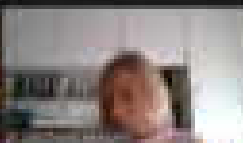
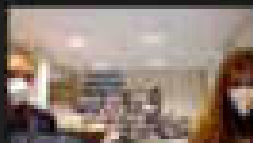
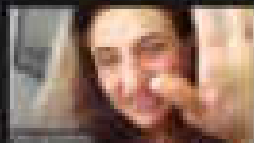
The screenshot displays a website interface for a project. On the left, a sidebar contains the following elements:

- Navigation icons: a red circle, a magnifying glass, and a 'P' icon.
- Text describing the project: "L'Università Ca' Foscari di Venezia è un'istituzione che...".
- Logos for "Patrimonio Culturale", "Università Ca' Foscari Venezia", "Erasmus+", and "REGIONE P.E.L.L.A.". The Erasmus+ logo includes the text "ERASMUS+ Programma di cooperazione internazionale".

The main area features a dark map of the Venetian lagoon with a green location pin. A large, semi-transparent watermark "Dipartimento di Studi Umanistici, Università Ca' Foscari di Venezia" is overlaid across the map.

In the bottom right corner, there are logos for "Intereg" and the European Union flag.





# *UnderwaterMuse: gli obiettivi, i progetti-pilota e il rapporto con le comunità e il territorio*

Rita Auriemma – Università del Salento

# UNDERWATERMUSE che cos'è UM?

Programma	<b>Programma INTERREG V A Italy – Croatia CBC</b> <b>Immersive Underwater Museum Experience for a wider inclusion</b>
Priorità	Investment Priority 6c – Conservare, proteggere, promuovere e sviluppare il patrimonio naturale e culturale
S.O.	3.1 Rendere il patrimonio culturale e naturale una leva per lo sviluppo territoriale più bilanciato e sostenibile
Partners	<b><i>LP – ERPAC – Ente Regionale Patrimonio Culturale del Friuli Venezia Giulia</i></b> <b><i>PP21– Università Ca' Foscari di Venezia</i></b> <b><i>PP2 – RERA – Public Institution for coordination and development of Split - Dalmatia County</i></b> <b><i>PP3 - Municipality of Kaštela</i></b> <b><i>PP4 – Regione Puglia – Dipartimento del turismo, dell'economia della cultura e valorizzazione del territorio</i></b>
Duration	30 mesi (01.01.19 – 30.06.2021 > proroga <b>30.06.2022</b> )

Space for Logos

# UNDERWATERMUSE *Gli obiettivi specifici*

**valorizzare e rendere accessibile l'ingente patrimonio sommerso delle aree coinvolte, altrimenti invisibile o comunque riservato a pochi, attraverso la creazione di parchi archeologi sommersi e l'uso narrativo e comunicativo della realtà virtuale.**

Concepire le piccole comunità come risorsa per l'innovazione

Diversificare l'economia locale e sviluppare opportunità di lavoro legate all'industria culturale e creativa

Ri-direzionare il flusso turistico dai siti ad alta intensità a quelli più piccoli e testare il "turismo creativo" basato sulla percezione esperienziale dei luoghi e del loro paesaggio (imparare, vedere, assaporare, acquistare).



