

Interreg



Co-funded by  
the European Union

IPA South Adriatic

Wrecks4All 2.0



under the auspices



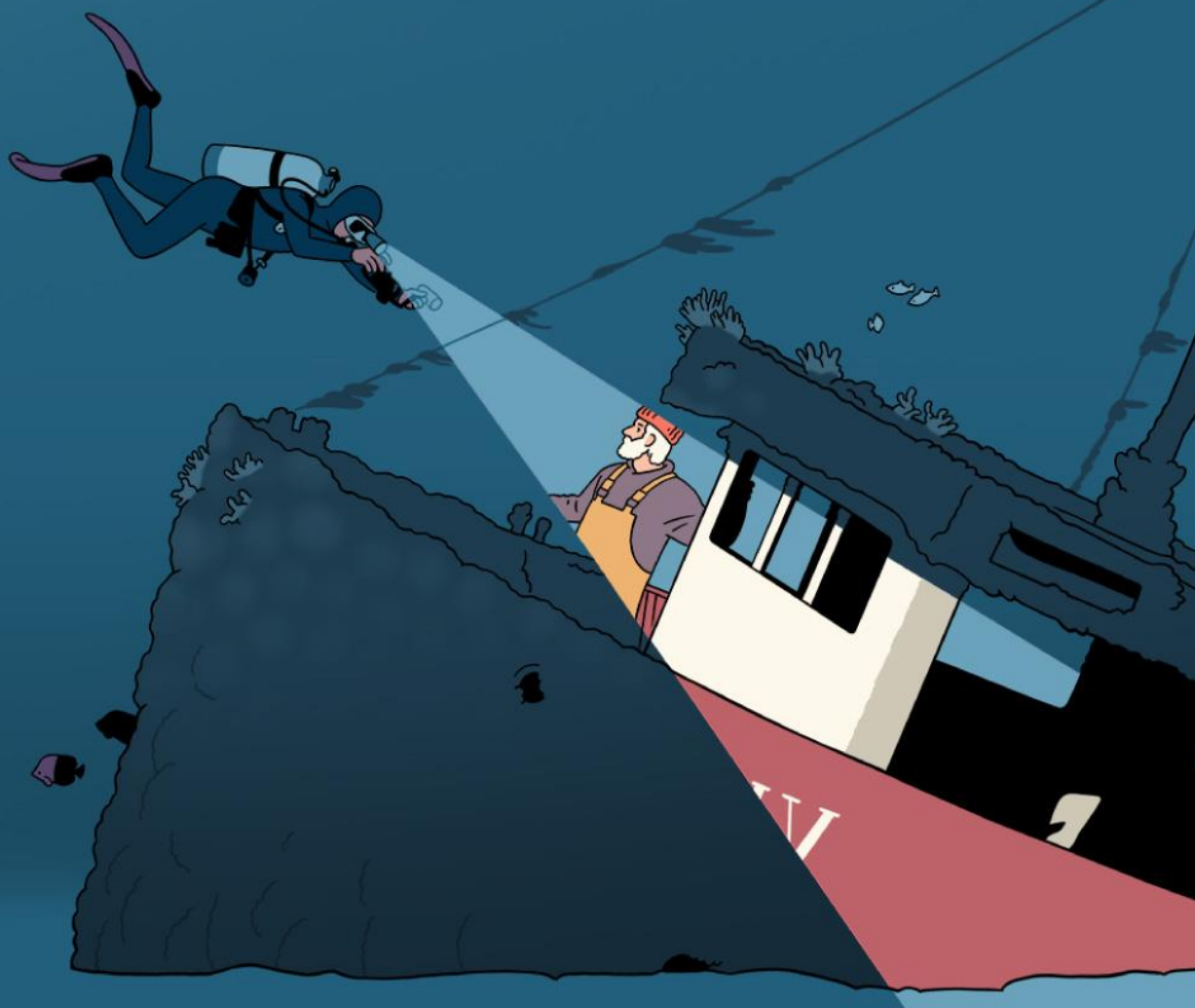
Centre  
Under the auspices  
of UNESCO



MEĐNARODNI  
CENTAR ZA  
POVIŠANJE  
ARHEOLOŠKIJ  
U ZADRU  
INTERNATIONAL  
CENTRE FOR  
UNDERWATER  
ARCHAEOLOGY  
IN ZADAR

# Training in underwater archaeology and digitization of underwater cultural heritage

April 7-11, 2025  
Ulcinj, Montenegro



## Wrecks4All 2.0

### Course Overview:

The underwater environment holds an immense cultural heritage, often described as the world's largest museum. This course introduces participants to underwater archaeology, emphasizing its importance in the preservation, research, and promotion of submerged cultural heritage. A particular focus is placed on documentation techniques, introducing traditional methods and mastering advanced digital photogrammetry for creating photorealistic 3D models. These methods support site conservation, monitoring, and public engagement.

