HERITAGE AT RISK

SPECIAL EDITION

HERITAGE UNDER WATER AT RISK

THREATS – CHALLENGES – SOLUTIONS

ICOMOS ICUCH

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LE PATRIMOINE SOUS L'EAU
EN PERIL
MENACES – DÉFIS – SOLUTIONS
~
PATRIMONIO BAJO EL AGUA
EN PELIGRO
AMENAZAS – DESAFÍOS – SOLUCIONES
~

EDITED BY
ALBERT HAFNER – HAKAN ÖNIZ – LUCY SEMAAN – CHRISTOPHER J. UNDERWOOD

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FOREWORD – AVANT-PROPOS – PREÁMBULO

Toshiyuki Kono, President ICOMOS

One of my favorite themes in the field of international heritage law is the protection of underwater cultural heritage. At least three different areas of law, i.e. the salvage law, the United Nations Convention on the Law of the Sea, and the UNESCO Convention on the Protection of the Underwater Cultural Heritage are related to this area. One can trace an important part of the history of the relationship between human activities and the sea through the lens of norms and regulations. The UNESCO Convention on the Protection of the Underwater Cultural Heritage would not have been adopted without the scientific advice from underwater archaeology experts. I am therefore particularly proud of the fact that ICOMOS experts played a crucial role in providing UNESCO with the scientific foundation for the Convention.

Compared to other types of cultural heritage, underwater cultural heritage suffers from a lack of recognition beyond the expert field, as it is by definition less visible, also stemming from the principle of *in situ* protection. Therefore, it is ICOMOS's social and professional responsibility to raise awareness of the importance of underwater cultural heritage and its protection. Hence, I would like to thank ICUCH for taking the initiative to publish this special edition. I hope that it will be widely shared among experts, the wider professional community and the public, and that it will contribute to the increased promotion and protection of underwater cultural heritage.

~

L'un de mes thèmes favoris dans le domaine du droit international du patrimoine est la protection du patrimoine culturel subaquatique. Ce thème réunit au moins trois domaines juridiques différents, à savoir le droit en matière de sauvetage, la Convention des Nations Unies sur le droit de la mer et la Convention de l'UNESCO sur la protection du patrimoine culturel subaquatique. Nous pouvons retracer une partie importante de l'histoire des relations entre les activités humaines et la mer à travers le prisme des normes et des réglementations. La Convention de l'UNESCO sur la protection du patrimoine culturel subaquatique n'aurait pas été adoptée sans l'avis scientifique des experts en archéologie sous-marine. Je suis donc particulièrement fier du rôle crucial qu'ont joué les experts d'ICOMOS en fournissant à l'UNESCO les bases scientifiques de la Convention.

Comparé à d'autres types de patrimoine culturel, le patrimoine culturel subaquatique souffre d'un manque de reconnaissance au-delà du domaine des experts, car il est par définition moins visible, conséquence directe aussi du principe de protection *in situ*. C'est pourquoi il relève de la responsabilité sociale et professionnelle d'ICOMOS de contribuer à faire prendre conscience de l'importance du patrimoine culturel subaquatique et de sa protection. Je tiens donc à remercier l'ICUCH d'avoir pris l'initiative de publier cette édition spéciale. J'espère qu'elle sera largement diffusée parmi les experts, la communauté professionnelle au sens large et le public, et qu'elle contribuera à une meilleure promotion et une meilleure protection du patrimoine culturel subaquatique.

~

Uno de mis temas favoritos en el campo del derecho internacional del patrimonio es la protección del patrimonio cultural subacuático. Al menos tres áreas diferentes del derecho, es decir, el derecho de salvamento, la Convención de las Naciones Unidas sobre el Derecho del Mar y la Convención de la UNESCO sobre la Protección del Patrimonio Cultural Subacuático están relacionadas con esta área. Se puede rastrear una parte importante de la historia de la relación entre las actividades humanas y el mar a través de la lente de las normas y reglamentos. La Convención de la UNESCO sobre la Protección del Patrimonio Cultural Subacuático no se habría adoptado sin el asesoramiento científico de los expertos en arqueología subacuática. Por lo tanto, estoy particularmente orgulloso del hecho de que expertos del ICOMOS desempeñaron un papel crucial al proporcionar a la UNESCO la base científica de la Convención.

En comparación con otros tipos de patrimonio cultural, el patrimonio cultural subacuático adolece de una falta de reconocimiento más allá del ámbito de los expertos, ya que por definición es menos visible, lo que también se deriva del principio de protección *in situ*. Por lo tanto, es responsabilidad social y profesional del ICOMOS generar conciencia sobre la importancia del patrimonio cultural subacuático y su protección. Por lo tanto, me gustaría agradecer a ICUCH por tomar la iniciativa de publicar esta edición especial. Espero que sea ampliamente compartida entre los expertos, la comunidad profesional más amplia y el público, y que contribuya a una mayor promoción y protección del patrimonio cultural subacuático.

ICUCH

The International Committee on the Underwater Cultural Heritage (ICUCH) is one of ICOMOS' (International Council on Monuments and Sites) International Scientific Committees. It was founded in 1991 to promote international cooperation in the protection and management of underwater cultural heritage and to advise ICOMOS on issues related to underwater cultural heritage around the world.

The committee is composed of international experts, members of ICOMOS, in underwater cultural heritage. It currently has more than 60 members representing 47 countries, spanning the five geographical regions as defined by UNESCO: Africa, the Arab States, Asia and the Pacific, Europe and North America, and Latin America and the Caribbean. ICUCH's first mandate led to the creation of the Charter on the Protection and Management of Underwater Cultural Heritage, adopted by ICOMOS in 1996, which formed the basis of the Rules in the Annex of the UNESCO Convention on the Protection of Cultural Heritage (Paris 2001).

Among its activities are to promote sound ethical management of underwater cultural heritage where *in situ* preservation is the first option; support scientific research, including both disturbance and non-disturbance activities; encourage public presentation of underwater cultural heritage and public participation in underwater cultural heritage; raise the profile and increase public awareness of the existence and value of the world's underwater cultural heritage; promote ethical activities on and with underwater cultural heritage through facilitating development of national and regional cooperation, programs and legislation; encourage an inclusive approach to underwater cultural heritage; support, initiate and/or assist in education and capacity-building initiatives in respect of the management, research, protection, conservation and dissemination of underwater cultural heritage and provide information for governments, the general public and political organizations about the protection and preservation of underwater cultural heritage.

The authors wish to dedicate this book to past and present ICUCH members and especially to Pilar Luna Erreguerena and Thijs Maarleveld, who are sadly no longer with us.
The dedication is for their outstanding contributions to promoting the better protection of the world's underwater cultural heritage.

INTRODUCTION TO HERITAGE UNDER WATER AT RISK: THREATS, CHALLENGES, AND SOLUTIONS

Christopher J. Underwood, President ICUCH

In his introduction to *Underwater Cultural Heritage at Risk: Managing Natural and Human Impacts*, published in 2006, Robert Grenier then president of the International Committee on the Underwater Cultural Heritage (ICUCH) reflected on the 'very tough four-year battle' during the extensive and intense drafting process between 1998 and 2001 at UNESCO. The result was the UNESCO Convention on the Protection of the Underwater Cultural Heritage, adopted on 2nd November 2001. It was a watershed. Combined with the ICOMOS Charter on the Protection and Management of Underwater Cultural Heritage (Sofia 1996) — that had formed the foundation of the Convention's Rules — there was a recognised international legal framework of standards and practices that would help improve the protection and management of underwater cultural heritage, worldwide. At the time of publishing *Underwater Cultural Heritage at Risk: Managing Natural and Human Impacts,* eleven states had ratified the 2001 UNESCO Convention.

Grenier went on to mention the significant challenges in preserving and protecting underwater cultural heritage other than encouraging states to ratify and implement the embryonic convention. He noted that clear differences remained with some stakeholders about the utilisation and relative importance of underwater cultural heritage, noting other problems. He saw a continuing need to dispel stereotypic impressions that it was impossible to undertake science under water and change the public perception of underwater cultural heritage away from the comic book characterisations and romanticising often seen in the media.

Since 2006, there has been progress. Having fulfilled the customary requirement of twenty ratifications, the 2001 UNESCO Convention entered into force, 2nd January 2009, and at the time of this publication now stands at sixty-six states with others actively working towards ratification. As a consequence, more countries have domestic legislation protecting their underwater cultural heritage. There has also been a growth in professional capacity, evidenced by the increasing numbers of universities in UNESCO's UniTwin network, supplemented by vocational training programmes, workshops, and other events, many involving ICUCH members. The strong academic base of the discipline is also reflected in the range and quality of the peer reviewed articles published in *The International Journal of Nautical Archaeology* and the *Journal of Maritime Archaeology.* Underwater cultural heritage is also represented in heritage management and other thematic academic journals, further evidence that research applied to underwater heritage is of a sustainably high academic standard.

There has been a development of field techniques which are allowing more sites to be preserved *in situ* rather than being left unprotected and subject to unauthorised human interventions or environmental forces. The application of sophisticated remote sensing equipment has become routine practice producing ever higher resolution imagery of the seabed and sub-seabed in 2D and 3D. In recent years, there has been a dramatic increase in the use of photogrammetry software to produce accurate and stunning 3D representations of complex underwater sites. This is not only assisting archaeologists to interpret sites but also helping to present them to the public in innovative and interactive ways. The popularity of cultural heritage in the media is high, which shows public awareness and interest, above and below water. The aforementioned factors have gone some way to illustrate the broad range of science involved in the search for underwater cultural heritage sites and subsequent research. What is not so clear is whether the public is aware of the challenges and problems in sustaining underwater cultural heritage in the face of traditional and additional new threats.

A further development has seen an expansion of citizen science programmes, They offer recreational divers, coastal walkers, and other members of the public training in the requisite skills to enable their effective participation in domestic and international cultural heritage projects, the latter illustrated in this volume. These citizen scientists are often working in support of heritage bodies including some of UNESCO's accredited non-governmental organisations (NGOs) accomplishing tasks ranging from surveying, monitoring, researching, and in some cases excavating sites.

Looking to the future, there are growing concerns and challenges relating to Climate Change. Consequences such as rising sea-levels will exacerbate tidal ranges and increase associated current strengths; the impact of ocean acidification

and ocean warming cannot be underestimated and should not be ignored. The combined impacts are a significant existential threat to the preservation of underwater cultural heritage, particularly in coastal or shallow water environs. More science is required to fully understand the impacts and remediation.
Another significant indirect threat is the Covid-19 pandemic. At the beginning of 2020 it was unthinkable to conceive that it would be necessary to consider such an impact on heritage. In some respects, it is too early to do much more than speculate as to the full range of consequences. It is, however, feasible to say that in the short-term, international co-operative projects will be delayed or even cancelled due to travel or quarantine restrictions, and that there is likely to be a redirection of government resources to what are considered more important aspects of economies. This would see a reduction in public spending on heritage and cuts to grant programmes. It is already known that the sustainability of some museums and NGOs is at risk, putting more pressure on private finance and philanthropy to fill funding gaps.

On a more positive theme, there are new opportunities for the development of the discipline, not least is the United Nations Decade of Ocean Science for Sustainable Development 2021–2030. The Decade is directly related to Sustainable Development Goal 14 Life Below Water, one of seventeen sustainable development goals. The United Nation's Intergovernmental Oceanographic Commission (IOC) is managing and promoting the Decade. The key aim is to develop a sustainable ocean environment with the tag 'the science we need for the ocean we want'. ICUCH has been increasingly aware of the UN's SDGs, the Decade, and the realisation that the underwater cultural heritage community can and must play an important role in making the Decade a success. In 2019, a coordinated cross-discipline campaign ensured that underwater cultural heritage is fully integrated into the Decade. A fundamental step towards this goal came through interaction with the natural marine science community — First Global Planning Meeting for the Decade National Museum of Denmark Copenhagen, May 2019 — and with UNESCO's Intergovernmental Oceanographic Commission (IOC). ICUCH was well represented among a group of archaeologists who successfully lobbied for greater representation of cultural heritage in the Decade's planning and consciousness. This success is recognised within the Decade's Implementation Plan which mentions the need for interaction with the 2001 UNESCO Convention and the importance of the social and cultural aspects of humanity's connection with the ocean. As many will recognise heritage organisations and archaeologists have been doing this for years. Using this experience will be of significant benefit in increasing the public's ocean literacy throughout the Decade.

The cultural heritage community must recognise the challenges including understanding and adapting to an eco-system management approach, which will require, in relevant circumstances, a closer working relationship with other marine sciences.

In this volume there are 29 authors contributing 30 articles representing 23 countries from Asia and the Pacific, Arab States, Europe and North America, and Latin America and the Caribbean. With such geographical diversity there is inevitably a wide range of themes and scope of archaeological sites located in, rivers, lakes, cenotes, as well as coastal and offshore marine environments. The articles cover all of the themes and topics mentioned above in more detail and related to specific sites. This book is divided into five sections: legal and policy frameworks, challenges and solutions, preservation *in situ*, public engagement, and capacity building, noting that some papers span more than one theme. The focus is aimed at presenting examples of where heritage is at risk, but also where applicable, presenting sustainable solutions.

For readers with an interest in the discipline's fundamental principles a first-hand account describes the challenges in establishing whether a wreck could be received as a gift even though it was already within its own territorial waters, prior to initiating a multi-national partnership project. The story emphasises the importance of embracing the concept of 'shared heritage' where irrespective of the legalities underwater cultural heritage brings together nations to cooperate in the investigation of sites with interwoven histories. Other chapters outline the development of national and international legal and policy frameworks, including how one geographic region's heritage managers and archaeologists remain sceptical about the application of the 2001 UNESCO Convention, which must be a concern.

Although not mentioned above there has been a disturbing increase in commercial salvage, not for the antiquities contained within a shipwreck, but for the economic value of pre-nuclear steel, from which thousands of vessels were built prior to 1945. The focus of the salvage are warships sunk in the Far East during the Second World War and considered the last resting place of their crews. Industrial-scale salvage activity has led to entire shipwrecks literally disappearing, leaving only scars on the seabed. This raises issues of sovereignty and the ethics of disturbing 'war graves'. Another global trend is the increasing urbanisation of coastal zones. The resultant pressure to expand coastal industries and living spaces is leading to numerous threats, including land reclamation and infilling which could destroy, as yet, undiscovered and unrecorded cultural heritage.

The following section discusses *in situ* preservation which is recognised as one of the fundamental principles of the 2001 UNESCO Convention. Over recent years more cultural heritage sites are being actively preserved and monitored *in situ* rather than leaving them at the mercy of the natural environment. The papers in this section focus both on the underlying philosophy and case studies featuring shipwrecks and lake dwellings.

By contrast, some shipwrecks have been excavated and recovered in their entirety, and are now on public display. One such example takes the reader on a journey from the initial search for the wreck site in the mid-1960s to a museum housing the ship's hull and associated artefact collection. Throughout the archaeological process the author explains how the project team were acutely aware of the need to justify actions and proposes that full excavation under the right circumstances and resources is a legitimate protective solution.

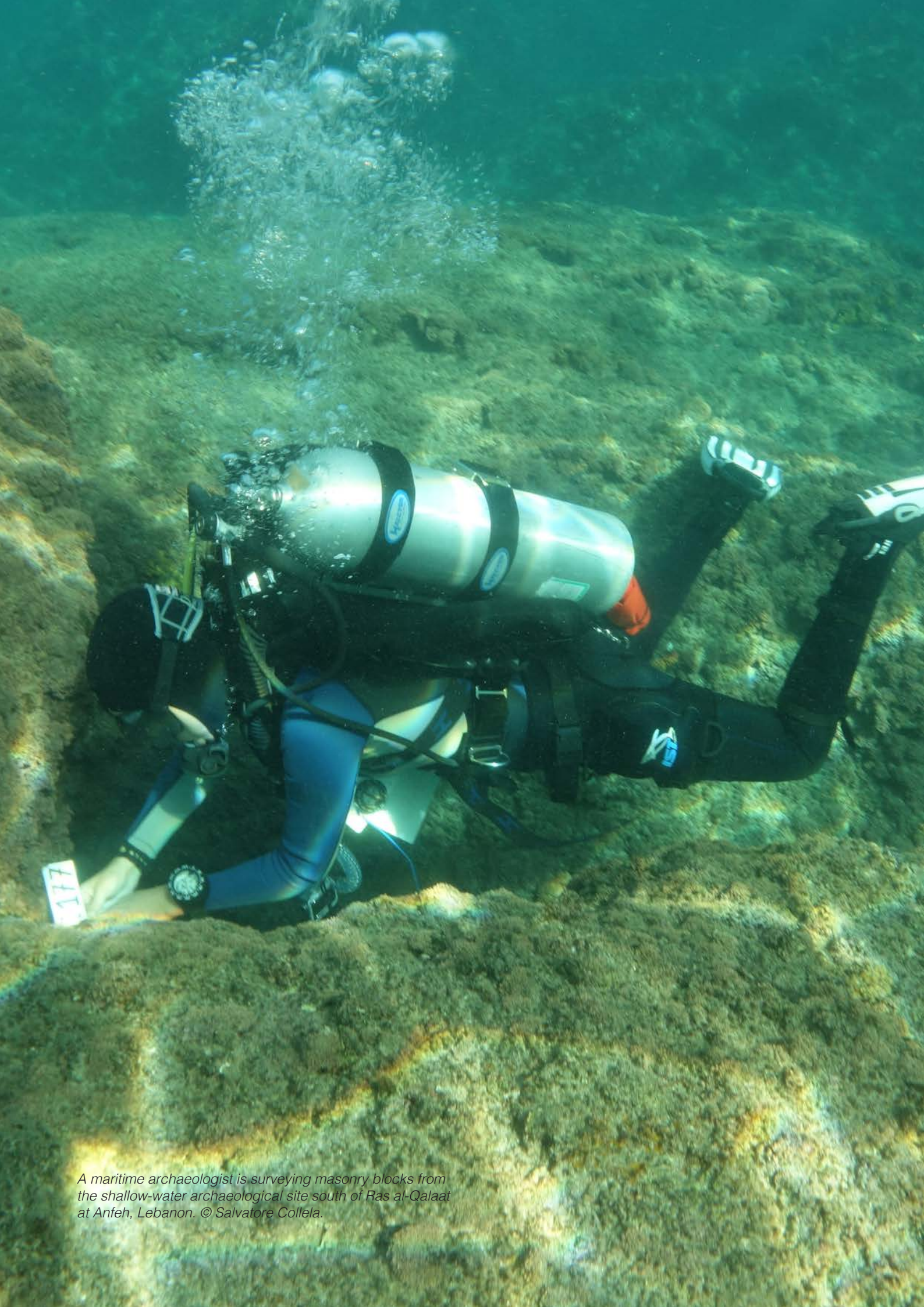
The articles on public engagement cover a broad range of themes from the values of community archaeology, public involvement, and presentation to the public, with others featuring the less positive outcomes such as vandalism and the illegal discovery and recovery of artefacts by stakeholders. A case study describes the issues with a group of recreational quad-bikers who discovered and subsequently recovered part of a cargo of ceramics found exposed as a result of beach erosion. The relationship between them and the archaeological team and local government began with mistrust on both sides but eventually, through dialogue, led to improved cooperation and an understanding of the importance of the archaeological process, conservation, and public display. Another investigates the values and opinions of subsistence fisherpersons who find underwater cultural heritage in a country which is only beginning to raise national awareness of the cultural and touristic value of underwater cultural heritage.

The final section of the book features capacity building, a theme in which many ICUCH members have been involved for decades. They have participated in regional planning meetings which stressed the need for additional professional capacity considered essential in assisting the implementation of the 2001 UNESCO Convention and in undertaking the multi-faceted requirements of managing, preserving, and researching underwater cultural heritage. Consequential to these meetings, members have been closely involved in the design and delivery of courses, contributing major parts and responsible for the technical editing of what has become known as UNESCO's Foundation Course. It has been utilised in its long form of six weeks, whereas others have been shorter.

The articles in *Heritage Underwater at Risk: Threats, Challenges, and Solutions* outline the strategic process of customising regional capacity building requirements, the evolution and utilisation of the foundation course, and the particular needs of a nation with limited cultural heritage resources.

This compendium of papers reveals that the members of ICUCH encompass a very broad scope of themes and interests within underwater and coastal cultural heritage. They range from research, university teaching, archaeological investigation, *in situ* preservation, archaeological conservation, public engagement, legal advocacy, and heritage management. Such diversity within ICUCH underlines the strength of the committee in possessing the knowledge and experience to continue to be an important and influential force in all matters relating to cultural heritage, underwater or coastal. By so doing ICUCH will continue to demonstrate the importance and relevance of the ICOMOS Charter on the Protection and Management of Underwater Cultural Heritage (Sofia 1996) that underpins the fundamentals of the committees formation and purpose.

I hope readers will find within this 'cornucopia' of themes and topics related to underwater cultural heritage something of particular interest.



A maritime archaeologist is surveying masonry blocks from the shallow-water archaeological site south of Ras al-Qalaat at Anfeh, Lebanon. © Salvatore Collela.

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A Lykian type sarcophagus from Simena, a partially submerged Roman City in the Kekova Region of Antalya, Turkey. © Tahsin Ceylan.

SECTION 1
LEGAL AND POLICY PERSPECTIVES

CULTURAL HERITAGE: ITS INTERNATIONAL LEGAL PROTECTION

Mariano J. Aznar, Spain

Fig. 1 The UNESCO Convention on the Protection of the Underwater Cultural Heritage was adopted in 2001. At the time of writing 66 states have subsequently ratified it, with other states using the Rules in the Annex to the Convention as an operational framework. © UNESCO.

Introduction

The international legal protection of the underwater cultural heritage (UCH) offers a clear example of its legal complexities given the nature, the location, and the uses of that heritage. Cultural objects, sometimes of the greatest importance, deserve to be properly preserved for future generations, and are thus governed by international heritage law mainly codified by the United Nations Educational, Scientific, and Cultural Organization (UNESCO). As cultural objects located at sea[1], other corpuses of law may apply, mainly the law of the sea generally codified in the 1982 United Nations Law of the Sea Convention (UNCLOS)[2] and sometimes maritime law mainly conformed by private law rules occasionally codified by treaties.[3] Depending on its location, whether under the sovereignty or jurisdiction of the coastal state or not, the domestic legislation of the latter may also apply. Finally, as objects, UCH may also have a private or public owner, may be a marine peril — for navigation or for the environment — or deserve to be protected or managed for other reasons, for example as artificial reefs which became ecosystems, or marine gravesites transformed into venerated places.

UCH is thus governed by a complex canvas of domestic and international rules, the latter sometimes expressed in recommendatory soft language and nature; sometimes in hard conventional texts with compulsory and hortatory language; and some others transformed in general principles, applicable to all states, irrespective of their conventional obligations, because a particular rule has gained customary status opposable to the entire international community. Attending to its terms, to a longstanding practice of states and the object and purpose of its content — and its context, including the general duty to protect cultural heritage in broad terms, deduced from numerous treaties —, Art. 303(1) UNCLOS can be considered among those general universal rules when saying that 'States have the duty to protect objects of an archaeological and historical nature found at sea and shall cooperate for this purpose.'

Keywords: Legal Protection – Law of the Sea – Underwater Cultural Heritage – Maritime Law – UNCLOS

This twofold obligation imposed by UNCLOS is echoed in the special agreement states have adopted on the subject: the 2001 UNESCO Convention on the Protection of the Underwater Cultural Heritage[4] (2001 UNESCO Convention). To complete the sometimes contradictory and ambiguous (even counterproductive) regime for the UCH created by UNCLOS[5], states decided to negotiate this new international agreement around four main ideas:

(a) the enhancement of this general duty to protect and the organization of the duty to cooperate,
(b) the prohibition of commercial exploitation of UCH,
(c) the importance of a scientific approach to UCH avoiding the discussion on title upon that heritage, and
(d) the incardination of this new convention into a more ample and diverse canvas of laws and policies trying to preserve cultural heritage, in general, and underwater heritage, in particular, for future generations.

This new convention has provoked, however, some criticisms, most of them due to misunderstandings generated around its terms and purposes. There are also some problems still existing which deserve a close legal scrutiny; and some challenges that need to be evaluated and, if possible, resolved.
This contribution will briefly address some of these questions in legal terms, i.e. focusing only on the legal aspects of these misunderstandings, problems, and challenges that may of course have some other profiles including historical, archaeological, and technical.

Misunderstandings

Three main misunderstandings can be discussed here: the concept of UCH as defined in Art. 1(1)(a) of the 2001 UNESCO Convention; the exact meaning and purpose of the *in situ* preservation rule outlined in art. 2(5) and rules 1 and 4 of the Annex[6]; and the relationship between the 2001 UNESCO Convention and UNCLOS.
1. Art. 1(1)(a) definition of UCH includes 'all traces of human existence having a cultural, historical or archaeological character which have been partially or totally under water, periodically or continuously, for at least 100 years such as:

(i) sites, structures, buildings, artefacts and human remains, together with their archaeological and natural context;
(ii) vessels, aircraft, other vehicles or any part thereof, their cargo or other contents, together with their archaeological and natural context; and
(iii) objects of prehistoric character.'[7]

Two questions may be discussed: the first, for some states — particularly the United Kingdom —this would propose the 'blanket protection' of millions of objects located at sea, creating an impractical regime that might protect all and any remains of human traces. This concern, however, forgets that these traces must have 'a cultural, historical or archaeological character', thus implying a scientific identification and valorisation of the object before labelling it as UCH. The second is the time limit of 100 years which was adopted due to two intertwined motives: to leave aside, for the moment, recent human traces beneath the waters — therefore also avoiding the problems of the title of recent sunken vessels, for example — and because that threshold was predominantly adopted by the majority of domestic legislations imposing age limits in their heritage laws.[8] However, it must be underlined that the 2001 UNESCO Convention time limit does not prohibit domestic legislation from protecting more recent UCH in their respective waters under sovereignty or jurisdiction. Again, as with the 'blanket protection concern', it will depend on the relevance of the archaeological site and the objects within it.
2. The *in situ* preservation concept has been misused by politicians, lawyers and, even, archaeologists, as an excuse for inaction or as an absolute rule provoking an overzealous desire to protect, regardless of the specific needs of each underwater site. However, the 2001 UNESCO Convention in its art. 2(5) and rules 1 and 4 of the Annex clearly define *in situ* preservation 'as the first option before allowing or engaging in any activities directed at this heritage.' *In situ* preservation is not necessarily the best underwater archaeological solution, nor is it legally required in all circumstances. Rather, it is the first and, perhaps, the most technically desirable option, when archaeological, legal, and political circumstances — in that order — so advise. The removal of an historical object or objects found under the sea and their conservation outside the marine environment is another plausible option, provided the archaeological standards accepted by the international scientific community are met (Aznar 2018).
3. Perhaps the most problematic misunderstanding is that regarding the relationship between the 2001 UNESCO Convention and UNCLOS. This concern was generated by what has been qualified as 'constructive ambiguities' of the Convention, needed for its final adoption.[9] The misunderstanding derives from the negotiating days of the Convention when some states (prominently Norway) understood it to be a 'subordinated text' to UNCLOS, i.e. a treaty on the law of the sea instead of a treaty on cultural heritage, as was widely understood by the rest of the states' delegations at UNESCO. This derives from the fact that UNCLOS, as already said, is the 'Constitution of the Oceans', and thus was apparently carved in stone. However, both UNCLOS and 2001 UNESCO Convention preambles declare 'the need to codify and progressively develop' international rules; and the latter does it regarding the protection and preservation of underwater cultural heritage in conformity with international law and practice, including UNCLOS and other cultural heritage conventions already in force.

Actually, this special relationship with the UNCLOS is anticipated in art. 3 of the Convention, which plainly states that '[n]othing in this Convention shall prejudice the rights, jurisdiction and duties of states under international law, including the United Nations Convention on the Law of the Sea'; and that the some misunderstanding was created with regard to the notification process foreseen in art. 9 for UCH discoveries in those zones. Its paragraph 1 establishes an alternative system to report them by the discoverer (a person or a vessel) either to the coastal state — which implies for some states a new ob-

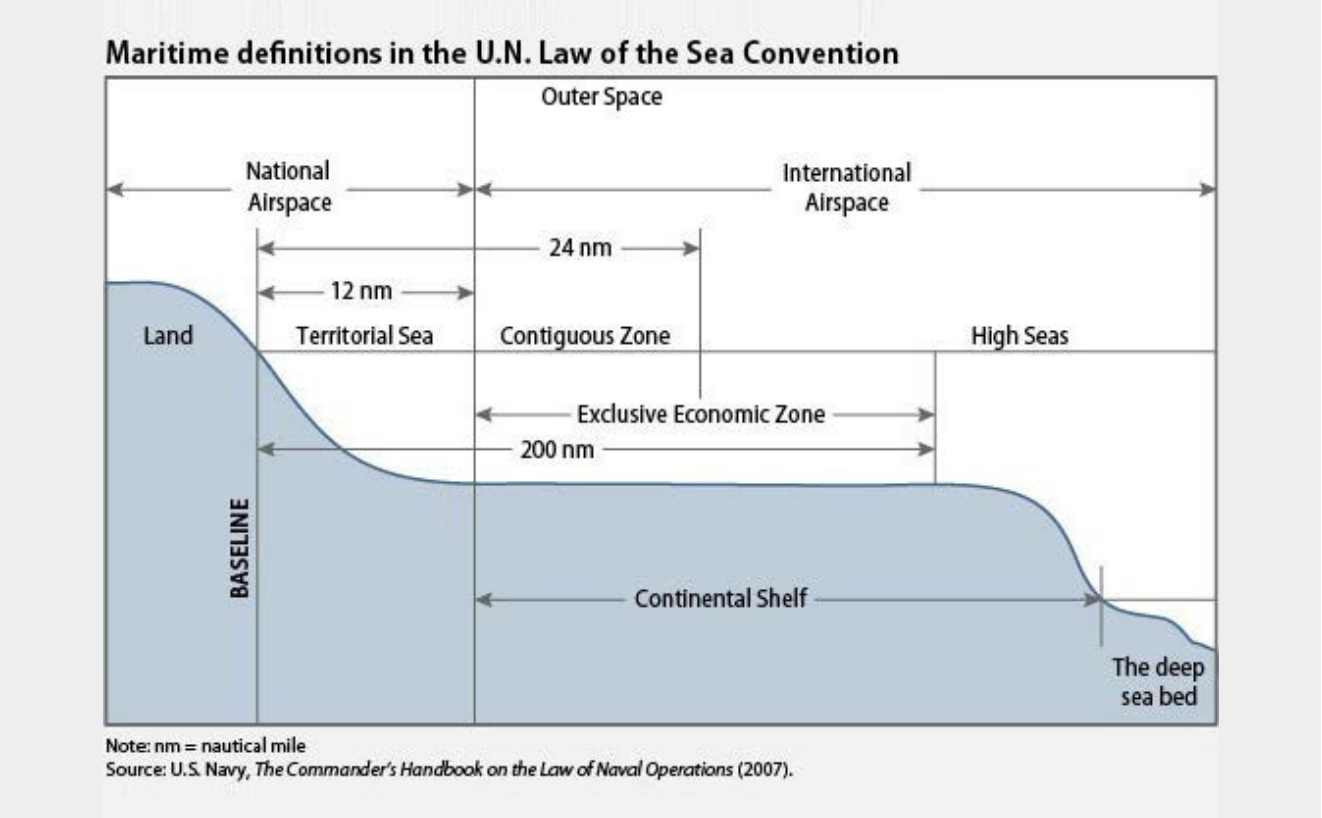

Fig. 2 Maritime zone definitions in the United Nations law of the Sea Convention. © US Navy. The Commander's Handbook on the Law of Naval Operations (2017).

