



Project co-financed by the European
Regional Development Fund

SEE the SEA

Virtual Dive at "CHRISTOFOROS" Shipwreck

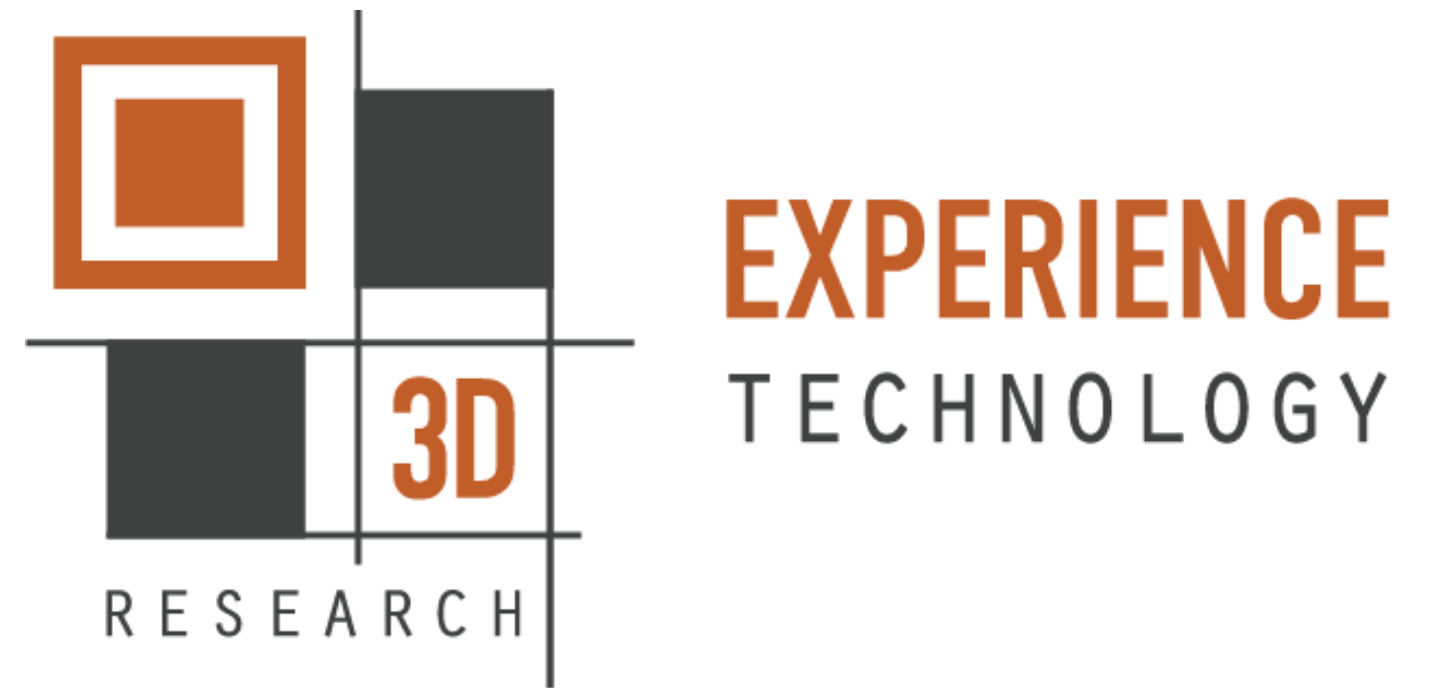
WEBINARI_Rethinking Tourism
B2B Event_Projekt EU "MISTRAL"

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Participants

- 3D Research Srl presents an outstanding experience and knowledge on digitalization, creation of 3D models, virtual reality reproductions, etc. It is considered ideal as a knowledge provider, for its involvement in a vast variety of projects related to photogrammetry, VR and AR content development and the construction of 3D models for Underwater Cultural Heritage sites.
- Skopelos Dive Center is a certified PADI Dive Center, fully licensed by the Greek Port authorities and supported by DAN Europe (Dive Alert Network). Skopelos Dive Center is repertoried by PADI as Dive Resort. The center is fully equipped ensuring a safe and pleasant diving experience to all visitors. Skopelos Dive Center's Head office is located in Thessaloniki, four branches one in Adrina Beach Hotel at Panormos bay and another at the main harbor of Skopelos while the other two are located in Alonissos island, one in Patitiri and the other in Senti Vala.