Through a combination of theoretical lectures and practical exercises, participants will gain hands-on experience in underwater archaeological documentation, from site identification to data processing and 3D model creation. The course also explores the application of digital documentation in scientific research, cultural heritage management, and recreational diving operations.

### Course Objectives:

By the end of this course, participants will:

- Understand the fundamentals of underwater archaeology.
- Develop skills in both traditional and digital documentation techniques, mastering 3D photogrammetry.
- Learn to about the equipment, underwater photogrammetry workflows, including data collection, processing, and 3D modeling.
- Learn how to utilize photogrammetry for monitoring, research, and the promotion of underwater sites within the tourism sector.
- Recognize the significance of underwater cultural heritage for tourism and conservation.

### Learning Outcomes:

Participants will master:

- Digital documentation of underwater archaeological sites using photogrammetry.
- Data acquisition and processing in Agisoft Metashape.
- The creation and interpretation of 3D models for research, monitoring, and tourism.
- Integration of digital documentation into the daily operations of heritage institutions and diving centers.



Under the auspices of:



MEDUNARODNI  
CENTAR ZA  
PODVODNU  
ARHEOLOGIJU  
U ZADRU  
INTERNATIONAL  
CENTRE FOR  
UNDERWATER  
ARCHAEOLOGY  
IN ZADAR



UNITWIN Network for  
Underwater  
Archaeology 

## Wrecks4All 2.0

### Teaching Methods:

The course consists of both theoretical and practical components:

- **Lectures:** Delivered in English using PowerPoint presentations, covering key topics in underwater archaeology and digital documentation.
- **Hands-on Training:** Practical exercises, instructed in English, include:
  - 2D documentation methods (offset, trilateration, direct survey techniques) on land.
  - Underwater photogrammetry exercises in a controlled environment (pool or shallow water) and field applications.
  - Photogrammetry exercises on land.
  - Data processing and 3D model creation using specialized software.

### Course Modules:

- Introduction to Underwater Archaeology
- Traditional and Digital Documentation Methods: Introduction to Photogrammetry
- Underwater Photogrammetry: Data Collection and Imaging Techniques
- Processing Photogrammetric Data in Agisoft Metashape
- 3D Model Applications in Research, Conservation, and Diving Tourism
- Site Monitoring and Integration with Heritage Management Institutions

### Required Materials and Equipment:

- Laptop (participants must bring their own laptops)
- Agisoft Metashape software (to be provided at the beginning of the course)

**This course is designed for heritage professionals, students, researchers, and diving professionals interested in applying digital tools to the preservation and study of underwater cultural heritage.**



Under the auspices of:



MEDUNARODNI  
CENTAR ZA  
PODVODNU  
ARHEOLOGIJU  
U ZADRU  
INTERNATIONAL  
CENTRE FOR  
UNDERWATER  
ARCHAEOLOGY  
IN ZADAR



UNITWIN Network for  
Underwater  
Archaeology 

# Training in Underwater Archaeology and Digitization of Underwater Cultural Heritage

April 7-11, 2025 Ulcinj, Montenegro

(April 6, 2025) Sunday

**Travel to Ulcinj, arrival at the accommodation.**

*20:00 – 21:00 Dinner*

(April 7, 2025) Monday

*07:00 – 09:00 Breakfast*

09:00 – 10:00 Opening speeches - TBC (Mayor of Ulcinj, UNESCO, Ministry of Culture, University of Montenegro, etc.)

10:00 – 10:30 Darko Kovačević and Mladen Pešić: **Introduction to the objectives and program of the workshop**

10:30 – 11:15 Doris Kurtov: **ICUA Zadar; mission, organization, and activities**

*11:15 – 11:45 Coffee break*

11:45 – 12:30 Darko Kovačević: **Introduction to underwater archaeology, historical development of underwater archaeology**

13:30 – 14:15 Maja Kaleb: **Introduction to underwater archaeology methodology**

- Non-destructive research methods (reconnaissance, geophysics, remote-sensing survey)
- Destructive methods (probing, sampling, excavation)

*14:15 – 15:00 Lunch*

15:00 – 16:00 Maja Kaleb: **Introduction to 2D underwater documentation**



Under the auspices of:



MEDUNARODNI  
CENTAR ZA  
PODVODNU  
ARHEOLOGIJU  
U ZADRU  
INTERNATIONAL  
CENTRE FOR  
UNDERWATER  
ARCHAEOLOGY  
IN ZADAR



UNITWIN Network for  
Underwater  
Archaeology 

## Wrecks4All 2.0

- Importance of documentation
- Documentation of findings
- Traditional methods (offset, direct survey method, triangulation)
- Photography and photomosaic
- Documentation in real-life situations

16:00 – 19:30 Maja Kaleb: **Practical dry-land exercise – 2D documentation**

- Offset, triangulation

**Creating 2D drawings after collecting information on site (AutoCAD)**

20:00 – 21:00 *Dinner*

(April 8, 2025) Tuesday

07:00 – 09:00 *Breakfast*

09:00 – 10:00 Anita Jelić: **Conservation and restoration of underwater archaeological finds**

10:00 – 11:00 Roko Surić: **Monitoring and in situ protection of underwater archaeological sites**

11:00 – 11:30 *Coffee break*

11:30 – 12:15 Roko Surić: **Introduction to practical photogrammetry**

- Concept, development, and principles of photogrammetry
- Data collection – photography
- Video – structure from motion

12:15 – 14:00 Roko Surić: **Using AgiSoft MetaShape software – orientation**

14:00 – 15:00 *Lunch*

15:00 – 19:00 Roko Surić: **Practical dry-land exercise**

- Photographing an object with 50 to 70 photos and processing in AgiSoft MetaShape (align, dense cloud, mesh, texture, scale)

20:00 – 21:00 *Dinner*



Under the auspices of:



MEDUNARODNI  
CENTAR ZA  
PODVODNU  
ARHEOLOGIJU  
U ZADRU  
INTERNATIONAL  
CENTRE FOR  
UNDERWATER  
ARCHAEOLOGY  
IN ZADAR



UNITWIN Network for  
Underwater  
Archaeology



## Wrecks4All 2.0

### (April 9, 2025) Wednesday

07:00 – 09:00 Breakfast

10:00 – 13:30 Roko Surić, Maja Kaleb, Darko Kovačević: **Photogrammetry – practical sessions**

- Briefing (diving and photogrammetry)
- Equipment and maintenance
- Dive planning and photography strategy for the site or object
- Diving

(Participants will photogrammetrically document an object in a pool (max depth 2 m) using 50-70 photos)

Participants who do not dive will perform the same task on dry land.

14:00 – 15:00 Lunch

15:00 – 19:00 Roko Surić, Maja Kaleb, Darko Kovačević – **Data acquisition practical sessions in the pool (diving) and on land**

20:00 – 21:00 Dinner

### (April 10, 2025) Thursday

07:00 – 09:00 Breakfast

09:00 – 11:00 Roko Surić: **Processing collected data in AgiSoft MetaShape**

- Workflow
- Creating orthomosaics and Digital Elevation Models

11:00 – 12:30 Darko Kovačević: **Model comparison in Cloud Compare – site monitoring**

12:30 – 14:00 Mladen Pešić: **The contribution of divers – monitoring – the necessity of connection with cultural and tourism institutions – forming a protection and monitoring network**

14:00 – 15:00 Lunch



Under the auspices of:



MEDUNARODNI  
CENTAR ZA  
PODVODNU  
ARHEOLOGIJU  
U ZADRU  
INTERNATIONAL  
CENTRE FOR  
UNDERWATER  
ARCHAEOLOGY  
IN ZADAR



## Wrecks4All 2.0

15:00 – 19:00 Roko Skurić, Maja Kaleb, Darko Kovačević – **AgiSoft MetaShape data processing**

20:00 – 21:00 *Dinner*

(April 11, 2025) Friday

07:00 – 09:00 *Breakfast*

09:00 – 10:00 Šime Vrkić: **Underwater archaeology in Croatia**

10:00 – 11:00 Artur Mecollari: **Underwater cultural heritage in Albania**

11:00 – 12:00 Darko Kovačević: **Underwater archaeology in Montenegro**

12:00 – 13:00 **Certificate of Attendance distribution to workshop participants**

13:00 – 14:00 *Lunch*

14:00 – Departure of participants



Under the auspices of:



MEDUNARODNI  
CENTAR ZA  
PODVODNU  
ARHEOLOGIJU  
U ZADRU  
INTERNATIONAL  
CENTRE FOR  
UNDERWATER  
ARCHAEOLOGY  
IN ZADAR



UNITWIN Network for  
Underwater  
Archaeology