Convention 'shall be interpreted and applied in the context of and in a manner consistent with international law, including the United Nations Convention on the Law of the Sea'.

The misunderstanding, and consequently the concern, mostly arrived with the regime established in the Convention for the exclusive economic zone (EEZ) and the continental shelf (CS) in arts. 9 and 10. However, on the one hand, and with regard to the activities directed at UCH in these zones, art. 10(2) clarifies that '[a] State Party in whose exclusive economic zone or on whose continental shelf underwater cultural heritage is located has the right to prohibit or authorize any activity directed at such heritage to prevent interference with its sovereign rights or jurisdiction as provided for by international law including the United Nations Convention on the Law of the Sea.' In addition, under art. 10(6), any decision or measure adopted by the so-called 'coordinating state' implementing those activities 'shall not in itself constitute a basis for the assertion of any preferential or jurisdictional rights not provided for in international law, including the United Nations Convention on the Law of the Sea.'[10] On the other hand, ligation not provided for by UNCLOS — or to its national/flag state, which would transmit the information to the rest of the States parties, including the coastal state (a reporting obligation peacefully nested in UNCLOS). Surprisingly, concerned states seem to forget that this reporting system only applies to the States parties to the 2001 UNESCO Convention. It is not compulsory for third party states, nor has it changed the text of UNCLOS.[11]

Problems

There are three problematic issues that originated some discussions and, to some extent, still generate concerns among states: the legal regime of sunken state vessels as UCH; the applicability of the law of finds and, most particularly, the law of salvage relating to UCH; and the regime provided for the UCH located beyond national jurisdiction.

1. With regard to the legal status of sunken state vessels (and aircraft)[12], the problem derives from two facts and two negotiated decisions: first, that states jealously preserve the immunity of those vessels as public property, most time in-

volved in sovereign and sensitive activities, both today and in the past[13]; second, that a relevant number of these vessels – again: today and in the past – when sunk, accidentally or in combat, become marine gravesites, thus deserving a special protection given by the law of nations (Forrest 2015); third, that states considered however that those vessels and their archaeological submerged sites are undeniably good examples of UCH, thus meriting to be protected by the 2001 UNESCO Convention; and, fourth, notwithstanding this, that should not discuss or affect the ownership of these sunken vessels.[14] Rather, with another 'constructive ambiguity', the Convention tries to solve this question with a typical non-prejudice clause in its art. 2(8), saying that '[c]onsistent with state practice and international law, including the United Nations Convention on the Law of the Sea, nothing in this Convention shall be interpreted as modifying the rules of international law and state practice pertaining to sovereign immunities, nor any state's rights with respect to its state vessels and aircraft'. The Convention thus moves the question to general international law (including UNCLOS), but practice and doctrine have not yet settled this problem definitively (IDI 2015; Aznar 2010). In any case, what might be underlined is not so much the question of ownership but that of responsibility in the best protection of those fragile pieces of UCH and the cooperation between nations under strict scientific standards.

2. This is also urgently needed with regard the applicability to UCH — and particularly to old state vessels sunk while carrying precious metals or valuable cargoes — of the law of finds and the law of salvage.[15] This is because treasure hunters are using the law of salvage as a legal conceptual framework to recover UCH and commercialize it without any scientific care (Varmer and Blanco 2018). Therefore, the 2001 UNESCO Convention, after sound discussions, opted for a non-total exclusion of the application of the law of finds and the law of salvage to UCH. Rather, the reference text — its art. 4 — was precisely drafted in negative tense, as an exception, and imposing cumulative conditions in its application: '[a]ny activity relating to underwater cultural heritage to which this Convention applies shall not be subject to the law of salvage or law of finds, unless it: is authorized by the competent authorities, and (b) is in full conformity with this Convention, and (c) ensures that any recovery of the underwater cultural heritage achieves its maximum protection.'

3. Finally, the third problem relates to the protection of UCH in the Area, that is, the seabed and ocean floor and subsoil thereof, beyond the limits of national jurisdiction, i.e. beyond the habitual outer limit of 200 nm of states' EEZ/CS. As submarine technologies advance, deeper marine sites are accessible to human activities. As these (and coastal) activities increases, threats to marine environment intensify quantitatively and qualitatively.[16] Exploitation of marine resources — ancient like fishing, recent like submarine mining, including hydrocarbons, and even more recent like the profit of energies or biogenetic marine resources — created new and renewed threats to that fragile environment, including its intimately linked natural and cultural resources. The problem is that natural heritage (environment) has already been in the agenda of the policy- and law-makers during the last decades. How to expand this concern to the cultural heritage located in the Area and, perhaps, to mirror and expand to UCH the legal regime already existing for the protection of natural resources should be a thought-provoking task for the coming years (Aznar 2017).

Challenges

Having addressed some misunderstandings and problems still existing with regard to the international legal protection of UCH, some challenges ahead must also be faced in order to make workable the effective protection of this heritage proposed by the 2001 UNESCO Convention (read in context with other international and domestic texts): 1. to underline that the major threat to UCH comes from activities indirectly affecting this heritage; 2. to realise that the protection unfailingly is a cooperative task and 3. that most states and, what is even more dangerous, the general public still ignore what UCH is and how it should be preserved for future generations.

1. From my point of view, the most important but rarely discussed proviso of the 2001 UNESCO Convention is art. 5, which states that '[e]ach State Party shall use the best practicable means at its disposal to prevent or mitigate any adverse effects that might arise from activities under its jurisdiction incidentally affecting underwater cultural heritage.' This is a wide-ranging duty imposing both obligations of result (to protect UCH) and of behaviour (to use best practicable means) against licit, day-by-day and generalized activities performed at sea by different stakeholders, including states: from fishing to coastal development, from laying submarine cables or pipelines to installing off-shore wind farms, from creating new artificial reefs to draining coastal wetlands. This also relates to art. 16 of the Convention (See Petrig and Stemmler 2020). Along with the impact of climate change and natural events, the Anthropocene era characterized by a deep impact in all kind of environments, with global effects. To inoculate the 'UCH-DNA' into any policy and law-making process — as it was gradually done with the (natural) environmental variable — is the main challenge we have in the very near future, both at international and domestic level.[17]

2. This should be done properly through a more cooperative approach since challenges to UCH cannot usually be spatially reduced to one or two adjacent states. Moreover, UCH sites cannot be totally explained only from a national

perspective: old Phoenician or Roman routes, for example, intensively used by different cultures transporting products, languages, ideas, artistic artefacts, technical solutions, faiths and gossips, did not end at sea. They crossed the waves and opened new trading and cultural routes. The Manila Galleon enterprise (1565–1821) — the most fabulous, longest, and longstanding maritime route linking for centuries three continents and four oceans — implied that cargoes and people bound for the Indian Ocean coasts and South China and Philippines Sea were loaded in Manila in a Spanish vessel which, guided by the newest state-of-the-art technologies of that period, arrived to Mexico by the safest and fastest route crossing the Pacific Ocean. Some cargo and people disseminated from Mexico throughout the Americas. The rest arrived to the Caribbean where, from Havana, crossing the Atlantic Ocean in new vessels to the route, were finally downloaded at Cádiz, Spain, from where people and cargo disseminated throughout Europe. Add to this incredible voyage the returning route, with people and cargo from Europe to America and Asia.[18] If the remains of one of these galleons were found, how many countries would be therefore involved as what the 2001 UNESCO Convention denominates as 'interested states'?[19] Cooperation is the landmark of the Convention, as expressed in its arts. 2 and 19 — echoing art. 303 (1) UNCLOS — [20] and establishing in arts. 10 and 12 a perhaps perfectible system of collaboration. But cooperation may be also sought through new hard and soft agreements (art. 6) and including both information sharing and training in underwater archaeology (art. 21).

3. However, all these normative and institutional efforts must be directed to the main purpose of the Convention, summarised in its art. 2(3) when saying that 'States Parties shall preserve underwater cultural heritage for the benefit of humanity in conformity with the provisions of this Convention.'[21] Unfortunately, due to the spatial location of UCH and the special characteristics of its preservation (preferably *in situ*), the general public very often ignores the richness of its heritage beneath the waters. The Convention is 'convinced of the public's right to enjoy the educational and recreational benefits of responsible non-intrusive access to *in situ* underwater cultural heritage, and of the value of public education to contribute to awareness, appreciation and protection of that heritage' (Preamble); and its art. 2(10) calls for a '[r]esponsible non-intrusive access to observe or document *in situ* underwater cultural heritage shall be encouraged to create public awareness, appreciation, and protection of the heritage except where such access is incompatible with its protection and management'. Because the public protects what they appreciate, and appreciate what they know, the most challenging task for historians, archaeologist, curators, and policy- and law-makers acting through NGOs like ICOMOS and intergovernmental institutions like UNESCO is to imagine and perform all kinds of dissemination, education, outreach and research efforts to fulfil the mandate to adequately preserve UCH for future generations imposed by UNCLOS, the 2001 UNESCO Convention, and general international law.

1 Objects located in continental waters (rivers, lakes, inlets, wetlands, etc.) are ultimately governed by the domestic law of the territorial state and do not offer (unless special cases) 'international' problems.

2 UN Convention of the Law of the Sea (UNCLOS), adopted in 1982 and in force since 1994. As for today, UNCLOS has 168 States Parties, that is, the vast majority of states which consider UNCLOS — even those nonparties like the US — as the 'Constitution of the Oceans'.

3 The 1989 London Salvage Convention or the 2007 Nairobi Wreck Removal Convention may be good examples.

4 Adopted 2 November 2001, in force since 2nd January 2009. As for today, the UNESCO Convention has 66 States parties: Albania, Algeria, Antigua and Barbuda, Argentina, Bahrain, Barbados, Belgium, Benin, Bolivia, Bosnia-Herzegovina, Bulgaria, Cambodia, Cabo Verde, Costa Rica, Croatia, Cuba, DR Congo, Ecuador, Egypt, Estonia, France, Gabon, Ghana, Granada, Guatemala, Guinea-Bissau, Guyana, Haiti, Honduras, Hungary, the Islamic Republic of Iran, Italy, Jamaica, Jordan, Kuwait, Lebanon, Libya, Lithuania, Madagascar, Mexico, Micronesia, Montenegro, Morocco, Namibia, Nigeria, Niue, Oman, Palestine, Panama, Paraguay, Portugal, Romania, San Kitts & Nevis, Saint Lucia, San Vincent & the Grenadines, Saudi Arabia, Senegal, Slovakia, Slovenia, South Africa, Spain, Switzerland, Togo, Trinidad & Tobago, Tunisia and Ukraine.

5 Most particularly, paragraph 3 of art. 303 UNCLOS is really counterproductive for the protection of UCH when it says that '[n]othing in this article affects the rights of identifiable owners, the law of salvage or other rules of admiralty, or laws and practices with respect to cultural exchanges', mixing public and private law rules without hierarchizing the public and private interest also included.

6 The negotiating States decided to include in the Convention (as an integral part of it, under art. 33) a set of 36 rules (the Annex) which constitutes the archaeological protocol widely accepted by the scientific community and seminally drafted by ICOMOS in its Charter of Sophia (1996).

7 Subparagraphs (b) and (c) of this same article leave aside the concept of UCH the pipelines and cables placed on the seabed as well as installations other than pipelines and cables, placed on the seabed and still in use. I consider the later exception inconsistent with some underwater heritage (fish traps, old harbor structures, for example) which merit to be consider UCH but, because they may be (and actually are) still in use, are not technically protected by the Convention.

8 There are numerous domestic legislations which do not impose any kind of time limit trying to be as protective as possible when addressing cultural heritage through archaeological methods.

9 Adoption according to the typical procedure in UNESCO, that is, vote of the states present in its General Conference, showing a positive result of 87 votes in favor, 15 abstentions and 4 against (Norway, Russia, Turkey, and Venezuela). The United States of America did not vote since they were (and are) not a UNESCO member.

10 The 'coordinating State' for these activities in the EEZ/CS — normally the coastal State — acts always 'on behalf of the States Parties as a whole and not in its own interest' when organizing and conducting the measures to protect UCH in these zones.

11 Actually, most States parties which have declared what reporting procedure they do prefer have select the second option, more aligned with UNCLOS.

12 For the 2001 UNESCO Convention, those are 'warships, and other vessels or aircraft that were owned or operated by a state and used, at the time of sinking, only for government non-commercial purposes, that are identified as such and that meet the definition of underwater cultural heritage' (art. 1(8)). Art. 29 UNCLOS defines (only) warship as 'a ship belonging to the armed forces of a state bearing the external marks distinguishing such ships of its nationality, under the command of an officer duly commissioned by the government of the state and whose name appears in the appropriate service list or its equivalent, and manned by a crew which is under regular armed forces discipline.'

13 Art. 32 UNCLOS recognizes that 'nothing in this Convention affects the immunities of warships and other government ships operated for non-commercial purposes.' See further art 16(2) of the UN Convention on Jurisdictional Immunities of States and Their Property, adopted in 2004, not yet in force but codifying customary law.

14 From the earlier drafts of the Convention and during the negotiating meetings, the questions of abandonment and title upon these wrecks were explicitly avoided in order to prevent a deadlock among two opposite group of States: those strictly defending the supremacy of the immunity rule (derived from the public property of the flag States) and those giving prominence to the territorial sovereignty (derived from the assumption that everything located in its territory, including maritime territory, belongs to the coastal state). As long as the territorial argument diminishes, the immunity argument increasingly applies, as can be seen in the Convention in arts. 10(7) and 12(7) where, for the EEZ/CS and the Area (respectively), no activity directed at state vessels and aircraft shall be adopted without the agreement or consent of the flag state.

15 Although rooted in ancient law, including roman law, the law of salvage as discussed here has been mainly conceptualized in common law doctrine and admiralty courts. The latter has asserted, for example, that the law of salvage and the law of finds are mutually exclusive [R.M.S. Titanic, Inc. v. Haver, 171 F.3d 943, 961 (4th Cir. 1999)]. Both set of rules are different indeed: 'Granting title to artefacts under a salvage award is different from granting title to the salvor as a finder; in the former case but not the latter, the court may retain jurisdiction and continue to supervise the salvage operations.' (Schoenbaum 2018, 802).

16 As a reaction, UNESCO has decided to revisit its 1972 World Heritage Convention and discuss the possibilities to expand its regime beyond the outer limit of the territorial seas of States parties. See the special website of UNESCO at http://whc.unesco.org/en/highsea; accessed 30th September 2020.

17 Unfortunately, the 2021-2030 Sustainable Development Agenda (see https://www.un.org/sustainabledevelopment/development-agenda/; accessed 30th September 2020, does not specifically refer to the protection of UCH in its Sustainable Development Goal (SDG) 14 on oceans, seas and marine resources. However, the United Nations Conference to Support the Implementation of SDG 14 of the 2030 Agenda that took place in June 2017 expressly recognized that the ocean forms an important part of our cultural heritage and called on all stakeholders to develop comprehensive strategies to raise awareness of the natural and cultural significance of the ocean. See https://oceanconference.un.org/callforaction; accessed 30th September 2020. On the contrary, the UN General Assembly, during the last annual sessions has constantly urged all States 'to cooperate, directly or through competent international bodies, in taking measures to protect and preserve objects of an archaeological and historical nature found at sea […]' See A/Res/72/73, 4th January 2018, on 'Oceans and the law of the sea', for its last mention.

18 The same could be said about the maritime 'silk route' across Asia or any west African cabotage nautical routes along the centuries.

19 That is, those States with 'a verifiable link, especially a cultural, historical or archaeological link, to the underwater cultural heritage concerned' (art. 9(5)) (Maarleveld 2014).

20 Completed for the Area with art. 149 UNCLOS, which establishes that '[a]ll objects of an archaeological and historical nature found in the Area shall be preserved or disposed of 'for the benefit of mankind as a whole, with particular regard being paid to the preferential rights of the State or country of origin, or the State of cultural origin, or the State of historical and archaeological origin'.

21 The Preamble of the Convention further acknowledges the importance of UCH 'as an integral part of the cultural heritage of humanity and a particularly important element in the history of peoples, nations, and their relations with each other concerning their common heritage.'

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Further reading

Along with the cited references in this article, a complete general overview of the international legal protection of UCH and the making of the 2001 UNESCO Convention may be seen in these five books in five different languages:

Aznar Mariano J (2004) La protección internacional del patrimonio cultural subacuático. Tirant, Valencia.

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RISK AND PROBLEMS RELATING TO PROTECTING AND RESEARCHING UNDERWATER CULTURAL HERITAGE IN EAST AND SOUTHEAST ASIA

Akifumi Iwabuchi, Japan

Fig. 1 Stone Tidal Weirs in Mainland China. © Akifumi Iwabuchi.

Introduction

The UNESCO Convention on the Protection of the Underwater Cultural Heritage (2001 UNESCO Convention) is extremely unpopular in East and Southeast Asia. Only Cambodia has ratified it in these regions. It is possible that the absence of ratifications of the Convention in Asia is due to the underdevelopment of Asian underwater archaeology, but this viewpoint is radically mistaken. In Japan, the academic subject of underwater archaeology was, practically speaking, born on submerged sites in Lake Biwa in 1959, noting that it is often stated that George F. Bass, the father of underwater archaeology, started his career in the Mediterranean Sea in 1960. The National Research Institute of Maritime Cultural Heritage in South Korea, which was originally established in 1994, is now one of the best developed underwater archaeological institutions in the world. Many training courses for local researchers, mainly in Southeast Asia, were offered since by UNESCO or foreign universities in order to foster professional underwater archaeologists. Some of them have already gained skills and knowledge in no way inferior to Occidental maritime archaeologists. Chinese Taipei adopted a new law on the protection of underwater cultural heritage in 2015, which is highly receptive to the ideas and principles of the 2001 UNESCO Convention.

The 2001 UNESCO Convention and *in situ* preservation

Why is the 2001 UNESCO Convention still so unpopular in East and Southeast Asia? First of all, the Convention itself seems to contain some problematic items, which many Asian nations or people are unwilling to accept. For instance, Article 2–5 stipulates that *in situ* preservation shall be considered as the first option before allowing or engaging in any activities directed at underwater cultural heritage. The region's underwater environment is influencing archaeologists' opinions that preservation *in situ* is interfering with their desire to investiga-

Keywords: 2001 UNESCO Convention – *In Situ* Preservation – Human Remains – War

te sites. In comparison to the Mediterranean or the Caribbean Seas the degree of sea clarity is generally much reduced in Asian waters. For example, at the Mongolian shipwreck site, from around the 13th century, located in western Japan, the water visibility is only a few metres at a depth of about 20 metres. It is believed that if wrecks are not completely or even partially recovered it would be more difficult for scholars to study in detail a vessel's structure or their loaded cargoes. In addition, countless shipworm such as *Teredo navalis* live in the warm Asian waters, which consume temporarily excavated wooden hulls left *in situ*.

Fig. 2 Wagae-no-shima. © Akifumi Iwabuchi.

Indeed, the Convention's Annex Rule 1 suggests that salvaging or recovery is allowed for the purpose of scientific studies or for the ultimate protection of the underwater cultural heritage. For the sake of the aforementioned objects, therefore, the desalination, preservation, and storage facilities such as underwater archaeological museums or institutions have to be prepared on land. In East and Southeast Asia, only China and South Korea have already built such proper scientific institutions, but other countries cannot afford to do so.

Human remains

According to Article 1–1(a) of the Convention, underwater cultural heritage includes submerged human remains. For Asians, human remains have never been 'cultural heritage', but are considered to be 'religious objects' (Iwabuchi 2014, 47–48), although Article 2–9 says States Parties shall ensure that proper respect is given to all humans remains located in maritime waters and Rule 5 says activities directed at underwater cultural heritage shall avoid the unnecessary disturbance of human remains or venerated sites. Almost all underwater cultural heritage sites in the Pacific from the Second World War have the potential for the discovery of human remains. When Japanese human remains are found underwater, Japan has committed to recover them seemingly against the 2001 UNESCO Convention, to repatriate them if they are in foreign waters, and then consign them to land-based graves in their home country; its government having promised Japanese soldiers going to the battle-fields to do so, although its navy partially adopted burial at sea. Several years ago, the UNESCO Bangkok office made a poster of Japanese human remains in the Pacific with the view to their protection. Although UNESCO did not mean offense, almost all Japanese felt that honoured fallen soldiers' bones were exposed to public view, as if in the pillory. According to my anthropological surveys relating to Muslims in Southeast Asia, the concept of publicly displaying human remains is considered a kind of punishment. This matter has occurred due to the rapid development of underwater technology; human remains in the deeper parts of the sea, to which neither skilled diver nor underwater vehicle was able to gain access to in the past, have nowadays, relatively easily, attracted the attention of divers or the operators of remotely operated vehicles.

Territorial and border disputes

Secondly, however, the most important outside factor for the apparent unpopularity of the 2001 UNESCO Convention is the fact that the Cold War has not yet ceased in East and Southeast Asia. In Asian waters, there have been considerable disagreements concerning maritime national borders between many nations since 1945, so that the borders have not been demarcated in accordance with the 1982 United Nations Law of the Sea Convention (UNCLOS), which the 2001 UNESCO Convention follows concerning ocean boundaries. Due to the extent that some territorial seas or exclusive economic zones have not been precisely defined, many countries have not been able to legislate, for example, for the protection of underwater cultural heritage under their exclusive economic zones. In South Korea, therefore, its navy is the main opposing force to the 2001 UNESCO Convention. Although détente on the Korean Peninsula may be possible for the time being, the diplomatic and military tensions in the East and South China Seas are intensifying rather than the contrary (Chand et al. 2018, 23). The 2001 UNESCO Convention does not include the issue of the ownership of wrecks, but a few Asian countries claim their ownership for the purpose of using them as icons of national jingoism. Quite the opposite in bringing Asia to peace, underwater cultural heritage might possibly lead this region to war (Campbell 2015, 23). Under these circumstances, all major powers around East and Southeast Asia, viz. the U.S., Russia, India, and Australia, have not ratified the 2001 UNESCO Convention, either. The U.S. has not even ratified UNCLOS, therefore it would be difficult for Asian countries, which have congenial diplomatic relations with the U.S., to ratify the 2001 UNESCO Convention.

The 2001 UNESCO Convention does not contain the word 'shipwreck' in its articles at all, but most Asian countries seem to be interested only in shipwrecks as underwater cultural heritage. This is partly due to the frequent focus on shipwrecks containing treasure, which bring about the possibility of gaining further research funds, and partly because they can be symbolized for justifying the territorial expansions into alien waters. On the other hand, the underwater cultural heritage sites around intertidal zones such as old harbour ruins or shellfish middens, which have usually nothing to do with nationalism, are occasionally discarded or destroyed to the verge of disappearance. For example, the underwater cultural heritage of stone tidal weirs in mainland China has not been studied by underwater archaeologists properly and demolished rapidly, owing to coastal developments (Fig. 1).

In some nations, however, such underwater cultural heritage sites have already been well preserved and surveyed by professional scholars; Chinese Taipei has designated a group of stone tidal weirs in the Penghu Islands as a potential World Cultural Heritage site, which is carefully protected by its government. In 2018, three representatives of member institutions of the UNESCO UNITWIN Network for Underwater Archaeology, viz. Guam University in the U.S., Warsaw University in Poland, and Tokyo University of Marine Science and Technology in Japan discussed the preservation management or further research possibilities of stone tidal weirs in the world, together with Chinese Taipei's authority. The first National Historic Site of underwater cultural heritage in Japan, which was designated in 1968, is not a shipwreck, but a mediaeval port ruin off the city of Kamakura, i.e. Wagae-no-shima (Fig. 2). Ports of ancient Southeast Asia have also started to be investigated recently (Miksic 2012, 53–54). Rather than submerged shipwrecks in deep waters, indeed, these underwater cultural heritage sites along the shore are more vulnerable to ocean environmental change such as the global sea level rise.

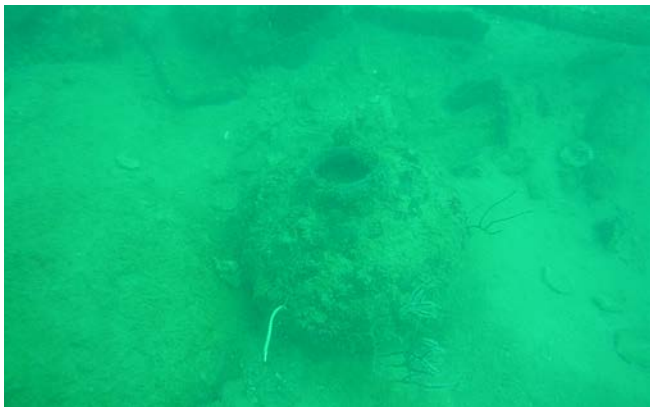

Fig. 3 Underwater Cultural Heritage in the Bangka-Belitung Islands. © Akifumi Iwabuchi.

Commercial exploitation of underwater cultural heritage

Treasure hunters are still active in East and Southeast Asia. In 2018, a fraudulent South Korean group, which collected investments for the purpose of salvaging gold in a Russian shipwreck were arrested; as it is a wreck without any gold bars which sank during the Russo-Japan war in 1905. Presumably, the 2001 UNESCO Convention is meant to protect it. The Indonesian 2010 Cultural Property Act seeks to promote the preservation of all cultural properties including underwater cultural heritage more than 50 years old, to ban their possessions by foreigners, and so forth (Ghautama 2012, 117), but mainly due to bureaucratic or geographical reasons many underwater cultural heritage sites are still 'legally' looted by foreign treasure hunters in Indonesia. For example, there are numerous shipwrecks with ceramics around the Bangka-Belitung Islands (Fig. 3), where European treasure hunters are planning to salvage some shipwrecks and to sell recovered items to museums around the world. Because foreigners themselves are not allowed to export any cultural properties

from Indonesia, they have established a front foundation. As long as enough museums keep buying such items from treasure hunters, treasure hunting will never be eradicated. Everybody still remembers the shocking news that almost all cultural properties from the Belitung shipwreck were purchased from 'poor' Indonesia by 'rich' Singapore legitimately in 2005, when the 2001 UNESCO Convention had already been adopted, but not yet in force until 2009. Since then the exhibitions of the Belitung shipwreck have been held in several museums around the world, under the artful title of 'The Tang Shipwreck' for fear visitors would realize it is actually from Indonesia. Cham Island off Vietnam has a private maritime museum, consisting of ceramics from local shipwrecks, many of which were recovered often local fisherpersons, and not by trained underwater archaeologists.

Especially in Southeast Asia, not only treasure hunters but also professional salvage companies have become a threat to modern metal shipwrecks. In particular, many shipwrecks from the Second World War have been recovered and sold as scrap iron, and human remains inside them have been abandoned on the spot. It is true that the 2001 UNESCO Convention does not apply to shipwrecks from the Second World War; it applies only to the underwater cultural heritage which has been under water for at least 100 years. However, war-related shipwrecks from the Second World War will become underwater cultural heritage from 2039. In Indonesia, these have already been recognized as being Cultural Property. Such salvage issues have been complex, because there are many different interpretations of the law of war, the Treaty of San Francisco, the Treaty of Den Haag between the Netherlands and Indonesia, and so on, even among internationalists. In accordance with sovereign immunity, the U.S. president gave the following statement on U.S. policy to protect sunken State craft in 2001:

> 'The United States will use its authority to protect and preserve sunken State craft of the United States and other nations, whether located in the waters of the United States, a foreign nation, or in international waters' (U.S. Government Publishing Office 2001: 2956).

Although many war-related shipwrecks in East and Southeast Asia are of Japanese descent, Japan has not passed any domestic laws or cabinet orders on them since 1945. For instance, however, the Reparations Agreement between Japan and the Philippines, which was signed in 1956, exceptionally includes an article on the political disposal of Japanese shipwrecks. In contrast, Japan has not even signed the peace treaty with Russia since the end of the Second World War. Because neither the 2001 UNESCO Convention nor UNCLOS has solved problems concerning the sovereignty rights and the ownership of wrecks, conversely, protecting war-related shipwrecks in East and Southeast Asia does not seem to be so easy. As a consequence, a new multilateral international agreement for the region might be needed.

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UNESCO WORLD HERITAGE SITES UNDER WATER: ARCHAEOLOGICAL PLACES OF OUTSTANDING UNIVERSAL VALUE

Albert Hafner, Switzerland

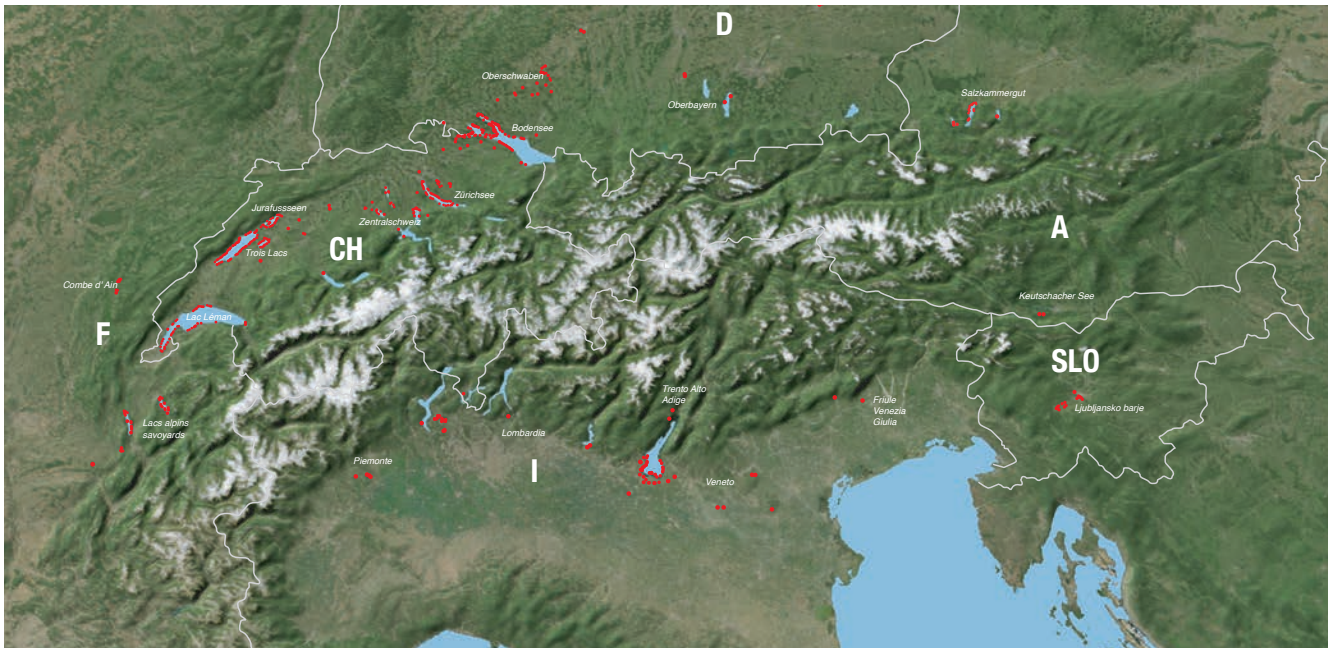

Fig. 1 Pile dwellings of the Alpine Space. Mapping of about 1,000 Neolithic and Bronze Age settlement sites as part of the successful UNESCO nomination of 2011. © Archaeological Service of the Canton of Bern.

