

DIGITIZATION OF UNDERWATER MONUMENTS AND NATURAL HERITAGE

**INSTITUTE FOR INNOVATION &
SUSTAINABLE DEVELOPMENT - AEIPLOUS**

George Karelas

President of AEIPLOUS

Economist University of Athens,

MA Reading University

IANTD Trimix technical diver

Email: gkarelas@aeiplous.org



Institute for Innovation & Sustainable Development -AEIPLOUS

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Digitization of underwater historical sites

Shipwrecks – sunken cities



Necessity to reconstruct underwater sites

The example of Pavlopetri: The British School of Athens collaborated with JSTOR to *digitize, preserve & recreate* a city of Mycenaean age



Digitization in situ



The *Return to Antikythera* team scanned every artifact discovered at the site during 2016 mission, so that scholars all over the world can examine their findings. Here is a 3D model of the bones found in situ.

The need of digitization of modern historical shipwrecks in Greece

- Are not under Ephorate's of Underwater Antiquities priorities
- Corrosion changes their structure rapidly
- Fishery with dynamite and trawler nets damages the ships' and planes' wrecks – (example the WWII airplane in Leros)
- Souvenir hunters remove objects



Digitization can protect wrecks and sunken cities

Digitization examples of Greek shipwrecks (photo mosaics)

