

## **Underwater Archaeology and Cultural Resources: Methodology, Preservation and Communication – A Dialogue Between Denmark and Greece**

Denmark and Greece possess vast territorial waters that hold irreplaceable tangible cultural heritage including shipwrecks and submerged settlements. Both countries therefore have been at the global forefront of developing the discipline of underwater archaeology. While there are shared attributes of Danish and Greek underwater cultural heritage, differing approaches to its study have been applied in each country. This lecture series aims to take advantage of each country's decades of practice by implementing a targeted knowledge-exchange designed to create dialogue and enhance interaction between Danish and Greek underwater archaeology and cultural heritage experts, while communicating to the public the discipline and significance of the underwater resources.

The lectures will be held in a hybrid audience format (in-person at The Danish Institute at Athens and online) and will all take place at 7pm (Greek Time).

### **Organizing Committee:**

Sanne Hoffmann – The Danish Institute at Athens  
Athena Trakadas – Saxo Institute, University of Copenhagen  
Panagiotis Athanasopoulos – The Danish Institute at Athens  
Dimitris Kourkoumelis – Greek Ephorate of Underwater Antiquities



*November 7<sup>th</sup>, 2023*

## **Introduction:**

### **Archaeology and Underwater Cultural Resources: Reviewing a Sea-change in Practice**

Denmark and Greece both possess vast territorial waters that hold irreplaceable tangible cultural heritage including shipwrecks and submerged settlements. With the wide variety of archaeological material recovered – beginning with the Antikythera wreck in Greece over a hundred years ago and the Viking-Age ships at Skuldelev in Denmark over fifty years ago – datasets have increased vastly in number and type. Initially, the traditional approaches to studying the evolving datasets within these countries (and globally) simply focused on associating archaeological material with specific chronologies, cultural groups or historical narratives. This is no longer a tenable or sustainable practice.

Touching upon examples from Greece and Denmark, this talk will introduce the general evolution of approaches to underwater cultural resources through the practice of maritime archaeology and possible future directions. An intellectual momentum exists to pose probing and interdisciplinary questions of underwater cultural assemblages, and the invited lecturers for this 2023-24 DIA series are at the forefront of this sea-change. I pose that today the practice has reached a stage of reflection: knowledge generated from maritime archaeological excavations can inform and drive the broader methodological and theoretical basis in the field of archaeology, as well as natural marine science disciplines, and vice-versa.

**Athena Trakadas, Saxo Institute, University of Copenhagen, Denmark**

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**Discussant: Dr. Dimitris Kourkoumelis, Archaeologist, Greek Ephorate of Underwater Antiquities**

### **Development-led Maritime Archeology in Denmark: Legislation, Management Practices and Research Output**

The field of archaeology in Denmark, including both land-based and maritime endeavors, is primarily funded by developers. Robust legislation and management practices ensure that archaeological screening is carried out in development areas, as part of the government's application system for development projects. Maritime archaeology in Denmark originated in the 1960s, initially focusing on shipwrecks. However, by the 1970s, the field expanded to include the survey, excavation, and research of submerged Stone Age settlements and paleo-terrains. A long coastline and shallow protected natural environment in the inner Danish waters provide ideal conditions for preserving paleo-terrains and their legally protected submerged Stone Age sites. In recent years, an upsurge in marine development projects, coupled with improved quality and accessibility of geophysical data for archaeological screening, has significantly increased the number of development-led investigations in Danish maritime archaeology.

However, it is important to note that the funding provided by developers does not cover the scientific post-processing of survey and excavation results. Consequently, the research output stemming from these archaeological investigations is relatively modest. This creates a disparity between the resources allocated to maritime archaeology and its research output and relevance to the broader community. This raises the question of the goals of development-led archaeology. Should the focus simply be on clearing the area for the developer by excavating and safeguarding the archaeological data for future study? Alternatively, should each archaeological excavation be seen as a scientific investigation in its own right? If so, how can heritage legislation and research practices evolve in the future to better incorporate research questions into development-led archaeology?