Introduction

The protection of cultural heritage under water has only recently become a matter of public interest. Cultural properties on land such as historical buildings and archaeological sites were already the subject of discussion in the Hague Conventions of 1899 and 1907. An institutional interest in protecting archaeological sites that are submerged in the seas and inland waters was first expressed in the 1996 ICOMOS (Sofia) Charter on the Protection and Management of Underwater Cultural Heritage and the 2001 UNESCO Convention on the Protection of the Underwater Cultural Heritage (2001 UNESCO Convention). The 2001 UNESCO Convention entered into force in 2009. It is beyond question that the implementation of the Convention and the further ratification by 66 states (2020) have led to a significantly improved awareness of the importance of the cultural heritage for achieving a global understanding of the past of human societies. At the same time, the 2001 UNESCO Convention drew attention to the fact that underwater archaeological sites are exposed to a variety of hazards. These include erosion-induced destruction of natural origin, but above all are the human impacts on the seabed and inland waters in connection with industrial and construction activities, and the destructive pillaging of shipwrecks in search of valuable objects.

The Convention Concerning the Protection of the World Cultural and Natural Heritage is perhaps the most successful UNESCO Convention. Adopted in 1972, this Convention combines the concepts of nature conservation and the preservation of cultural properties. The programme identifies and preserves sites of outstanding universal value to be considered the common heritage of mankind. Outstanding Universal Value implies cultural and/or natural significance that transcends national boundaries and is of common importance to present and future generations. As such, the permanent protection of this heritage should be an aim to the international community.[1] As of today, 1,121 sites are inscribed on the UNESCO World Heritage list. These are located in 167 countries and of these 869 are cultural properties, 213 natural properties and 39 mixed, cultural and natural. The World

Keywords: World Heritage Sites – Under Water – Universal Value – UNESCO Convention

Fig. 2 Swiss underwater archaeologists on Lake Lucerne, near the pile-dwelling of Stansstad-Kehrsiten. © State Archives of Nidwalden; Thomas Oertle, Department of Underwater Archaeology of the City of Zurich, 2008.

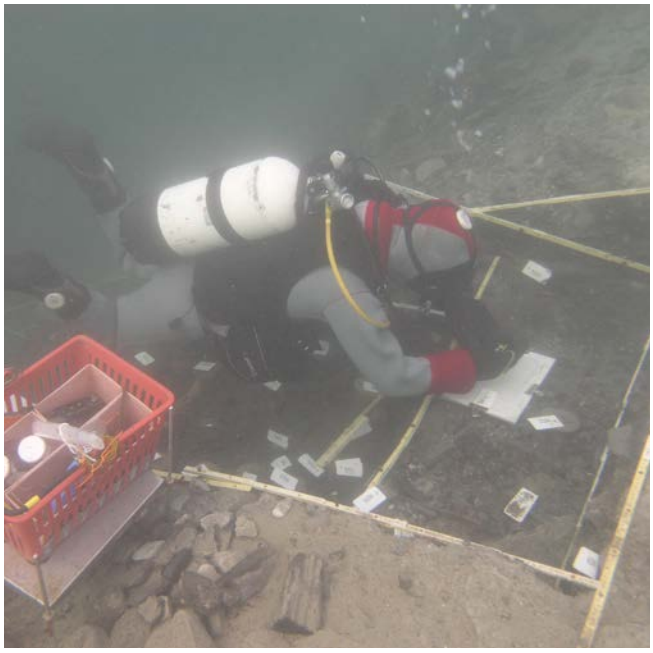

Fig. 4 Working place under water: Each pile is numbered and tagged, discovered objects are recovered and measured at the site of Stansstad-Kehrsiten at Lake Lucerne, Switzerland. © State Archives of Nidwalden, Thomas Oertle, Department of Underwater Archaeology of the City of Zurich, 2008.

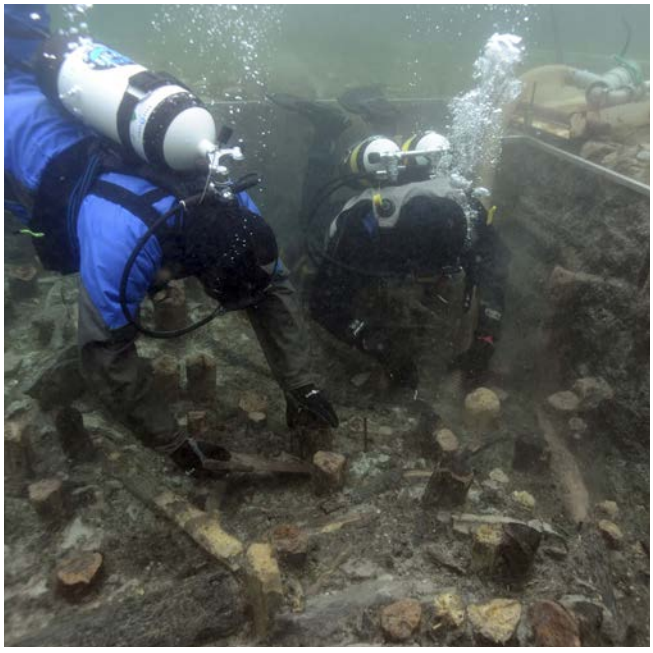

Fig. 3 Excavations yield large quantities of wood which can in many cases be dated to the exact year by using dendrochronology. Divers are excavating and sampling wooden piles of the Neolithic settlement of Sipplingen, Osthafen at Lake Constance (Germany). © State Office for Cultural Heritage Baden-Württemberg, 2008.

Fig. 5 Underwater archaeological excavations make special demands on the surveying of sites. Divers in Thun, Lake Biel, Switzerland, setting up a measuring system. © Archaeological Service of the Canton of Bern, Carlos Pinto.

Heritage list will continue to grow in the future, as numerous sites are still listed on the so-called tentative list. It can be assumed that applications for inscription of these properties on the official World Heritage List will be made in the future.
Approximately 50 sites of marine character have been inscribed on the World Heritage List since 1978, the year of the first inscriptions. The most famous ones of these are marine ecosystems like the Australian Great Barrier Reef, but also less known are entire archipelagos or islands like UK's Henderson Island in the South Pacific. The UNESCO's World Heritage Marine Programme has been designed to protect those sites. The scope of the programme is however limited to natural sites only. Underwater cultural heritage sites can be proposed for inscription on the World Heritage List for their cultural significance and they have to fulfil at least three of the defined cultural criteria.[2] Cultural sites are expected to be outstanding witnesses of the material, architectural, technological, subsistence, and cultural traditions of past and present civilizations.

On the UNESCO World Heritage list there are currently only very few sites that are partially or completely under water and that can be considered as cultural heritage under water. To anticipate it: although more than two thirds of the earth is covered by oceans and seas, there is not a single cultural property that lies exclusively under water. There is also no famous shipwreck among the objects on the UNESCO World Heritage List. Sites inscribed on the World Heritage list like Papahānaumokuākea (US), Mahabalipuram (India) and Chichen-Itza (Mexico) are occasionally mentioned in context with underwater cultural heritage.[3] Papahānaumokuākea is a vast and isolated cluster of islands and atolls in the Pacific Ocean northwest of the main Hawaiian Archipelago (inscribed in 2010). The region is of great cosmological and traditional importance for the life of the indigenous Hawaiian population. On two of the islands there are archaeological remains of cult sites on land from the pre-European period. A group of temples in Mahabalipuram was listed in 1984 and consists of numerous shrines along the Indian Ocean. In 2005, a tsunami hit the coast and revealed the presence of underwater archaeological remains by uncovering harbour and temple ruins. In the vicinity of the prehispanic city of Chichen-Itza, inscribed in 1988, natural water basins (cenotes) were used for sacrificial acts. Gold and jade objects as well as human skeletons were discovered under water.
Only two archaeological sites inscribed on the UNESCO World Heritage list clearly show evidence of underwater cultural heritage. These are the prehistoric Neolithic and Bronze Age settlement remains in Alpine lakes (inscribed in 2011) and a 16th century Basque whaling station in the Arctic added to the list two years later (2013).

Prehistoric Lake Dwellings around the Alps is a serial UNESCO World Cultural Heritage property consisting of 111 individual sites in Austria, France, Germany, Italy, Slovenia and Switzerland (Figs. 1–5).[4] They represent a selection from 937 archaeological waterlogged sites known to date within the Alpine space (Hafner 2014). This cultural heritage includes the remains of prehistoric lake dwellings in and around the Alps, built between 5000 and 500 BC on the shores of lakes, rivers, and wetlands. Research into these settlements of early European farmers began as early as the middle of the 19th century. Archaeological excavations took place in bogs, but also under water: The first scientific diving was undertaken in 1854 in Lake Geneva and since the 1920s, specific methods have been developed for the excavation of settlement remains under water. From the 1970s onwards, specialized diving teams were active in various lake regions. So far, only some of the sites have been excavated on a large scale and only in a few cases complete settlements have been investigated. In many cases, only small parts of the settlement area were explored and are thus held back as a research reserve for future generations. Nevertheless, there are sufficient indications of life in prehistory during the Neolithic and Bronze Age in the Alps of Europe. They shed light on the way the communities dealt with their environment. The settlements are a unique group of exceptionally well-preserved and culturally rich archaeological sites, which represent one of the most important sources for research into early European agricultural societies. The land on which they were built was flooded after climatic cycles, leaving their remains under water and under these ideal conditions of preservation organic materials such as wood, textiles, plants, and discarded food survived the intervening millennia. In particular, the massive preservation of wood has allowed the precise dating of sites and layers by referring to a continuous year-ring chronology (dendrochronology). The submerged settlement remains have provided substantial evidence of the design and subsistence practices of early agricultural societies and their millennia-long development in Alpine Europe during the Neolithic, Bronze Age, and Early Iron Age. The prehistoric pile dwellings around the Alps were the first underwater UNESCO World Heritage sites to be inscribed on the list.

The *Red Bay Basque Whaling Station* is located in north-eastern Canada on the Belle Isle Strait, which separates Newfoundland Island and the Labrador Peninsula (Figs. 6–7). In the 16th century, Basque sailors established a maritime base for Arctic whaling in Red Bay (Grenier and Tuck 1989). It is the earliest, most comprehensive and best-preserved archaeological record of a pre-industrial whaling station.[5] In summer, coastal whaling and whale processing were carried out, and oil was produced and stored. Whale oil was sold in Europe

Fig. 6 Red Bay is considered to be one of the best natural harbours on the Atlantic coast of Newfoundland, Canada. From the 16th century on it was for a short time a centre of Basque whaling activities. It is a National Historic Site of Canada and UNESCO World Heritage since 2013. © Ko Hon Chiu Vincent/UNESCO, 2014. https://whc.unesco.org/en/documents/133758; accessed 30th September 2020.

mainly for lighting purposes. The cultural heritage includes the remains of ovens, cooperages, a quay, living quarters, and a cemetery, as well as the underwater wrecks of ships and whale bone deposits. In Red Bay, underwater remains of five 16th century shipwrecks have been found at a depth of about 25–70 metres. Their condition is very good and they are clearly identifiable, such as the *San Juan*, built in 1565. The wrecks provide information about shipbuilding and the use of ships for whaling.

The World Heritage tentative list includes the cultural and natural monuments nominated by the individual States Parties to the 1972 Convention Concerning the Protection of the World Cultural and Natural Heritage.[6] These will in future be proposed to the World Heritage Committee for inclusion in the UNESCO World Heritage List. Among these candidates are also several cultural properties under water.[7] These include sites with shipwrecks, sunken cities and other sites of special character. Among these are the stone carvings from the historical period on the island of Gaddtarmen (Hauensuoli, Finland), where three shipwrecks with well-preserved structures were discovered. The Banco Chinchorro Biosphere Reserve (Mexico) is located in the Caribbean. Its archaeological and

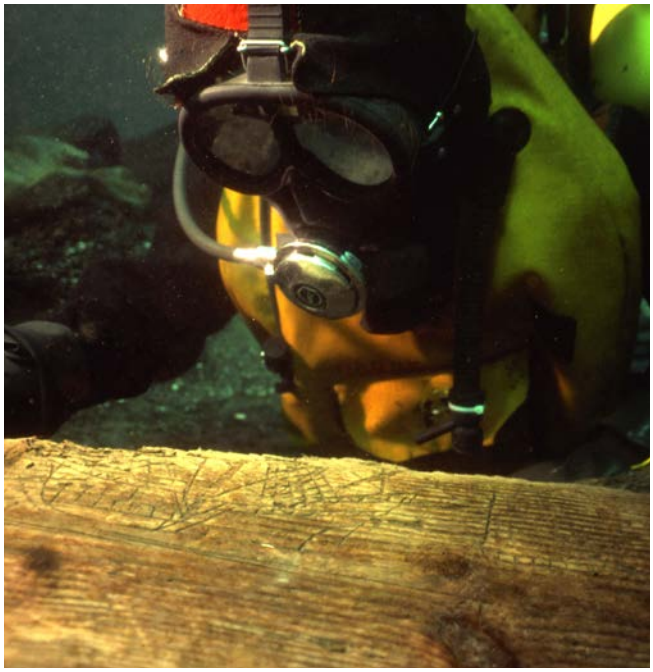

Fig. 7 Ruins of buildings, a historic graveyard, and underwater wrecks of whaling ships and sloops are evidence of the whalers' activities in Red Bay. A diver is examining a plank with a carved representation of a ship at the wreck of San Juan, dating to 1565. © Parks Canada, Denis Pagé, 1983.

historical importance is due to the existence of 44 wrecks on the barrier reef dating between the 16th and 20th centuries. SS *President Coolidge* was launched as America's largest passenger ship in 1931 (with her twin sister, SS *President Hoover*). In 1942, the ship sailed as a military craft and sank after hitting a mine near Vanuatu. The SS *President Coolidge* is currently known as the largest accessible wreck dive in the world. Kekova is the name of a region in Turkey with islands, bays and sunken cities. The geological movements after an earthquake in the 2nd century AD led to the disappearance of the ancient city of Simena and a strange situation with half of the city under water and half above. In Alexandria, Egypt, ancient archaeological remains have been identified at a depth of 6 to 8 metres. Excavations since 1995 have led to the discovery of 30,000 blocks scattered over more than 2 hectares. An examination of all the remains could make it possible to confirm that monuments and perhaps even parts of the famous Pharos of Alexandria lighthouse are still under the sea. Since 1997, several wrecks of Greek and Roman ships from the 3rd century BC to the 6th century AD have been discovered. A survey of the underwater remains identified large Pharaonic, Greek and Roman objects, including five colossal, 12 m high statues from the Ptolemaic period and 25 sphinxes. The underwater remains are extremely valuable and testify to the important role Alexandria played in the Mediterranean from its foundation until its demise. Port Royal, Jamaica, popularly referred to as 'the most wicked city in the world', looks back on a turbulent history, as it quickly became the most important trading post in the New World. At the height of its wealth, 7th June 1692, the trading centre was struck by an earthquake and two-thirds of the city sank into the sea after only 37 years of existence. Two sites with features under water, the Flegrea Area of Pozzuoli, Italy and Baiheliang Ancient Hydrological Inscription, China are of completely different character. Bradyseism is a phenomenon of the Italian site, which led to an uprise level of submerged coastal parts during the Holocene. Ancient hydrological inscriptions on a rock wall in the Yangtze River in the Chinese province of Hubei were submerged after the construction of a dam within the Three Gorges Project.

This brief overview reveals the remarkable breadth of cultural heritage sites lying under water, which represent the diversity of human settlement, navigation, and water exploitation strategies. But it also shows the status of efforts in raising the awareness of this submerged heritage, which was still hardly accessible a few decades ago. However, awareness needs to be combined with specific protection and conservation policies in order to preserve the cultural heritage under water for future generations. In order to achieve the goal of establishing cultural heritage as being of global importance, the 2001 UNESCO Convention on the Protection of the Underwater Cultural Heritage and the 1972 UNESCO Convention for the Protection of the World Cultural and Natural Heritage (leading to the establishment of the World Heritage list) are two indispensable instruments.

1 WHC.19/01

2 WHC.19/01

3 https://whc.unesco.org/en/list/1326/; https://whc.unesco.org/en/list/249/; https://whc.unesco.org/en/list/483/; accessed 30th September 2020.

4 https://whc.unesco.org/en/list/1363/; https://www.palafittes.org/homepage.html; accessed 30th September 2020.

5 https://whc.unesco.org/en/list/1412/; accessed 30th September 2020.

6 https://whc.unesco.org/en/tentativelists/; accessed 30th September 2020.

7 http://www.unesco.org/new/en/culture/themes/underwater-cultural-heritage/museums-and-tourism/tentative-list/: accessed 30th September 2020.

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UNDER THE WATERS OF GALLE: A PRELUDE TO THE AVONDSTER PROJECT

Somasiri Devendra, Sri Lanka

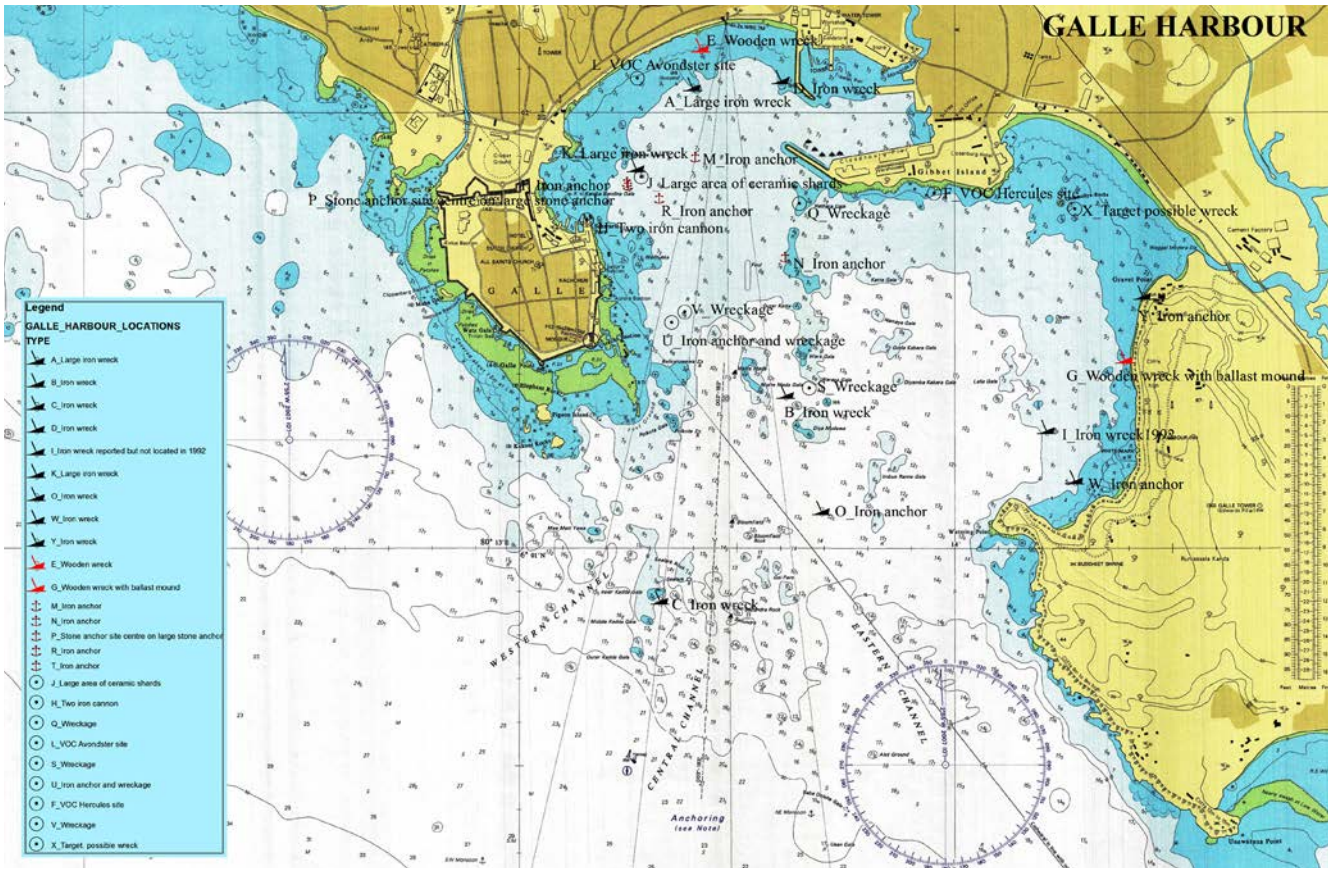

Fig. 1 Hydrographic chart showing the location of all known underwater cultural heritage sites in Galle Bay. © Somasiri Devendra.

Introduction

The following text is a personal record of how and why Sri Lanka faced the question of its title to the wrecks of the Dutch East India Company (VOC) that now lie in Sri Lankan waters. The writer, a party to the decisions eventually taken, places the relevant matters on the record in this chapter. The focus is on the question of title to such wrecks, the arguments advanced and the pertinent historical issues that led to Sri Lanka taking a particular position in regard to these wrecks and specifically to the *Avondster* wreck in Galle Bay. While the issue and its solution were relevant to Sri Lanka and Sri Lankan law, certain strands will be seen as relevant in other international contexts and this is the justification for this narrative and its contribution to this volume.

***Avondster*: a shipwreck and its discovery.**

The *Avondster*, was an armed merchantman of the Vereenigde Oost-Indische Compagnie (VOC),[1] a ship of dual parentage, which had begun life as the John and Thomas of the English East India Company in 1641, having been captured and modified by the VOC and used in their inter-Asian trade. She was one of nine ships carrying areca nuts to the Coromandel coast. The last nuts of the harvest were slow to arrive in Galle and the *Avondster* had been ordered to await them. She was wrecked on 2nd July 1659 while at anchor, becoming one of many cultural heritage sites in Galle Bay (Fig. 1). During the night she slipped her anchor and hit the shore northeast of the anchorage, breaking in two, and soon becoming totally submerged in the soft sand.

Keywords: Avondster – Title – VOC – Sri Lanka – Central Cultural Fund (CCF)

In the mid-twentieth century developments along the shoreline brought about changes in the tidal flow over the site, causing the *Avondster*'s shroud of soft sand to be stripped away, revealing her uppermost structural parts.

The first steps in the development of maritime and nautical archaeology in Sri Lanka

Interest in nautical/maritime archaeology had first surfaced in Sri Lanka at two symposia featuring these themes in 1986 and 1987. By 1990, during an international conference to mark 100 years of archaeology in the country, it was resolved that the Department of Archaeology should take the lead in developing capacity in nautical/maritime archaeology, though initially no concrete steps were taken. In a parallel development in 1991, the new Sri Lankan President of ICOMOS[2] Dr Roland Silva appointed a steering committee (headed by Graeme Henderson of the Western Australian Maritime Museum) to form an ICOMOS scientific committee on the underwater cultural heritage (now ICUCH), nominating me a member. The following year a consortium comprising the Central Cultural Fund, the Department of Archaeology, and the Post-Graduate Institute of Archaeology of the University of Kelaniya (all of Sri Lanka) partnered with the Department of Maritime Archaeology of the Western Australian Maritime Museum (MADWAM) to train a core of future maritime archaeologists. The site selected for the training was the Bay of Galle. The first practical steps were taken in 1992 to induct archaeology students and conservators into the new discipline and, at the same time, to investigate the many shipwrecks in the historic Bay of Galle. This was the Sri Lanka-Australia 'Galle Harbour Project'. During the third season, 1996–1997, the Netherlands joined the project and after extensive research in their national archives identified that one of the wrecks was that of the *Avondster*. It was then that the Netherlands' authorities showed interest in exploring, and eventually excavating the site in cooperation with Sri Lanka; talks were initiated with the Central Cultural Fund (CCF).[3]

The CCF had been created for a specific function under the Central Cultural Fund Act No.57 of 1980. Its function was to raise funds for the development, restoration, and preservation of monuments and other matters pertaining to the cultural heritage from sources other than revenue. Not bound by all of the restrictions placed on a state department, it was able to raise funds from several sources, enter into agreements, and other such instruments and, thereby, assist the State Departments of Archaeology and Cultural Affairs to carry out their functions. The Director-General of Archaeology gave it the authority to undertake the restoration and preservation of specified monuments. When maritime archaeology appeared as an issue, the DGA felt his department lacked the flexibility to pursue it and assigned the subject to the CCF, while retaining its statutory authority. As a result, the CCF emerged as the lead organisation during the discussions that ultimately led to clarifying legal title to the *Avondster*.

A question of ownership, a gift, and shared heritage

In 2002, I received a call from the Additional Director General, Central Cultural Fund (ADG/CCF) to discuss a glitch in the *Avondster* Project which was soon due to get off the ground. I was, then, wearing several hats: Consultant (to the CCF) and Special Advisor on Maritime Archaeology to the Director-General, Archaeology (DGA); and a member of the Advisory Committee to the Ministry of Cultural Affairs. I was also a member of ICUCH (the ICOMOS International Committee on the Underwater Cultural Heritage) and had been marginally involved in the formulation of both the 1996 ICOMOS Sofia Charter and the 2001 UNESCO Convention on the Protection of the Underwater Cultural Heritage (2001 UNESCO Convention). Neither I, nor anyone else in the country, had received formal training in maritime archaeology, so it was very clear that I needed expert advice. Weighed down as I was by all these honorary positions, I strove to balance national and international interests.

The ADG/CCF had been shown a copy of a letter drafted by the Netherlands Embassy in Sri Lanka, which had not yet been formally delivered (it never was). The draft stated that the Netherlands, wished to formally gift the *Avondster* to Sri Lanka and to join Sri Lanka in exploring and excavating the wreck. The letter said that according to Netherlands' law,[4] the shipwreck belonged to the Netherlands government, which was derived from the State being the successor to the VOC, liquidated in 1798.[5] The company's Assets Register included all ships afloat or shipwrecked. Therefore, though the *Avondster* had been wrecked a hundred and fifty years previously she now belonged to the Netherlands Government.

The question was asked whether Sri Lanka was willing to accept the gift. The letter shown was only a draft: it would be delivered only if embassy officials were assured of a positive response. A quick answer was required. Though a positive one came to mind, I required time for consultation. Our experience was very limited and a hasty response could place the project at risk. Moreover, this matter involved two sovereign nations: the CCF was not empowered to make a commitment in the country's name.

To accept the gift, Sri Lanka would have to recognize that the shipwreck belonged to the Netherlands, even though it was in Galle. I gained time by invoking the Antiquities Act which placed all sites under the authority of the Director General of

Archaeology. As it stands, Art. 2(3) of this Act states that:

> 'All undiscovered antiquities (other than ancient monuments), whether lying on or hidden beneath the surface of the ground or in any river or lake or within the territorial sea of Sri Lanka, shall be deemed to be the absolute property of the State, subject to the provisions of this Act'. 'Territorial sea' is defined as 'the area declared to be territorial waters of Sri Lanka by Proclamation made under the Maritime Zones Law, No.2 of 1976'.[6]

Realising the question could be answered only by the Director General, Archaeology, the ADG/CCF called for a meeting with the Archaeological Department, asking me to draft a reply to be tabled. In the draft I noted that:

1. The Department (Dept.) was the statutory authority, although it authorized the CCF to carry out certain functions.
2. The Dept. was fully aware of and committed to the international agreements laid down by UNESCO[7] in 1956 and notes that the Netherlands also follows them.
3. The Dept. will ask the CCF to submit a project proposal.
4. The question of rights to the site involves two sovereign nations and will have to be referred to the Foreign Ministry.

Searching for precedent: Australia

This was an administratively correct position but I was curious as to how other countries had dealt with the problem of VOC ships sunk in their territorial waters. I decided to seek assistance from fellow ICUCH member Jeremy Green of the Western Australian Maritime Museum. Green advised me to go along with the Netherlands' proposal as Australia had signed a similar agreement and had set up the Australian Netherlands Committee on Old Dutch Shipwrecks (ANCODS).[8] This Committee was tasked with maintaining and allocating artefacts from 17th and 18th century Dutch shipwrecks off the coast of Western Australia. In 1976, the Historic Shipwrecks Act was enacted where the nature of the Netherlands' claim for these centuries-old shipwrecks was very clearly spelt out as:

'Having Regard to the Fact:

1. That vessels that belonged to the Dutch Vereenigde Oostindische Compagnie known as the VOC, hereinafter referred to as 'the VOC', were wrecked on or off the coast of Western Australia;[9]
2. That the Netherlands, by virtue of article 247 of the 1798 Constitution of the Batavian Republic, is the present legal successor to the VOC:' and it is as 'successor to the property and assets of the VOC' that the Netherlands transfers, 'all its right, title and interest in and to wrecked vessels of the VOC lying on or off the coast of the State of Western Australia' to Australia. The other party to the Agreement, Australia, must have been content with this position.

Australia, it must be noted, was not a sovereign state in 1798 and could not have made a counter-claim to the wrecks. This was where the Australian solution did not suit Sri Lanka or enable us to accept the gift of the *Avondster*, noting we had to agree that it was property of the Netherlands as successors to the VOC.

By the time the VOC arrived in Sri Lanka (around 1640), it had its own government and, in fact, the VOC arrived here at Sri Lanka's invitation. The VOC left Sri Lanka in 1796, a clear two years before the Constitution of the Batavian Republic (1798) from which the Netherlands' claim to VOC shipwrecks flow. The departure of the VOC in 1796 as a result of the impact of the Napoleonic wars had significant consequences. Four years later, in 1802, the Batavian Republic formally ceded Ceylon (now Sri Lanka) and all property, sovereignty, possessions and establishments to the British under the Treaty of Amiens.[10] Among the possessions were the wrecks in Sri Lanka's territorial water. In 1798, therefore, the VOC had no assets in this country it could effectively claim: not even the by-then 150-year old wreck of the *Avondster* could be considered an asset. I quote:

> 'Clause 3 – His Britannic Majesty restores to the French Republic and to her allies, viz., to His Catholic Majesty and Batavian Republic, all the possessions that formerly belonged to them, and that have been conquered and occupied by the British forces in the course of the present war, with the exception of the Island of Trinidad and the Dutch possessions on the Island of Ceylon.
>
> Clause 4 – His Catholic Majesty cedes and guarantees in full property and sovereignty to His Britannic Majesty the Island of Trinidad.
>
> Clause 5 – The Batavian Republic cedes and guarantees in full property and sovereignty to his Britannic Majesty all the possessions and establishments in the Island of Ceylon that before the war belonged to the Republic of the United Provinces and to their East India Company. Amiens, 4th day of Germinal (March 27th) 1802' Government Gazette of July 7th. 1802[11, 12].

The British departed Ceylon: in 1947,[13] Ceylon becoming a self-governing Democratic Socialist Republic of Sri Lanka in 1972. At this juncture, all British Crown property, possessions and establishments now became Ceylon's among them were the wrecks in territorial waters. Ceylon's claim to the *Avondster* thus stemmed from it having been a British possession. Reviewing all of this it appeared, to me, that Sri Lanka, unlike Australia, was in a position to lay claim to all wrecks in its seas.

Fig. 2 ICUCH meeting project participants at the Avondster site office, 2003. © Somasiri Devendra.

Fig. 3 ICUCH meeting at Nooit Gedacht in progress, Galle, 2003. © Somasiri Devendra.

Administrative and legal arrangements

At the meeting between the Heads of the Department of Archaeology and the Central Cultural Fund, at the latter's Office in 2002 with Dr Wijepala (DG/Archaeology), Dr Siran Deraniyagala (former DG/Archaeology), Mr Hettipathirana (ADG/CCF) and myself, the idea was floated that the Ministry of Foreign Affairs be consulted at an informal level. I suggested that we contact Dr Rohan Perera, then Legal Advisor to that Ministry (and, until recently, our Permanent Representative to the United Nations at New York), with whom I had met in relation to maritime archaeology law in the lead up to the UNESCO Convention. The suggestion being approved, I contacted Dr Perera while the meeting was still in progress and explained the problem to him. He immediately agreed to meet us and a very early date was agreed on.