3D Research srl

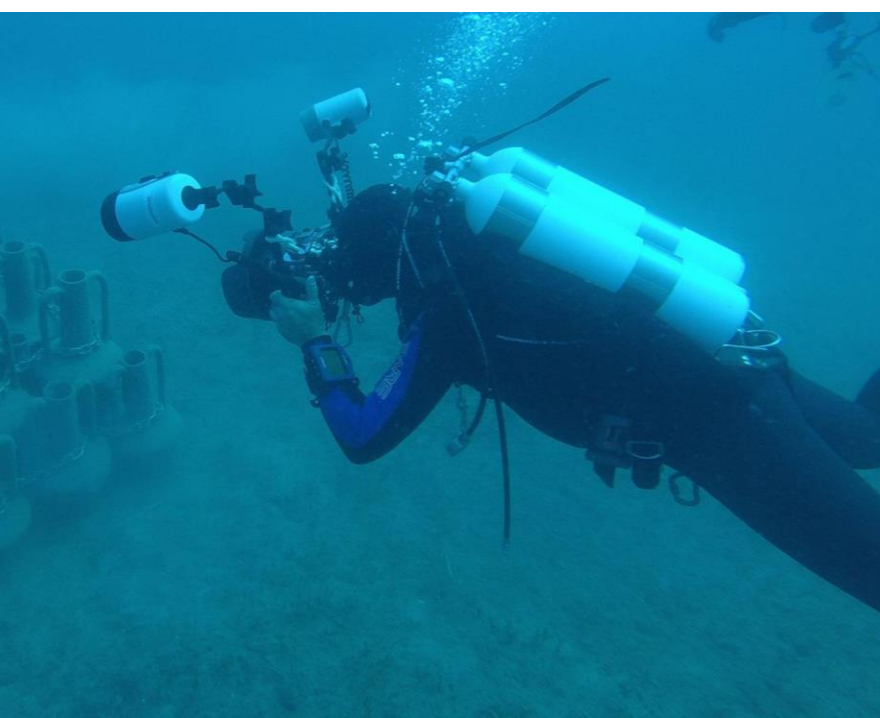
<https://www.3dresearch.it/en/>

3D Research Srl (3DR) is a spin-off company of the University of Cosenza. It has **considerable experience in the field of Cultural and Creative Industries (CCI)**, mainly related to the use of digital technologies (Virtual and Augmented Reality, Computer Graphics) to create new ideas, innovative products, and services for the **promotion of the Cultural Heritage**. The digital models, together with other cultural and creative multimedia contents (texts, audios, videos), are used to enhance the visitors 'experience both in-situ (i.e. helping a diver during the exploration of an underwater archaeological site or a tourist during the visit to a museum) and ex-situ, to promote CH destinations and revitalize tourism attractions. **The underwater domain is one of the core business of the company.**

- Support of heavy investments in R&D for the creation of innovative hi-tech products for the promotion and exploitation of the underwater natural and cultural heritage: the underwater tablet **Divy**, which the company is developing through various research projects (VISAS, Lab4Dive, IMARECULTURE and MOLUX).



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Skopelos Dive Center

<http://sporadesdiving.gr/>

The team of Skopelos Dive Center offers not only unique diving experiences but also helps substantially in raising people's awareness concerning the protection of natural and cultural heritage of Greece.

- After long time efforts and with the help of Skopelos Dive Center the modern wreck "CHRISTOFOROS" can be visited by the diving community- a practice that wasn't possible due to a legal framework until 2018
- Skopelos Dive Center has participated recently in the first dives of the classical shipwreck of Peristera, in Alonissos island. This initiative is of the utmost importance for the protection and management of Underwater Cultural Heritage.