**Klara Fiedler, Curator, The Viking Ship Museum, Denmark**

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*December 5<sup>th</sup>, 2023*

## **Methodology:**

### **Towards a New Understanding of the Early Mesolithic: The Role of Underwater Archaeology, Strategies, and Problem-oriented Focus Areas**

The seabed in southern Scandinavia contains numerous traces of a submerged landscape that is thought to be the remnant of a once important habitat for Mesolithic hunter-gatherers. Large parts of this landscape were gradually flooded by rising seas between 9500 and 4000 BC and perceptions of the Maglemose culture (9500-6400 BC) have, consequently, been based almost exclusively on former inland settlements. These sites have been found on land and is typically situated far from their contemporary coastlines. As a result the Early- and late Mesolithic societies are understood as almost diametrically opposed with regards to their reliance upon marine resources and their degree of sedentism.

It should be apparent that submarine landscapes and the archaeology found in them have the potential to answer a range of questions and fill many gaps in our knowledge that cannot be done solely with the materials found on land. This is especially true with regards to the role of the coast in the early Mesolithic. The main objective of the presentation is to demonstrate how a wide range of developer paid offshore projects and archaeological research projects have been designed to provide answers to specific questions / knowledge lacunae.

**Peter Moe Astrup, Curator of Underwater Archaeology, Moesgaard Museum, Denmark**

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### **Marine Remote Sensing Techniques in the Studying of Underwater Cultural Heritage Sites: Case Studies from the Eastern Mediterranean Sea**

The application of remote sensing techniques has been raised as fundamental tool for the detection, mapping and monitoring of underwater cultural heritage sites. These are non-destructive, reliable and accurate techniques which can operate regardless the depth or the extent and the water visibility of the examined area. In the underwater archaeological surveying, common techniques are multibeam echosounders (MBES), side scan sonars, sub-bottom profilers, marine magnetometers, Remote Operated Vehicles (ROVs), Autonomous Unmanned Vehicles (AUVs) and Unmanned Surface Vehicles (USVs). These produce geo-referenced data for the reconstruction of the seafloor topography and texture and the detection and mapping of regions of interest (RoI) lying on the seafloor, the seafloor seismic stratigraphy and the RoI buried under loose sediments and the optical confirmation and optical mapping of RoI lying on the seafloor. The Eastern Mediterranean sea hosts ancient and historic wrecks and submerged ancient coastal zones of archaeological interest. The ancient wrecks illuminate aspects of the ancient civilizations that flourished around the sea, regarding sea routes, trade, navigation and shipbuilding, while historic wrecks usually are memorial fragments of the two World Wars. On the other hand, the sea level rise due to eustatic, isostatic and tectonic factors, has inundated large areas causing changes in coastal geography which has often resulted in coastal landscapes and thus prehistoric and historic settlements and/or installations becoming submerged. These underwater archaeological sites, are often well preserved geo-archaeological records elucidating aspects of human civilization since Paleolithic times.

In this lecture, we will focus on the marine remote sensing techniques and their application in case studies from the surveying of underwater cultural heritage sites in the Eastern Mediterranean Sea.

**Maria Geraga, Professor of Archaeological Oceanography, Geology Department, University of Patras, Co-head of Oceanus-Lab, Greece**

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*January 17<sup>th</sup>, 2024*

## **Methodology:**

### **Methodology Against Budget: A Compromised Business**

Underwater archaeologists across the Mediterranean, can today operate in many different environments and types of sites and vary significantly in their specific interests and approaches to their research field. But they all share, more or less, something in common: they all have to struggle with limited resources. This is an aspect of the work deeply embedded in the everyday reality of any archaeologist who wishes to do field research at sea. Planning a project by definition presupposes a serious compromise between what is desirable and what is actually possible in the real (unstable) world.

As in any field of archaeological research, in underwater archaeology methodology is crucial to ensure effective and efficient survey, excavation, and preservation of underwater cultural heritage according to accepted standards and principles. However, limited budgets can present significant challenges. The biggest challenge for a modern underwater archaeologist is therefore to prioritize research objectives by pre-calculating elastic and inelastic costs, to remain in compliance with specific safety protocols for his or her staff and to estimate how the cost of a project can be compressed with the smallest possible impact in the quality of the result. Methodology should therefore be considered as a flexible set of principles to ease the work, rather than a rigid framework not amenable to adjustments. And most importantly, methodology should not become an end-goal in itself at the expense of archaeological interpretation.