The problem was discussed iterating the need for the Ministry to advise the Department and the CCF so that all government institutions would be united in their views. I informed Dr Perera, leaning heavily on the Antiquities Act, the Maritime Zones Law that the *Avondster* was in internal waters and not even in the territorial sea. I then expanded on the Netherlands claim to the shipwreck. Dr Perera agreed, stressing that the outcome should only depend on Sri Lankan law and not be concerned about any other law and guided by the Antiquities Act and that, should the matter go beyond that, it should be referred to him.

A short time later, with neither of the previously draft letters being written, the Netherlands authorities and the CCF entered into a formal Agreement for Sri Lanka and the Netherlands to undertake the study of the *Avondster* wreck site for a period of three years. The question of title was not raised nor referred to and the focus shifted to the heritage value of the wreck, concerning which there could be no dispute. The *Avondster* Project became the first maritime archaeology project to be conducted under the requirements of the Annex to the UNESCO Convention. It resulted in the design of an application form, to be submitted annually to the Director General, Archaeology by the Project proponents, which spelt out the obligations of each party.[14]

Problem resolved

How did our problem of title solve itself? The answer lay in a sequel to the meeting with the Legal Advisor, Ministry of Foreign Affairs, which was made known to those involved informally, only sometime later. It appeared that the Netherlands authorities had sought a meeting with legal adviser, later the same day, where they had broached the question. As a result of our timely action all the information had been put in the hands of Dr Perera at the correct time to present the case that the *Avondster* for the reasons stated above was already Sri Lankan.

The Avondster project

With the minefields of conflicting laws satisfactorily negotiated, the *Avondster* Project was undertaken in a spirit of co-operation and respect for the underwater cultural heritage, which belongs to humanity and not to any one nation.

The project was the first new one to be undertaken under the ideals of the UNESCO Convention. It was also Sri Lanka's first (and yet only) maritime archaeological excavation. As such it attracted world-wide interest and students from other countries participated in it as a part of their training (Fig. 2). In 2003 ICUCH itself met in Galle (Fig. 3) to view the progress of the Project and to critically evaluate it (Fig. 4).

The project provided immense experience to local fledging team of archaeologists, and much hands-on experience for the conservators at MAU's laboratory. Although the team had

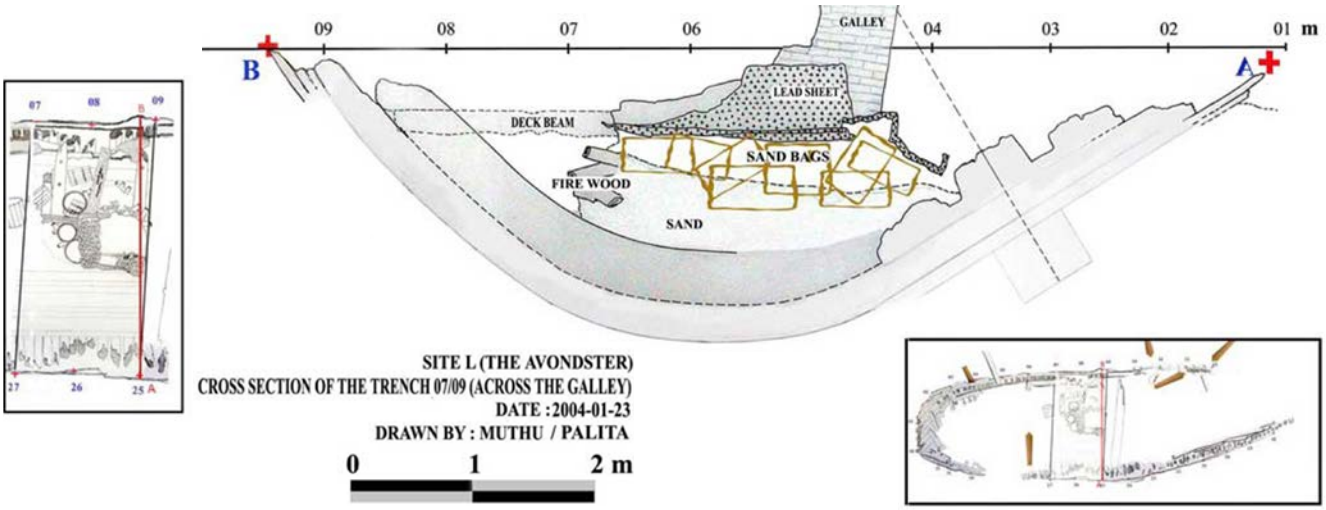

Fig. 4 A cross-section of the excavation of Avondster's galley area. © Somasiri Devendra.

worked with visiting maritime archaeologists as part of their induction to the discipline, this was their first experience of working under a systematic and research-oriented excavation. It was a steep learning curve and, with many obstacles to overcome, but they did emerge as the archaeologists of the future (Fig. 5).

Further challenges

The day after the *Avondster* Project was completed the tsunami on Boxing Day in 2003 devastated the premises of the MAU and the laboratory. Buildings were destroyed, shipping containers of chemicals were on top of trees, and 80% of the artefacts reclaimed by the sea (Fig. 6). All team members, however, were safe and the CCF and MAU sifted through the debris and started again: the legacy of the *Avondster* Project was not allowed to die. Today, the MAU and the laboratory are under their own management and their field of operations has expanded to cover the entire Sri Lankan coastline. Members have ventured abroad, worked at other sites, and are on the verge of undertaking investigations on a very significant site which they hope to work on in collaboration with foreign institutions. But, this time, under Sri Lankan management.

In objective and scientific terms, however, the project was a qualified success.[15] It did lead to an international conference being held in Galle, a General Meeting of the ICOMOS International Committee on the Underwater Cultural Heritage (ICUCH) followed by a UNESCO Asia-Pacific Meeting of experts on the Underwater Cultural Heritage on 9th April, 2007. The shortcomings in the management of the project were then identified and discussed and the Netherlands, too, had conducted an audit and suggested several improvements. Such shortcomings stemmed, largely, from the fact that Sri Lanka was venturing into maritime archaeology for the first time. Obsessed with the issue of 'Title', (though this question had not been brought up by Sri Lanka) we did not pay sufficient attention to the matters dealt with at length by the Australian Netherlands Committee on Old Dutch Shipwrecks ANCODS. Had Sri Lanka entered into a detailed agreement, we would have profited immensely in the long run. My own input had been specifically sought on the matter of 'Title' and, blinkered by this fact, I had failed to appreciate the broader implications of ANCODS.

It can now be said that, shortcomings notwithstanding, the *Avondster* Project was of great importance to Sri Lanka, and that laying to rest the legal conundrum was an important part of that experience. In and near Galle Bay, alone, the VOC ships *Hercules* (1661), *Molen* (1658), *Dolfijn* (1661), *Vlissingen* (1665–66), *Landsman* (1679), *Gienwens* (1776), and *Barbestijn* (1735) were wrecked. There is, thus, much potential for future collaboration between the Netherlands and Sri Lanka unhampered, now, by dubious questions of law.

Fig. 5 Our first woman archaeologist diver, checking her diving gear with an on-looking admirer. © Somasiri Devendra.

Fig. 6 The Maritime Archaeology Unit's (MAU) laboratory after the tsunami, 2004. © Somasiri Devendra.

1 Dutch East India Company, officially the United East India Company.

2 International Council on Monuments and Sites, a Paris-based international non-governmental organisation focused on the protection and preservation of cultural heritage.

3 The CCF is not the statutory authority in charge of archaeology and antiquities: this responsibility lies with the national Department of Archaeology, empowered under the Antiquities Act No.9 of 1940 (though it had functioned under another name since 1890) and subsequent amendments.

4 Art. 247 of the 1798 of the Constitution of the Batavian Republic.

5 The Dutch East India Company, as I remembered, had been in a bad way after the outbreak of the Napoleonic wars. The Stadtholder William V, had fled the country and, at home, the Batavian Republic had been established.

6 Legislative Enactments of Sri Lanka. Maritime Zones Law No. 22 of 1976. https://www.lawnet.gov.lk/1948/12/31/maritime-zones-2/; accessed 30th September 2020.

7 Convention for the Protection of Cultural Property in the Event of Armed Conflict with Regulations for the Execution of the Convention. The Hague, 14 May 1954. The General Conference of the United Nations Educational, Scientific and Cultural Organization, meeting at New Delhi, from 5 November to 5 December 1956, at its ninth session.

8 Historic Shipwrecks Act 1976 - Schedule 1 Agreement between the Netherlands and Australia concerning old Dutch shipwrecks. Federal Register of Legislation. https://www.legislation.gov.au/Details/C2012C00174*; accessed 30th September 2020*.

9 Section 3, Clause 2A.

10 The Treaty (also called the Peace) of Amiens was signed in that city by Britain, France, Spain and the Batavian Republic on March 27th 1802. It was called a 'Definitive Treaty of Peace' but lasted only for 14 months, yet it was the only period of peace during the Napoleonic Wars, 1803–1814. Some matters in dispute were not dealt with to achieve an agreement. France and Spain regained territories lost in war but Britain retained Ceylon [now Sri Lanka] and Trinidad.

11 'The Ceylon Manual (for the use of Officials). Historical, Statistical and Other Information concerning The Island of Ceylon and its Administration. For the Year 1910. By Herbert White (of the Ceylon Civil Service)'.

12 The Kings of Sri Lanka, the successors to Rajasingha II had no claim to any of it. After annexation, Ceylon (now Sri Lanka) was briefly administered by the British East India Company but, shortly afterwards, taken over as a Crown Colony in 1802. In 1815 the reigning King of Ceylon was defeated and exiled and the British Crown took possession of the whole of the island. For the next 150 years or so it remained one with degrees of self-government being meted out incrementally. Ceylon was a 'loyal' colony with a rapidly expanding educated middle class. After the World Wars it became questionable whether Ceylon was worth the cost to Britain and the British, too, departed these shores declaring, by the Ceylon Independence Act of 1947.

13 Ceylon Independence Act 1947 (Westminster).

14 I presented a paper on this experience ['Designing a licensing system for maritime archaeology: The Sri Lanka experience.'] at a UNESCO Convention on the Protection of the Underwater Cultural Heritage, for the Americas, in Kingston, Jamaica (2002).

15 For a most readable account of the Project see 'Maritime Lanka: maritime archaeology & history of Sri Lanka' https://maritimeasia.ws/maritimelanka/index.html; accessed 30th September 2020

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JAPAN'S APPROACH TO CHALLENGES AND SOLUTIONS: DEVELOPMENT OF A NEW ADMINISTRATIVE POLICY FOR UNDER-WATER CULTURAL HERITAGE

Jun Kimura, Japan

Introduction

In 2017, Japan implemented new policies regarding heritage management to facilitate the protection and management of underwater cultural heritage (UCH) at municipal and prefectural level. Japan has a comprehensive heritage management system for terrestrial sites, which developed as measures to prevent their destruction from a number of construction projects from the 1960s onward during the period of rapid economic growth (Habu and Okamura 2017). The system, however, did not function in safeguarding archaeological sites in water environments, and which faced similar circumstances in that underwater archaeological sites in Japanese waters could have been exposed to the various threats from human impact. To improve the situation, the Agency for Cultural Affairs (ACA) under the responsibility of the Ministry of Education established the Advisory Committee for the Protection of Underwater Archaeological Sites (National Committee) in 2013. In 2017, The ACA and National Committee issued the Guidelines for the Protection of the Underwater Archaeological Sites (Guidelines) to facilitate the better protection of UCH.[1] In the Guidelines, the ACA and the National Committee outlined principles for the protection of underwater archaeological sites and highlighted the importance of the protection of Japan's valuable underwater cultural resources, which evidence past human activities remaining in the rich water environments of the country. The Laws for the Protection of Cultural Properties applies to waters, and the Guidelines explained legal perspectives on UCH in relation to related laws. It outlines the effective methods for their protection and stipulates the roles of the national and the local governments regarding UCH management. The sections below show where the new Guidelines for UCH management are situated within the existing framework of the archaeological heritage management system.

Archaeological heritage management in Japan

The ACA has a division that specializes in the protection of archaeological sites and archaeological heritage. They are defined as 'buried cultural properties'. Heritage Management for the buried cultural properties is implemented by 47 prefectural governments' agencies and more than 1,700 municipal governments — districts, towns, and cities. The decision-making processes regarding archaeological administration are made not by the ACA but by prefectural governments. There is a legislative system that designates an archaeological site according to the Law for the Protection of Cultural Property.

A rescue survey and excavation are mandatory and must be implemented ahead of any construction project at the designated sites. While there are approximately 90 private consultant companies for archaeological work, most of the rescue excavations and surveys are directed by qualified civil servants at the Board of Education of the local municipalities or by archaeologists of the research units of municipal offices, such as the Buried Cultural Properties Research Centre located in each prefecture nationwide. As of 2018, there are 5,629 experts in archaeology that are employed by municipal and prefectural governments across Japan.[2]

An archaeological site is considered national common property and local governments are mainly responsible for their protection. Since the 1970s excavation surveys of archaeological sites that were to be lost due to development have been actively carried out nationwide, and now recuse excavations are carried out at around 8,000 sites a year with some 468,000 sites having been identified. The annual spending total for the rescue excavations conducted in 47 prefectures are approximately 60 billion Japanese Yen (554 million US dollars) in fiscal year 2017; however, almost all of the expenditure is used on sites on land.

Even though Japan has the sixth longest coastline in the world and its waters have been the scene of numerous historical maritime incidents, the municipal offices administering Japan's archaeological heritage have not shown a particularly strong interest in the protection of its underwater archaeological sites. In the case of underwater sites only 387 sites have been recognized, just 0.08% of the 468,000 identified terrestrial sites, and annually only one site is excavated. There has been a concern about the loss of sunken relics resulting from human disturbance including: the non-scientific recovery of archaeological artefacts located under water; the negative impact of fishing activities on submerged landscapes and

Keywords: Archaeological Heritage Management – Underwater Cultural Heritage – Underwater Archaeology – Japan – Agency for Cultural Affairs – Law for the Protection of Cultural Properties

wreck sites, and the destruction of underwater sites due to existing policies and guidelines that do not encourage heritage officers to protect sites when they are in areas of onshore and offshore development, such as harbour or bridge construction, are implemented and so impossible to determine whether an underwater archaeological site is present or not.

Existing studies of underwater cultural heritage

It is considered that due to the country's rich sea and inland–water environments there should be extensive evidence of human activities underwater, in effect a submerged cultural landscape, though it is not known exactly how many of these sites there may be. The first attempt to identify such a site in Japan even dates back to 1908 when prehistoric lithic stones were found at a lakebed in Lake Suwa (Fig. 1).

Fig. 1 Stone tools from the Sone Site (approximately 12000–9000 BP) located at the lakebed of the Lake Suwa, Nagano Prefecture inland Japan. © Board of Education, Suwa City.

Fig. 2 Artillery shells at the warship Kaiyomaru found during the rescue underwater excavation. © Board of Education, Esashi.

Due to the limited availability of information about the archaeological sites under water, the ACA has funded projects to survey the state of such sites through the 1980–90s. The first extensive survey was conducted in 1980 and studied the archaeological contexts of representative underwater sites in different environments. The sites which had already been surveyed and excavated below were highlighted to be reported: Awazu site at Lake Biwa (largest lake in Japan) in Shiga Prefecture that is composed of shell middens dating to the Middle Jomon, or around 4500 BP., and the Kaiyomaru (1868), a Dutch built steam ship, sunk during Japan's civil war period (Boshin War), and was excavated in 1976 in the waters offshore Esashi in Hokkaido, the northernmost prefecture (Fig. 2).

Between 1989 and 1991, the ACA had conducted surveys to obtain the statistical information of potential underwater sites that have been reported to municipal offices from all over Japan. The result shows that as of 1990, the 3,245 municipalities located 216 potential underwater sites (Hayashida et al. 2014). Based on this data, it has been determined that 109 sites were located at sea or coastal areas and 88 sites were found in inland waterways, such as lakes and streams (Kimura 2009). According to the result of the most recent questionnaire survey conducted in 2012, municipalities reported the existence of 387 underwater sites. The underwater sites are distributed widely from Hokkaido in the north to Iriomote Island in the southernmost prefecture. The importance of unique value of the sites beneath the waters became to be recognized in recent years in some prefectures tightly linked to maritime history (Ono et al. 2016).

The resultant data of the above survey, however, may not necessarily reflect the exact nature and proportion of underwater sites in Japan. For example, the number of reported sites, as a percentage, has less wreck sites compared to UCH sites in other countries at only 14%. The distinctive value of shared maritime heritage has hardly been addressed (Fig. 3) but the number of designated wreck sites is relatively low. The lack of the development of nautical archaeology as a scientific discipline is possibly one of the factors restricting the identification of wreck sites. Also, the date of a number of submerged wreck sites does not necessarily fit to a preservation scheme which would not prioritize archaeological heritage dating back to post-medieval periods onward. There are historically important shipwrecks dating from the 19th-20th centuries, and the archaeological recording of Second World War (WWII) wreck sites is conducted for academic purposes in extremely limited cases (Kan et al. 2018).

Fig. 3 Possible wreckage of the Dutch shipwreck Van Bosse (1857) sunk off the coast of Tarama island, Okinawa Prefecture, investigated during the joint project for the Shared Cultural Heritage of the Netherlands and Japan. © Martijn R. Manders.

Challenges to developing a policy and guideline for the effective management of underwater cultural heritage

The mission of the ACA and National Committee was to develop a new management framework for the more comprehensive protection of UCH. This movement occurred partly by witnessing the expansion of other countries' management of their UCH. The lack of effective and appropriate management of UCH has been recognized, and the state may cause the loss of cultural resources from threats that include increased development, industrial extraction, diving and fishery activities, and sea-level rise and erosion. The impact of these activities and environmental changes on UCH have not been fully assessed yet; for example, while there are a few reports by fisheries cooperatives about the finding of ceramics during the net fishing (Fig. 4).

The discovery of the 13th century Mongol Empire fleet wreck site offshore from Takashima Island, in Nagasaki Prefecture, initiated the change to the country's attitudes to UCH (Kimura 2006; Ikeda et al. 2019). Immediately after the discovery, the area concerned was registered as the first nationally designated underwater 'Historic Site'. The municipal city of Matsuura is primarily a custodian and is responsible for the site management in cooperation with Nagasaki Prefecture with the aim of supporting the municipal and prefectural governments, as well as facilitating the broader protection for UCH. The ACA established the National Committee in March 2013, directed by 12 experts in the fields of archaeological heritage management for burial cultural properties, Asian studies, archaeology, maritime archaeology, conservation, and oceanography.

The management framework for UCH must be consistent with the existing management system for terrestrial archaeological sites. Municipal governments are responsible for the system that is composed of:

- Site identification in which the existence of an archaeological site must be registered to a local government inventory and database administrated by the municipal office.
- Initiation of actions that reduce the damage from planned development work to the designated areas, including the implementation of a rescue excavation at the site to record archaeological information.
- Preservation measures that are taken into consideration due to the impact that a development project could have on the site and its contents.
- Public access, use of the excavated artefacts and *in situ* preservation.

As with terrestrial sites, UCH is subject to protection in accordance with the Laws for the Protection of Cultural Properties. The scope of the legislative protection extends to areas of inland waters as well as the areas of sea floor within Japan's territorial waters. The basic principles for the protection of these areas are the same as those for land sites and the jurisdiction applies to municipal and prefectural level. In reality, however, most municipal governments do not have the capacity to adapt the terrestrial management to underwater cultural heritage management. Moreover, the jurisdiction of terrestrial waters is unclear as there are no maritime administrative districts, so that coordination is required among the relevant local governments.

Fig. 4 Ming Dynasty celadon bowls recovered by fishermen from the seabed of the Bay of Osaka before the designation of the site. © Jun Kimura.

The potential issues and difficulties for municipal officers implementing relevant management of UCH has been addressed, including:

- Applicable laws and regulations for underwater archaeological surveys other than those stipulated in the Law for the Protection of Cultural Properties apply.
- Safety measures for the implementation of archaeological operations in and above waters due to the additional technical difficulties and risks not encountered at land sites.
- Increased budget for underwater archaeological work as well as the conservation of waterlogged artefacts that are more complex and time consuming than artefacts found on a land site.
- The limited human resources and the requirement for diving qualifications required for underwater surveys and excavations.
- That ownership and administration issues must be determined in the case of a sunken vessel registered to a foreign country.

Guidelines for underwater cultural heritage management

The associated guidelines were issued to enhance the existing framework of Japan's archaeological heritage management. The concept of UCH is not legally determined under the Law for Cultural Properties as it only defines archaeological remains as 'buried cultural properties'. The guidelines, however, state that the jurisdiction for the safeguarding of the buried cultural properties under the Law extends to Japan's terrestrial waters in which sites are defined as an 'underwater archaeological site'. Such a site is considered to be consistently beneath water or underwater at high tide or is located in inland water environments such as lakes and rivers. The distinctive site formation processes of the underwater archaeological sites are acknowledged relating to the wrecking event of ships, the deliberate/accidental loss of cargo and goods, cargo and the submersion of landscape due to natural and human forces.

The guidelines highlight the archaeological value of sunken watercraft which has not been extensively addressed before. The National Committee had proposed a survey to be conducted to clarify the potential remains of unidentified shipwrecks and associated cargo in Japans terrestrial waters. The result of research, in cooperation with all 47 prefectures, shows that there are at least 5,598 records regarding abandoned or sunken ships between the 11th and 19th centuries. The Guidelines have pointed out that the loss of the ships often includes episodes involving stories of lives being lost or saved and have been handed down as local oral history thereby adding to the historical value of these sites. The other recorded shipwrecks relate to overseas trade and diplomatic exchange with neighbouring Asian and European countries. Artefacts found underwater tend to be well-preserved and found in large numbers due to them being part of the ships' cargo for trade.

The guidelines explicitly explain a structure for the bodies responsible for the management framework of underwater archaeological sites according to the existing system of archaeological heritage management and recommends:

- At municipality level a local heritage agency under the Board of Education is responsible for the identification of a site and the registry of designated areas and is obligated to share such information with stakeholders including other government agencies, local fisheries officials, and port development representatives. Municipal officers should undertake rescue excavations and initiate all necessary actions to prevent the disturbance and destruction of sites from development and fishing activities.
- Prefectures are a legal authority in the heritage management system and a prefectural heritage agency is a commissioning entity and an advisory body for municipalities. They approve the designation of the underwater archaeological sites by municipal offices and provide them with relevant advice for a long term of site protection and management.
- National government will need to enhance the capacity to facilitate administrative, financial, and technical support to municipal and prefectural governments. The national government should assign specialist staff who will be in charge of the protection of underwater archaeological sites, and should establish organizations/departments within relevant national governments to be pursue relevant methodologies for the survey, preservation and collaboration with foreign countries.

Summary

Over the last few decades there has been an increasing interest in the existence of archaeological assets in Japanese waters. The heritage management system for the buried cultural properties has successfully identified a vast number of archaeological sites on land for protection, but it did not necessarily lead to the identification of sites located in the sea and inland-water environments. The survey led by the ACA during the 1980–90s clarified the state of well-preserved sites ranging from the prehistoric to the pre-modern periods. While the result from a series of surveys in cooperation with municipal offices shows there are a limited number of underwater sites compared to the designated land sites, there would probably be more unidentified sites, illustrating the people's interaction with the rich water environment over history.

The Japanese government, however, has never developed a national policy or a systematic approach for the safeguarding of underwater archaeological sites. Whereas it has been interpreted that the Law for Cultural Properties can give inclusive protection for those buried cultural properties under water, the lack of implementation by government has placed vulnerable underwater archaeological objects under threat from human activities. To improve this situation, the ACA and National Committee has worked together since 2013 and have issued the Guidelines for the Protection of the Underwater Archaeological Sites. These guidelines are for municipalities and prefectures to facilitate the protection of underwater archaeological sites within the framework of the existing archaeological heritage management system. The national government needs to promote further the idea of safeguarding of underwater archaeological sites in cooperation with regional heritage agencies.

Acknowledgements

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1 The electronic copy of the Guidelines for the Protection of the Underwater Archaeological Sites is available for online access [in Japanese]: http://www.bunka.go.jp/seisaku/bunkazai/shokai/maizo.html; accessed 30th September 2020.

2 Statistical data related to archaeological heritage management available in a published report available for online access [in Japanese]: http://www.bunka.go.jp/seisaku/bunkazai/shokai/pdf/r1392246_13.pdf/; accessed 30th September 2020.

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LEGAL TOOLS FOR THE PROTECTION OF UNDERWATER CULTURAL HERITAGE IN THE UNITED STATES OF AMERICA

James K. Reap, United States of America

Introduction

While the United States of America (U.S.) is not a party to the 1982 United Nations Convention on the Law of the Sea (UNCLOS), it actively participated as an observer delegation during the development of the 2001 UNESCO Convention on the Protection of the Underwater Cultural Heritage (2001 UNESCO Convention). In fact, the U.S. had one of the largest delegations representing a variety of interests, the most controversial being those of the salvage industry. The U.S. delegation expressed support for the preservation principles included in the Convention. However, as with the UNCLOS, the United States did not become a signatory. Nevertheless, the delegation indicated support for underwater cultural heritage (UCH), its protection and management consistent with customary international law.

The U.S. cited two primary reasons for refraining from signing the 2001 UNESCO Convention. First, the U.S. disapproved of the 'creeping coastal state jurisdiction' over the UCH on the Outer Continental Shelf (OCS) and Exclusive Economic Zone (EEZ), seeing the possibility of creating new rights for coastal states over foreign nationals and vessels. Second, the U.S. objected to the provision allowing a coastal state to impose protective measures, including recovery, in situations of 'immediate danger' to UCH without the formal consent of the flag state as inconsistent with the current legal regime in the U.S. (Varmer *et al* 2010).[1]

Fig. 1 Blakely cannon from the CSS Alabama on display in the main hall of the Cité de la Mer in Cherbourg, France. © Keralab.

US cooperation

Although the U.S. is not a formal party to the 2001 UNESCO Convention, it has shown that it seeks to follow the fundamental spirit of the Convention. One example of this is The Agreement Concerning the Shipwrecked Vessel RMS *Titanic* which the U.S. negotiated with the United Kingdom, France, and Canada and signed in 2003. The agreement, which required ratification by two of the four states parties to enter into force, languished until November, 2019 when the United States deposited its acceptance with the United Kingdom. While the United Kingdom had ratified soon after the treaty was negotiated, France and Canada have yet to do so.[2] This

Keywords: United States of America – Environmental laws – Marine sanctuaries – Archaeological resource laws – Abandoned shipwrecks – Sunken military craft

agreement provided for the preservation and management of the RMS *Titanic* which currently lies on the Canadian continental shelf. It designates the wreck as a historical wreck of international importance and establishes it as a memorial to the lives lost from the tragedy. The agreement also obligates the parties to take 'all reasonable measures' to protect recovered artefacts and regulate access to the wreck.[3]

The U.S. has also entered into agreements with France to manage and protect the sunken warships CSS *Alabama* (Fig. 1) and *La Belle*, and with Japan on the *Kohyoteki* midget submarines (Fig. 2).[4] These agreements recognized the ownership and sovereign immunity of the respective sunken warships and, more generally, that coastal states hold jurisdiction and authority over foreign sunken warships located within their territorial seas.

US Laws and policies

In addition to the aforementioned international agreements, the U.S. has adopted a number of laws and formal policies that are consistent with the 2001 UNESCO Convention. Specifically, these laws, in order of importance and impact on policy, include:

Antiquities Act of 1906.
Archaeological Resources Protection Act of 1979.
National Marine Sanctuaries Act of 1972.
Abandoned Shipwrecks Act of 1987.
Sunken Military Craft Act of 2004.
National Historic Preservation Act of 1966.
National Environmental Policy Act of 1969.

Below is a brief explanation of each of these laws and how they mesh with the policies promoted by the 2001 Convention.

Antiquities Act of 1906

The Antiquities Act, passed by the United States Congress and signed into law by President Theodore Roosevelt in 1906, gives the President authority to proclaim national monuments on lands owned or controlled by the United States and to protect 'historic landmarks, historic and prehistoric structures, and other objects of historic or scientific interest.'[5] While most monuments are on land, there are several marine national monuments managed by the National Oceanographic and Atmospheric Administration (NOAA).[6] The most notable marine national monuments include the Marianas Trench, Papahānaumokuākea, and Northeast Canyons Seamounts. Beyond designation, research and recovery of antiquities on such lands requires permits. The Antiquities Act, has been used to protect cultural property in a marine environment managed by the U.S. National Park Service, the Canaveral National Seashore.[7] Yet, while designating marine national monuments to protect natural and cultural heritage within the EEZ/OCS is clearly within the U.S. government's authority, it is unclear whether and to what extent the U.S. will use its authority to enforce the permit process on lands outside designated Marine National Monuments.

Archaeological Resources Protection Act of 1979

The Archaeological Resources Protection Act of 1979 was enacted

> '...to secure, for the present and future benefit of the American people, the protection of archaeological resources and sites which are on public lands and Indian lands, and to foster increased cooperation and exchange of information between governmental authorities, the professional archaeological community, and private individuals (Sec. 2(4)(b)).'

Fig. 2 KN-2589 Japanese Type A Midget Submarine, photographed soon after its recovery near the entrance to Pearl Harbour, Hawaii, circa late July 1960. It had participated in the attack on Pearl Harbour on 7 December 1941, but had apparently been unable to enter the harbour as its torpedoes had not been fired. © Official U.S. Navy Photograph Catalogue.

OCS is not included in the definition of 'public lands.' The U.S. has notified other nations that it will enforce national law against foreign-flagged vessels and nationals within the 12-mile territorial sea, 24-mile contiguous zone, and 200-mile EEZ in a manner consistent with customary international law. However, this statute does not protect cultural resources in those zones from either foreign or U.S. nationals and flagged vessels. Consequently, while this statue establishes the U.S.'s authority to protect UCH, it has not resulted in concrete steps towards enforcement of such policies. Nonetheless, ARPA may be a tool to prevent trafficking in underwater cul-

tural property. Section 6(c) prohibits interstate or international sale, purchase, or transport of any archaeological resource excavated or removed in violation of a state or local law, ordinance, or regulation.[8]

National Marine Sanctuaries Act of 1972

In 1972, President Richard Nixon signed the National Marine Sanctuaries Act (NMSA), authorizing the designation and protection of areas in the marine environment. The laws specifically called for protection of areas possessing significant 'conservation, recreational, ecological, historical, scientific, educational, cultural, archaeological, or aesthetic qualities.' The law grants the U.S. authority to protect natural and cultural resources on the OCS and within the 200-mile EEZ. Authority is delegated to the National Oceanographic and Atmospheric Administration (NOAA) to regulate activities, issue permits, assess civil penalties, and conduct enforcement to protect resources. The NMSA prohibits removing or injuring historic resources within the sanctuary, and any alteration of the seabed (Fig. 3). The NMSA may be enforced against US-flagged vessels and nationals or against foreign-flagged vessels and nationals with their consent. However, in the case of seabed alteration, the law may be enforced against foreign vessels and nationals without their consent. The NMSA appears to be entirely consistent with customary international law as incorporated in the UNCLOS (Varmer 2014).[9]

Abandoned Shipwreck Act of 1987

The Abandoned Shipwreck Act of 1987 (ASA) law grew out of legal uncertainty and the severe damage caused by treasure hunters to wrecks in the Great Lakes and other coastal areas during the 1970s. It asserts title to 'abandoned shipwrecks' embedded in a state's submerged lands, or in coralline formations protected by a state on its submerged lands, and abandoned shipwrecks located on a state's submerged lands and included in or determined eligible for inclusion in the National Register of Historic Places. The Act transfers title and control of the shipwrecks to the states on which land it rests.[10] In general, abandonment is established after a considerable period where the owner has not attempted to salvage the property or claim it under salvage law, or through other evidence. One example where abandonment was established was in the case of the 'Dunkirk Schooner.' The court in *Northeast Research v. One Shipwrecked Vessel* found the wreck to be abandoned and title passed automatically to the State of New York under the ASA.[11]

Sunken Military Craft Act (SMCA) of 2004

This statute was the product of a series of court cases[12] that eventually led President William Clinton to adopt the Statement on the United States Policy for the Protection of Sunken Warships in January 2001.[13] Not long thereafter, Congress passed the Sunken Military Craft Act of 2004. SMCA protects sunken U.S. military craft in U.S. waters, the high seas, and marine zones controlled by foreign nations. SMCA also provides authority for the protection of foreign military craft lying within U.S. waters. In addition to protecting these military resources, SMCA also protects associated contents including archaeological and historical resources and, often, war graves. The Naval History and Heritage Command (NHHC) manages the wrecks of more than 17,000 ships and aircraft across the globe. The Department of the Navy has established a permitting programme for 'controlled site disturbance' of military craft for archaeological, historical, or educational purposes.[14]

National Historic Preservation Act of 1966

Section 106 of the National Historic Preservation Act of 1966 (NHPA) requires federal agencies to conduct a review process to 'take into account' the effects of any proposed federally funded or licensed projects ('undertaking') impacting any historic property included in or eligible for listing in the National Register of Historic Places (National Register).[15] The U.S. National Park Service, which administers the National Register programme, has published a bulletin dedicated to the nomination of historic vessels and shipwrecks both floating and submerged.[16] As part of its required procedural review, NHPA regulations provide for inventorying a project area, determining if properties eligible for the National Register will be affected and whether an adverse effect is expected. A consultation process with appropriate parties seeks to mitigate or avoid any adverse effects. Unfortunately, the Act is procedural rather than substantive in nature and cannot prevent an undertaking or require mitigation.