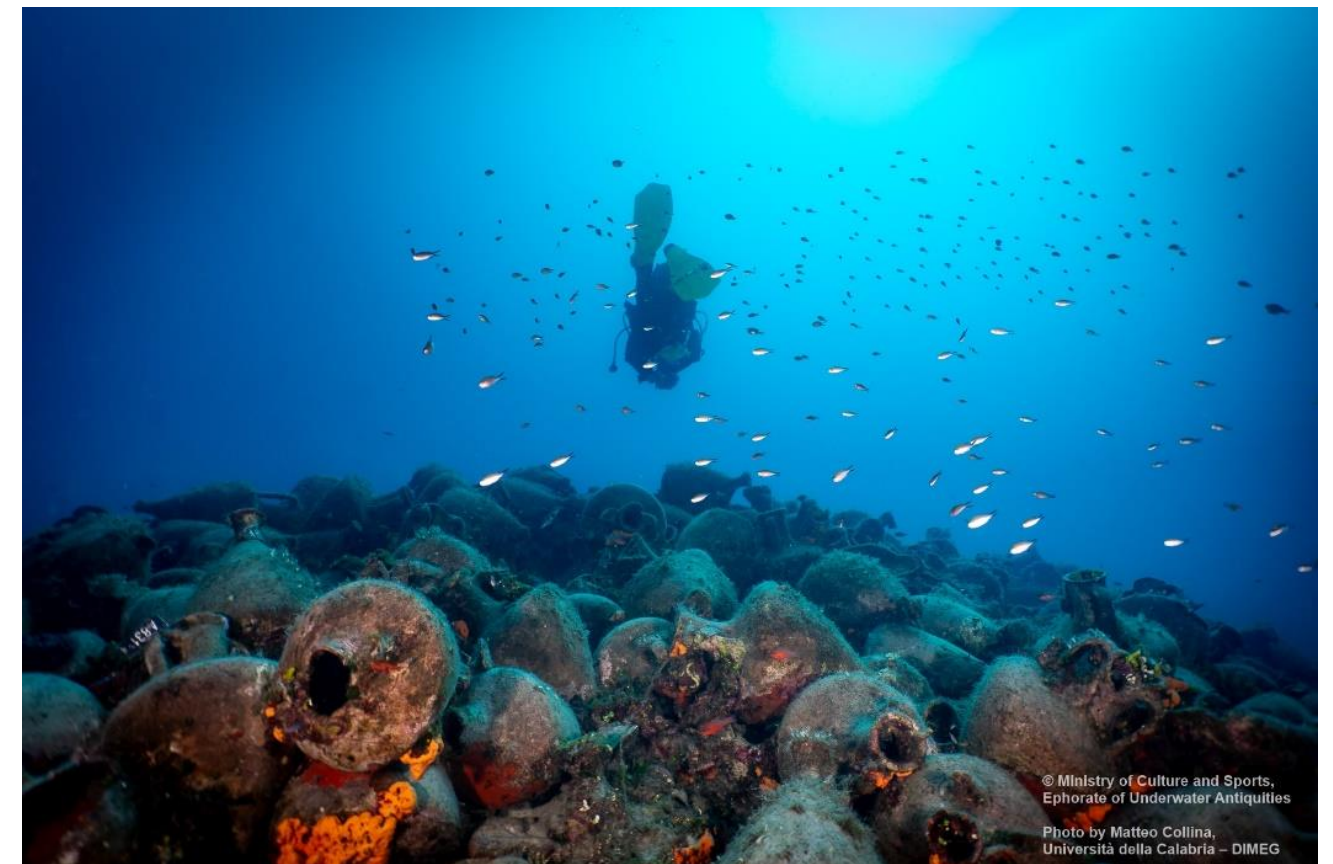


The Sea | An Eternal Bridge

- Diachronic nautical tradition
- Crossroads of civilizations
- Nautical routes uniting people

UP: The modern shipwreck “VERA” (1999) in Skiathos © LabTop

DOWN: The classical shipwreck of Peristera(425 BC) in Alonissos © MCS-EUA



The wrecks as time capsules

- define origin & destination
- information on equipment
- economic & trade activity
- development of naval technology
- a part of the economic and social life
- great condition of preservation
due to scarcity of oxygen
even in great depth (Black Sea)



Underwater Cultural Heritage

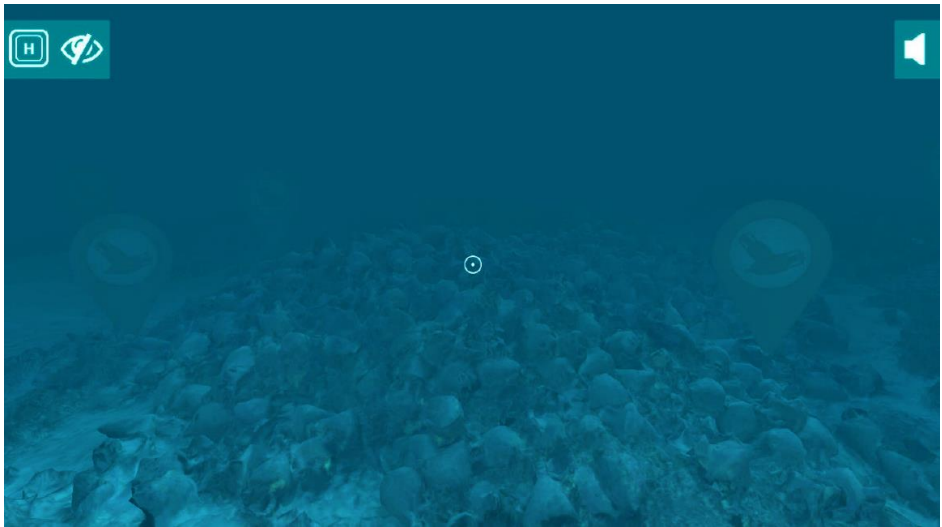
“All human remains of cultural, historical or archaeological character, which have been partially or totally under water, periodically or continuously, for at least 100 years” (UNESCO 2001)