# UNDERWATERMUSE

**Deficit di ricerca, tutela attiva e valorizzazione**

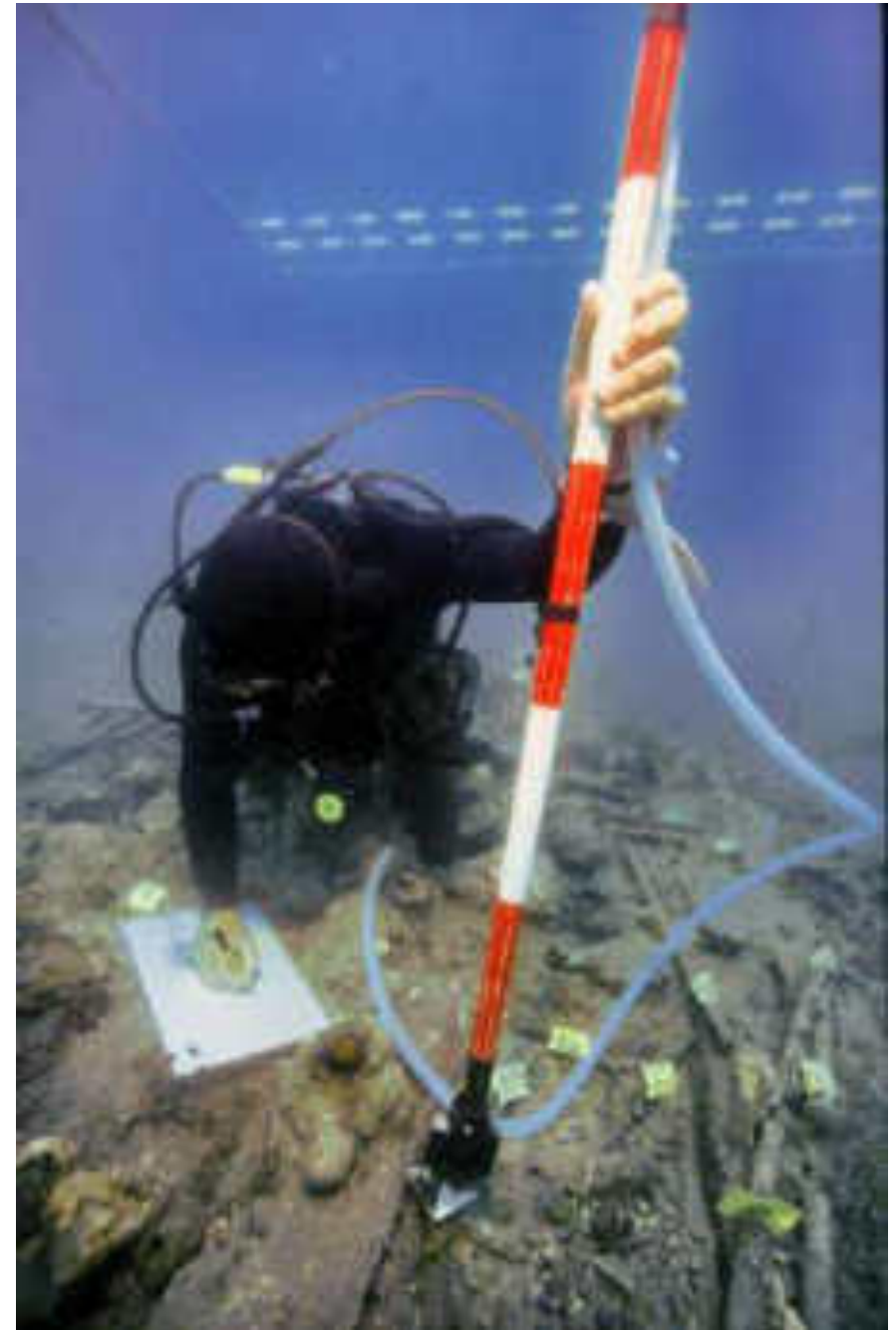


Abbandono, degrado, distruzione costante dovuta a saccheggi o ad azioni distruttive naturali e umane (pesca a strascico, moderne strutture portuali, etc.).



Assenza di un database internazionale dei siti archeologici subacquei

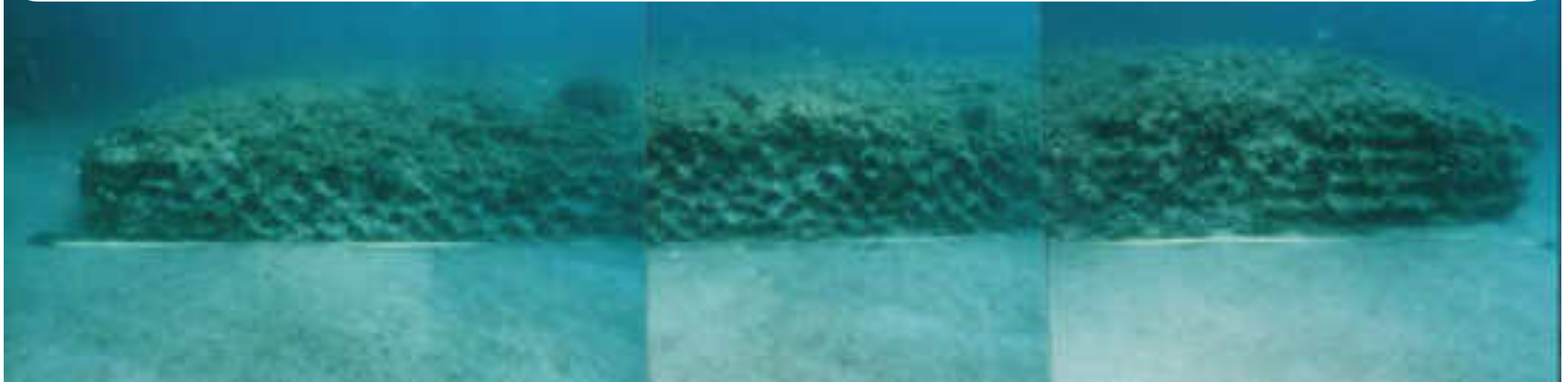
## *Lo stato dell'arte*



Tre progetti pilota per un museo subacqueo che possa essere fruibile a 360 gradi e replicabile in aree diverse, con i necessari cambiamenti basati sulle specificità del sito e del contesto.

La fruizione dei siti contribuisce alla loro stessa protezione su larga scala reintegrandoli nell'economia locale come una attività turistica economica vitale e redditizia.

Allo stesso tempo cresce un nuovo tipo di domanda proveniente dalle giovani generazioni sostanzialmente influenzate dall'era dell'informazione e della globalizzazione. Queste tendenze indicano la necessità di integrare il pensiero creativo e le idee innovative nello sfruttamento dei contenuti culturali tradizionali.



# UNDERWATERMUSE

perchè UnderwaterMuse ora?

*Through interpretation, understanding;  
through understanding, appreciation;  
through appreciation, protection*

Freeman Tilden  
Interpreting our Heritage

Space for Logos



# UNDERWATERMUSE

## *Archeologia dei paesaggi d'acqua Conservazione in situ e valorizzazione: la prima opzione*

### Passaggi chiave

**1. Convenzione sulla  
Protezione del  
Patrimonio Culturale  
Subacqueo 2001**

**2. Convenzione di Faro**

### Obiettivi chiave

Costruire una comunità  
culturale, costruire una  
consapevolezza

Il patrimonio culturale  
come bene comune e  
risorsa economica

Archeologia per il territorio,  
archeologia per l'ambiente

Ricerca, conservazione, protezione,  
management e valorizzazione  
come anelli della stessa catena

## 1. Una premessa lungimirante:

La Convenzione Unesco sulla Protezione del Patrimonio Culturale Sommerso 2001 > L. 157/2009

### *Portare le persone al patrimonio*

**Rule 1.** Conservazione in situ come prima e migliore opzione

**Rule 7.** Promuovere l'accesso pubblico al patrimonio culturale sommerso in situ, eccetto quando è incompatibile con la protezione e la gestione.

**Accesso Pubblico . Economia, turismo e diving nel tempo libero**

**Accesso = obiettivo prioritario**

contribuisce anche alla consapevolezza, aggiungendo valore all'approccio protettivo.

Conoscere il passato sott'acqua è diventato rapidamente una grande risorsa nel settore del tempo libero e nell'economia esperienziale > **rischi e opportunità per la protezione/tutela**

(UCH Manual; Recommendation 3/STAB 5)

**Coinvolgimento dei diving**

commisurando la responsabilità e il ruolo di custode è una possibilità per risolvere il problema della supervisione e del controllo .

(UCH Manual)



## 1. Una premessa lungimirante:

La Convenzione Unesco sulla Protezione del Patrimonio Culturale Sommerso 2001 > L. 157/2009

*Portare le persone al patrimonio*

### Costruire consapevolezza

Educazione, informazione e consapevolezza delle comunità sono fondamentali.