National Environmental Policy Act of 1969

The Environmental Policy Act of 1969 (NEPA)[17] seeks to ensure that all branches of government give prior consideration to the effects of a 'major federal action significantly affecting the quality of the human environment,' including UCH. Environmental assessments (EA) and environmental impact statements (EIS) are the tools used to assess the likely impacts from the proposed actions and their possible alternatives. Agencies are to take a 'hard look' at the potential long and short-term impact of their actions on the environment (including historical and archaeological resources) as they conduct activities under the authorizing legislation.

Summary

Although the United States has not ratified either the Law of the Sea Convention or the Convention on the Protection of the Underwater Cultural Heritage, a number of federal laws

Fig. 3 The shipwreck of the wooden schooner E. B. Allen at Thunder Bay Marine Sanctuary. This ship was built in 1864 and wrecked November 20, 1871. © NOAA/NOS/Thunder Bay National Marine Sanctuary.

have recognized the importance of cultural property, including UCH. The protection of UCH under these laws varies greatly. Some laws like the NHPA and NEPA are purely procedural but, in the best of circumstances can result in the avoidance of UCH or mitigation of the effects of federal projects. Others like the Archaeological Resources Protection Act and the Antiquities Act potentially provide substantive protections, but have not been utilized to their full potential. Other laws could have substantive and far-reaching implications. The Abandoned Shipwreck Act protects UCH in the submerged lands of the states and the National Marine Sanctuaries Act protects any UCH located in National Marine Sanctuaries. The Sunken Military Craft Act protects U.S. military craft wherever they are located as well as foreign sunken craft in U.S. waters. These laws provide substantive protections, but such protections tend to be narrow in scope or jurisdiction. Yet, taken as a whole, and with some amendments, these tools could serve to establish a comprehensive UCH preservation framework for the U.S. that supports the goals of 2001 UNESCO Convention.

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2 U.S. State Department media note, December 19, 2019, https://www.state.gov/united-states-accepts-agreement-protecting-titanic-wreck-site/; accessed 30th September 2020.

3 Agreement Concerning the Shipwrecked Vessel RMS Titanic, National Oceanic and Atmospheric Administration, Article 3.

4 La Belle Agreement between France and the U.S., March 31, 2003; CSS Alabama Agreement between France and the U.S., March 8, 1995; Agreement between United States and Japan (12th February 2004).

5 54 U.S.C. § 320301

6 National Marine Sanctuaries, NOAA. https://sanctuaries.noaa.gov/; accessed 30th September 2020.

7 Lathrop v. Unidentified, Wrecked, and Abandoned Sailing Vessel, 817 F. Supp. 953 (M.D. Fla. 1993).

8 16 U.S.C. §§ 470aa-470mm

9 Varmer, Ole. Closing the Gaps in the Law Protecting Underwater Cultural Heritage on the Outer Continental Shelf. Stanford Environmental Law Journal 33, no. 2 (May 2014): 251–87.

10 43 U.S.C. §§ 2101-2106

11 Ne. Research, LLC v. One Shipwrecked Vessel, 729 F.3d 197 (2d Cir. 2013).

12 Hatteras, Inc. v. The USS Hatteras, 698 F.2d 1215 (5th Cir. 1983); United States v. Steinmetz, 973 F.2d 212 (3d Cir. 1992); Sea Hunt v. Unidentified Shipwrecked Vessel, 221 F.3d 634 (4th Cir. 2000); Int'l Aircraft Recovery, L.L.C. v. Unidentified, Wrecked & Abandoned Aircraft, 218 F.3d 1255 (11th Cir. 2000).

13 37 WCPD 195 (Monday, 22nd January 2001).

14 Naval History and Heritage Command, Sunken Military Craft Act. https://www.history.navy.mil/research/underwater-archaeology/policy-and-resource-management/sunken-military-craft-act.html; accessed 30th September 2020.

15 16 U.S.C. § 470 et seq.

16 James P. Delgado & A National Park Service Maritime Task Force, National Register Bulletin 20: Nominating Historic Vessels and Shipwrecks to the National Register of Historic Places, U.S. Department of the Interior, National Park Service, 1992.

17 42 U.S.C. § 4321 et seq.

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UNDERWATER CULTURAL HERITAGE IN BELGIUM: RECENT DEVELOPMENTS 2012–2019

Marnix Pieters and Christophe Delaere, Belgium

Introduction

The ratification of the UNESCO Convention on the Protection of the Underwater Cultural Heritage (2001 UNESCO Convention) by Belgium in August 2013 was a key moment in Belgium. It emancipated what had been, until that moment, largely undervalued heritage. The ratification of the Convention allowed a legal framework to be put in place that stimulated scientific research and awareness-raising activities, related to underwater heritage known to be present in the North Sea.

The Belgian part of the North Sea and its intertidal zones

Less than a year after the ratification, in June 2014 a completely new underwater cultural heritage law came into force. The territorial scope of this new law covered the Belgian part of the North Sea — Territorial Sea and Exclusive Economic Zone/Continental Shelf — and as such allowed, for the first time, underwater archaeological sites to be protected *in situ*. At the end of 2019, 11 archaeological sites were protected including the recently identified First World War (WW1) U-boat (UB-29). This law also established a procedure for reporting underwater cultural heritage (UCH) found incidentally in the North Sea. In 2018, two UCH sites received international attention: the identification of an unknown German WW1 U-boat and the discovery of the crash site of a B-17 'Flying Fortress'. The newly identified German U-boat was the focus of an 'Underwater Cultural Heritage Forum' organized in Berlin on the 4th December 2018, collaboratively by Flanders and Germany in the context of the 'European Year of Cultural Heritage'.

In 2013, the year of the ratification, a multiannual (2013–2016) research project focused on UCH in Belgium ('SeArch', Missiaen et al. 2017) was funded by 'Flanders Innovation and Entrepreneurship (VLAIO)', a Flemish research funding body. The project developed a site assessment methodology and a sustainable management policy for the archaeological heritage of the North Sea in Belgium. It offered sea-users clear instructions on how to deal with incidentally found UCH via tailormade protocols for each activity or activity zone (sea, intertidal zone, terrestrial aggregate sites). In parallel with this project two PhD research projects were also initiated, one focused on the geology of the North Sea (De Clercq 2018) and the other on legal aspects related to UCH (Derudder 2018). The doctoral study by De Clercq received an interesting follow-up through investigations in the summer of 2017 of an area with exceptionally high concentrations of Late Pleistocene and Palaeogene bone finds in the lowest parts of the 'Scheur'. The 'Scheur' is the name of a shipping lane a few miles off the Belgian coast and situated at a similar latitude with the port of Zeebrugge. These finds promise to offer new insights on potentially well-preserved underwater paleo-landscapes present in the Belgian Territorial Sea.

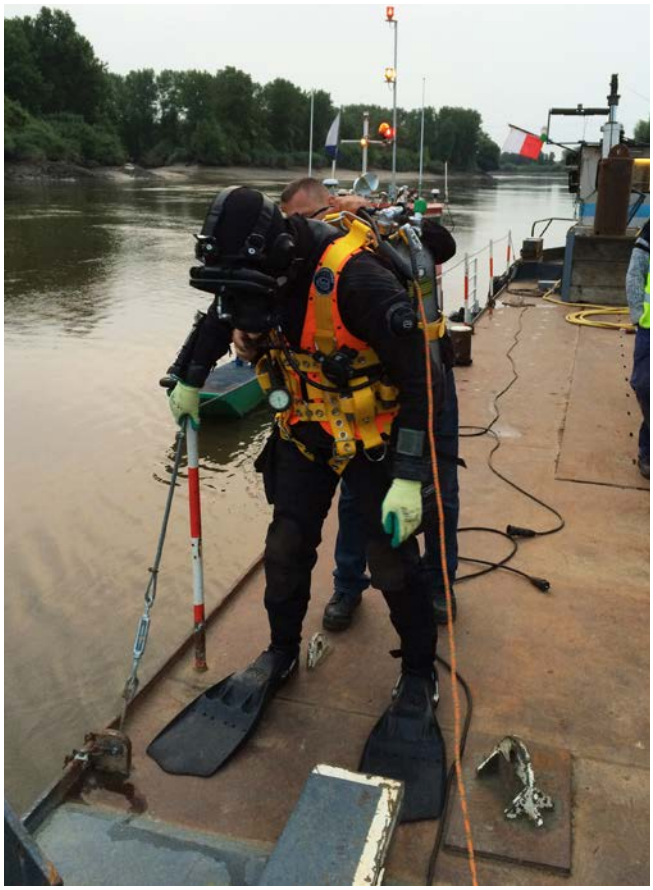

Fig. 1 Sven Van Haelst ready to explore an unknown shipwreck in the River Scheldt with zero visibility. © M. Pieters.

The first experiences with the practical application of the 2014 UCH law in the period 2014–2018, the results of the SeArch and the PhD research by T. Derudder (2018) revealed that some improvements to the law were highly desirable.

Keywords: Belgium – North Sea – Inland Waters – Scheldt – Lesse – Sambre

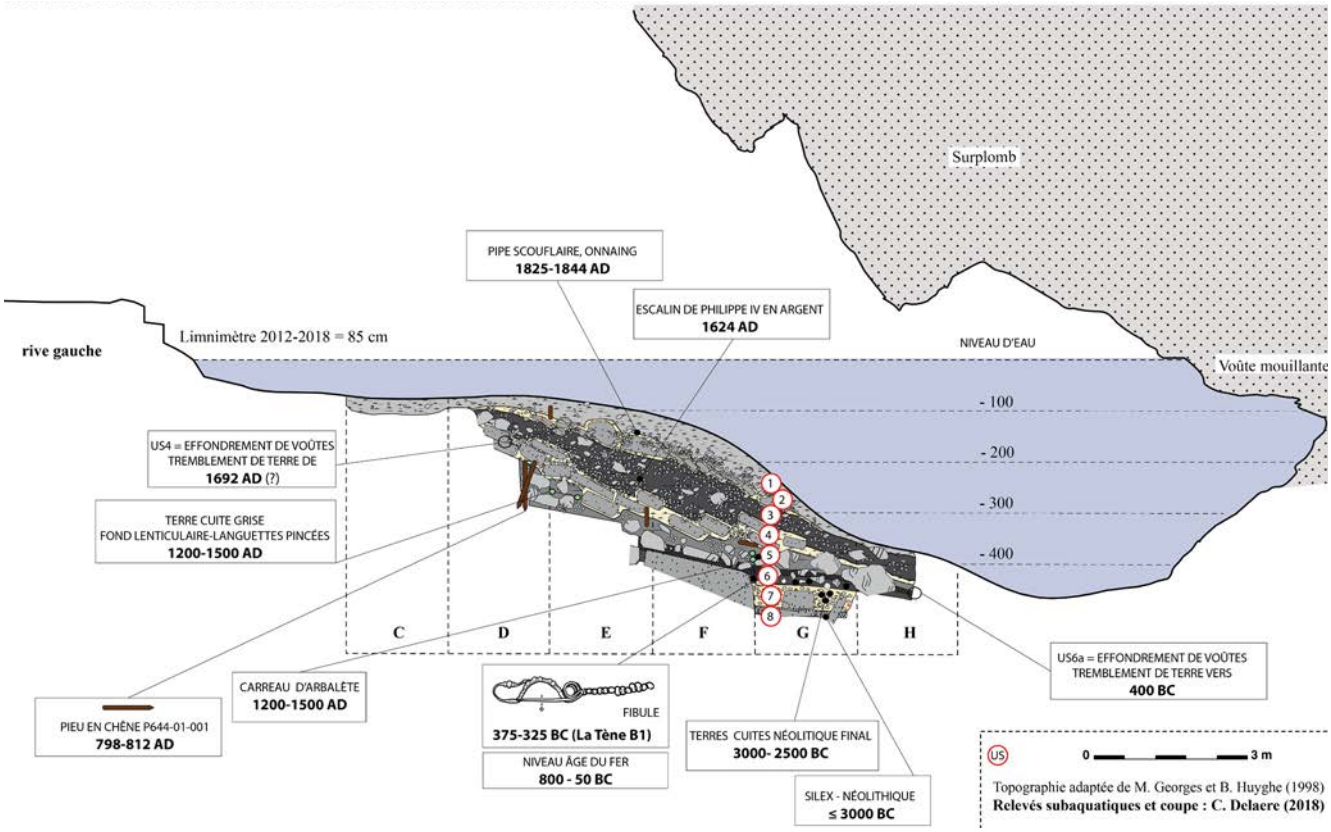

Fig. 2 Stratigraphic section of the 2012–2018 excavations in the River Lesse at Han's cave. © C. Delaere.

The federal government took the initiative in 2018 to start the preparations for amending the UCH law or even for replacing it with a new law, mainly in order to realize these improvements, but at the same time also to optimize the implementation of the ratification of the 2001 UNESCO Convention.
Seen from the heritage perspective the legal and research situation related to UCH in the Belgian part of the North Sea including the intertidal zone, that legally does not belong to the territorial sea, is clearly evolving in the right direction. The challenge is actually to achieve the same positive evolution in relation to the inland waters, mainly rivers, in the three Belgian regions of Flanders, Brussels, and Wallonia. Similarly, in rivers there are a lot of threatening activities that impact UCH, such as construction works, tunnels, and dredging activities.

Inland waters

In an inland water context, it seems to be more difficult at times to apply the protective measures prescribed by the 2001 UNESCO Convention, mainly through a lack of awareness, but also practically speaking.
In the slipstream of the SeArch-project a test case was carried out in 2016 in the River Scheldt (Van Haelst et al. 2019), whose waters have no visibility at all, and with a strong current (Fig. 1). In the southern part of Belgium, a further test case was carried out in 2017 in the River Sambre and excavations are organized in the River Lesse since 2012.

This was a re-initiation of the Han-sur-Lesse cave project located on the River Lesse, a known underwater archaeological site studied since 1963 (Jasinski 1965) (see below).

In Belgium, archaeological heritage is mainly the responsibility of the regions (Flanders, Brussels, Wallonia). In 1999 and 2000, the Walloon Department of Heritage took a major part in the UNESCO talks that finally led to the Convention on the Protection of the Underwater Cultural Heritage adopted in 2001. While the first drafts were mostly aimed at heritage lost at sea, inland water heritage was also taken into account, largely thanks to the efforts of the Walloon members of the Belgian delegation.

Meanwhile, river archaeology techniques had been gradually developing in Wallonia since the early sixties. From 2012 the *Centre de Recherches Archéologiques Fluviales* (CRAF) implemented a new programme of planned excavations in Han-sur-Lesse to evaluate the formation and disturbances of the archaeological deposits of the River Lesse as a 'test project'. On this historic site, the aim was to document, through new interventions, the results obtained by divers in the past. Indeed, since the first underwater excavations carried out in 1963 in the cave, thousands of artefacts dating from the Late Neolithic to modern times have been collected from the underground River Lesse.

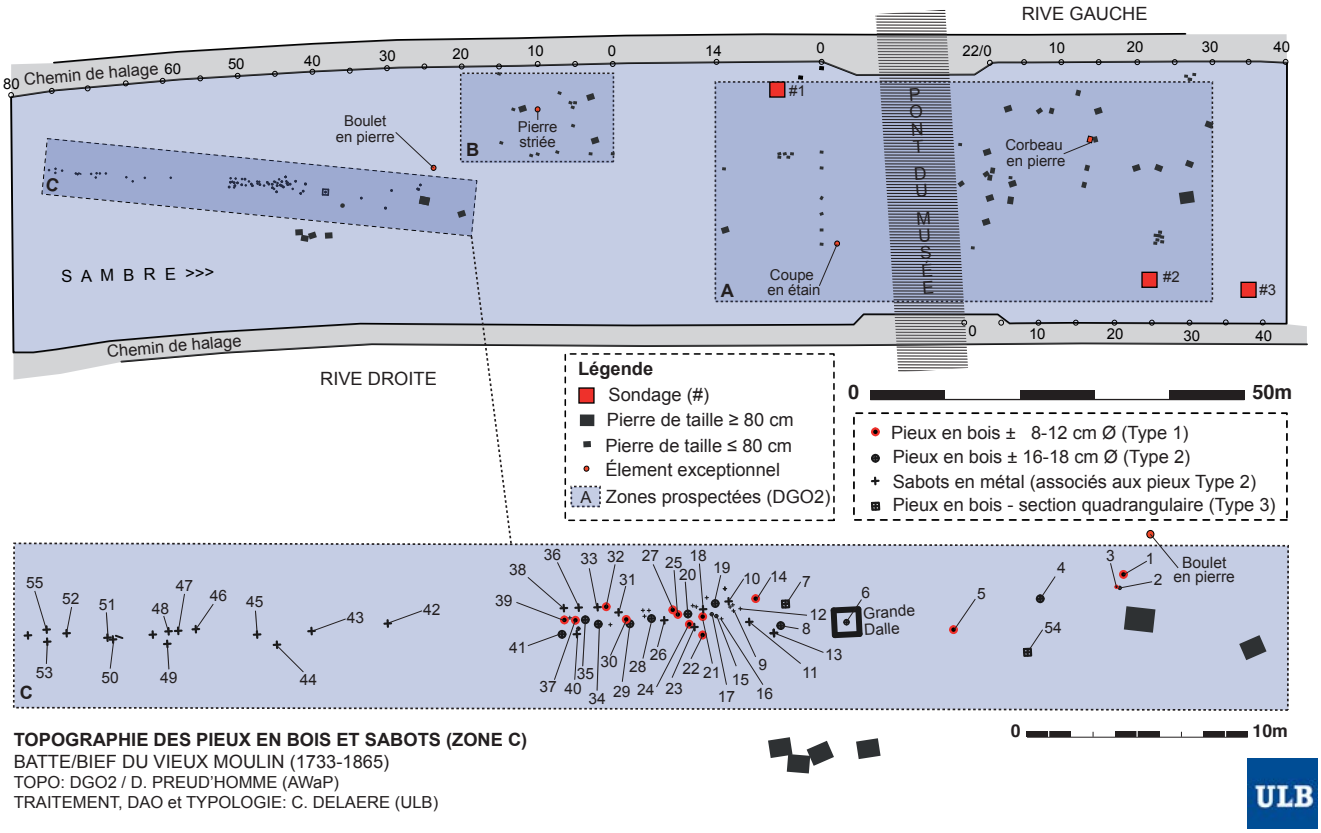

Fig. 3 Topographical plan of the 2017 excavations in the River Sambre at Namur. © C. Delaere.

Since 2012, part of the riverbed has been systematically excavated to study its sedimentary accumulation (Ansieau et al. 2013; 2015, Delaere et al. 2016, 2018; Delaere and Warmenbol 2019).

Between 2012 and 2018, diving archaeologists documented a particularly well-preserved archaeological deposit and identified different and distinct archaeological strata ranging from the 3rd millennium BC to the 21st century AD, which is an exceptional case study (Fig. 2). Underwater operations aggregated 1,020 hours of diving, the excavation of an 84 m² area and the recording of more than 10,482 fragments of artefacts[1] and ecofacts.[2] In 2017, undisturbed deposits from the Bronze and Iron Age were identified in the lowest levels of the excavation trench. These layers have literally been sealed, and fairly well protected, by the collapse of cave ceilings linked to ancient earthquakes. For the first time protohistoric artefacts have been discovered in a stratified context in the River Lesse.

We can now document, thanks to a 4-metre high stratigraphic section, 5,000 years of almost uninterrupted occupation, human activities, and also identify changes in the karst landscape, whether they are of anthropogenic origin — for example shoreline development — or natural occurrences such as earthquakes. The sedimentary accumulation of the riverbed, slopes, and banks has therefore recorded all the cultural and natural transformations of Han's Cave, and has provided a better general understanding of the formation of riverine archaeological sites in the area.

In 2017, another operation was conducted as a test project for preventive archaeology in a navigable river context. A group of archaeologist-divers from the *Université Libre de Bruxelles* (ULB), in collaboration with the CRAF and various departments of the *Service Public de Wallonie* – SPW (DGO2, DGO4/AWaP), carried out a night operation in the waters of the River Sambre at the confluence of the Grognon site in Namur (Delaere et al. in prep.). The team carried out an archaeological diagnosis of the river, both horizontally, artefacts horizontal contextualization / topography, and vertically — artefacts vertical contextualization / stratigraphy (Fig. 3).[3] More than 4,600 artefacts and ecofacts, ranging from Roman times to the 21st century, were recorded in three 4 m² test pits. In addition, the foundations of the Vieux Moulin (1733–1865), 55 wooden piles which are still preserved *in situ* in the river, have been located and surveyed upstream of the 'Museum bridge'. This first preventive underwater evaluation operation in the River Sambre involved 78 hours of diving, the excavation of a 12 m² area and a further 3,110 m² area was surveyed. Analysing the state of preservation of the archaeological levels of the river, the main objective of this test, confirmed that the river has been disturbed by dredging since 1859; channel-

ling from around 1825 to 1830 and between 1950 and 1953. However, the presence of many artefacts and of the foundations of the mill on the bottom of the River Sambre show that there are still partially or completely preserved areas that deserve further study, or at least protected as underwater archaeological sites.

Recently, the new *Code Wallon du Patrimoine* (CoPat), published 22 May 2018, introduced for the first time the notion of material heritage located in underwater areas in its sphere of definition. In 2019, the CoPat will replace the *Code Wallon de l'Aménagement du Territoire, de l'Urbanisme et du Patrimoine* (CWATUP), and gives a positive, albeit discreet, signal on the need to include immersed areas in historic areas that would currently benefit from preventive archaeological action in the event of redevelopment.

These test cases in inland water contexts provided useful experience and information, and will form a good starting point to further develop an assessment methodology and a sustainable management policy for inland waters in Belgium.

1 Examples of artefacts found in Han-sur-Lesse: ceramics, weapons, pearls, coins, leather soles, bronze and iron objects, glass fragments, etc. dating from the Late Neolithic to modern times.

2 Ecofacts: natural objects used by humans without modification.

3 For the excavation strategy see Delaere 2017.

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UNDERWATER CULTURAL HERITAGE IN INDIA

Alok Tripathi, India

Introduction

The Republic of India (Bharat), the seventh largest country in the world, by area, is prominently positioned in the Indian Ocean. Protruding deep into the Ocean, it played a very active role in trade and contacts in both, eastern and the western seas for the last several millennia. With a coastline of more than 7,500 km and over 5,000-year-old known maritime history, she is appropriately called the 'Mistress of the Eastern Sea'. About 2.1 million sq. km of water surrounds the vast peninsula with 1,197 islands, and is one of the richest repositories for underwater cultural heritage. Besides the above, internal waters comprise rivers, lake beds, swamps, tanks, and reservoirs, which have been used throughout the ages, and which are places to look for important submerged heritage. This brief article touches upon some of the relevant issues in the field such as the development of underwater archaeology in the country, some major investigations, legal aspects, professional training and public engagement for study and preservation of underwater cultural heritage (UCH) in India.

India offers a vast variety of UCH, inland as well as in the seas. Remains of hundreds of major and minor ports can be found on the coasts, in estuaries, and on river banks, or lying submerged. Besides them, as recorded in ancient texts there are several port cities believed to be submerged. Underwater archaeological investigations at Dwarka, Mahabalipuram, Elephanta, etc. have revealed a variety of submerged structures and finds related to ports, maritime trade, and navigation. Some of these sites were global centres for maritime trade and long-distance contact points. Furthermore, navigable perennial rivers provided excellent inroads for transport of goods and people to hinterlands in different parts of the country.

Beginning and development

Systematic and organized archaeological studies started in the country in 1861 with the personal efforts of Colonel Alexander Cunningham. Similarly, underwater archaeology marked its beginning with an underwater survey conducted in 1981 by geophysicists to establish the veracity of a legend mentioning the submergence of a city recorded in ancient literature (Vora 1987, 159–164).

The subject has since progressed considerably in the last four decades. Although the Archaeological Survey of India (ASI) had proposed to start underwater archaeology well before it actually started, the desire to implement the proposal never materialised. It seemed archaeologists working on the ground somehow did not appreciate the idea of exploring the 'liquid' earth. The first dedicated project was sponsored by the Indian National Science Academy supported by the National Institute of Oceanography and the Archaeological Survey of India. After a long gap, in 1987, the training of archaeologists started as a part of an ongoing project at Dwarka. In 1990, ASI conducted the first independent underwater exploration on a shipwreck off Bangaram Island in Lakshadweep (Tripathi 1994, 125–128) in accordance with existing laws. Despite having required technical competence, and staff having received advanced training abroad (1990–92), ASI could not decide to develop its own branch. Popularity of this branch attracted many senior officers who organised some programmes from time to time, in collaboration with other institutions. Establishment of the Underwater Archaeology Wing (UAW) in the Archaeological Survey of India was the real beginning of systematic underwater archaeological researches having clear objectives and methodology. The very extensive water areas around India are extremely rich in UCH but a systematic search and study requires a significant number of trained underwater archaeologists. In the first two decades, not even half a dozen personnel could be trained. Thus, proper training and exposure in the field was the primary need to further develop the subject. Though short-term training programmes for young and willing archaeologists from different institutions were organized, more advanced stages to impart practical training could not be held, as was originally planned, for want of suitable diving training facilities.

The first excavation, approved by the Government of India under the existing laws, was conducted off Mahabalipuram (Tripathi 2001–02). The UAW had a practical approach towards spreading the knowledge and utilizing available expertise and equipment shared with other institutions. With this clear vision, ASI worked in collaboration with the Indian Navy. As a result, the first decade of the 21st century witnessed

Keywords: Underwater Excavations – Dwarka – Mahabalipuram – Lakshadweep

Fig. 1 Diving ship INS Nireekshak. © Alok Tripathi.

major systematic underwater excavations off Bangaram Island (2002), Mahabalipuram (2005), Dwarka (2007), and Elephanta (2009).

Judicious utilization of state infrastructure (Fig. 1) towards the study of cultural heritage resulted in the successful excavation of *Princes Royal*, a shipwreck off Bangaram Island (Fig. 2) at a depth of 54 metres (Tripathi 2004). Results of the excavation were presented to experts regularly to seek their views and improve skills. With the adoption of a planned and methodical approach, the UAW had now become the leading centre in the Asia-Pacific region, in the field of underwater archaeology.

Since the establishment of the Wing, it emphasized on *in situ* preservation. Well–trained divers, exposed to archaeological methods, became an asset (Fig. 3). Onsite training was always an integral part of every project, which effectively catered for the need for trained manpower. Underwater excavations off Mahabalipuram (Tripathi 2007a, 127–139) had to be limited due to a tsunami which had occurred in December 2004.

Underwater investigations at Dwarka, the place associated with Lord Krishna (Fig. 4), generated huge popularity among the public about this branch of archaeology. At the same time a huge confusion was also created in academic spheres by contradictory claims made by different scholars on the basis of exploratory dives and digs made here and there, for about two decades (Rao 1988, 47–53; Desa et al. 2001). Results of the excavations conducted by UAW off Dwarka (Fig. 5) put all speculation to rest, and provided scientific data about the submerged remains off Dwarka (Tripathi 2013).

In order to draw attention of land–locked states, towards the potential for UCH in their internal waters, underwater exploration was conducted in Loktak lake (Fig. 6) in North–eastern part of India (Tripathi 2019a, 1–9). Besides underwater excavations, a systematic study and documentation of ancient boats and boatbuilding technology is another important area of research. There is also great scope in the field of nautical archaeology, which deserves immediate attention.

Besides these major systematic excavations, other agencies have also worked on a number of sites. Some of these include: explorations on the Tamil Nadu coast by Tamil University, Thanjavur (Athiyaman 2007, 141–154); exploration on the Andhra coast by Andhra University, Visakhapattnam (Gangadharam 1991, 198); geophysical survey off Mahabalipuram by the Marine Wing of the Geological Survey of India, Kolkata; geophysical survey in the Gulf of Khambhat by National

Fig. 2 Bangaram Island: in situ documentation of shipwreck. © Alok Tripathi.

Fig. 3 Diving on a shipwreck site. © Alok Tripathi.

Institute of Ocean Technology, Chennai; and several works at Dwarka, Kaveripattinam, Tranquebar, Lakshadweep, Somnath, Gujarat coast, Goa waters, etc. reported by the National Institute of Oceanography, Dona Paula (Sila, Gaur and Sundaresh 2004, 28–41).

Experimental archaeology has not become popular in India, so far, but India's participation in the Magan Boat Project, followed by an international seminar was a welcome step in this direction (Tripathi 2006, 8–11). Recommendations of an experimental project on Harappan ships are yet to be implemented. Such projects on ancient shipping and shipbuilding technology would add considerably to existing knowledge, which is based upon excavated finds and other archaeological evidence.

Fig. 4 Dwarka: Near shore acoustic survey. © Alok Tripathi.

Over the last four decades, considerable progress has been made and several institutions, such as the Tamil Nadu Department of Archaeology, Indian National Science Academy, National Institute of Oceanography, Tamil University, Andhra University, and Indian Navy, have also played important roles. Although some excellent projects have been executed, maintaining high standards, there should be no hesitation in mentioning that more is required to deal with the emerging challenges in near future.

Legal provisions

India is a union of states, and as per the Constitution of India matters concerning cultural heritage, ancient monuments, archaeological sites and remains, are divided amongst the Union and the States. All of the 'ancient and historical monuments', which have been declared to be of national importance are allotted to the Union (List I, item 67), whereas all remaining monuments are allotted to the states (List II, item 12). All 'archaeological sites and remains', which have been declared as of national importance are allotted to the Union (List I, item 67), and the remaining ones are placed in the Concurrent list (List III, item 40). Under this complex arrangement various departments under the central and state governments work for the protection and preservation of cultural heritage (Tripathi 2007b).