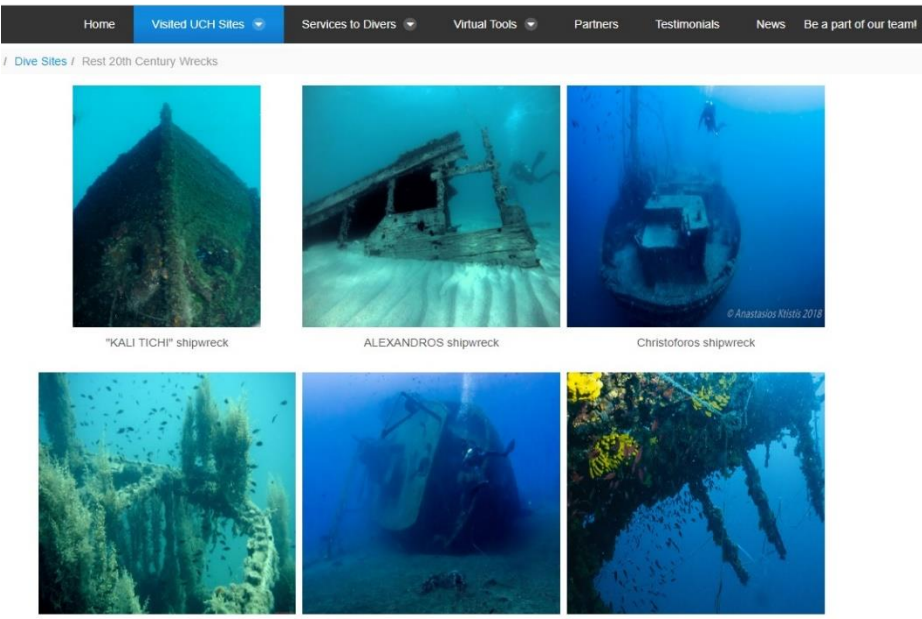


Knowledge Awareness Centers (KACs), Bluemed Project, 2014-2020

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Dive Virtually: Peristera, Greece



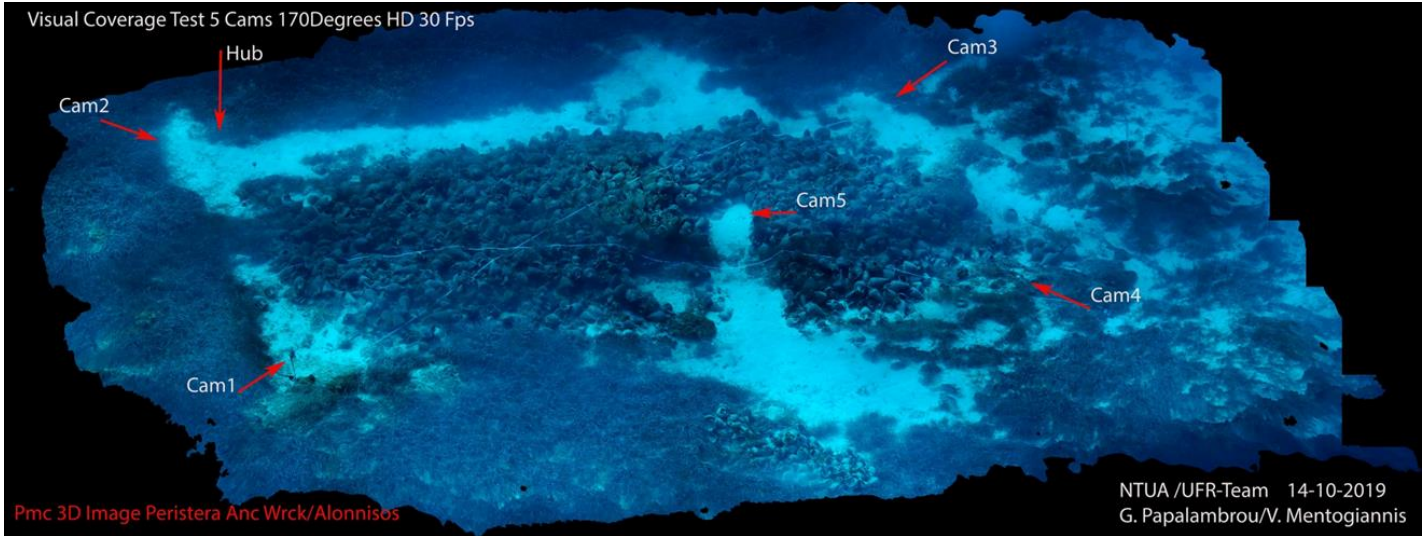
BLUMED platform, <http://meddiveinthepast.eu/>

Technology in the service of Cultural Heritage

- Introduction of a new reality
- Multiple examples in European and national level verify this new practice



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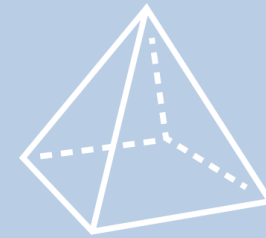


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The project

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3D reconstruction of the "CHRISTOFOROS"
shipwreck