### Il coinvolgimento e le sinergie: gli attori

- Enti pubblici preposti alla tutela del patrimonio culturale Nazionale (MiBACT, SABAP)
- Enti pubblici preposti alla protezione dell'ambiente e delle risorse naturali (Min. Ambiente, AMP, Riserve naturali, ecc.)
- Autorità responsabili della sicurezza del traffico marittimo (Guardia Costiera, ecc.)
- Università e istituti di ricerca
- Associazioni culturali e ambientaliste
- **Operatori economici:**
  - diving centersclub
  - sailing center
  - concessionari di spiagge
  - imprenditori di pesca turismo



## 2. Un profondo cambiamento culturale in atto: La Convenzione di Faro

23.09.2020: ratifica della **Convenzione quadro del Consiglio d'Europa sul valore dell'eredità culturale per la società**, approvata nel 2005 a Faro, in Portogallo, ratificato ora da 20 Paesi su 47.

La Convenzione nasce dal confronto fra quaranta Stati europei sui danni al patrimonio culturale causati dai recenti conflitti verificatisi in Europa e, oltre a includere la tutela e la conservazione del patrimonio stesso fra le azioni prioritarie da intraprendere, focalizza l'attenzione su molteplici temi.



Patrimonio culturale: *insieme di risorse ereditate dal passato che le popolazioni identificano come riflesso ed espressione dei loro valori, credenze, conoscenze e tradizioni, in continua evoluzione* e gli riconosce, oltre al suo valore intrinseco, *“un valore d’uso e vede nella valorizzazione il fine e la premessa della tutela, perché il patrimonio culturale deve essere finalizzato a elevare la qualità di vita materiale e immateriale delle persone”*.



### **Articolo 1 - Obiettivi della Convenzione**

*“...la conservazione dell’eredità culturale, ed il suo uso sostenibile, hanno come obiettivo lo sviluppo umano e la qualità della vita;... una maggiore sinergia di competenze fra tutti gli attori pubblici, istituzionali e privati coinvolti.”*

### **Articolo 4 - Diritti e responsabilità concernenti l’eredità culturale**

*“...chiunque, da solo o collettivamente, ha diritto a trarre beneficio dall’eredità culturale e a contribuire al suo arricchimento;...”*

### **Articolo 10 – Eredità culturale e attività economica**

*“... accrescere la consapevolezza del potenziale economico dell’eredità culturale e utilizzarlo;...accertarsi che queste politiche rispettino l’integrità dell’eredità culturale senza comprometterne i valori intrinseci.”*

# Archeologia e ambiente, archeologia dei “paesaggi d’acqua”

Le buone pratiche della conservazione in situ e suoi sviluppi



naturale obiettivo dell’archeologia dei paesaggi, nel nostro caso “paesaggi d’acqua”, “un modo integrato di comprendere le dinamiche umane nei paesaggi”



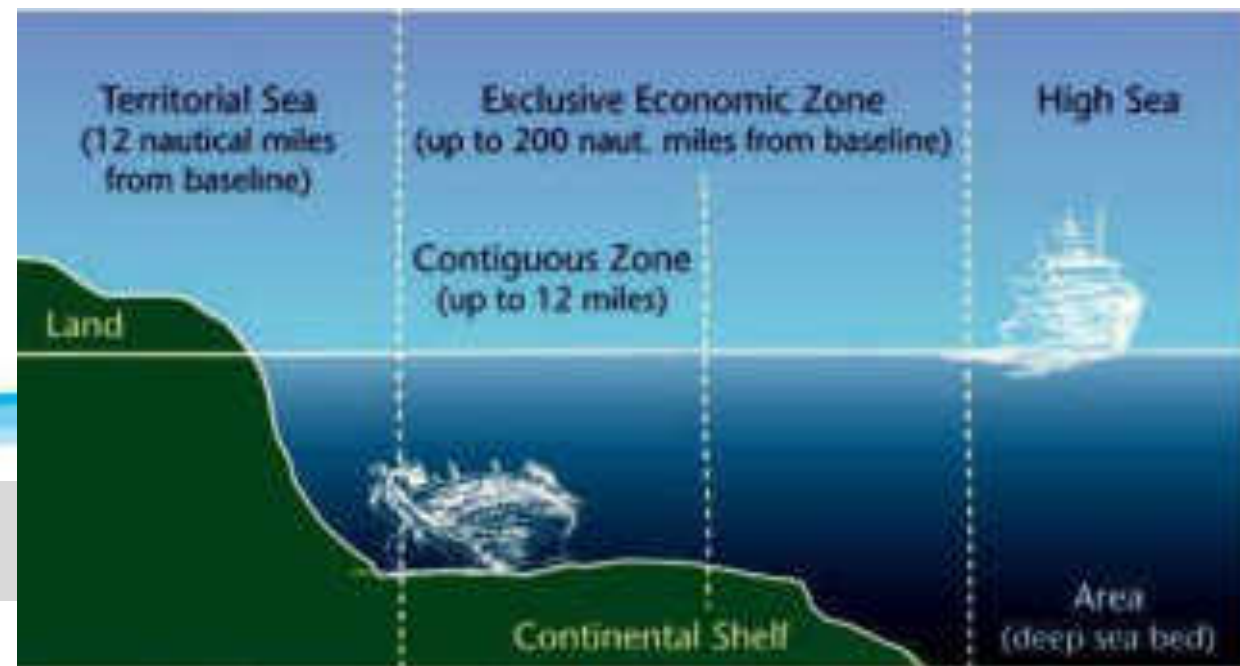
I siti archeologici sommersi o parchi sono un mix perfetto tra la natura e la cultura.



“eco-museo” o “museo diffuso”



Il paesaggio diventa museo, un sistema nel quale beni e oggetti sono connessi e, grazie a questo, comprensibili; un museo diffuso, dove il patrimonio culturale è conservato nell’ambiente del quale è parte integrante.