**George Koutsouflakis, Assistant Professor of Maritime Archaeology, University of Thessaly, Greece**

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### **Tree-ring Science for Maritime Archaeology: What Timber in Ships Can Tell Us**

Dendrochronology – analysis of the tree rings – of ships' timbers reveals not only the precise date of the ship. As the pattern of tree growth is particular to the region in which the tree grew, dendrochronology is also a powerful tool in identifying the origin of timber, found at a wreckage. As timber was increasingly a traded commodity, as ships large enough to carry this bulk product were built, often ships were built of timber from several sources. Therefore, we must analyse extensively to unravel the often-complicated story from the ship's timbers. This has allowed a detailed timeline of the changes in timber usage, exploitation and quality, across Northern Europe, from coastal traders to ocean-going ships that traversed the globe. In this talk, using a range of case studies, I will present this narrative.

**Aoife Daly, Independent researcher, Dendro.dk, Denmark**

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*February 20<sup>th</sup>, 2024*

## **Preservation:**

### **ENDURE: Sustainable Preservation of Underwater Archaeological Sites: A Novel Approach to Cultural Heritage Management**

Cultural heritage is the legacy of tangible, intangible and natural heritage assets of a society that is inherited from past generations. Preserving the remains of the past for the benefit of future generations is common in international heritage policy. Current management practice advocates preserving underwater cultural heritage (UCH) where it lies on the seabed, in situ. With over 3,000,000 shipwrecks and thousands of submerged prehistoric sites estimated to lie on the floors of the world's oceans, a holistic understanding of both natural and anthropogenic decay processes and how the products of these processes manifest themselves on shipwrecks and submerged prehistoric sites is essential for sustainable management of this non-renewable resource. The five year ENDURE project ([www.endureerc.com](http://www.endureerc.com)) is using digital visualisation, remote monitoring and computational modelling of decay processes to segregate the different processes and products. In line with current critical heritage theory, the aim of the project is to provide a ranking of the entropy, condition and hence preservation (or decay) potential of sites / areas. This will enable remote (desk based) assessment of this heritage, ultimately in a predictive manner and on a global scale. The presentation will highlight the "process based" approach to studying and understanding threats to UCH and the status of the ENDURE project.

**David Gregory, Senior Researcher and Honorary Professor, The National Museum of Denmark**

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### **Submerged Legacies: Connecting the Cultural with the Natural in a Common Narrative of Maritime Heritage Preservation**

In an era marked by increasing environmental challenges and the imperative to safeguard cultural heritage, the intersection of underwater archaeology and environmental conservation presents a unique and vital opportunity. Submerged archaeological sites hold a wealth of historical, cultural, and environmental information. They are repositories of human endeavors, offering insights into ancient maritime activities, trade routes, and technological advancements. However, these sites are also fragile ecosystems, intricately intertwined with the surrounding natural environment, often providing insight into environmental changes over time. By connecting cultural and ecological narratives, we gain a more holistic understanding of the ecosystem services that have been provided to the coastal communities over millennia, as well as the impact of human activities on coastal and underwater environments, which is pivotal for effective preservation strategies. This presentation will delve into the dynamic relationship between cultural and natural elements within submerged heritage sites. We will explore case studies from diverse underwater environments, ranging from coastal regions to deep-sea wrecks, demonstrating how our knowledge about nature and culture, as well as our preservation efforts, can be enhanced by a holistic approach. Furthermore, this discussion will shed light on the methodological challenges and ethical considerations inherent in underwater archaeology. Balancing the imperatives of scientific inquiry, cultural preservation, and environmental conservation requires nuanced approaches.

**Yiannis Issaris, Marine Ecology PhD, Research Fellow at the Institute of Oceanography, Hellenic Centre for Marine Research, Greece**

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*March 19<sup>th</sup>, 2024*

## **Preservation:**

### **Out of the Water Perspectives: Dialogue with Heritage Conservators**

It's a fascinating sight when archaeological finds emerge in underwater or water saturated environments. Upon recovery, they appear with stories burning to be told and shared. Waterlogged archaeological wooden artefacts often appear to be in a good condition, so why not take them out of the water and make available to everyone?