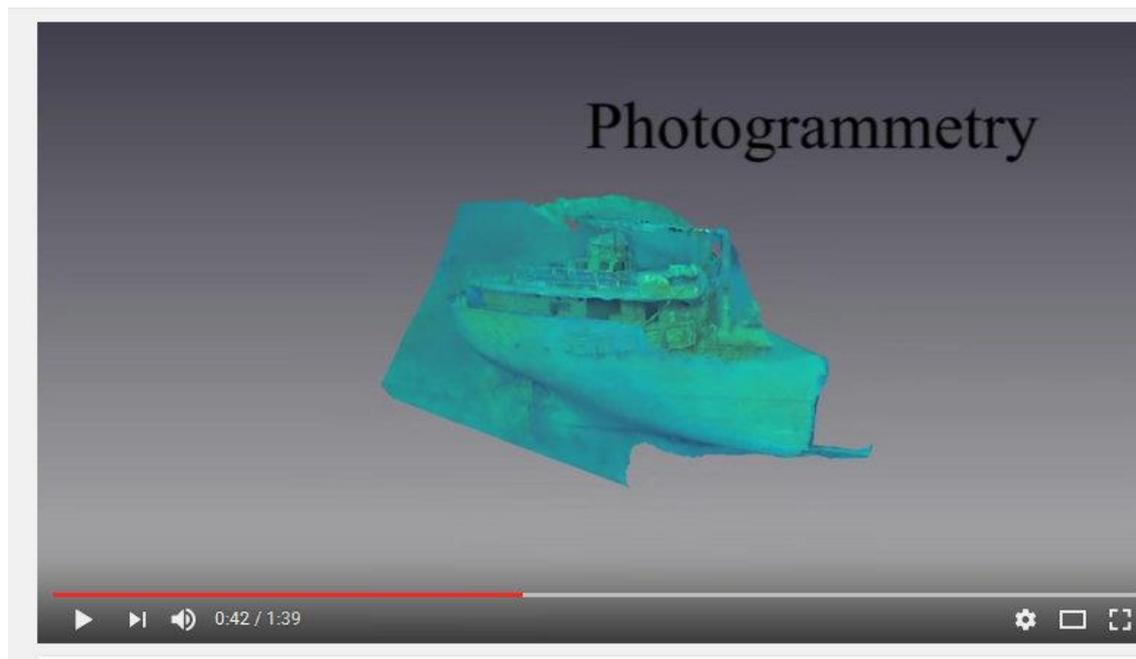


*Submarine Hms Perseus
(Kefalonia island), by UFR team*

*Nestos minesweeper
(gulf of Patras), by
Helen
Tsopouropoulou
(wreckdiving.gr)*



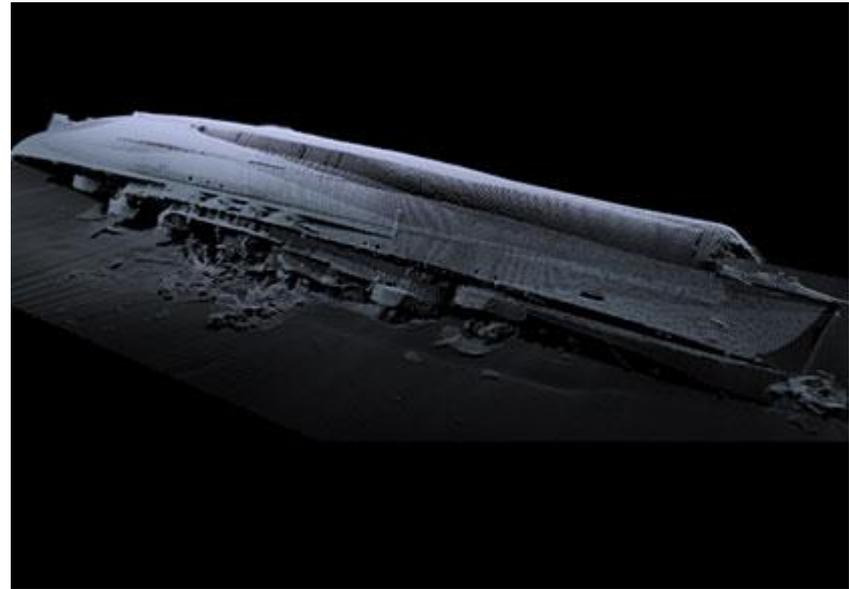
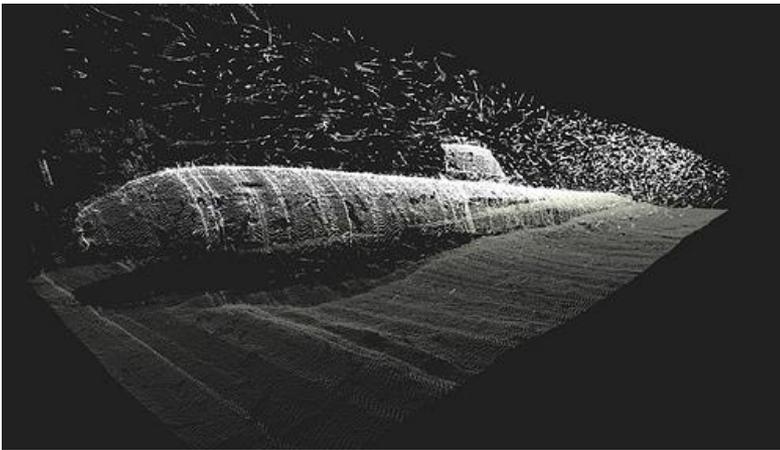
Digitation in 3d , presentation of a wreck close to Skiathos island created by a 3d scanner using Point Cloud



<https://www.youtube.com/watch?v=zgZKBiR9230>

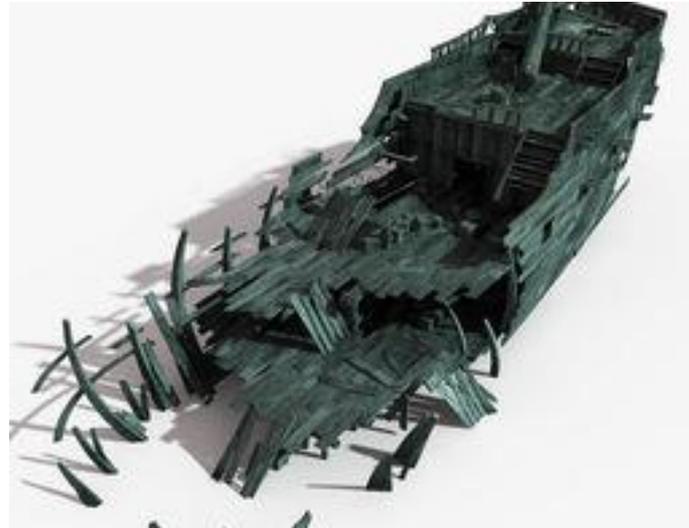
Creating 3d shipwreck models

- **ADUS DeepOcean** (St Andrews, Scotland) specializes in high-resolution surveys, using multibeam side scan sonars and ROVS often supported by laser and photogrammetry. The resulting metrical data can be visualized as a flat 2-D image; as a virtual 3-D interactive model