# Archeologia e ambiente.

## Conservazione in situ e sviluppi: il turismo subacqueo

### Il turismo subacqueo

- combina in un'unica attività tempo libero, sport, cultura ed ecologia
- è altamente sostenibile, a basso o nullo impatto ambientale
- è un “turismo alternativo programmato”, altamente regolato e con bassa intensità di flussi
- richiede un sistema turistico locale integrato, efficace, diversificato
- richiede aree provviste di uno status giuridico di protezione ambientale (MPA) e/o di parco archeologico> “cultura del territorio”,
- richiede investimenti in politiche di protezione e incentivazione con specifici *brand* ambientali (per es. MPA, Riserve, ecc.)
- è ad alta redditività

### Di contro

- Implica costi elevati per gli utenti
- Limita la fruizione> “gentrificazione”.

*E' un turismo per tutti?*

*Il patrimonio subacqueo, «the invisible heritage» è davvero un patrimonio per tutti?*

- 1. Status quo della valorizzazione del patrimonio culturale subacqueo**  
analisi, questionario e studio
- 2. Coinvolgimento degli Stakeholders**  
**Coinvolgimento degli attori locali: guide subacquee, aspiranti guide subacquee, associazioni turistiche, curatori museali, proprietari di stabilimenti balneari, clubs di vela, rappresentanti del governo locale, rappresentanti di MPA o CPA.**
- 3. Virtual reality e formazione**  
**Formazione focalizzata sull'uso di strumenti AR per offrire l'esperienza della visita dei siti archeologici subacquei ai non subacquei e a coloro che non possono immergersi (bambini, persone con disabilità, persone che non hanno sufficienti risorse economiche)**
- 4. Sviluppo del WEB GIS – Mappa dei siti sommersi accessibili realmente o potenzialmente**  
**Esplorazione virtuale dei siti archeologici sommersi attraverso informazioni vocali, testuali, immagini e animazioni**



1. *Status quo della valorizzazione.*

2. *Il coinvolgimento degli stakeholders attraverso il questionario*

## 1. Valutazione del significato del patrimonio culturale subacqueo

- *piena condivisione della rilevanza del patrimonio sommerso*
- *riconoscimento del suo valore storico e culturale*
- *riconoscimento del suo valore emozionale*
- *potenziale in termini di sviluppo sociale ed economico*

## 2. Stato della conoscenza del patrimonio culturale subacqueo

- *netta differenza tra i dati delle regioni italiane e la Croazia*
- *stakeholders italiani*      *grado di conoscenza varia a seconda delle categorie e della prossimità geografica*
- *scarsa conoscenza di Fondazioni, Associazioni importanti a livello nazionale e istituzioni pubbliche*
- *associazioni locali più informate e consapevoli*
- *disabilità*      *quadro chiaro*
- *Stakeholders croati*      *più informati in un quadro meno rappresentativo*

1. *Status quo della valorizzazione.*

2. *Il coinvolgimento degli stakeholders attraverso il questionario*

## 3. Valorizzazione in situ e accessibilità del patrimonio culturale subacqueo - Convenzione Unesco 2001

*Croazia: molti dei siti sommersi già da tempo accessibili, attraverso diving autorizzati*

*Italia : sporadiche esperienze di accesso autorizzato con la mediazione di guide senza un quadro comune di riferimento / molta discrezionalità.*

modello croato > best practice da seguire

## 4. Valorizzazione del patrimonio culturale subacqueo tramite realtà virtuale / realtà aumentata

*Molti non conoscono i prodotti della realtà virtuale o aumentata, o comunque digitali e/o interattivi, ma tutti li considerano attrattivi e funzionali alla valorizzazione dell'UCH*

1. *Status quo della valorizzazione.*

2. *Il coinvolgimento degli stakeholders attraverso il questionario*

## 5. Valorizzazione del patrimonio culturale subacqueo nei musei e nelle mostre

*Italia: diffusa disinformazione sui luoghi della cultura legati al patrimonio sommerso o alla cultura del mare, in particolare da operatori turistici e sportivi*

*Croazia: maggiore conoscenza e familiarità con musei e mostre*

## 6. Protezione del patrimonio culturale subacqueo

*Italia: non si identificano correttamente gli enti di tutela (uffici periferici del MiBACT) e non si conoscono misure e metodi di protezione*

*Croazia: comunità più partecipi e responsabili*

1. *Status quo della valorizzazione.*

2. *Il coinvolgimento degli stakeholders attraverso il questionario*

## 7. Valutazione della vulnerabilità del patrimonio culturale subacqueo

*- ricerca non percepita come minaccia*

*- giudizio positivo sulla fruizione turistica, se normata, controllata e gestita con guide subacquee opportunamente autorizzate e formate, che possano "educare" il turista subacqueo"*

*- mancanza d'intervento > pericolo*

## 8. Coinvolgimento del territorio per il patrimonio culturale subacqueo

**mezzi più efficaci per la promozione**

- *web e social networks (FB e Instagram)*
- *altri media (tv, radio, video, riviste, anche specialistiche, giornali on line)*
- *educazione delle scuole*



## 9. Raccolta fondi per il patrimonio culturale subacqueo



## 10. Gestione del patrimonio culturale subacqueo

- *compatibilità tra accesso diretto e tutela*
- *gestione dei siti controllata*
- *formazione di guide*



## 11. Turismo subacqueo e sostenibilità

*turismo di qualità, a basso impatto ambientale, esperienziale, lento e sostenibile. Non è per pochi ma richiede una specializzazione e un mercato, anche se la pratica dello snorkeling sui siti a bassa profondità incrementa molto il numero dei visitatori*

# UNDERWATERMUSE

## WP 5: TOOLKIT FOR REGIONAL ACTION PLANNING IN UCH VALORISATION

**action plans on the valorisation of underwater archaeological sites and the increased accessibility**

Rita Auriemma



# UNDERWATERMUSE

## 3. La nuova frontiera della realtà virtuale

**Valorizzazione del patrimonio sommerso**

*Portare le persone al patrimonio*  
**Conservazione e musealizzazione in situ**

*Portare il patrimonio alle persone*  
**Produzione di realtà virtuale**

I musei ospitati all'interno di edifici devono aggiornare le storie che vogliono raccontare. Possono raccontarle solamente attraverso le loro collezioni?