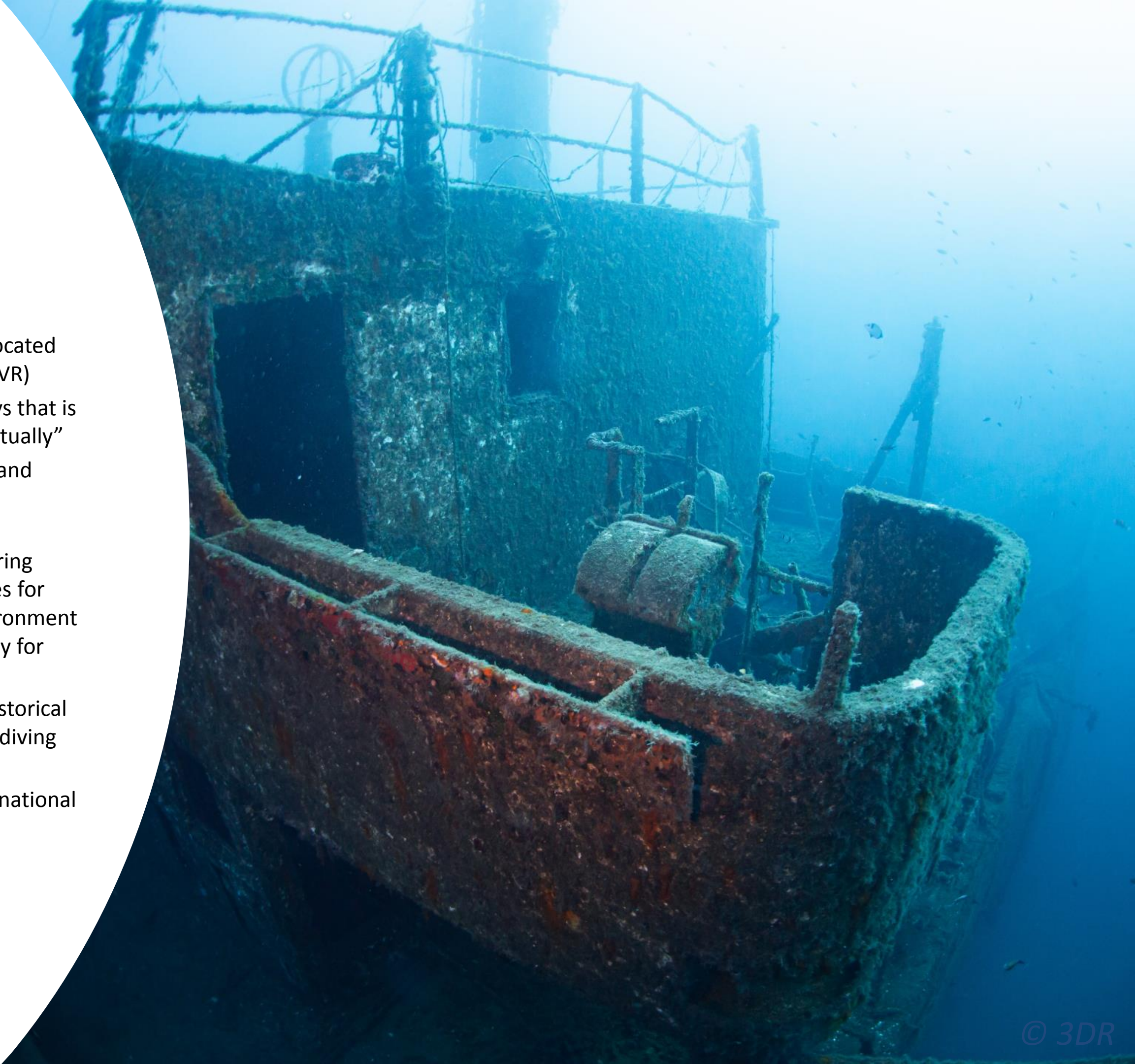


Virtual "Dry-Dive" at the shipwreck with the use of a
HMD (Head Mounted Display) piece

A unique opportunity for the non-divers to enjoy the treasures of the seabed

Objectives

- Digital reconstruction of the “CHRISTOFOROS” shipwreck, which is located in the island of Skopelos and the creation of a virtual reality model (VR)
- The exploration of the shipwreck in a virtual environment via displays that is attached on the head of the user (HMD) so that he/she can dive “virtually”
- Skopelos Dive Center will be able to offer innovative diving services and technologies gain the visibility at transnational level and broaden its professional network.
- Skopelos Diving Center will have the chance to improve the transferring process of skills and knowledge about methodologies and techniques for developing apps and create contents based on the underwater environment in order to bring these services to a level of maturity able to be ready for the market.
- The creation of an innovative dry dive application able to delivery historical information as storytelling in order to increase the attractiveness of diving services
- To develop a VR exhibit that could be used during national and international events for promotional purposes.
- It will contribute substantially community awareness, and to the engagement and participation in underwater heritage affairs.



Benefits

Skopelos Dive Center will be benefited by:

- Increasing its visibility in an international level.
- Expanding its professional network.
- Acquiring new skills in their diving activities and knowledge.

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With the finalization of the project Skopelos Diving Center will have the chance to broaden its professional network, to attract non-divers to visit virtually the “Christoforos” shipwreck, and to enhance the touristic interest in the underwater world of the Skopelos island



“CHRISTOFOROS” shipwreck

- Type : Cargo ship
- Construction date: January 1950
- Construction site: Scotland (shipyard Grangemouth)
- Names: 1950-1968 “THOMAS HARDIE”
1968-1975 “BIRLING”
1976-1983 “CHRISTOFOROS”