Printing wreck models in 3 dimensions

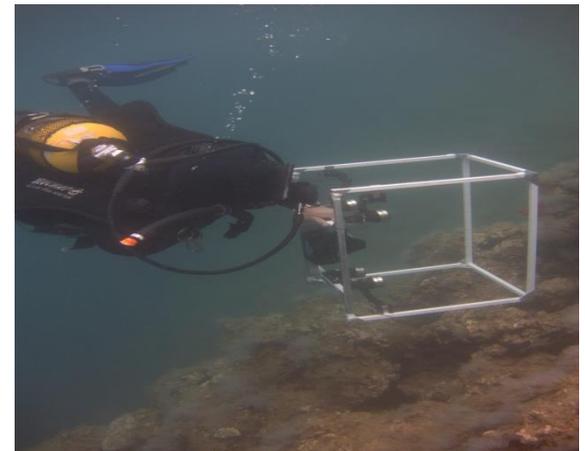
It is now feasible with new revolutionary techniques to print 3d wreck models using 3d printers, even though not a single shipwreck model is known to have been printed in 3d yet.



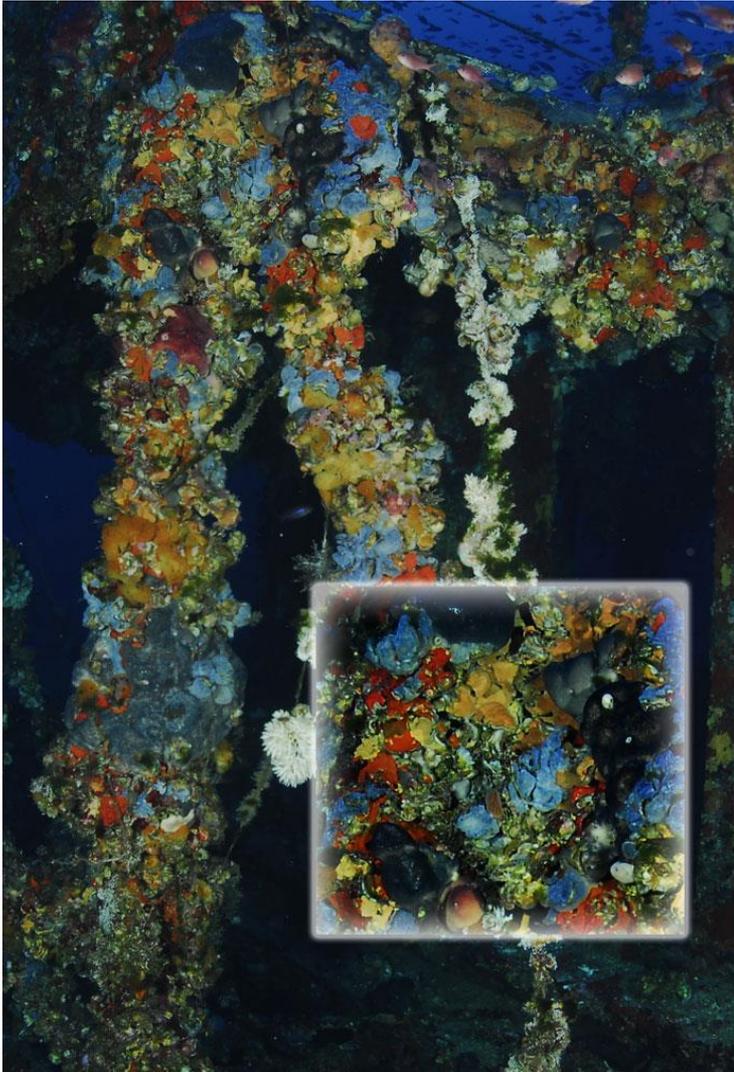
Shipwrecks become reefs

- ✦ Shipwrecks become home for many fish, where they also reproduce. A new ecosystem appears. Big pelagic fish visit the wrecks for feed. In our times, where overfishing leads to smaller fish populations, shipwrecks are very important even more in places like the gulf of Patras, where the seabed is flat and muddy and do not exist other places for the fish to make homes and avoid trawler nets.
- ✦ Coralligenous based Indicators lately are used to evaluate and monitor the "Good Environmental Status" of the Mediterranean coastal waters