I musei possono introdurre nuove tecniche per fornire esperienze nuove e diverse?

È possibile collegare il museo ai siti che giacciono sui fondali sottomarini?

Display olografici e animazioni 3D possono ricreare ambienti e atmosfere insieme agli odori, trasportando il visitatore in un vero e proprio viaggio nel tempo (Manders 2008).



# UNDERWATERMUSE

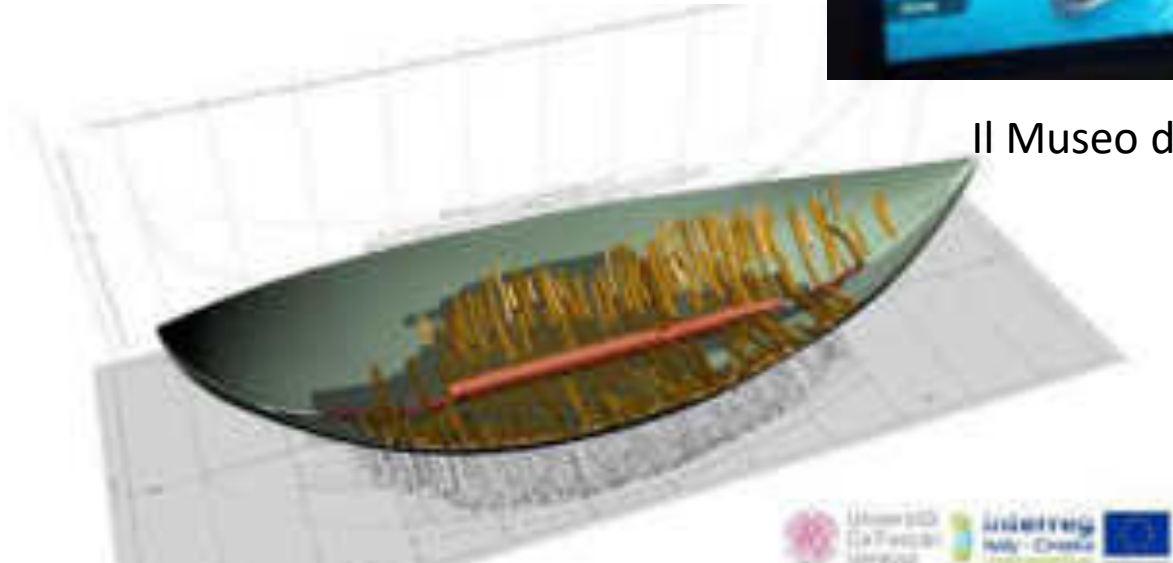
## 3. La nuova frontiera della virtual reality



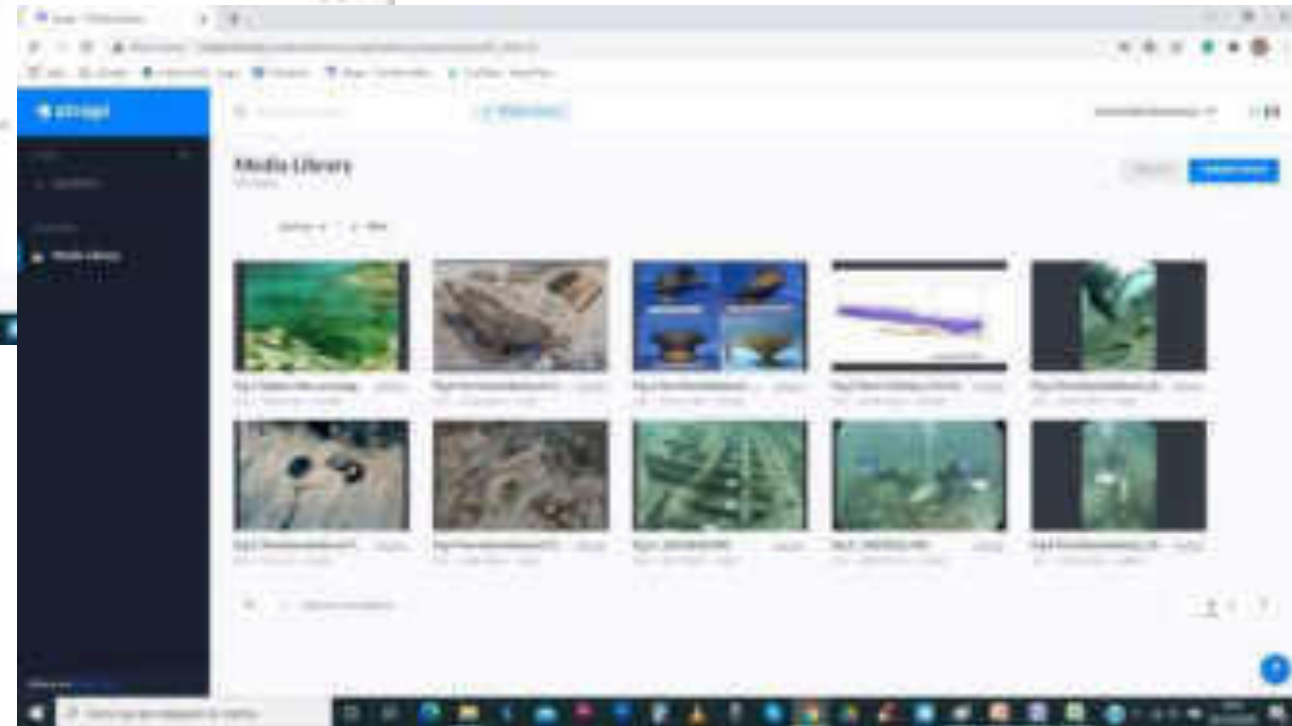
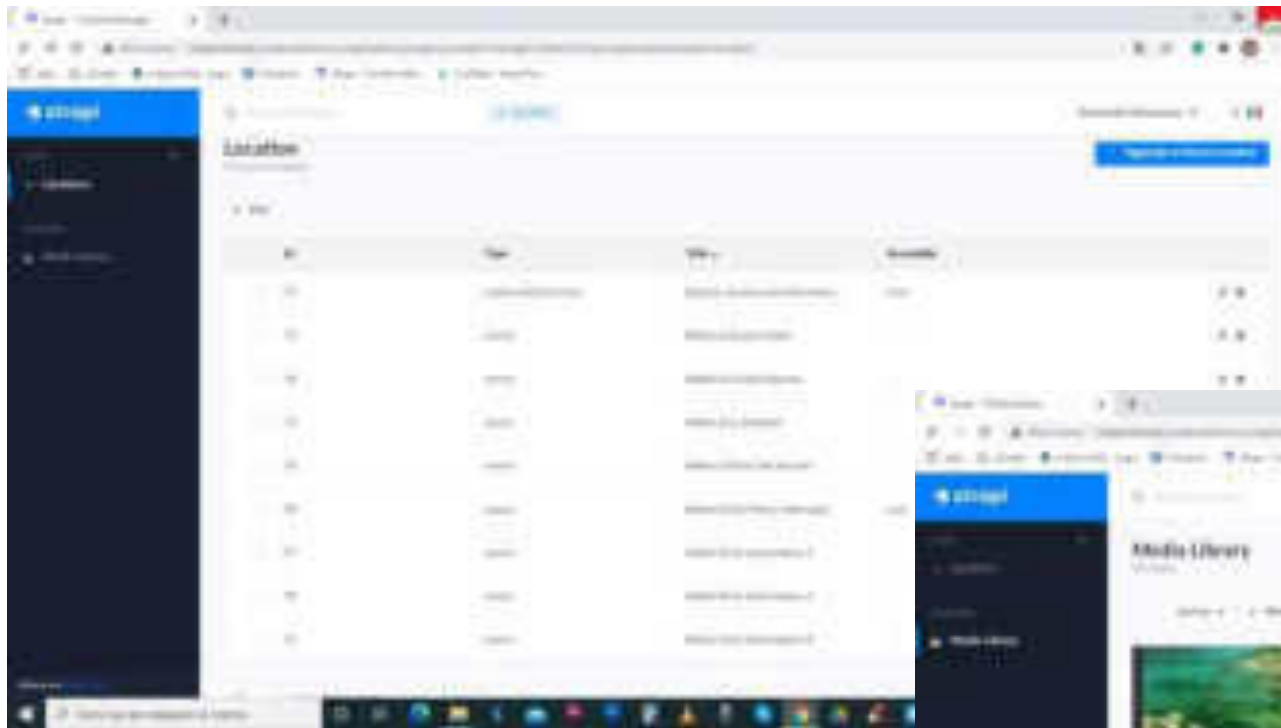
Il Museo di Caorle