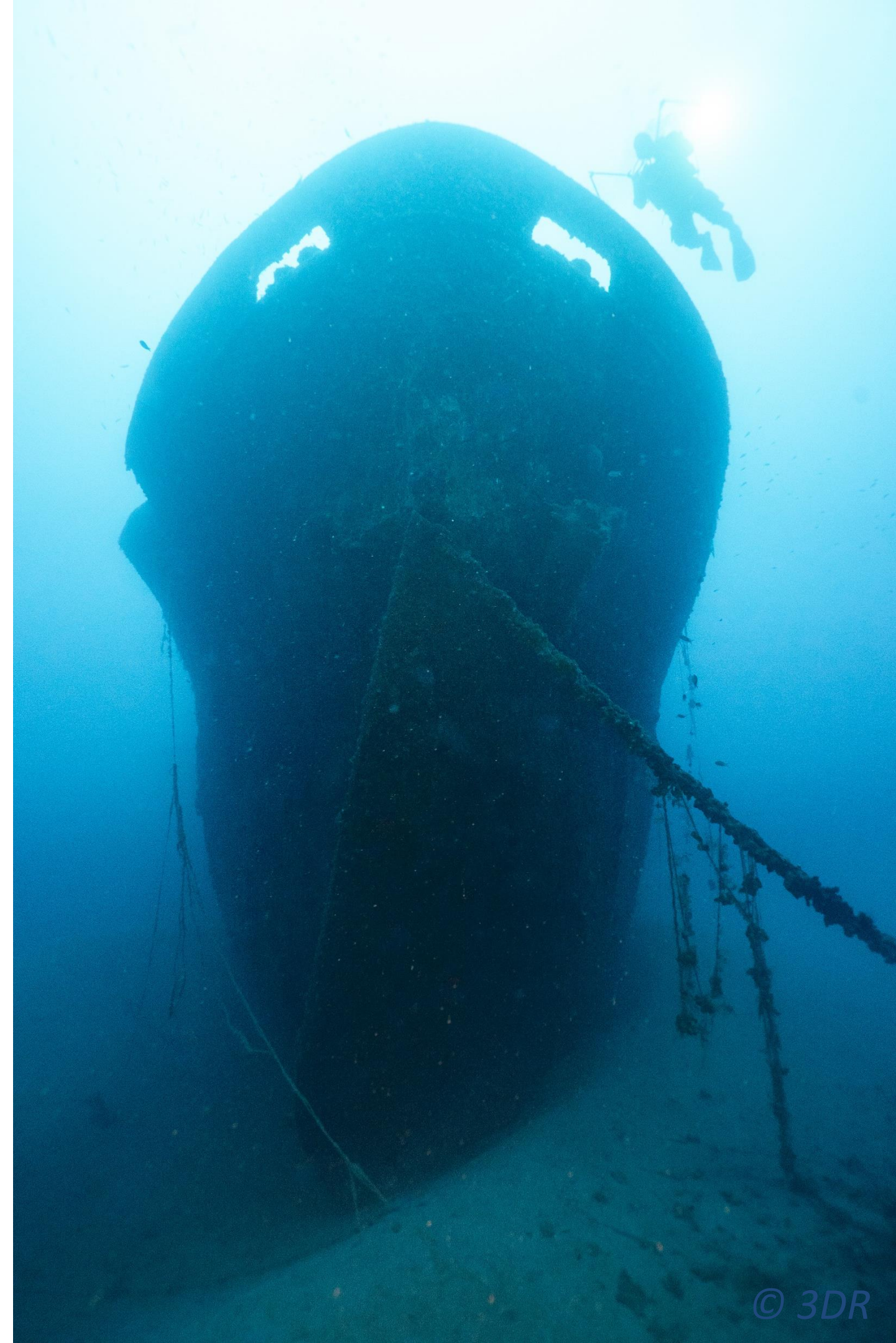
Length: 85m- 90m

Width: 13m

Sinking date: October 1983

Maximum depth: 42m

Preservation state: Excellent



Historical information

- Typical example of a “collier” type cargo ship

A new type of boats that were exclusively build for the transportation of coal (developing market of the “black diamonds”)

How did it sink?

In October of 1983, the ship had to travel from the port of Volos to Peiraeus port with a cargo of 2.600t of cement. In the evening the ship had a 7 degrees list to the right which continued to increase as the time was passing by. Due to these conditions, the captain of the ship lead the ship to a safe port in Panormos bay, Skopelos. Unfortunately, the waves had broken one of the portholes causing the ship to slowly sink and the captain unable to save it gave the order to abandon the ship.

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Πηγή: <http://sporadesdiving.gr/sites/christoforos-shipwreck>



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Implementation of the project

- I. Preparation of dives
- II. Collection of data
- III. Processing the data
- IV. Virtual dive at “CRHISTOFOROS” shipwreck

Preparation

Two-day training in Alonissos (7-8 August 2019) and preparation of the participants for the:

- Potentials of Virtual Reality(VR)
- Dive planning
- Methodology of the survey
- Successful filming and recoding of data for the creation of the virtual model