Project CIGESMED (Stephan Sartoretto university of Marseilles, France. Photo from 1016 survey gulfs of Patras and Corinth). ***Digitization of coral reefs and evaluation of the effects of pollution and environmental and climate changes***



Shipwrecks as sources & sinks of marine biodiversity



- Colonies of sponges and shells are created after a few years a ship has been sunk
- Micro life is also developing
- Studies revealed that wrecks often create new and different sorts of habitat and not emulate rock reefs

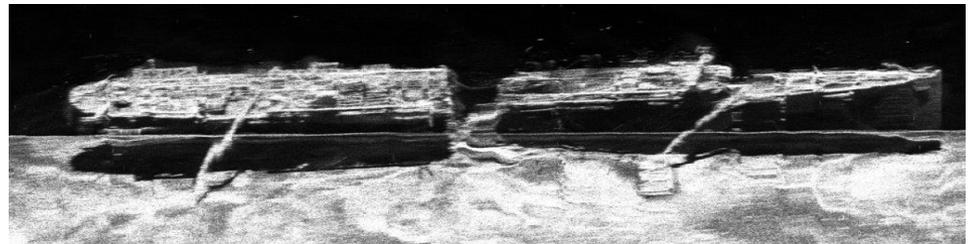
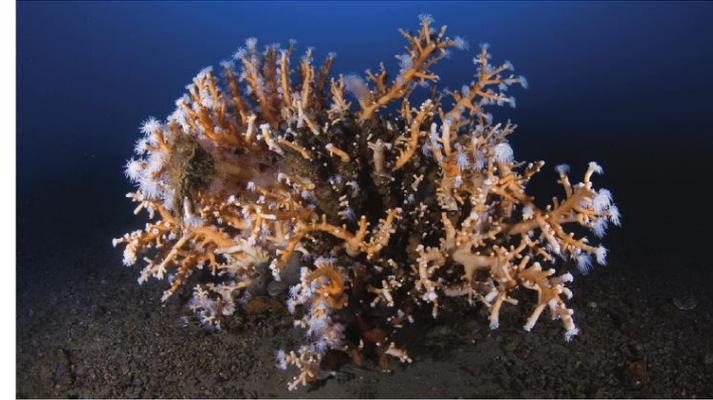


Photo of the French liner SS Burdigala sunk in 1916 and explored in 2008 by Kea dive expedition team

The coral gardens of the gulf of Corinth

A place with coral colonies and rich and diverse marine life.

- Documented presence of **coral formations** (subtype of habitat 1170 Reefs) in the southern and eastern shores of the bay, high biological, functional and aesthetic significance of underwater landscapes
- Presence of ***Posidonia meadows*** (habitat type 1120 * - priority for the EU) and other marine phanerogams (eg *Cymodocea nodosa*) in the region of the Corinthian Gulf at depths ~ 5-25m,
- Presence of **four species of dolphins**, the bottlenose dolphin (*Tursiops truncatus*), common dolphin (*Delphinus delphis*), the striped dolphin (*Stenella coeruleoalba*) and the gray dolphin (*Grampus griseus*) that in the gulf of Corinth present two global singularities: a) The population of striped dolphins the Corinthian Gulf is the only known in the world that lives in a secluded bay, in distance and isolated from the open sea, b) 3 of the 4 species that live in the deep waters of the Gulf form stable mixed flocks of a very-special society which do not occur anywhere else in the world



A plan backed by Greenpeace aims to make the Gulf of Corinth one huge marine park



**PREVENTION, PROTECTION,
DOCUMENTATION,
DIGITIZATION !**

Thank you for your attention!

George Karelas

Email: gkarelas@aeiplous.org