Modello 3D dello scafo del relitto Grado1 (E. Costa)







Rita Auriemma

# UNDERWATERMUSE

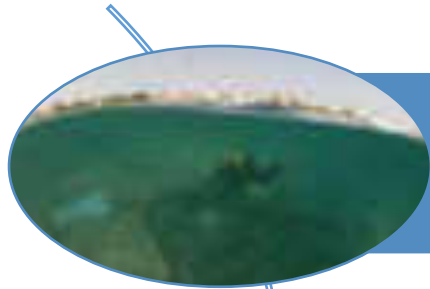
Ricognizione in Puglia per l'implementazione del portale  
Web GIS (Sett.-Ott. 2020)



Scoperta e  
ricognizione di  
strutture portuali  
sommerse e di un  
relitti/ carichi



Rita Auriemma



Torre S. Sabina (Br)

attività preliminari e campagna di ricerche 2020



Resnik/Siculi

attività preliminari e campagna di ricerche 2020



Grado 2 – attività preliminari

**Programma di mostre e attività educative sviluppate ai fini di un museo subacqueo interattivo**

**Visite incrociate/ revisione tra i partner**



In **Puglia** la scelta di Torre S. Sabina (Carovigno, Brindisi) quale scenario di un intervento-pilota in seno al Progetto *UnderwaterMuse* muove dalla qualità e varietà dei giacimenti archeologici presenti nella baia. Le eccezionali potenzialità di questo millenario approdo sono scenario ideale per un approccio olistico della ricerca, cioè quello dell'archeologia globale dei paesaggi, in questo caso costieri e marittimi, o *paesaggi d'acqua*. Si tratta di un "super-sito", con stratificazioni di eventi che sono anche significativi indicatori dell'evoluzione del paesaggio costiero: carichi e scafi, ma anche resti di attività estrattive e insediamenti.

# UNDERWATERMUSE

*Il progetto pilota della Regione Puglia:  
la campagna 2020 a Torre S. Sabina (Br)*