Until the establishment of the Underwater Archaeology Wing (UAW) in 2001, there was no mechanism to regulate activities

Fig. 5 Dwarka: Submerged structural remains. © Alok Tripathi.

directed towards UCH. UAW started regulating these activities by implementing relevant provisions of existing national legislation, which marked a paradigm shift in the underwater archaeological studies in the country. In the same year, the General Conference of the United Nations Educational, Scientific, and Cultural Organization (UNESCO) adopted the Convention on the Protection of the Underwater Cultural Heritage (Paris 2001). India voted in favour of the Convention and in principle, legally, the government had no issue in ratifying the Convention. Somehow, this issue was side-lined and the Convention was not ratified, as yet. However, in 2004 the Rules annexed to the Convention were adopted, with minor modifications, for implementation (Tripathi 2019b, 33–42).
For effective implementation of policies towards protection of UCH in the country, there is a need to have a dedicated agency with an effective secretariat, and a Scientific and Technical Advisory Committee. It should regularly meet the officials of states and offer required necessary scientific and technical support.

Collaboration

Sharing resources, expertise, and collaboration are necessary for any meaningful multidisciplinary research. Inputs from experts from relevant fields, collaboration with various agencies, and participation of the public is a tested path to success. As far as technological advances and availability of scientific equipment is concerned, institutions in the country are second to none. It is satisfying that scientists and professionals working in diverse areas are readily willing to collaborate with projects related to the study and protection of UCH. The enthusiasm from these institutions to conduct fieldwork, at times, is so high that it practically becomes difficult to oblige them, as the systematic analysis, study, and conservation is a time-consuming process.

The collaboration of the UAW and the Indian Navy was a turning point in the history of underwater archaeology in India. It was a unique venture where professionals who were more accustomed to military training for underwater operations were deployed, on a large scale, to the conservation of cultural heritage which was often destroyed in the past. State-of-the-art technology and scientific tools available for military purposes were effectively used for search, study, and retrieval in the field of culture. Human resources and advanced equipment were made available according to specific requirements, which resulted in the most systematic underwater archaeological excavations and important discoveries during the first decade of this century.

Concerns

Like terrestrial archaeology, underwater archaeology also started with individual efforts and seriously lacked a wider national vision. As a result, until today we could not adequately prioritize our concerns. Those in position to control all the activities directed to underwater cultural heritage created a big hurdle in the development of this branch of archaeology and

Fig. 6 Loktak: Underwater archaeological investigations in internal waters. © Alok Tripathi.

the subject could not develop as it should have been by now. Agencies like the Archaeological Survey of India, universities, the Department of Ocean Development, the National Institute of Ocean Technology, the National Institute of Oceanography, the Indian Navy and Coast Guards, the Maritime Boards, port authorities, and the Marine Police, need to collaborate and work together for the preservation of underwater cultural heritage. International agencies, particularly academic and research institutions can also be involved as is permissible under the law.

Proper management of UCH would require effective legislation and an active framework for its implementation. As mentioned above, India has not ratified the 2001 UNESCO Convention, as yet. There is no national legislation dealing exclusively with UCH. Provisions in existing national legislations and shipwreck protection are being used for regulating underwater operations and maintaining standards.

Lack of awareness among the concerned agencies combined with the impact of rapid developmental activities is undoubtedly posing a serious danger for the underwater cultural heritage. Salvage of sunken cultural heritage has not been reported frequently but with to-days easy availability of information and technology, a phenomenal increase in such incidents in the near future cannot be ruled out.

Viable options for the preservation of heritage requires the active participation of the public, to whom it belongs. The present approach of total dependence on governmental agencies requires a drastic change. This is an area where custodians of the heritage have to work seriously. The old sense of ownership needs to be replaced by a democratic sense of partnership.

The way ahead

Oceans are an integral part of our cultural heritage. In the decade (2021–2030) which is termed as the UN Decade of Ocean Science for Sustainable Development, Indian agencies will have to work together to prioritize common goals to conserve coastal and marine areas according to national and international law. With the sustainable use of oceans and their resources, an appropriate focus on conservation of cultural heritage will also have to be ensured. Mechanisms will have to be devised so that developmental activities are permitted as per internationally accepted best practices.

To achieve these goals, there is a need to develop comprehensive strategies towards the underwater cultural heritage. In general, the cultural significance of the ocean, and in particular, raising awareness about the underwater cultural heritage is the need of the hour. In a country like India, with a huge water area it is a gigantic task which can only be achieved by active collaboration, sharing of information, resources and expertise.

Acknowledgement

While writing on Underwater archaeology in India it becomes my duty to express my thanks to all those who played a key role in this field in various capacities. I record my thanks to the Archaeological Survey of India, Ministry of Culture, Government of India for funding my training in India and abroad and for providing all the necessary facilities to conduct underwater archaeological excavations. I would fail in my duty, if I forget to express my gratitude to Shri Jagat Pati Joshi, the Director-General, Archaeological Survey of India for selecting me for the training and to Dr S.R. Rao, Principle Investigator, Marine Archaeology in India Project for my initial training. Thanks are also due to Smt. Komal Anand, the Director-General, Archaeological Survey of India and Dr. R.V.V. Ayyar, Secretary, Department of Culture for according sanctions for the establishment of the Underwater Archaeology Wing. I am also thankful to the Secretary, Ministry of Culture for strengthening the Underwater Archaeology Wing and providing the much needed functional autonomy within the system. Mention must also be made of Admiral Madhvendra Singh, Chief of the Naval Staff, Indian Navy, and Smt. Kasturi Gupta Menon, Director-General, Archaeological Survey of India, for approving the collaboration between Archaeological Survey of India and the Indian Navy for the search, study and preservation of underwater cultural heritage. Thanks are also due to my colleagues in the Archaeological Survey of India and officers and officials of Indian Navy, who supported me and those who tirelessly worked with me on these projects.

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SPAIN AND THE LEGAL PROTECTION OF THE UNDERWATER CULTURAL HERITAGE

Mariano J. Aznar, Spain

Introduction

Spain's position between the Mediterranean Sea and the Atlantic Ocean, and between Europe and Africa, located the country in a maritime *carrefour* from very early times, with more than 8,000 kilometres (≈ 5,000 miles) of coastline. Historically, the different populations, peoples, and kingdoms in the Iberian Peninsula (Phoenicians, Romans, Arabs, and Christians, to mention just a few)[1] along with visitors from elsewhere, made their presence felt along Iberian waters, with traces of civilization, commerce, architecture, and fisheries. Later, the leading role undertaken by Spain in the Modern Era (≈ 1470) spread its vessels and sailors through all the seas up to the end of the 19th century.

However, contemporaneous Spain only considered its international role on the protection of its underwater cultural heritage (UCH) quite recently, a turning point resulting from sad cases occurring in the 1980s, such as the looting of the *Atocha*[2] or the destruction of the *San Diego*.[3] That same decade witnessed, however, the main legal development of protection at a domestic level: The Law 16/1985, on the Spanish Historical Heritage, followed by replicant regional laws in all the quasi-federal territorial entities created by the 1978 Constitution (the *Comunidades Autónomas*: autonomous regions). The Constitution and these laws operated, not without discussions, a general transfer to the regions of most of the legal responsibilities regarding the protection of UCH in Spanish waters, including the continental shelf (art 40 of the Law 16/1985). Since then, all historical and archaeological objects located up to the outer limit of the continental shelf (i.e. 200 nautical miles) are declared to belong to the Spanish Historic Heritage. This declaration is mirrored in all and each of the regional laws governing the cultural heritage, declaring also that these objects belong to the respective regional cultural heritage.

Up to this legislative change, UCH located on Spanish coasts was not properly protected since, as in many other countries, there was no clear protective awareness of a heritage that was still largely unknown. However, another turning point may be found in the first cases (in the 1990s) when Spain litigated against treasure-hunters before foreign courts: the cases of the illegal salvage of two Spanish Armada frigates sunk in U.S. waters – the *Juno* and *La Galga* –[4] which provoked a strong reaction coinciding with the start of the negotiations of the 2001 UNESCO Convention on the Protection of the Underwater Cultural Heritage (2001 UNESCO Convention).

The road to ratification of the 2001 UNESCO Convention

During these negotiations, Spain had a complex position since, as a naval power, it defended, for example, the applicability of the immunity principle to non-abandoned sunken state vessels, and the relevance of the UN Convention on the Law of the Sea (UNCLOS); but, at the same time, Spain also endorsed the principles and cooperative scheme framed by the Convention and wished to collaborate with other states (particularly the former Spanish dominions in America and Asia) in the protection and enhancement of shared UCH. Spain eventually considered that the 2001 UNESCO Convention neither affected the immunity rule nor the delicate balance created by UNCLOS in the different marine zones, most particularly the exclusive economic zone (EEZ) and the Continental Shelf, but also the Contiguous Zone.

Consequently, Spain was able to ratify the Convention on 6th June 2005 and, once the Convention entered into force on 2nd January 2009, it was incorporated into Spanish domestic law on 5th March 2009.

Spain decided to ratify the Convention to send a clear message to states saying that Spain found in the principles and rules embodied in the Convention the best common language to protect UCH. This was done amid another two turbulent cases, discussed before foreign and international tribunals, again around the looting of Spanish UCH: the destruction of the Spanish frigate *Mercedes*[5] by a treasure-hunter company (Odyssey Marine Exploration) and the looting from the M/V *Louisa*[6] of some heritage in the Bay of Cádiz (Figs. 1, 2). Spain won both cases and reinforced the policy to react vigorously against any attempt by commercial enterprises to destroy Spanish UCH located elsewhere. But, at the same time, Spain also decided to complement this policy with another one, nested in the Convention itself: to create a network of cooperation via administrative and political agreements with different states. Two Memorandum of Understanding (MoU) have been signed between the US-NOAA and with México, and some others are in preparation. Both MoUs have as their objectives the creation of a framework of cooperation between

Keywords: Spain – Law of the Sea – Underwater Cultural Heritage – UNCLOS

the signatories concerning the identification, protection, management, and preservation of underwater cultural heritage sites and resources within the signatories' respective areas of responsibility.

Fig. 1 Enforcement actions by the Spanish Civil Guard detained the 'Louisa'. © AFP/José Luis Roca.

Fig. 2 Enforcement actions by the Spanish Civil Guard detained the 'Odyssey Explorer'. © Spanish Guardia Civil.

A new national policy: domestic legislation and institutional cooperation

Along with that foreign policy, at a domestic level some other changes have also been produced. Although there is not an implementing law of the 2001 UNESCO Convention, most prominent principles and rules have been endorsed by Spanish legislation (both as State legislation and as regional legislation). As already said, after its official publication, the Convention forms part of Spanish law; and given the self-executing nature of some of its rules (and particularly those of the Annex), the Convention may be legally evoked before the administration and courts.

Several questions have been implicitly or explicitly applied, or implemented at a domestic level. In general terms, threats to UCH have been catalogued as threats to national security both in the National Security Strategy 2017 and in the National Maritime Security Strategy 2013.[7] This has meant for the very first time, that Spain had categorised these questions among other serious threats to national security. Previously, several inter-ministerial agreements were concluded between the ministries of Culture, Home Office, and Foreign Affairs as a by-product of the 2007 National Plan for the Protection of Underwater Cultural Heritage and the Green Paper published in 2009.[8]

Once the basic of the renewed national policy was adopted, some legislative initiatives were passed. For example, the Law 14/2014 on Maritime Navigation which, going beyond article 4 of the Convention, prohibits the application of the law of salvage to UCH.[9] Most of heritage regional laws and regulations explicitly endorsed – or are going to endorse – the preservation *in situ* as the first option.[10] Precautionary measures foreseen in the Convention — particularly its article 5 and the Annex — are also included in the domestic legislation under the scheme of the natural and cultural impact assessments, compulsory before any activity which may indirectly affect UCH in Spanish waters.

Along with the action of the National Museum (ARQVA)[11] and several regional centres for the protection of the UCH (Figs. 3, 4), there is also a high-tech monitoring and surveillance system provided by the Guardia Civil: the *Sistema Integrado de Vigilancia Marítima* (SIVE, Integrated System of Maritime Surveillance), which covers most of the Strait of Gibraltar waters as well as the Spanish Mediterranean coasts, including the Balearic Islands. Initially created for the monitoring of drug trafficking and illicit migration, it now permits a total control of any movement of vessels — even the smallest ones — and their navigation patterns in archaeological sensitive areas.[12]

These areas are not only those declared as 'archaeological areas'[13] but also other categories of protective areas which have proven to be an extreme useful tool for the protection of UCH: the so-called 'archaeological preservation areas', i.e. those clearly determined areas in which the existence of archaeological remains of UCH is presumed to be located and it is considered necessary to adopt precautionary measures. As may be seen in figure 5 as an example, the coast of Andalucía is mapped with numerous cases of the two types of zones: those with known archaeological remains (in red) and those preservation areas with most probable archaeological sites (in green). The latter implies several limits to different activities to be performed in these areas (from fishing to diving, from mining to prospecting) and the need of special permits for any activity.

This brief *tour d'horizon* shows how Spain has legally and politically implemented some relevant parts of the Convention. There are still gaps and on-going policies which must be correctly implemented. Once adjured most cases and opportunities for treasure hunting, the biggest challenge for Spain – as well as for the rest of the States Parties to the

Fig. 3 Divers working on the in situ preservation of the Bou-Ferrer roman wreck. © José A. Moya.

Fig. 5 The coast of Andalucía is mapped with two types of zones: those with known archaeological remains (in red) and those preservation areas with most probable archaeological sites (in green). © Spanish Government.

Convention – is to properly implement its article 5, under which each State Party shall use the best practicable means at its disposal to prevent or mitigate any adverse effects that might arise from activities under its jurisdiction incidentally affecting underwater cultural heritage. This implies a multi-layered, integrated, and complete national policy which need to be implemented in the forthcoming years. Last but not least, Spain is trying to have an intense scientific and political cooperation with other states where UCH linked to Spain is located, most particularly with American States and the Philippines. Along with the funding offered by the Agencia Española de Cooperación Internacional para el Desarrollo (AECID), Spain is currently discussing the signature of new MoU with several States as Colombia, Panama, Uruguay, or Ecuador, among others, where treasure hunters are still marauding, or with other States with already strong collaborative approaches, like Argentina or Cuba.

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Fig. 4 Divers working on the in situ preservation of the Bou-Ferrer roman wreck. © José A. Moya.

1 It is estimated that Phoenicians established in the southern part of Spain more than 3,000 years ago, founding the oldest western European city: Gadir, later the Greek Gádeira (τὰ Γάδειρα) and the Roman Gades, then the Arab Qadis (قادس) and today's Cádiz. Rome began its conquest of the Iberian Peninsula after the Second Punic War (218 BC) and the Arab invasions commenced in 711 BC. The Christian Reconquista ended in 1492, the same year of Columbus' arrival to America.

2 The remains of the Atocha a Spanish galleon of the fleet sunk in the Florida Keys in 1622 — were looted and commercialised by Mel Fisher since the end of the 1980s, and its collection was irremediably dispersed.

3 The San Diego was a galleon pertaining to the route of the Manila Galleon, sunk in 1600 fighting against a Dutch fleet in Manila Bay. The site was 'recovered' by Frank Goddio and part of its collection was bought by the Spanish Government.

4 Sunk in Virginia waters in 1750 (La Galga) and 1802 (Juno). See T Scovazzi (2018) Sunken Spanish Ships before American Courts, 33 International Journal of Maritime & Coastal Law 1; and M J Aznar (2010) Treasure hunters, sunken State vessels and the 2001 UNESCO Convention on the Protection of Underwater Cultural Heritage, 25 International Journal of Maritime & Coastal Law 209.

5 This well-known case initiated when a US treasure-hunting company – Odyssey Marine Exploration Inc. – recovered in 2007 from the Portuguese continental shelf a cargo of around 600,000 coins (mainly silver Spanish Reales de a Ocho) and some other artifacts from the remains of a Spanish Royal Navy frigate sunk in October 1804 while in combat against a British squadron. The recovery of the cargo was made without any permit from Spanish or Portuguese authorities and without any scientific care of the submerged remains — including human remains —, thus 'irreparably' disturbing the archaeological site, as the Admiralty decision which decided the case plainly said (for references, see previous note).

6 The case around the Louisa begun with the looting of underwater heritage in the Spanish internal waters and territorial sea from that vessel flying St. Vincent and the Grenadines flag. The case ended before the International Tribunal for the Law of the Sea in 2010–2013. See M J Aznar (2015) Patrimonio cultural subacuático español ante tribunales extranjeros o internacionales: Los casos de la Mercedes y del Louisa', 19 Anuario de la Facultad de Derecho de la Universidad Autónoma de Madrid 47.

7 See the text of both National Strategies at https://www.dsn.gob.es/en/estrategias-publicaciones/estrategias

8 The Green Paper https://es.calameo.com/read/000075335015cc9543e0f; accessed 30th September 2020.

9 The text of the Law 14/2014 https://www.boe.es/eli/es/l/2014/07/24/14/con; accessed 30th September 2020.

10 The VII BC Mazarrón I & II wrecks are a good example: wrecked in south-east Spain they were discovered, excavated and protected by the Spanish authorities and are allegedly the oldest Phoenician vessels ever excavated. For a complete appraisal of the site, see M Martínez Alcalde, J M García Cano, J Blánquez Pérez & Á Iniesta Sanmartín (eds) (2017) Mazarrón II. Contexto arqueológico, viabilidad científica y perspectiva patrimonial del barco B-2 de la bahía de Mazarrón (Murcia). En homenaje a Julio Mas García (Madrid: UAM Ediciones).

11 The Museo Nacional de Arqueología Subacuática (ARQVA) was initially created in 1980 and transformed and moved into its current building with its collection in 2008. http://www.culturaydeporte.gob.es/mnarqua/en/visita/horarios.html; accessed 30th September 2020.

12 More information available at the Guardia Civil webpage: http://www.guardiacivil.es/en/prensa/especiales/sive/funciones.html; accessed 30th September 2020.

13 The highest protection being given to those declared as Bien de Interés Cultural (Cultural goods of interest), which can be established up to the outer limit of the territorial see, i.e. 12 nm.

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A drone image of the sunken Roman City of Aperlai in the Kekova Region of Antalya, Turkey. © Günay Dönmez and Hakan Öniz.

SECTION 2
THREATS – CHALLENGES – SOLUTIONS

UNDERWATER CULTURAL HERITAGE IN THE YUCATAN PENINSULA, MEXICO

Helena Barba-Meinecke, Mexico

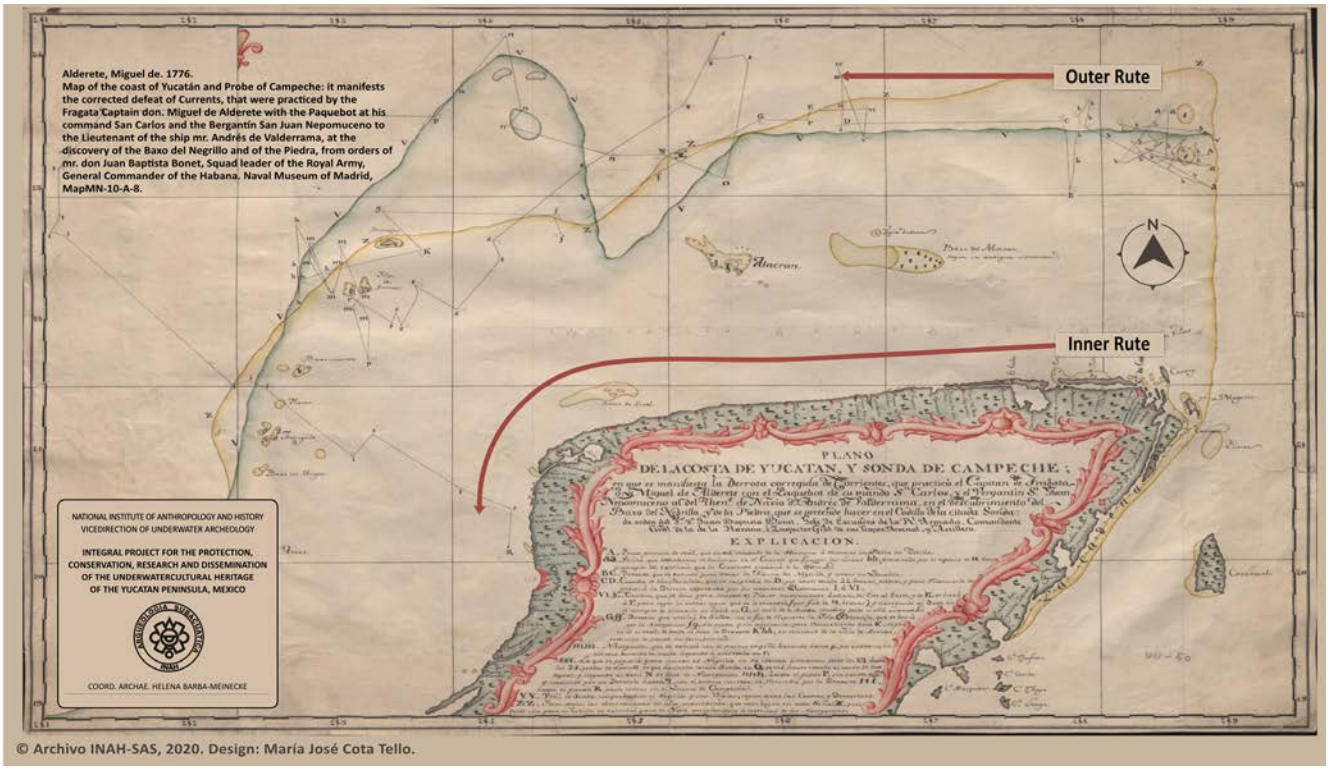


Fig. 1 The map by Miguel de Alderete, 1776 which identifies the inner and outer Campeche routes. © INAH-SAS.

Introduction

The Yucatan Peninsula, comprising the states of Yucatan, Quintana Roo, and Campeche is located in south-eastern Mexico. It has a coastline of more than 1,300 kilometres (≈ 800 miles), with rivers, coastal lagoons, marshes, swamps and land reclaimed from the sea. There is also an extensive network of underground caves, cenotes, and water holes among other inland bodies of water. In these aquatic spaces, a large part of the registered underwater cultural heritage (UCH) in this area of Mexico has been identified and studied during forty years of exploratory and historical research projects. These important advances carried out by the Subaquatic Archaeology Subdirectorate (SAS)[1] of the Instituto Nacional de Antropología e Historia (INAH) are presented in this article.

Campeche

The port of Campeche, on the west coast of the Peninsula facing the Gulf of Mexico, was an important shipbuilding facility from the 18th century. It was also from these shores that, in November 1979, the first Mexican underwater archaeology scientific campaign set sail for Cayo Nuevo, Campeche Sound, Gulf of Mexico. During this campaign, the first wrecks were identified, dating from the 16th and 18th centuries. This watershed in the development of UCH research in Mexico gave rise to a series of further investigations related to submerged cultural heritage and the development of the discipline in Mexico.

In the 1980s, INAH-SAS carried out the first inspections and explorations along the Mexican Caribbean coastline and islands of Quintana Roo State: Palma and Xcalak, Banco Chinchorro; Bahia Mujeres, Cancun and Hanan and Cocos, of Cozumel Island (Luna 1984a; 1984b; 1985a; 1985b; 1991).

Keywords: Archaeology – Underwater – Cenote – Cave – Yucatan – Maya

During the 1990s, larger scale projects emerged, among them: Aids to Navigation on the Eastern Coast of Quintana Roo (Romero 1993). The results from this project provided important information about the Mayan culture, including identifying routes, a system of navigational signs and markers from ports of embarkation and disembarkation, safe havens, as well as the type of watercraft used. As a result of their navigation of rivers that cross the Yucatan Peninsula, the ancient Mayans established a trade network from 2500 BC that strengthened over time. By the Post-Classic period (AD 1100–1500), this had expanded to include trans-peninsular and Gulf of Campeche routes (Fig. 1).[2]

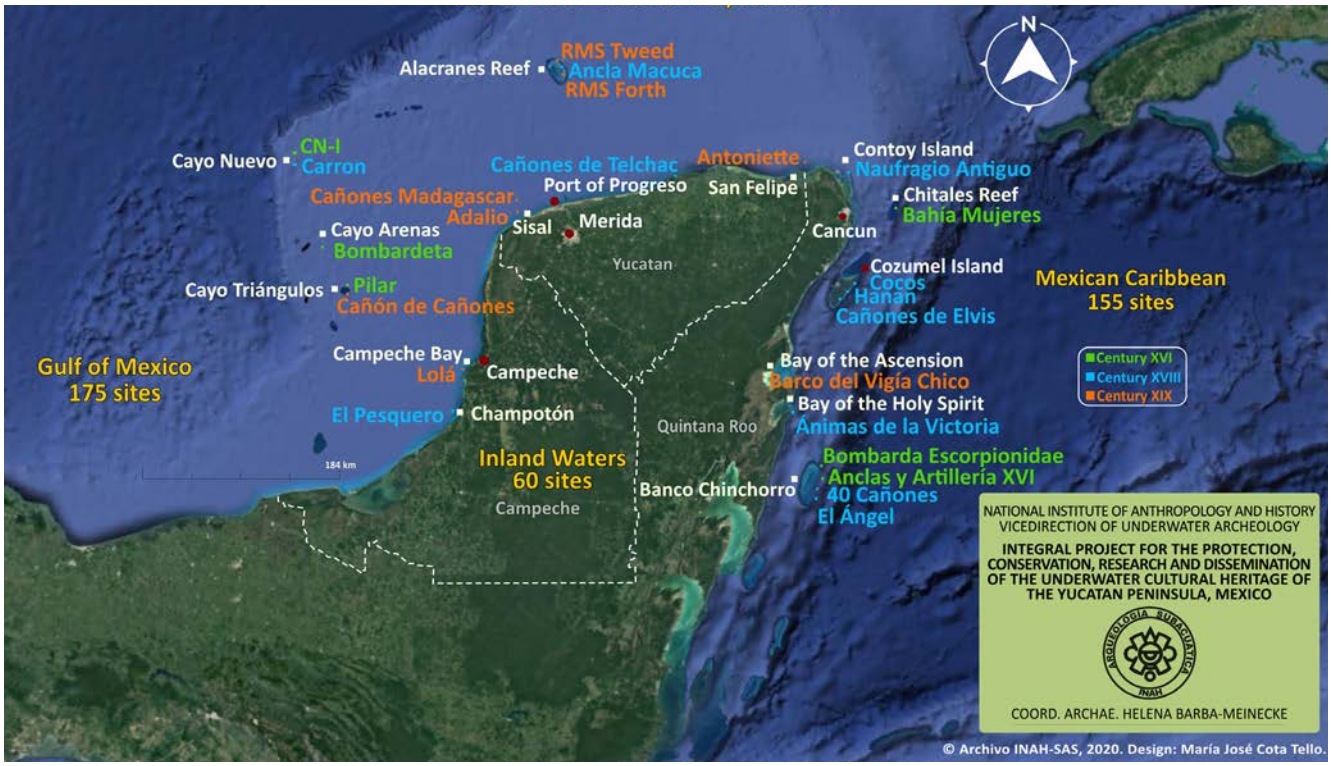


Fig. 2 Map of the Underwater Cultural Heritage identified in marine and inland waters. Yucatan Peninsula, Mexico. © INAH-SAS 2020. Design: María José Cota Tello.

Underwater cultural heritage on the coast of the Yucatan Peninsula

From 1997 and the first decades of the 21st century INAH-SAS actions focused on creating an inventory of sites (Barba-Meinecke 2017). This phase integrated information from site identifications, historical, and archaeological records of UCH in the Gulf of Mexico, the Mexican Caribbean and land reclaimed from the sea. The aims were to define the extent of the study area, carry-out diagnostic investigations, and generate appropriate protective legal instruments. There was also a strong campaign to disseminate the scientific results, build capacity and popularise UCH through various media outlets.

The UCH in and around the Yucatan Peninsula including the maritime landscape, is a reflection of both the intense maritime traffic and the prevailing technology of the societies that produced them (Fig. 2). Broadly speaking, the resource includes the remains of wooden hulled sailing vessels (16th–18th centuries), wooden hulled steamships, those with both sail and steam propulsion (early 19th century); metal hulled steamships (from the mid-19th century), and both metal and fibreglass watercraft, equipped with engines (20th century).

During Montejo's mandate[3] and the establishment of the Viceroyalty of New Spain in 1535, the waters of the Gulf of Mexico and the Caribbean Sea were crossed by Spanish-flagged vessels using inner and outer routes (Fig. 1). These ships patrolled, carryied fleet messages or mail; moving in convoys such as the New Spain, Tierra Firme, and Barlovento fleets. Ships of other foreign powers were also present in the area during this period.

The importance of Campeche port

Surrounding the Yucatan Peninsula there are a variety of navigational hazards. In the east, the Mesoamerican reef is a coral barrier with few breaks allowing beach landings or entry into bays. To the north and west the extension of the continental platform of Campeche Sound (0.1% slope) influences the shallow depths, with a first step at a depth of 18 metres located at 18 km offshore, and a second step at a depth of 180

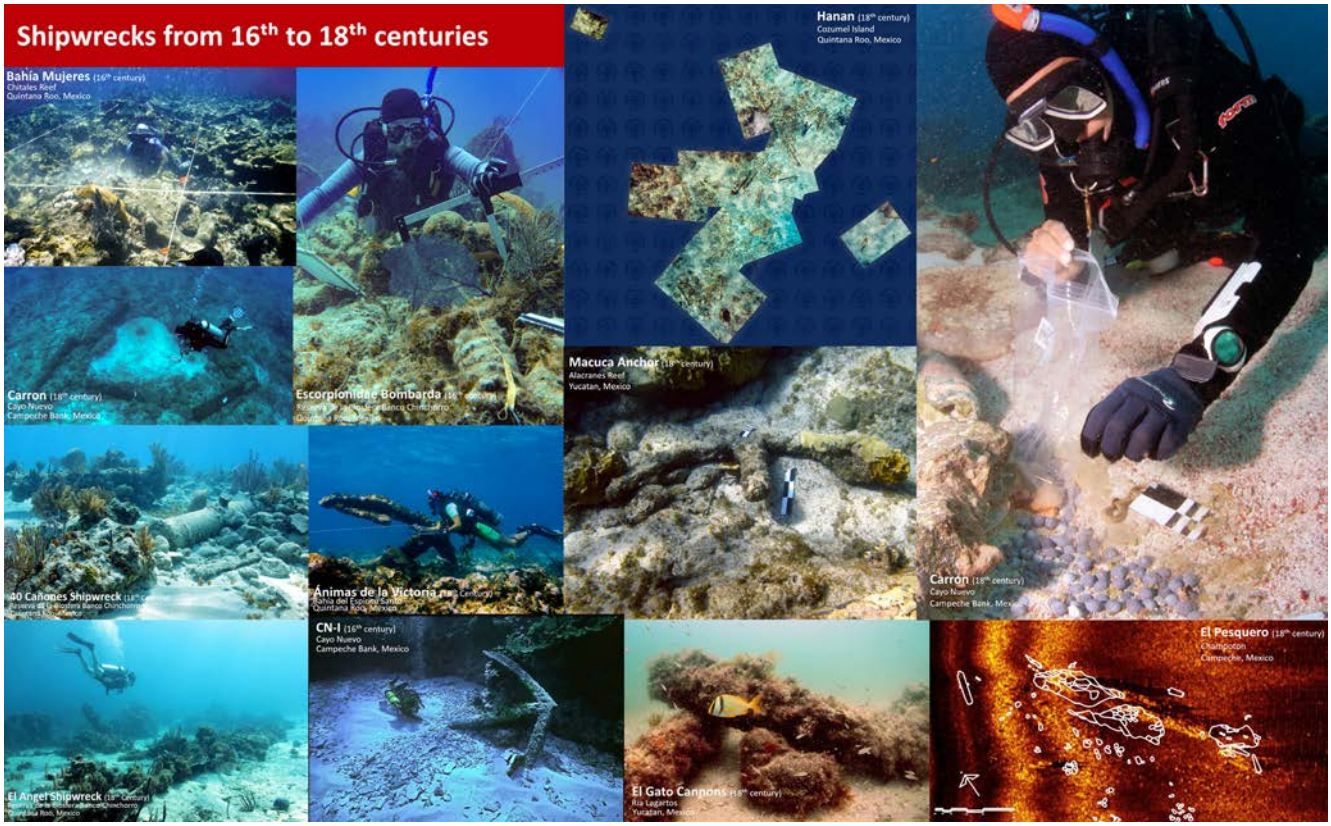


Fig. 3 16th to 18th century wrecks. Yucatan Peninsula, Mexico. © INAH-SAS 2020. Design: María José Cota Tello.

metres, 150 km from the coast. In Campeche Sound, sandy shallows, coral reefs, and rocky outcrops are common-place where vessels and their crews have and continue to become trapped and at nature's mercy.