Essential properties in archaeological, degraded wood from underwater or water saturated environments diverge considerably from those of fresh or undegraded wood. Once removed from the underwater/ water saturated environment, a chain of destructive processes starts – unless they are met with precautions, concrete plans, and resources to secure the future of the excavated artefacts.

The presentation will take its outset in work carried out at the National Museum of Denmark, where waterlogged wood is frequently encountered in archaeological excavations along the coasts, in rivers, lakes, and water saturated land sites. Decades of continuous waterlogged wood conservation projects have promoted and produced valuable research and experiences. Still, with the knowledge, experience and equipment at hand, the process from exposure to exhibition of large archaeological finds – such as shipwrecks – continue to spark discussions, challenges, and compromises. The presentation will focus on some of them, the rationale behind the current methods and the techniques applied. It will investigate questions as; when does conservation start, when is it finished and what are criteria for a successful conservation of archaeological wood coming from waterlogged environments? The presentation will include examples of almost straightforward processes and some not so straightforward.

**Kristiane Strætkvern, Conservator, Department of Research, Collections and Conservation, The National Museum of Denmark**

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### **Underwater Perspectives: Dialogue with Heritage Conservators**

“In 2020, almost twenty-five years after the excavation of the Roskilde shipwrecks, we still have ship timbers in our treatment tanks, awaiting a future in the museum storages” (Strætkvern, K. and Hjelm-Petersen, A., 2021). Contemporary with and quite unaware of the Roskilde shipwrecks being brought to light, I was initiating my future as a heritage conservator. I was the new students' generation. Could I be the future the Roskilde shipwrecks were awaiting? It is difficult to glean through experiences and boil down one's thoughts to something concrete that will not read too personal and which still communicates a new perspective, including to one's self. Working as a heritage conservator underwater is a conscious choice. People involved in it share that extra essential in life that finds comfort in diving the underwater world. The focus of this paper is around practising conservation underwater and on site and how we heritage conservators approach this fieldwork, what is our actual contribution, caring for different types of materials, how we collaborate, how we compromise if so, and how can we manage underwater finds and sites. It also includes some general reflections and challenges for the way ahead with the preservation of Lechaion, the main harbour of Ancient Corinth in Greece. Whilst a dialogue underwater is a rather quiet one, this presentation hopes to sound some of those thoughts running round both heritage conservators' and maritime archaeologists' heads as to why do we do what we chose to do.

*Reference:* Strætkvern, K., & Hjelm-Petersen, A. (2021). Standing on the shoulders of our predecessors - a base and a viewpoint. Fifty years of working with conservation of waterlogged archaeological shipwrecks in Denmark. *TINA MARITIME ARCHAEOLOGY PERIODICAL*, (13), 46-68. [http://www.tinaturk.org/dergi/TINA\\_DERGI\\_SAYI\\_13/tina-13.pdf](http://www.tinaturk.org/dergi/TINA_DERGI_SAYI_13/tina-13.pdf)

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*April 9<sup>th</sup>, 2024*

## **Communication:**

### **Unlocking the Depths: Engaging Audiences through Artistic Perspectives in Maritime Archaeology**

Collaborations between maritime archaeologists and storytellers from different disciplines offer exciting opportunities to present archaeological discoveries in innovative and relatable ways.

Journalists utilize their investigative skills to uncover the historical context surrounding underwater sites, weaving personal accounts and expert insights into captivating articles and reports. Cartoonists simplify complex archaeological concepts, employing visual storytelling to engage readers of all ages and making the subject more accessible.

Writers immerse themselves in maritime history, using the power of words to breathe life into ancient shipwrecks and seafaring civilizations through novels, short stories, and poetry. Through their artistic renditions, they evoke emotions and provide a visual gateway for audiences to explore maritime archaeology.

Furthermore, actors and filmmakers bring maritime archaeology to life through documentaries, reenactments, and dramatic interpretations. By embodying the characters and narratives derived from archaeological research, they create immersive experiences that transport audiences to pivotal moments in history. Through the use of visual and audio elements, they provide a dynamic and engaging medium to present maritime archaeology.