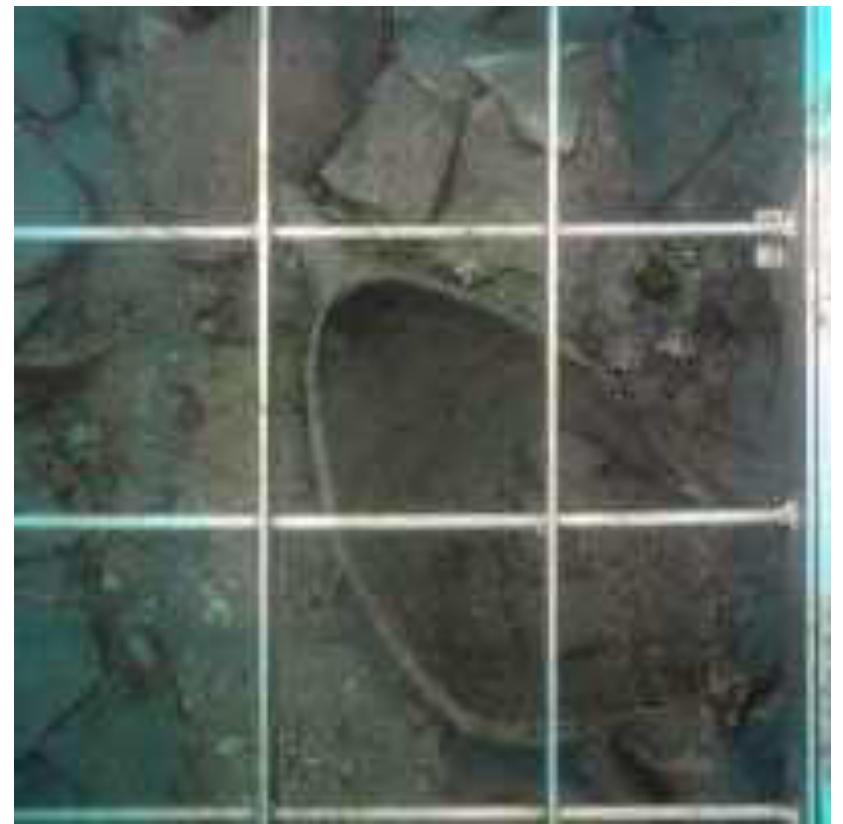
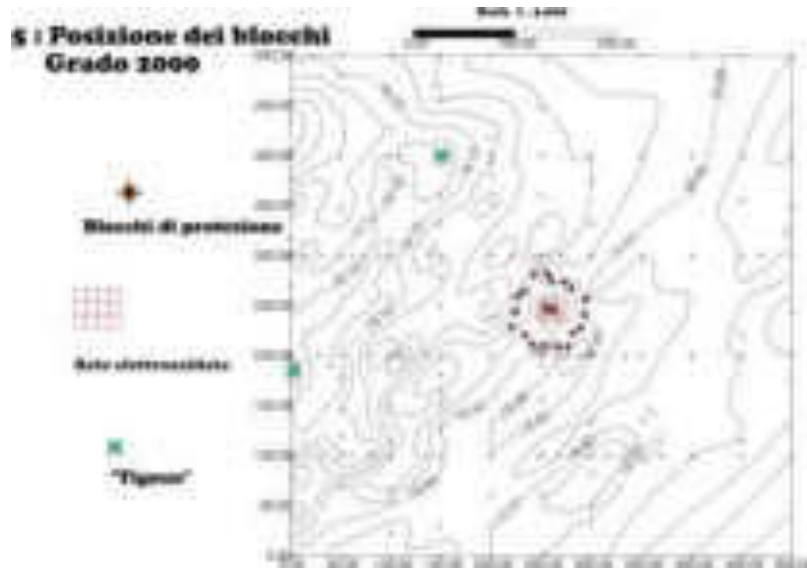
# UNDERWATERMUSE

*Il progetto pilota in Croazia:  
la fruizione virtuale del sito di Resnik/Siculi*



# UNDERWATERMUSE

*Il progetto pilota in FVG:  
la musealizzazione in situ del relitto di Grado 2*



# UNDERWATERMUSE

*Il progetto pilota in FVG:  
la musealizzazione in situ del relitto di Grado 2*

## Gli attori e la rete

- SABAP FVG
- ERPAC
- Università di Venezia Ca' Foscari
- Università di Udine
- Università del Salento

Convenzione tra SABAP ed ERPAC





## Metodi di protezione fisica del sito

Esistono diversi sistemi di protezione fisica dei siti che li salvaguardano dai danni fisici e nel contempo limitano i danni causati da fattori naturali.

Quando selezioniamo un metodo di protezione dobbiamo tener presenti **diversi parametri**;

### 1. **Caratteristiche generali del sito:**

- Tipo di sito (porto, relitto, strutture, edificio, oggetti e resti umani, resti preistorici, aerei e navi),
- Il tipo predominante di materiale nel (legno, ceramica, metallo, vetro)
- La profondità alla quale si trova
- Il livello di rischio del sito
- Il suo stato di conservazione
- La sua accessibilità in generale da parte delle persone
- Il valore storico e archeologico del sito

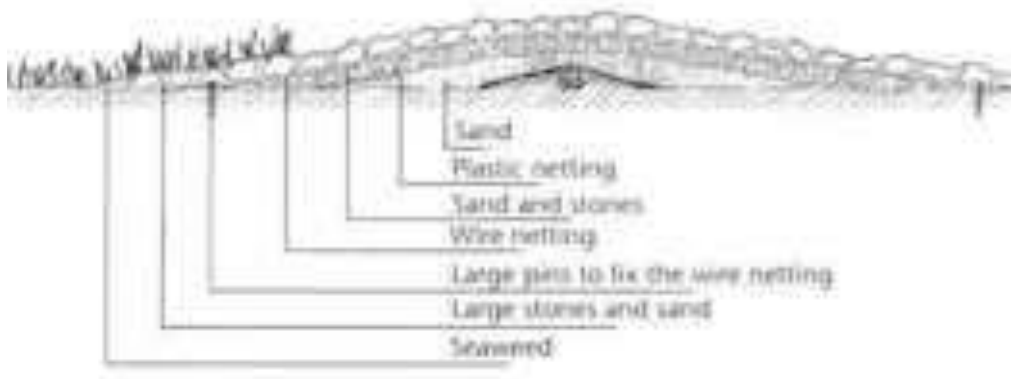
### 2. **Le condizioni ambientali che determinano la sopravvivenza del sito**