In this context, the port of Campeche played an important role in the distribution of goods produced by the Yucatan Peninsula, such as purple dye sticks or Campeachy wood (also known as Campeche logwood), murexes or rock snails, cocoa, honey, leather and cotton, among other goods, which were transported to Europe. The returning ships brought European products to be consumed by the colonists. However, not all of the ships reached their final destination, leaving cultural remains and thousands of documents containing the stories of such disasters to be studied by nautical and underwater archaeologists. Some examples found in the historical documentation are the *Nuestra Señora del Juncal* (1630), 'El Ángel' (Banco Chinchorro) and 'Tejas' (Isla Mujeres). Thanks to the record of the entry and exit of ships, it is possible to reconstruct the maritime landscape and imagine port scenes. As a result of the work carried out by various INAH-SAS[4] projects; a total of 390 submerged archaeological sites have been recorded in the waters around the Yucatan Peninsula: 175 located in the Gulf of Mexico and 155 in the Mexican Caribbean, as well as 60 in inland waters (lagoons and rivers), identified in figure 2.

These are distributed as follows: Campeche coast 93; Yucatan coast 51 and Campeche Sound 31 (Gulf of Mexico). In the Mexican Caribbean 155 underwater archaeological contexts have been recorded: 130 located on the islands of Cozumel, Mujeres, Contoy and Banco Chinchorro, and 25 on the coastal strip of Quintana Roo. As for inland waters with access to the sea, 50 sites have been recorded in Laguna de Términos, nine in the Palizada River and one on the banks of the Candelaria River, all in the State of Campeche. These correspond to the following periods: Pre-Hispanic (2500 BC-AD 1517), Discovery (AD 1517-1535), Viceroyalty (AD 1535-1803), Industrial (AD 1803-1914) and Contemporary (1914-present). A key part in the identification and protection of submerged archaeological sites has been the joint work between INAH and the Mexican Navy (SEMAR) supported by the valuable participation of the coastal and offshore fishing communities, as well as by sport diving groups (Barba-Meinecke 2011).

Wrecks from the 16th to 18th century

Among the 16th century wrecks located in Campeche Sound illustrated in figure 2 are the CN-I[5] wreck on Cayo Nuevo, already mentioned, as well as the 'Pilar' on Cayo Triángulos; 'Bombardeta' on Cayo Arenas; 'Bahía Mujeres' on Chitales Reef (Luna 2010), as well as the 'Anchors and Artillery XVI' and 'Bombarda Escorpionidae' on Banco Chinchorro.

Although it has proven difficult to chronologically place sites

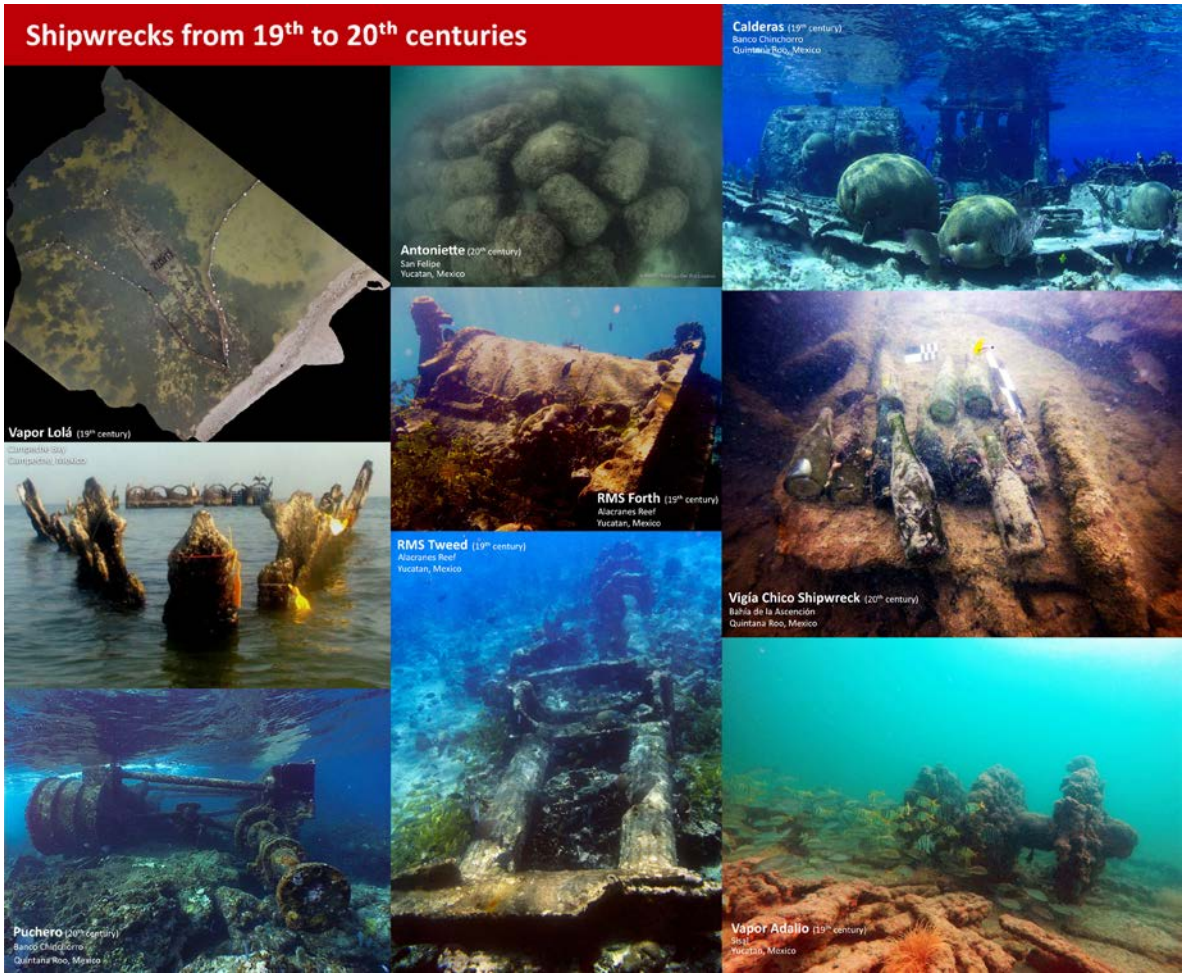


Fig. 4 19th to 20th century wrecks. Yucatan Peninsula, Mexico. © INAH-SAS 2020. Design: María José Cota Tello.

corresponding to the 17th century, numerous sites have been linked to the 18th century. Many of these have been subject to multidisciplinary case studies where the application of archaeometric techniques and new technologies has been rewarding. The 'El Pesquero' wreck, located on the coast of Champoton, contained the remains of six cannons representing four types,[6] 9lb and 12 lb cast-iron cannonballs, an anchor, various types of stone ballast, and parts of the wooden hull. The wreck has been interpreted as a copper sheathed wooden ship, probably dating from the end of the 18th to the early 19th century (Barba-Meinecke 2008).

There is also the case of the wreck named 'Carron' (previously CN-II), a two decked-ship with 60 cannons, under the command of Brigadier Miguel Alfonso de Sousa until it ran aground on Cayo Nuevo (Bajo Nuevo) during a storm, 7th May 1783. It is currently the object of detailed historical research and the application of archaeometric techniques in the study of its materials (Barba-Meinecke 2019).

Another wreck locally known as the 'Cañones del Gato', identified as the Spanish warship *Santa Marta* lost on 6th March 1780 was found approximately 3 km off the shore of the Lagartos estuary at a depth of 5.5 m. Commanded by Captain Andrés Valderrama, it was part of a larger force led by Captain Juan Bautista Bonet. The squadron set sail from Havana to guard the coasts of Yucatan and force any English presence to withdraw, a prelude to the Battle of Mobile in 1781.[7]

In addition to the above, there were investigations of three wrecks located on the east coast of the island of Cozumel: the 'Hanan', 'Cocos' and 'Elvis Canyons' (18th century) (Fig. 3). These sites relate to the following historical references: a warship that sank in 1623 during its return voyage to Spain, which transported war materials; the ship *La Candelaria* sailing from Santo Domingo to Havana (1623); the galleon *Santiago* (1659) of the Navy of Tierra Firme; the Spanish ship *La Fetis* lost during its return voyage to Spain (1760) from Cartagena, and the merchant ship *Tates* sailing from Cartagena to England, which sank in March 1761.

Likewise, in Espiritu Santo Bay, among 14 wrecks located, the wreck of *Ánimas de la Victoria* stands out; a wooden hulled ship sailing vessel, where 19 cannons, four anchors, olive oil jars of different ceramic types and square glass (case-gin) bottles were discovered and recorded. Archival research points to six possible references: an unknown ship of 1557,

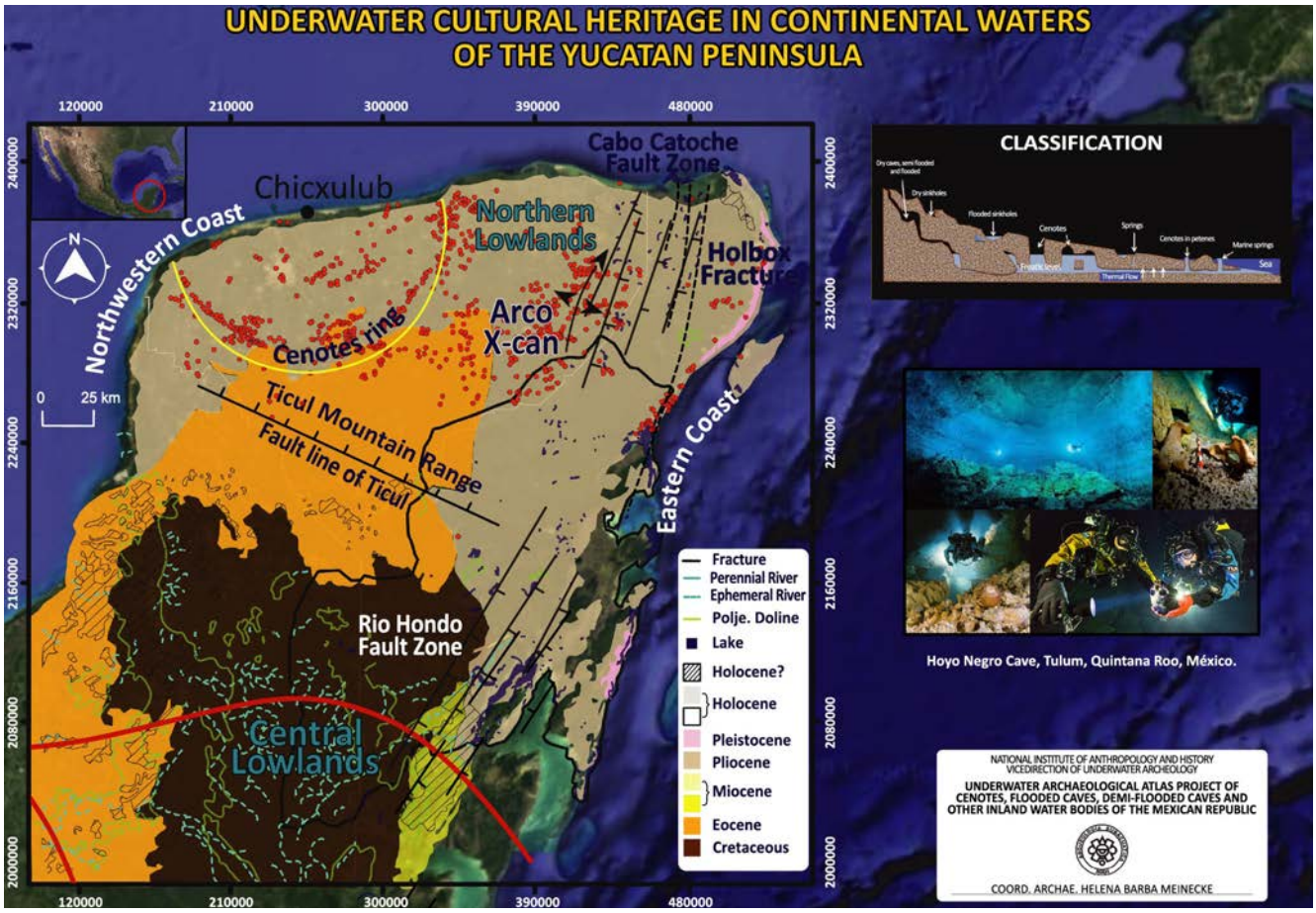


Fig. 5 Map Underwater cultural heritage identified in inland waters. Yucatan Peninsula, Mexico. © INAH-SAS 2020. Design: María José Cota Tello.

unknown galleon of 1628, the galleon *Santiago* (1647), *San Raymundo de Peñafort* (1755), an unknown ship of 1762 and the merchant ship, *Nuestra Señora del Carmen* (1794), all flying the Spanish flag (Barba-Meinecke, Díaz, Luna 2010).

The wreck known as the 'Ancla Macuca'

Also noteworthy are the archaeological, historical, and archaeometric investigations of the wreck of the 'Ancla Macuca', discovered on the Alacranes Reef, Yucatan, possibly a Spanish flagged wooden sailing ship. Fragments of lead, nails, bolts and copper sheets, as well as two possible floor timbers were found. As the floor timbers were not found in direct association with the other remains, we were cautious in connecting them to the metallic elements recorded in this section. The copper sheets are believed to be copper sheathing — manufactured by hammering or rolling — used from the last quarter of the 18th century onwards to protect ships hulls from attack and degradation caused by *Teredo navalis*[8], as well as improving a ship's sailing qualities.

With regard to the lead fragments, the studies carried out[9] indicate that they are likely to be lead sheets used for patching repairs or the manufacture of ammunition for light weapons such as pistols and muskets.

Also identified in the wreck were six artillery pieces — cast-iron cannons —, covered by calcareous concretions mimicking the surrounding coral mass, which made it difficult to record their construction details. Despite this, it was estimated that four of the documented cannons — No. 1, 2, 4 and 6: length of 1.70 m x 33 cm diameter — had very similar dimensions and correspond to the same type of artillery, being probably of similar calibre, while cannons No. 3 and 5, given their smaller characteristics — length of 80 cm x 20 cm diameter — it is possible that they were mounted on the ship's sides and used to repel enemy boarders.

Similarities in the barrel's general morphology between the No. 1, No. 2, No. 4 and No. 6 guns suggest a similar casting pattern, characterized by the presence of two reinforcement rings — at the joints of the first and second barrel sections — and two ornamental *taluses*, at the rim and first barrel section; the latter limiting and defining the sector of the vent field. None of them comply with the 3/7 rule.[10] With the exception of the cannons believed to have been cast outboard during the wrecking process, the two other cannons were found with ventral side uppermost. So far, it has not been possible to see whether they have inscriptions or identification marks, usually visible on their dorsal side.[11]

16th century	18th century	18th - 19th century	19th- 20th century
CN-I (Cayo Nuevo)	El Pesquero (Campeche)	40 Cañones (Banco Chinchorro)	Antoniette (San Felipe, Yucatan)
Pilar (Cayo Triángulos)	*Carron* (previously CN-II) / El Dragón (1783) (Cayo Nuevo)	El Ángel (Banco Chinchorro)	*La Unión* (1861) (Sisal, Yucatan)
Bombardeta (Cayo Arenas)	Cañones del Gato / Fragata *Santa Marta* (1780) 18th century (San Felipe, Yucatan)	Cañón de Cañones / H.M.S. *Meleager* (1801) (Cayo Triángulos)	RMS *Forth* (1849) (Arrecife Alacranes)
Bahía *Mujeres* (Arrecife Chitales)	Ancla Macuca (Arrecife Alacranes)	Cañones Madagascar (Sisal, Yucatan)	RMS *Tweed* (1847) (Arrecife Alacranes)
Anclas y Artillería XVI (Banco Chinchorro)	Hanan & Cocos (Cozumel, Q. Roo)		Barco del Vigía (Chico)
Bombarda Escorpionidae (Banco Chinchorro)	Cañones de Elvis (Cozumel)		*Puchero / Crijnssen* (1942) (Punta Herrero, Q. Roo)
	Ánimas de la Victoria (Bahía Espíritu Santo)		

Table 1 Chronology of the main shipwrecks identified in the Yucatan Peninsula – see Fig. 2 for their geographic location. © INAH-SAS.

From the number and dimensions of the guns an estimate can be made of the ship's dimensions, however, it should not be ruled out that there was contemporary salvage of other pieces of ordnance. Setting aside this possibility, the types of vessels that could correspond with the number of artillery pieces found could be a varity of armeed merchant ships or small warchip.[12]

Some of the ship's cargo was identified, consisting of 409 complete and fragmented items of jewellery (gold), precious gems (74 emeralds set and three loose, five diamonds set and one amethyst also mounted) and rosary beads (Barba-Meinecke 2017a). In order to establish their characterization, 71 archaeological elements representing ~18% of the total assemblage) have been subjected to archaeometric analysis[13] (Tab. 2; Barba-Meinecke 2019).

18th to 19th century sites

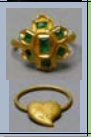
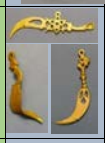
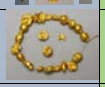
Between the end of the 18th century and the beginning of the 19th century, various shipwrecks under English, Dutch, and French flags have been recorded in the field, and through archival studies. Among them are the wrecks of the '40 Cannons' (Moya and Reichert 2010) and 'El Angel,' a ship possibly belonging to the British merchant company that transported dye sticks (Carrillo and Zuccolotto 2017), both located on Banco Chinchorro,[14] the 'Cañón de Cañones' wreck, associated with the English frigate HMS *Meleager* that sank in 1801 on Cayo Triángulos, Campeche Sound; the wreck 'Madagascar Cañones', which has been associated with the British warship HMS *Madagascar* that ran aground around in 1837 off the coast of Sisal, Yucatan. According to references she was re-floated, which required several of its cannons, munitions, cables and anchors to be cast overboard, which coincides with what has been observed in the archaeological context.[15] In this regard, there are also texts describing two Dutch ships shipwrecked in the area with contraband on board (see Tab. 1).[16]

19th – modern sites

It should be noted that dozens of isolated finds such as anchors, cannons, cannon balls, rudders, masts, among other items, lost during nautical accidents have also been recorded. They are used mainly as comparative archaeological materials, useful for the relative chronological dating of the wrecks. With the technological development of steam-powered ships, navigation around the world underwent a major transformation. In the region, the wreck *Lolá* has been registered; a vessel belonging to the French merchant navy under the command of Captain Diego Begovich (Pérez 1944), stranded in the Bay of Campeche. The wrecks *Antoniette* and *La Unión* — in San Felipe and Sisal, Yucatan, respectively — , related to a ship of possible French affiliation and believed to be a Cuban flagged slaver, have also been registered; the wreck *Puchero* (Punta Herrero, Quintana Roo), possibly the ship *Crijnssen,* a vessel of the Royal Dutch Steamship Company (Luna 2009), which sank at 6 pm, May 10th, 1942 (Barba-Meinecke and Pizá 2019); the English mail ships identified on Alacranes reef, Yucatan: RMS *Forth*, sank 14th January 1849, and RMS *Tweed*, which ran aground 12th February 1847. Both belonged to the Royal Mail Steam Packet Company. Another example is the Vigia Chico ship, *Ascension Bay* (Barba-Meinecke 2017a), as well as the so-called 'Calderas' (boilers) and 'Ladrillos' (bricks) wrecks identified in Banco Chinchorro, Quintana Roo State (Carrillo 2010). In addition to the above (Fig. 4), there are numerous wrecks related to the contemporary fishing industry which, being the most visible, are in greater danger of disappearing.

Underwater cultural heritage in flooded and semi-flooded caves and cenotes

As for the explorations and studies in flooded and semi-flooded caves, several research projects preceded those led by SAS-INAH.[17] In the 1980s the first cave divers[18] began to

N°	ITEM	QUAN'Y	IMAGE	DRX	FTIR	MO	FRX	MEB	EDX	RMN	SEM	UV	COL
1	Crimped Chaton Rings	14		X	-	X	X	-	X	X	X	-	X
2	Rings Without Chaton	109		-	-	X	-	-	X	-	-	-	-
3	Rings with gemstones set and motifs	10		-	-	X	-	-	X	-	X	-	-
4	Fake gem ring (glass)	1		-	-	X	-	-	X	-	X	-	-
5	Toothpick	15		X	-	X	-	-	X	-	-	-	-
6	Shoe buckles	2		-	-	X	-	-	X	-	-	-	-
7	Buttons	2		-	-	-	-	-	-	-	-	-	-
8	Fragments of Chain	3		-	-	-	-	-	-	-	-	-	-
9	Pink mollusk rosaries and filigree (10R 6/8 Light Reed-Munsell color)	4		-	-	-	-	-	X	X	X	X	X
10	Rosaries with gold links	4		-	-	-	-	-	-	-	-	-	-
11	Gold beads for rosary	141		-	-	-	-	-	-	-	-	-	-
12	Religious Crosses	8		-	-	-	-	-	-	-	-	-	-
13	Devotional medals	11		X	X	X	-		X	-	-	-	-
14	Horizontal reliquaries	3		-	-	-	-	-	-	-	-	-	-
15	Vertical reliquaries	2		-	-	-	-	-	-	-	-	-	-
16	Double glass reliquaries for *Agnus Dei*	3		-	-	X	-	-	X	-	-	-	-
17	Relicarios de rosetón	2		-	-	-	-	-	-	-	-	-	-
18	Cross for neck or chest	1		X	X	X	X	-	X	-	-	-	-

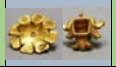
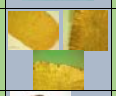
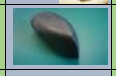
N°	ITEM	QUAN'Y	IMAGE	DRX	FTIR	MO	FRX	MEB	EDX	RMN	SEM	UV	COL
19	Dragon-shaped artifacts (centre) and snakes set with emeralds and diamonds	3		X	X	X	X	-	X	X	X	-	X
20	Artefacts (flower shape)	17		-	-	-	-	-	-	-	-	-	-
21	Artefacts (circular shape)	2		-	-	-	-	-	-	-	-	-	-
22	Fig	1		-	X	X	-	-	-	-	-	-	-
23	Emeralds	3		X	-	-	X	-	-	X	X	-	X
24	Glass bead (Fake emerald)	2		X	-	-	X	-	-	X	X	-	X
25	Gold foil with cut and percussion prints	1		-	-	X	X	X	-	-	-	-	-
26	Macuquina coins	20		-	X	-	X	-	X	-	-	X	-
27	Stone hammer (jadeite / onfacita)	1		X	-	X	X	-	X	X	-	-	-
28	Rosario's beads	1		-	-	X	-	X	X	-	-	-	X
29	Cap screw/bolt (antique)	1		-	-	X	-	-	-	-	X	-	-
30	Copper sheet	1		-	-	-	-	-	-	-	X	-	-
31	Lead sheet	1		-	-	X	-	-	-	-	X	-	-

Table 2 Archaeometric analysis applied to diagnostic materials recovered from the wreck 'Ancla Macuca', Yucatan, Gulf of Mexico. © Archive INAH-SAS, 2020 created by Helena Barba-Meinecke.

Pleistocene	Pre-hispanic	Classic			Post-classic		Modern	>19th - Industrial
126,000-10,000 BC	Late to end Pre-classic 350 BC-AD 250	Early AD 250-550	Late AD 550- 830	End AD 830-950	Early AD 950-1200	Late AD 1200-1535	AD 1535-1803	AD 1803-1914
						Balankanché	Sutupil	Ziiz Ha
Hoyo Negro	San Manuel	Nai Tucha	Huachabí		San Antonio	Cocodrilo		Mercadillo
Las Palmas	Yaalutzil	Mariposa	Balmí	El Templo	La Guadalupana	Aktun Amm		Noria del Exconvento
Naharon	Canún	Angelita	Cenote Azul	Grupo Xibalbá-Valladolid 1	Cenote Sagrado, Chichén Itzá	Aktun Koot/Calica		
Aktun Ha	Canun Che´en	Las Calaveras	Xibalbá-Calkmul	Cueva Ikil	Xcanyuyum	Tzaatz		
Cenotes de los huesos	Xkankal	Calica	Ka Ú Hum/Calica	Akulá	San Antonio Yaxché	Xtabay Loché		
Koi	Kankabchen´en	Manitas	Xtacumbilxunaan	Usil	Loxboxbé	Tres Bocas		
Taj Majal	Satachanah/Calica	Calica	Cacalchén	Kukultún	Lol-Ha	Zopilotes		
Toh	Manantial	Huachabí	Chancancazonot	Kikal	Cueva Sagrada	Tres Labios		
Muknal	X-AUIL		Xibalbá-Calkmul		Grupo Xibalbá-Valladolid 2	La Cavernita		
Sifa	La Noria-Chemax		Cueva Domingo			Con Aire		
Papakal	Yandzonot		Kantemó			Ranchito		
Tres Potrillos			Mono			Xtabay Loché		
Cueva C1						Kisim-Calica		
Cueva 1 Km								
Cueva Tortuga								

Table 3 Chronology of the main caves and cenotes with cultural heritage in the Yucatan Peninsula. © INAH-SAS, 2020.

explore and map the interior of the flooded karst systems (caves and cenotes) in Quintana Roo and Yucatan States[19], in parallel with archaeological and geological expeditions in semi-flooded caves (Fig. 5).[20]

Technological advances in caving and potholing equipment in the 21st century led to intense exploration, recording 7,000 caves and cenotoes and more than 600 km of flooded galleries and tunnels. Not all have revealed cultural heritage (Barba-Meinecke and Benítez 2015)[21], but many led to a series of paleontological and archaeological discoveries that INAH-SAS specialists are currently studying.

The registration, study, and protection of cenotes and caves in the Yucatan Peninsula, was carried out in various stages of the project Underwater Archaeological Atlas of Cenotes, Flooded and Semi-flooded Caves and other bodies of water in the Mexican Republic, has identified 93 archaeological contexts, 50 of them located in cenotes and 43 in flooded[22] and semi-flooded caves (Tab. 3). Of these, 16 have evidence from the late Pleistocene and Holocene periods in the coastal strip of Quintana Roo and the cenotes ring (Yucatan).

In most of the primary contexts, bones of extinct Ice Age animals were identified. They date to the pre-flooding times of the karst systems, where both animals and hominids are believed to have explored these cavities in search of fresh water and shelter. This is supported by the archaeological evidence registered in the caves of Hoyo Negro, Las Palmas, Naharon, Aktun Ha, Cenotes of the bones and Koi located around Tulum; Taj Majal, Toh and Muknal, close to Solidaridad, and Sifa in Cozumel, all in the Quintana Roo State, with the exception of Papakal which is in Cuzamá, Yucatan State (Fig. 2).

Hoyo Negro

The multi-disciplinary research of the Hoyo Negro[23] cave, part of the Sac Actun System, identified geofacts and specimens that contributed to the paleoecological reconstruction of the area: stalactites, clusters of calcites — 19,000 years old — and shells. In addition, there are samples of ten plant families; charcoal and seeds from the guano deposits dating from Paleo-Indian period from 12,000 to 9000 BC; and 15 animal species — extinct and extant — among them.[24]

In addition, the bones of a young woman known as 'Naia' were found, estimated to have lived between 13,000 and 12,000 BC and died between 15–17 years old. According to DNA analysis it is believed that the skeleton corresponds to the sub-haplogroup D1, of Asian origin, whose ancestors lived in Beringia[25] before entering the Americas[26]. 'Naia' is among the six human skeletons scientifically dated as the oldest found, so far, on the American Continent (Gallareta 2000).

During the pre-Hispanic period, the importance of cenotes and caves for the Mayan culture was related to obtaining water. This was mainly due to different periods of drought reported towards the Classic period from AD 250–900, when a relatively dry climate dominated, albeit, with periods of extreme drought dated around AD 585, 862, 986 and AD 1051+/-50.

The materials recorded in these contexts are associated with activities that include domestic tasks such as the collection of water and the acquisition of raw material for the manufacture mainly of metates (flat stones for grinding); as well as food preparation during long stays inside the caves. These could also be indirectly related to ritual and religious activities such as initiation rites, investiture, cults associated with fertility, mortuary deposits (Bonor 1987) and sacrifice, among others (Barba-Meinecke and Benítez 2015).

There is archaeological evidence of the use of these spaces during the pre-Hispanic era from the late Pre-classic period (350 BC–AD 250) until the Post-classic period, many of them continuously such as: the cenotes San Manuel (Tizimín) (Barba-Meinecke and Pizá 2015).

With respect to the semi-flooded caves, the presence of architecture such as small temples and staircases, as well as mural paintings and petroglyphs is recurrent. Examples include Huachabí in Hopelchén; Aktun Amm and Loxboxbé in Champotón; Xibalbá and Cueva Domingo, both located in Calakmul, in Campeche State.[27]

Closing comments

Progress in underwater archaeology in the Yucatan Peninsula has been achieved thanks to co-ordination between the SAS and the regional INAH Centres, entities that have been supported by the three levels of government, civil associations, and the local coastal communities.

Thanks to this partnership, more than thirty campaigns have been carried out in marine and inland/continental waters in the region, together with continuous desk-based research in the general, provincial, parish and technical archives, both nationally and around the world. All of this has led to the identification of 482 palaeontological, archaeological and historical contexts, in addition to studies of the maritime cultural landscape from a holistic viewpoint.

The study of this heritage has encouraged a generation of specialized professionals and technicians, so that various regional projects have multidisciplinary teams comprising archaeologists, historians, conservators, metallographic engineers, architects, biologists, graphic designers, photographers, museographers, speleodivers and speleologists. These specialists come from INAH, as well as from various institutions, universities, and civil associations, national and international.

Although progress has been made around the Yucatan Peninsula, there remain many miles to be sailed, roads to be travelled, and caves to be explored. In this sense and as a conclusion, it is worth mentioning that, thanks to the continuity of the work of INAH-SAS and its collaborators, the Geographic Information System and the Underwater Archaeological Chart of the region, the first ones at national level in this matter, are being developed.

Likewise, a significant achievement at an international level was the management and implementation of the Museum of Underwater Archaeology (MARSUB), at Fort San José el Alto, which houses a collection of more than 700 pieces recovered from underwater archaeological contexts in the Yucatan Peninsula and Veracruz. This museum, the first of its kind in the Americas, has been declared as representing 'Best Practice' by the Secretariat to the 2001 UNESCO Convention on the Protection of the Underwater Cultural Heritage. This was preceded by initiatives such as the Museum of Life (MUVI) and El Principal (on fortifications, navigation and trade), all in the city of San Francisco de Campeche (Barba-Meinecke 2018).