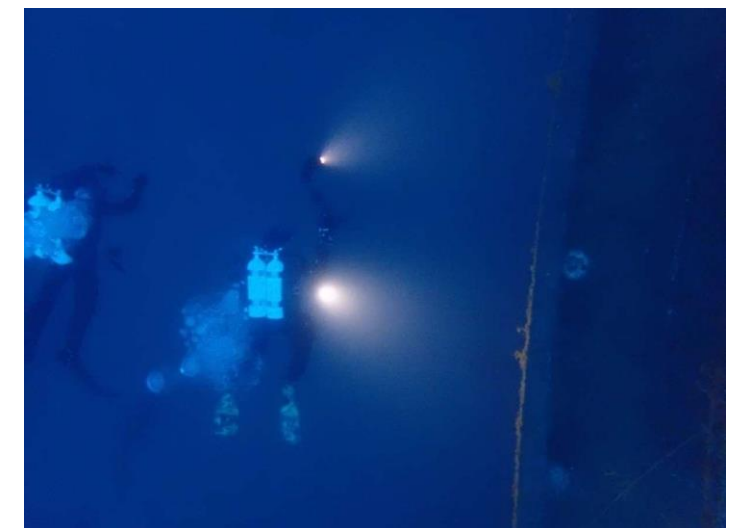
Collection of data I (multimedia data)

9-10 August 2019

The team:

Two members from 3DResearch srl

Two members of Skopelos Dive Center and
a few local divers



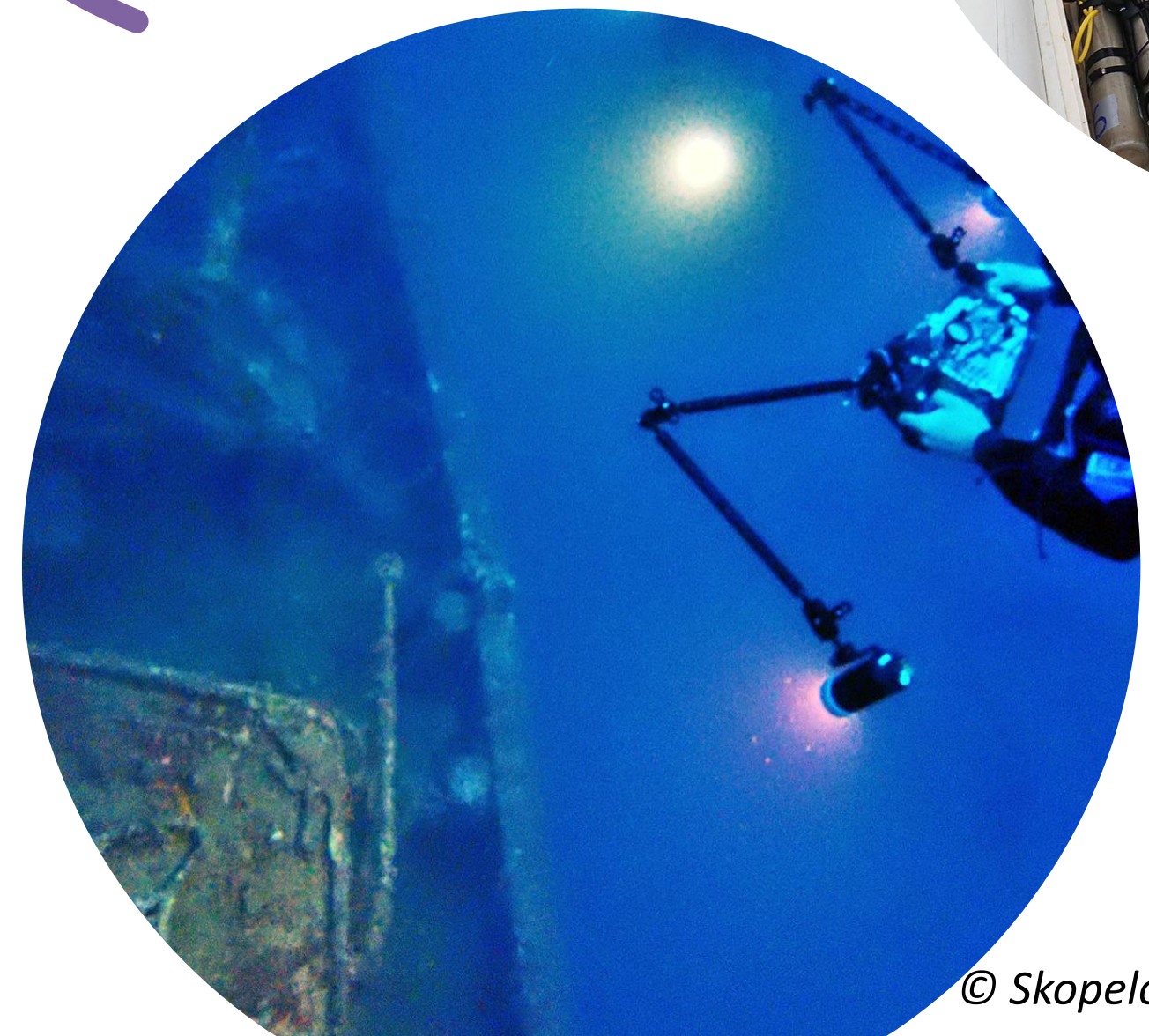
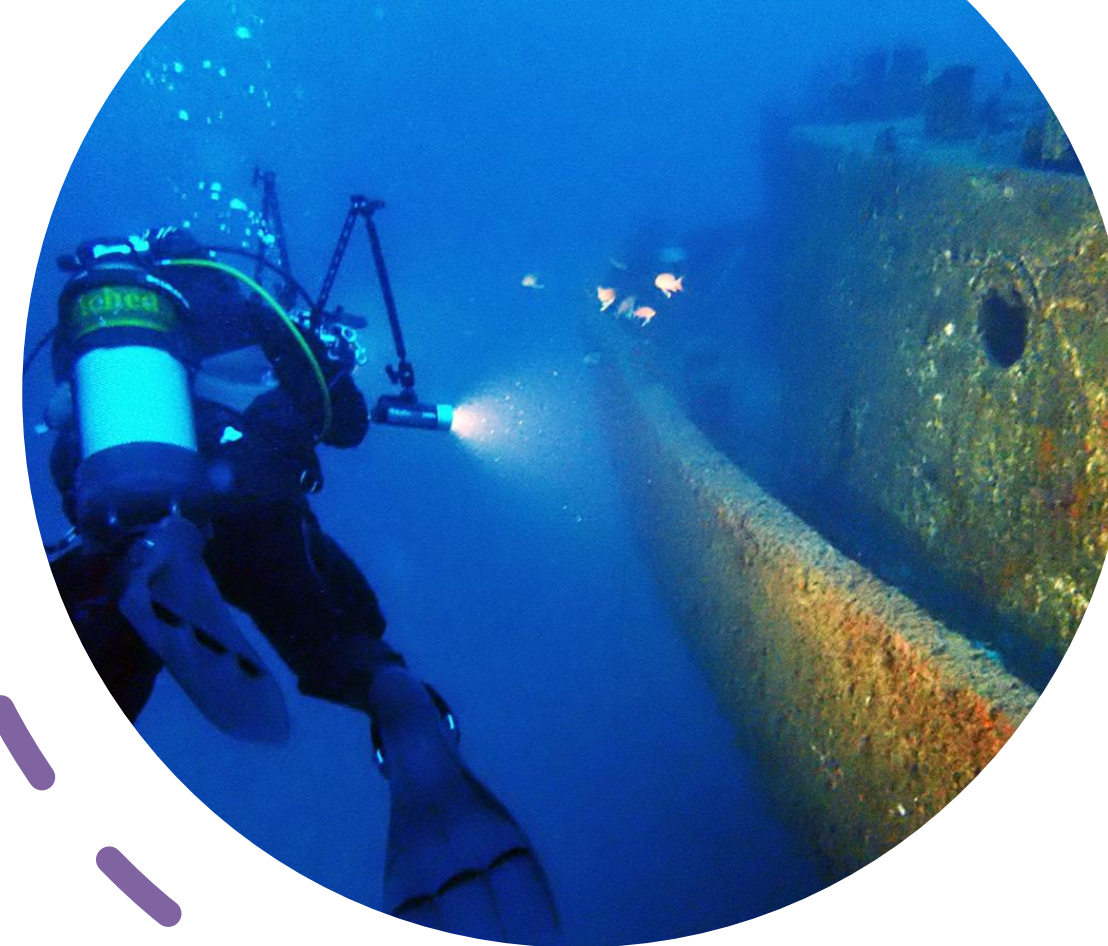
Φωτογραφίες: © 3DR & © Skopelos Diving Center