- Fattori fisici, biologici e chimici

### 3. **Possibilità e fattibilità della protezione in situ e quadro finanziario**

# Metodi di protezione fisica del sito (Pešić 2011)

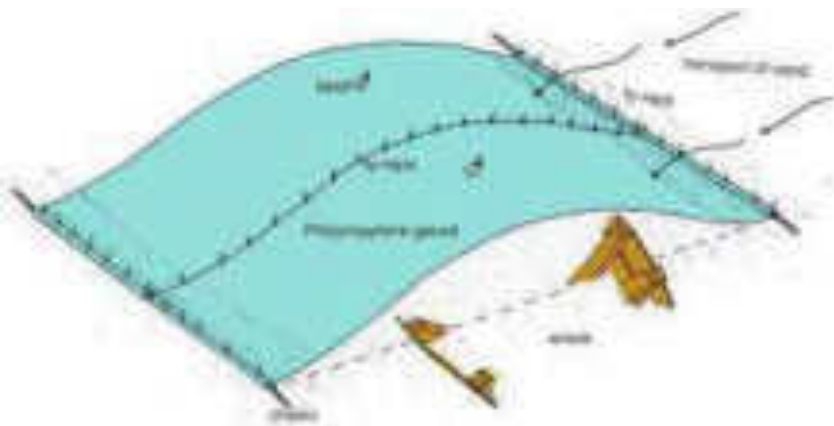
## 1. Copertura del sito con strato di sabbia e pietre (legno / resti organici)



## 2. Copertura del sito con sacchi di sabbia e geotessuto (legno/ resti organici)



## 3. Copertura del sito con tela o rete in polipropilene (legno / resti organici)



## 4. Copertura del sito con cassone (legno/ resti organici)



## 5. Copertura del sito con rete metallica



# UNDERWATERMUSE

*Il progetto pilota in FVG:  
la musealizzazione in situ del relitto di Grado 2*

La strategia adottata:  
non solo protezione  
ma anche fruizione.  
La copertura con  
gabbie  
metalliche modulari



- 

Nel **2003**, il Ministro della Cultura ha autorizzato per 5 anni le immersioni in **10** siti subacquei.

L' **obiettivo** era rendere i siti destinazioni turistiche conosciute attraverso il coinvolgimento dei diving center come agenzie di turismo responsabili della salvaguardia .

Il progetto riguardava circa **60 diving centres**, per i quali questa attività è diventata redditizia, mentre d'altro canto il patrimonio ha acquisito nuovi alleati.

L' iniziativa ha stimolato la consapevolezza pubblica riguardo la questione della conservazione del patrimonio sommerso.

Nel **2008**, **50.000 divers** hanno visitato i siti subacquei. Questo sistema ha garantito sia la protezione fisica che legale dei siti.

**I siti censiti e protetti - con livelli diversi di accesso, anche autonomo - nella regione Split-Dalmazia sono 58, dei quali 41 sono relitti e 14 sono strutture portuali**

SITES	MANAGEMENT	PROTECTION/ CONSERVATION	REAL ACCESSIBILITY	LEGISLATION/ REGULATIONS	VALORISATION
46 (structures and shipwrecks of various ages)	Ministry of Culture	Surveyed  Partially surveyed/ conserved  not conserved  Survey in process	11: only freediving and snorkeling allowed  15: diving not allowed  1: diving allowed  19: diving permitted through licensed diving centers	Protected cultural property of the Republic of Croatia	12: Presented in situ  13: in situ presentation planned  3: in situ presentation planned, protected with cage  7: in situ and VR/AR presentation planned  8: Presentation not planned  1: ravaged by lundering (diving allowed)

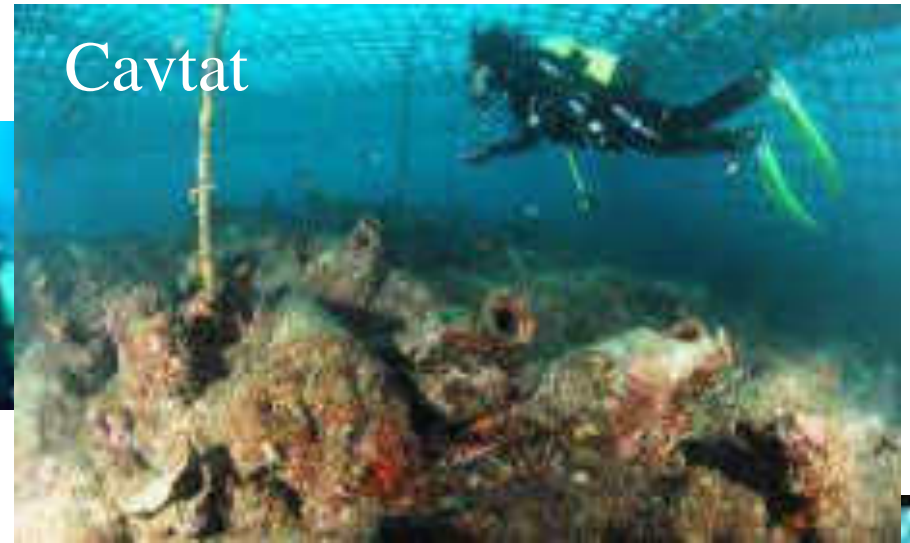
## L'esperienza Croata.

### Mappa dei siti con le gabbie di protezione



*Exploring Underwater Heritage in Croatia 2009*

# L'esperienza Croata.





**SITES THAT CAN'T BE VISITED WITHOUT EXPERT SUPERVISION:**

1. SHIPWRECK "CORIOLANUS"
2. SHIPWRECK "BARON GAUTSCH"
3. SHIPWRECK "SZENT ISTVAN"
4. PROTECTION ZONE ISLAND JABUKA
5. PROTECTION ZONE ISLAND LASTOVO
6. PROTECTION ZONE ISLAND VIS
7. PROTECTION ZONE ISLAND PALAGRUŽA
8. PROTECTION ZONE ISLAND MLJET
9. SHIPWRECK "S57"
10. SITE CAVTAT
11. SITE ŽIRJE

**ARCHAEOLOGICAL UNDERWATER SITES**



SHIPWRECK "BARON GAUTSCH"

PROTECTION ZONE  
ISLAND VIS

SHIPWRECK "CORIOLANUS"

SITE CAVTAT



7 000

6 000

3 000

3 000

VISITORS

ARCHAEOLOGICAL UNDERWATER SITES-VISITORS

# UNDERWATERMUSE

*Il progetto pilota in FVG:  
la musealizzazione in situ del relitto di Grado 2*

## La strategia dell'intervento