The versatility of artistic storytelling allows maritime archaeology to transcend academic boundaries and reach wider audiences. The talents of journalists, cartoonists, writers, painters, actors, and filmmakers contribute to a tapestry of narratives that foster curiosity, empathy, and a deep appreciation for our maritime heritage.

Can maritime archaeology become vibrant and accessible through various artistic mediums and still be based on academic research? By embracing the creativity and perspectives of different storytellers, we ensure the preservation and celebration of our shared maritime legacy for generations to come.

**Andreas Kallmeyer Bloch, Curator, The Viking Ship Museum, Denmark**

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### **The Antikythera Mechanism in Comix: Communicating Maritime Archaeology through a Multidimensional Narrative Medium**

Sharing archaeology with the public is nowadays an acknowledged scientific aspect of our job. Not only because it is socially ethical, but also because it helps us evaluate our perspective and develop our scientific thought. However, this is no easy feat. One must find the right equilibrium between scientific accuracy and simplification, avoid manipulation, and promote inquiry and further engagement in order to increase the level of interactivity between archaeology and the public. Since the 80's and the emergence of "New Museology" cultural communication experts have developed many theories and methodologies concerning the various media that can be used in the creation of attractive narratives with scientific content. "The Antikythera Mechanism in comix" graphic novel was shaped in this framework. It tells the story of a unique artifact that was found in a 1st c. BCE shipwreck in northwestern Greece, but at the same time it provides information about maritime archaeology and other scientific data concerning either the artifact itself or the scientific research that was developed around it. In this presentation we will use the book -along with other similar publications- as an example of the ability of comic art to transfer maritime archaeological knowledge in an engaging yet scientifically based manner.

**Alex Tourtas, Archaeologist, PhD, Postdoctoral Researcher, University of the Aegean, Greece**

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*May 14<sup>th</sup>, 2024*  
**Communication:**

## **On the Concept Behind the New Museum in Thorsminde**

Strandingsmuseum St. George reopened in 2017 after a major expansion with new architecture and new exhibitions. Initially established in 1992 to exhibit the objects from the National Museums excavation of the wreck of the English ship of the line HMS St. George, which ran aground on the Danish west coast in 1811 during the Napoleonic Wars. The museum later expanded its dissemination to include the cultural history of wrecked ships on the Danish west coast in general, including their influence on the local population.

The museum is site specific, located by the North Sea in the small harbour and tourist town of Thorsminde, close to the place where HMS St. George was wrecked. The museum won the Silletto Prize for community participation and engagement in 2019.

HMS St. George's dimensions are integrated in the new architecture, where e.g. the number of floors corresponds to the ship's deck. The building's distinctive landmark is the high tower, which forms one large display case that stretches up through all the museum's floors. This display case contains the 11.5 m long rudder from HMS St. George. The five new exhibition rooms are built as independent scenarios, each with its own theme, with HMS St. George's stranding and the objects from this wreck as the central narrative. In each exhibition space, lighting design, sounds, smells, animations and interactions are part of the communication as strong elements that appeal to both the senses and curiosity. The engaging design means that everyone, regardless of age and background, is enlightened, touched and enriched by the stories.

**Anders Jensen, Curator and Maritime Archaeologist, Strandingsmuseum St. George, Denmark**

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## **Contemporary Approaches to Traditional Wooden Boatbuilding: the Case of the Museum of Aegean Boatbuilding and Maritime Crafts (MNNTA) in Samos, Greece**

What is the role of a contemporary maritime museum in displaying, safeguarding, and communicating the knowledge, techniques, and oral traditions of the people associated with traditional wooden boatbuilding? In this presentation we will explore the above questions through the case study of the municipal Museum of Aegean Boatbuilding and Maritime Crafts (MNNTA), which soon will be up and running on the Greek island of Samos. Furthermore, we will discuss issues such as the potential socioeconomic impact on traditional wooden boatbuilding on modern coastal and island societies, as well as the excessive subsidy by the EU and the Greek State of the destruction of old fishing caiques in the context of the renewal of the Greek fishing fleet, which has led to a tremendous loss of intangible cultural heritage elements.

**Dr. Eleni Stefanou, Archaeologist, Museologist, Adjunct Lecturer - Hellenic Open University, Heritage Public Officer - The Heritage Management Organization, Secretary - Association of the Friends of MNNTA, Greece**

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