Collection of data II (multimedia data)

Two camera operators, supported by at least one more diver, both from the 3DResearch and from Skopelos Diving Center teams, have worked together in order to recover all the data necessary to the 3D reconstruction of the model.

4 GPS points along the shipwreck deck for geo-reference) photos and videos.

- Precision of location
- Precision of scale



Process of data

- Captured images *in RAW file format*
- Process of the images for better resolution
 - Light
 - Color
 - Saturation
 - ISO

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3D reconstruction

- 3D reconstruction with the use of the Agisoft Metashape Pro program
- At the end, the model has been cleaned up and corrected from the unwanted surfaces and all the holes were properly closed with Geomagic Wrap and Mesh lab softwares, in preparation of the use in a virtual scenario environment.





The result in an Oculus Quest device

A “dive” at “CHRISTOFOROS” shipwreck

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https://youtu.be/ozbqf_KaVTI

The contribution of the project in 4HELIX+

- Enhance of the **Blue Growth Economy**
- Responsible accessibility & inclusion of divers and the general public
- Protection of Underwater Cultural & Natural Heritage
- Promotion and boost of the **Remote Distance & Innovation** (RD&I) strategies in national and international level
- **Implementation** of models Compatible with the modern model of tourism development in the Mediterranean
- Presentation of new management practices of the underwater cultural and natural wealth (“Dry-dives”) in the creation of **Bottom-up initiatives & multiple helix partnerships**
- **Contributes** to local development (new job opportunities, mainly in tourism sector)

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Thank you for your attention!