Acknowledgement

Four decades after its founding, we can only thank my dear friend and colleague archaeologist Pilar Luna Erreguerena (RIP), for having the vision to recognise the need to protect such important heritage, and for her support at all times during the development of those of us who have been part of her team for the past 20 years. To INAH for their financial support, as well as to the participants of the Vice-Directorate of Underwater Archaeology in the Yucatan Peninsula: Hist. Abiud pizá Chávez, Tec. Gabriel Quetz León and archaeologists Fernanda Ramírez Islas and Jesús Manuel Gallegos Flores. To the team of researchers led by PhD Javier Reyes Trujeue (CICORR, Autonomous University of Campeche)

1 The Sub-direction of Underwater Archaeology is a Mexican legal entity entrusted with the protection, conservation, research and dissemination of Mexico's cultural heritage.

2 The inner gulf that is part of the Gulf of Mexico borders the southwest coast of the Yucatan Peninsula. It includes part of the coast of the State of Veracruz to the west, the States of Tabasco and Campeche, and the western part of the State of Yucatan.

3 Governor and Captain General of Yucatan from 1526 to 1553.

4 Inventory and Diagnosis of Submerged Cultural Resources in the Gulf of Mexico, Special Programmes of the SAS, Inventory and Diagnosis of Submerged Cultural Resources in the Banco Chinchorro Biosphere Reserve, Quintana Roo and the Integral Project for the Protection, Conservation, Research and Dissemination of the Submerged Cultural Heritage of the Yucatan Peninsula.

5 The archaeological context CN-I, was placed chronologically in the 16th century thanks to the discovery of a bronze demi-culverin, an artillery piece considered until now to be the oldest of its kind located in the Western Hemisphere, along with other artefacts of everyday life and for the defence of the ship that carried them. Luna 1985a, pp. 59–71. With respect to the CN-II wreck, as of 2009 it was renamed as 'Carron', derived from the archaeological evidence found, which is related to the Carron Iron Foundry and Shipping Company artillery foundry in Falkirk, Scotland (18th century). Luna 2009, pp. 41–60.

6 The measurements (length and calibre) of six of the seven guns found resemble small English ship's guns from the second half of the 18th century and used 3, 6, 9 and up to 12lb cannon-shot.

7 The Battle of Mobile, between the Spanish empire and the Kingdom of Great Britain, 7th January 1781.

8 Teredo navalis is a marine mollusc which is commonly known as ship-worm.

9 Idem.

10 By applying the system of 3/7 with respect to its length (divided by 7), it is possible to determine if the trunnions are centred, besides helping to estimate the date and culture of production. This method is helpful to know the real size of a fragmented piece, as well as to locate the possible location of the trunnions in case they are lost or are concreted.

11 In the various wrecks identified around the Yucatan peninsula, it is common to find cannons in this position since they usually travelled mounted on gunwales and during the maritime accident, the weight of the cannon, greater than that of the piece of wood or even a gun-carriage, often caused this type of artefact to invert.

12 The possibilities are: Xebec with up to three masts with triangular sails; pinque, a single-masted vessel with a gaff sail; polacca or polacre, a two-masted ship with a brigantine rig (fully sqaure rigged foremast and aft mizzen mast which has a square rigged topsail and gaff mainsail); queche, a two-masted ketch (foremast taller than the mizzen mast); tartane, one or more masts and lateen sail; sloop, a single-masted vessel; fluyt, a two or three-masted merchant vessel; goleta a two or more masted rig schooner; paileboat a twin-masted schooner pilot boat.

13 Techniques: X-Ray Diffraction (XRD), X-Ray Fluorescence (XRF), Scanning Electron Microscopy (SEM) coupled to an Energy Dispersive X-Ray Spectrometer (EDX), Optical Microscopy (OM), Fourier Transform Infrared Spectroscopy (FTIR), Scanning Electron Microscopy (SEM), Ultraviolet Spectroscopy (UV), RAMAN Spectroscopy (NMR) and Colorimetry (COL). Dr Javier Reyes of (CICORR-UAC).

14 Archaeologist Laura Carrillo coordinated this project.

15 Madagascar: Beeler, John. 2006. Maritime Policing and the Pax Britannica: The Royals Navy Anti-Slavery Patrol in the Caribbean, 1828–1848. In: The Northern Mariner/Le marin du nord, Vol. XVI, No. 1, January 2006, pp. 1–20. Ottawa, Ontario, Canadá.

16 AGI: MP–México, 119. Map of part of the coast of Yucatan, whose capital Mérida, with small surrounding villages that were visited by its governor General Don Antonio de Cotayre, 1722.

17 These include projects by Samuel Lothrop 1924–1964 (Root et. al. 1952); Stephan F. de Borhegyi (Wendorf 1970); Robert Smith (Smith 1952); Wyllys Andrews 1956 and 1966 (Andrews 1962); Román Piña and William Folan 1967–1970 (Piña 2013 & Folan 1974); Ricardo Velázquez 1978 (Velázquez 1991); and Ernesto González Licón 1984–1986 (González 1984).

18 James Coke, Mike Madden, Parker Turner, Chuck Stevens, Steve Gerrard, Steve Ormeroid, Judy Ormeroid, Jeff Bozanic, Steve Boagart, Bill Phillips, Dennis Williams, Wes Skiles, Sheck Exley, Sergio Zambrano, Ángel Soto, and Germán Yáñez.

19 Christian Thomas, Gustavo Vela, Roberto Rojo, Germán Yáñez, Peter Sprouse and Michell Vázquez.

Alberto Nava, Roberto Chávez, David Mayor, Eugenio Aceves and Jerónimo Avilés.

20 Mike Madden, Germán Yáñez, Robie Schmittner, Curt Bower, Sam Meacham, Alejandro Álvarez, Fred Devos.

21 Sac Actun, Nohoch Nah Chich, Aktun Hu and Dos Ojos (Kambesis and Coke 2016).

22 Roberto Rojo, Gustavo Vela, Peter Sprouse, Michell Vázquez, James Coke, Christian Thomas, Germán Yáñez, Aida Ferreira, Mónica Torre and Osama Gobara.

23 Principle investigators Pilar Luna Erreguerna (INAH, Mexico) and Dr James Chatters.

24 Four species of sloth (Nothrotheriops shastensis, Paramylodon harlani, Noho-chichak xibalbahkan, Nohochichak, Fam. Megalonychidae tipo megaloníquido), two sabre-toothed tigers (Smilodon fatalis, Smilodon), gonphotherios (Cuvieronius tropicus), canids (Protocyon troglodytes), six species of bear (Arctotherium, Brutus, Arctotherium wingei, Tremarctos floridanus), puma (Puma concolor), lynx (Lynsrufus), feline (Leopardus), ocelot, coyote (Canislatrans), coati (Nasua, Nasuanarica), Mexican porcupine (Fam. Erethizontidae), skunk (Spilogale angustifrons), collared peccary (Pecari tajacu, Tayassupecari) (Luna et. al 2013; 2020), tapir (Tapirus bairdi, Tapirus sp.), two opossums (Didelphis tlacuaches), snake (Fam. Boidae) and fruit bat (Artibeus).

25 Beringia is the name given to the land bridge or plain (1,500 km2) that covered the eastern end of Siberia (Asia), western Alaska (America) and most of the current Bering Sea, which was formed in two periods during the last glaciation (Würm or Wisconsin 80000–10000 BP), due to the drop in ocean levels, with a temperate climate. Most of the 'bridge' was where the Bering Strait is today.

26 Ten other pre-ceramic human skeletons are known to exist, but their absolute dates have not yet been verified.

27 Also Loltún, Actun, Actun Ch'on and Tixkutun (Oxcutkab), Dzibichen (Tizimín), Actun Kahua (Tinum), Manitas (Homún), Chemax and Aktun Santuario (Tec 2016) in Yucatan; as well as in: Tancah, Xcaret (Andrews and Andrews 1975), Aktunkoot-La Rosita (Tec 2016), Punta Venado, Cueva del Danzante, Cueva de las Caritas (Martos 2002), Aktun Na Kan, Xelha, Ich Tun and the area of Yalahau (Rissolo 2001), among many others.

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THE ISSUES WITH LARGE METAL WRECKS FROM THE 20TH CENTURY

Martijn R. Manders, The Netherlands

Introduction

The management and protection of shipwrecks from the Second World War (WW2) is very complicated, not least because of the various values that different stakeholders attach to them. These WW2 shipwrecks contain military information, are often war graves, important to relatives as *lieux de mémoire*, and due to their often-high upstanding structures are also important as artificial reefs and their biodiversity. Shipwrecks, therefore have an emotional component, a commemorative value, and are important for nature and sometimes also a threat due to pollution from for example, leaking fuel oil. They also have valuable historical and archaeological information (intrinsic) that can help us reconstruct the past. However, this is not all: metal ships also have an economic value. Divers pay to get the chance to dive on these often-recognisable remnants of war, and fisherpersons know that significant quantities of fish can be caught near the wrecks. However, this income is insignificant in comparison to the money that can be made by the salvage of the precious metals relating to wrecks. Only with a proper understanding and consideration of the different values WW2 shipwrecks hold to different stakeholders, can new ways of managing these complex sites be developed. Only then can we develop ways that will be effective in the long run. Countries and different interest groups must work together on this.

Background

In the 1980s when underwater archaeology was still in its infancy, metal shipwrecks, especially those from the World Wars and after, were often of no interest to professional archaeologists. In fact, earlier, right after WW2 these wrecks seemed to be of no importance to anyone except contractors that needed to remove the wrecks from shipping lanes and harbour entrances. Quite a few salvage contracts were issued at that time, economies had to grow. Archaeologists and heritage managers, if they had any interest in maritime sites, focused on wooden shipwrecks from before 1800. However, when sports diving became fashionable it was the metal wrecks that instantly became popular because they were large, exposed, and full of sea life.

The approach towards shipwrecks from these more recent periods has now changed. Archaeologists today see the benefits of studying these 'young' sites because they provide additional information to the narratives we already know from historical sources. Shipwrecks are a source of objective information from a time in which contemporary documents are almost by definition not objective.

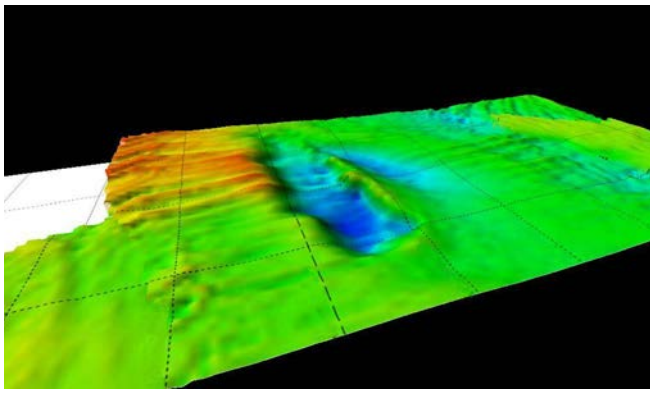

Fig. 1 A multibeam sonar image of the HNLMS Java shipwreck location that is clearly showing the hole in the seabed where once the ship was lying. © KDF/Royal Dutch Navy.

Different values

Although WW2 ended 75 years ago, there are still people alive that experienced the associated maritime disasters. Families are still dealing with the loss of (grand)parents, uncles, aunts, brothers and sisters, or other relatives that died on these ships. People consider the wrecks to be war graves. In some countries these wrecks therefore have an official protection status while in other countries they do not. In these places wrecks may be threatened by another value they contain: an economic value. Copper, lead, and steel salvaged from the seabed are worth millions. Salvage companies make use of that, destroying wrecks, and mining them on an industrial scale. By doing so, they take away the only hard substrate from the seabed which has an effect on the local biodiversity. They also take away the places for commemoration and/or diver enjoyment.

Keywords: Underwater Cultural Heritage Management – Metal Wrecks – Second World War – Salvage – Low-background Steel – War Graves – Lieu de Memoire

Dutch Second World War wrecks in the Java Sea

These different values played a major role in the joint Dutch-Indonesian investigation that followed after the report in November 2016 that three Dutch warships had disappeared from the bottom of the Java Sea (Figs. 1–3). Relatives of the ones that died on board HNLMS *De Ruyter*, HNLMS *Java*, and HNLMS *Kortenaer* reacted emotionally to the news. The media paid a lot of attention to this matter, making the subject even more politically focused than it already was. To understand what might have happened, scientists had to view, weigh, and evaluate the available data from third parties. During this process the question arose: what is important in the management and protection of these shipwrecks? How can we establish their value, and who determines that? These questions are relevant because they affect an eventual management plan that needed to be drawn up. Both the Netherlands (as a flag state) and Indonesia (as a coastal state) were involved in the assessment.

Different angles

To be effective, their management should be a cooperation and a shared responsibility between the two countries. It is therefore important to also consider friction points when it comes to decisions about management, in order to be able to overcome them. In this case an additional sensitivity was brought in due to the fact that the Netherlands is the former colonizer of Indonesia. This memory remains locally sensitive and did play a role in the background of the project. In other situations, it may be a troubled relationship due to the sides they took during the war, political situations they are in nowadays or other (local, national or global) ethical, cultural, or religious tensions. Recent heritage means that these may be associated with recent sensitivities as well. We therefore need to be inclusive and opt for multiple angles in research and appreciation. There is not just one history, there are multiple, and we can only learn from the ones we do not know. Different views on the same events or periods, especially in times of war, are essential for the real understanding of what has happened or how it could have happened. In the case of the Java Sea shipwrecks, both the Netherlands and Indonesia are learning a lot from each other and the way history is perceived.

Law enforcement

The fact that individual countries may have different opinions about what is considered heritage, or not and for different reasons, is widespread and not exclusively the case with the three Dutch wrecks in the Java Sea, but many other sites as well. In Asia, from the Philippines to Malaysia during the last couple of years, many wrecks have been salvaged for the value of their metal. Law enforcement is still very weak. In relation to the salvage of the three Dutch warships, the American battleship *Houston*, the Australian HMAS *Perth*, and British and Japanese ships, the Chinese salvage ship *Chaung Hong 68* was arrested. No other arrests have been made. The marine areas where the salvage takes place are enormous, making law enforcement difficult. The problem of salvage is not only an Asian problem. Also, in Europe illegal salvage operations have been noticed in the North Sea.

Money

The question asked is why are salvage companies so persistent in the salvage of these wrecks when they know there is a lot of emotion associated with the sites? The bare answer is: because of the money. Metal has become a precious commodity. We do not have an unlimited access to all metals anymore, and apart from steel contained within these wrecks, there is also bronze, copper, and lead in large quantities. With the development of new techniques to investigate the seabed, sites are being found more easily, and for less money than before. New salvage techniques have reduced the cost of recovering the materials, and equally important, in a shorter amount of time, so that the activities can stay under the radar of coastguard or police authorities.

Metal, particularly steel from shipwrecks, worldwide, that sank before the first nuclear bomb 'Trinity' exploded on the 16th of July 1945, has a high industrial value. This 'low-background steel' as it is referred to, contains many less radioisotopes than steel that was produced at a later date. After the 'Trinity' explosion and those of the two atomic bombs during WW2, the worldwide background radiation count increased. Therefore, during the smelting process of steel, the radioisotopes become embedded. The 'low-background steel' is, among other purposes, used in the manufacture of medical equipment and Geiger counters. This makes battleships and

Fig. 2 A pilot is deploying his remotely operated vehicle (ROV) at the wreck site of the Java. © Battle of the Java Sea Project.

cruisers with their thick protective steel plates very attractive targets for salvage companies. Besides the steel, there is often also other valuable metal present on these warships such as phosphor bronze (the propellers), brass, copper, lead, and high-grade aluminium (Allen 2017; Geertsma 2016; Miles 2017; Perez Alvaro 2013, 41–43). Wrecks are the new mines and they have become accessible.

Fig. 3 Ammunition found on the wreck site of HNLMS Java. © Battle of the Java Sea Project..

The legal status of warships

Warships are state vessels and enjoy sovereign immunity at all times. This is stated in the UN Convention on the Law of the Sea (UNCLOS).[1] This immunity remains in force even after sinking, as long as the ship is considered to be a state ship or a warship by the flag state.[2] Immunity of warships is a generally accepted principle in international law and is usually not disputed.[3] However, according to international law, the flag state and the coastal state must agree to all activities aimed at these wrecks, including conservation (Fink 2017, 4–5). Some shipwrecks are regarded as war graves. This is usually based on an 'emotional appeal'. However, it is possible to find international law in the UN Convention on the Law of the Sea (UNCLOS) that supports this. None of the Dutch ships that were lost during WW2 were claimed by the Netherlands to be war graves, while there are still many shipwrecks in Indonesian waters that probably still contain the remnants of Dutch sailors.[4] In many countries there is no regulation for war graves at sea, while on land it is common practice. Britain has protected more than thirty WW2 shipwrecks under the Protection of Military Remains Act 1986.[5] The protection of the Dutch WW2 shipwrecks therefore depends to a great extent on legislation made by the coastal state. The Netherlands can put a claim on ownership of a site, but this has to be accepted by the coastal state. If done, they can work together in the management of it. This is very much in line with what the UNESCO Convention of 2001 wants to achieve: cooperation in protection and management. The United Nation General Assembly resolution 71/257 (2017) paragraph 341 addresses the concerns of war graves being looted at sea, and the lead role of the coastal state in order to prevent this through the regulation of commercial exploitation and the activities of its citizens (see also Campbell 2016).

Management and protection of Second World War shipwrecks

As we have seen above, besides gaining of knowledge of or the commemoration of an event, the management of WW2 shipwrecks involves other specific issues such as human remains and repatriation, unexploded ordinance, and potential pollution by oil spill. Implementation of a management regime can be even more difficult due to regulated and unregulated visitors and wreck divers. This puts pressure on the sites (Emesiochel et al. 2017). The difficulties of managing these sites is a worldwide problem. Issues have occurred not only in Asia, but also in the North Sea in Europe, where the Netherlands and Great Britain have repeatedly failed to prevent shipwrecks from being illegally (partially) salvaged in the North Sea (Brockman 2018), and in South America where salvage has been conducted on the German WW2 battleship *Admiral Graf Spee,* in Uruguay.[6]

An example of a wreck that is under threat by too many dive visitors is the USAT *Liberty* in Bali. The opening up of the site to sports divers has been a big success in the past. Protected through customary law (called Awig-awig), the site has been a great touristic attraction for the island. However, in recent years the pressure on the site has been so great that the number of diver-visits needed to be reduced considerably in order to maintain the integrity of the site.

For a few years, heritage agencies have been frantically searching for better ways to protect sites underwater, or in cases where it went wrong, to be able to find those who damaged sites and bring them to justice. The methods used to protect half-buried wooden wrecks can often not be used for the large upstanding steel wrecks of the World Wars. It serves no purpose to cover them up. The solutions to protect them have to be found in legislation, policies, awareness raising, and better law enforcement. Especially with respect to law enforcement, big steps are being made. Monitoring at a distance with satellite systems is being trialled, as well as the use of acoustic listening devices. Also, materials to mark the wrecks underwater so that these can be tracked when removed from the seabed are also under development.

Conclusions

Metal wrecks from WW1 and WW2 are under heavy and persistent threat. Besides the relatively normal processes of deterioration, illegal salvage is putting a lot of pressure on

the resource. For most of the post-war period extending to more recent times, metal wrecks have not been highly valued as sites of cultural significance. However, this has changed. Wrecks from the World Wars are now being considered to have multiple values that go beyond their historical or archaeological value. This includes their commemorative significance as war graves or locations to reflect past events or their value for recreational sport divers and their value for biodiversity, all of which are now being taken into consideration. The pressure and threats related to these sites remain, however, and need to be addressed quickly before there are none left to protect. Protecting these vessels can only be done through international cooperation, national, and international law and law enforcement. New developments are being created in how to better facilitate law enforcement, but further legal developments and stakeholder cooperation are necessary to ensure these methods become effective.

1 Article 29 of UNCLOS 1982: http://www.un.org/depts/los/convention_agreements/texts/unclos/part2.htm Accessed 30th September 2020.

2 TK 2013–2014, nr. 996. Aanhangsel. Answer to question 2 and 3.

3 United Nation GA resolution 71/257 (2017) paragraph 314.

4 Archive Maritime Programme, RCE.

5 For definitions, see http://www.legislation.gov.uk/ukpga/1986/35/section/3; accessed 30th September 2020.

6 https://www.dw.com/en/salvage-team-prepares-to-raise-WW2-ship/a-1104786; accessed 30th September 2020.

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UNDERWATER CULTURAL HERITAGE AT RISK: PROBLEMS RELATED TO URBANIZATION

Hakan Öniz, Turkey

Introduction

A significant part of modern life has become increasingly entwined with the sea, but this greater connectivity has become a source of a wide variety of problems that are having a significant impact on it, including underwater cultural heritage (UCH). These problems influence both natural and cultural heritage in numerous ways, either directly or indirectly. These effects are more obvious in cities and their environs built on the shores of oceans, seas, lakes, and rivers. As coastal cities have evolved as important centres of social and cultural development over millennia, associated trade and commercial activity has increased in parallel. The result is that many more people are choosing them as places to live.[1] As a result of this population growth, expanding city infrastructure and associated industrialization has created factors that put more pressure on the ocean, lakes, and rivers.

As a consequence of these pressures described in this article, either consciously or unconsciously, numerous archaeological remains lying under coastal waters or on shores are now gone. It is widely recognised that the archaeological values hidden beneath the surface of seas, lakes, and streams are a rich source of information belonging to the past. The scientific value of this fragile resource should be protected and made accessible to the public, and where appropriate passed on to future generations.

Current situation regarding the protection of UCH

In this author's opinion we are, undoubtedly, in a much better place than ten years ago. Significant steps have been taken by both UNESCO[2] and ICOMOS.[3] In 1996, the ICOMOS Charter on the Protection and Management of the Underwater Cultural Heritage created a set of standards and guidance for the management and protection of UCH. This was followed by UNESCO's 2001 Convention on the Protection of the Underwater Cultural Heritage (2001 UNESCO Convention), currently ratified by 66 states. Other countries that have not yet ratified it for various reasons have created their own laws in compliance with the Convention; with some, such as the United Kingdom, committing to manage their UCH according to the Rules of the Annex of the 2001 UNESCO Convention.

The UniTwin[4] Network of Underwater Archaeology, established by UNESCO in 2012, is actively promoting inter-university collaboration between many universities around the world aimed at improving academic standards. There is also a growing awareness of the importance of protecting UCH among the recreational diving community. In particular, the participation of CMAS[5] (World Underwater Federation) with more than 100 member countries is encouraging sport divers to take unified steps in raising awareness, promoting preservation, and the value of UCH. Raising global awareness is also a way of reducing the illicit traffic of historical artefacts, treasure hunting, and looting. Despite the continuing progress there is a long way to go from discovering and documenting many underwater heritage sites, or from providing protective legal policies which aim at preventing illicit trade and promoting public awareness. This article illustrates the problems and suggests ways in how to mitigate them.

Direct impact of urbanization on coastal and underwater cultural heritage

As the number of people living on the coast has increased, they began to urbanise the shoreline and reclaim land from the sea which has led to significant changes in the coastal profiles of many places. The reasons for coastal and land reclamation are numerous and varied. They include improving and expanding settlements, industrialization, tourism, hotel and business complexes, park and beach recreation areas, coastal roads, piers, harbours, breakwaters, themed sea tourism areas, underwater hotels, artificial reef units, artificial islands, airports, international natural gas, oil, and water pipe lines, removal of waste materials from industrial areas and port dredging.

The worldwide attraction to living on the coast, stimulated by economic opportunity, has caused the value of coastal land in urban areas to rise significantly, and within this framework, land reclamation projects have increased around the world. These threats are confronting archaeologists, museums, and cultural heritage experts in many countries, within municipalities, and national public institutions. Unfortunately, in this struggle, the loser is often cultural heritage.

Keywords: Underwater – Heritage – Risks – Urbanization – Protection

Fig. 1 Fontvieille Stadium, Monaco: the difference in the country's coast line between 1955 and 2018 as a result of the infilling. Map data © 2020 Google – Image © 2020 TerraMetrics.

Such reclamation operations are frequently encountered not only today, but also in the past. For example, in the 5th and 6th centuries, the harbour breakwater in Antalya's Side Ancient City (Turkey) was infilled with the remains of a necropolis, sarcophagi, and grave steles[6] dating from earlier periods.

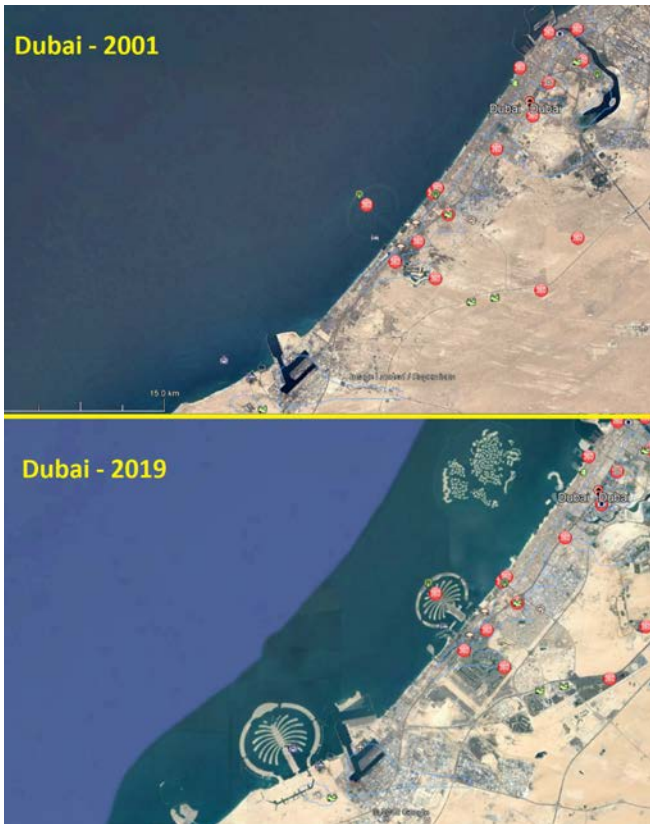

Fig. 2 Dubai UAE: the difference in the country's coast line between 2001 and 2019 as a result of the infilling. Map data 2001: Image LandSat / Copernicus © Google 2019: Image LandSat / Copernicus © Google Data SIO, NOAA, U.S. Navy, NGA, GEBCO.

This process was even bi-directional, with a necropolis being destroyed, and with potential shipwreck sites being covered by the displaced material (Öniz and Stefanile 2016, 117; Öniz 2017, 83).

Similar examples, most of which are port and dock infillings, have been observed in Istanbul throughout history, such as in the Sea of Marmara including the ports of Iulianus and Theodosius (Sodini 2011, 17–18). The port of Iulianus was probably built by Emperor Flavius Claudius Iulianus between the years of AD 361–363, and the Port of Theodosius was possibly built by Emperor Flavius Theodosius (AD 347–395) between the years of AD 379–395. Also, in Istanbul, a section of the Beşiktas coastline was infilled with the aim of making docks for Ottoman warships in the 16th century (Öniz 2014a, 63). While the Istanbul-Dolmabahçe Palace of the Ottoman Empire was a military port during the Roman period (27 BC–AD 476), Eastern Roman period (330–1453 BC) and Ottoman period (AD 1300–1900), it was built on an area that was subsequently infilled. Undoubtedly, such actions are ongoing operations in many coastal cities worldwide. It is possible, through Google Earth, to quantify the amount of coastal reclamation that has occurred over the last 20–30 years. As an example, on the shores of Monaco in the 1990s, an area of about 500,000 m^2 was infilled for the construction of Fontvieille Stadium, its surrounding marina, and living quarters (Fig. 1).

The artificial islands built in Dubai are another example (Fig. 2). Subsequent to building Kansai Airport in 1994 on land reclaimed from the Gulf of Osaka, Japan, at least 10 airports worldwide including Nagasaki (Japan), Rize-Artvin (Turkey)

and Dalian (China) (Fig. 3), were built in a similar way. It is unknown how many cultural sites have been lost beneath these constructions.

Submerged archaeological settlements are seen in many places around the world. The ancient settlements of Baia in Italy, Butrint in Albania, and in Turkey, Aperlai (Fig. 4), Simena, Dolikeste and Teimussa around Kekova Island of western Antalya in Turkey, are but a few examples. These and similar settlements were generally submerged as a result of earthquakes (Fouache et al. 1999, 305; Özdoğan 2011, 22). The famous lighthouse of Alexandria, dating to the 3rd century BC, was also submerged by earthquakes in the 4th and 14th centuries (Khalil 2004, 51). Many of these examples — due to the clarity of the water — can be detected by aerial photography and underwater surveys.

However, the remains of UCH required to be protected are undoubtedly not limited to these sites and include sites from the Neolithic, Chalcolithic, and sometimes Bronze Age settlements (about 10,000–3,000 years ago). The first Neolithic settlements established on the shores of, for example, the Mediterranean and the Black Sea, are now submerged because of subsequent rising sea-levels. It is thought that the first Neolithic settlements near the coast of the Sea of Marmara were inundated in 8000–5500 BC (Özdoğan 2010, 40). Neolithic and Bronze Age remains found on the island of Avşa in the sea of Marmara (Fig. 5) (Günsenin 1996, 361–362), in the Dardanelles, and Selimpaşa in Istanbul (Aydıngün et al. 2014, 21) can be given as examples of infilling to approximately 8000–1200 BC.

Research on the submerged late Neolithic-Chalcolithic (5600–3000 BC) necropolis at Cape Shabla on the north-eastern coast of Bulgaria in the Black Sea reveals a difference of minus 7 metres compared to today's water level (Peev, 2008, 303). In studies conducted on the Black Sea coast of Bulgaria, 10 settlements from the Late Neolithic Period and 29 settlements from the Bronze Age were found underwater (Stanimirov 2003, 2). There are also similar examples on the Carmel coast of Israel in the Eastern Mediterranean (Galili et al. 1993, 134–136). These settlements are extremely hard to recognize through aerial photography. They cannot be easily recognised by divers neither because of their irregular constructions.

Therefore, comprehensive investigations by expert underwater archaeologists are essential prior to any infilling and associated construction work on the ocean shores, seas, lakes and rivers. In addition, awareness to this issue should be created by public institutions, universities, and non-governmental organizations. Laws and regulations should be renewed to prevent ancient sites from being covered without first being investigated by archaeologists.

Fig. 3 Dalian (difference between 2010 and 2019) – Map data 2010: Image LandSat / Copernicus © Google 2019: Image © 2019 Maxar Technologies.

Fig. 4 Aerial Photo of Aperlai – Kekova Region/Antalya-Turkey. Drone Photo: Gunay Dönmez © Hakan Öniz.

Indirect effects of urbanization: problems caused directly by the hands of urban people: scuba diving

Since self-contained underwater breathing apparatus (SCUBA) was invented in the 1940s, the equipment has undergone rapid expansion throughout the world, particularly over the last 25 years. Owing to the general rise in society's purchasing power combined with the advantages of mass production, there has been a relative decline in the associated cost, which has brought about an increase in the number of divers worldwide. Together with other factors, the increasing number of divers and the spread of dive tourism have created pressure on UCH.

Thousands of sunken ships, artefacts, and settlements that remained unseen until the 1960s began to be visited by divers. A diver's natural curiosity can easily lead to an artefact being taken as a souvenir, broken, or disturbed, an apparent innocent act that can destroy the archaeological information related to it. As contact between divers and cultural remains increases, the likelihood of harm increases. The most significant concern is that the vast majority of divers do not understand the concept of non-intrusion, which helps protect the scientific integrity of UCH. Even today, a small number of people believe that archaeological shipwrecks are similar to pirate shipwrecks projected in Hollywood productions.[7] However, it is unlikely to find skulls, sail cloths, or 'traces of pirates running on board' in archaeological shipwrecks. The reality is that, in most cases, the wooden hull and organic remains of a ship have been wholly or partially destroyed or covered with layers of vegetation, sand, and rock or reef formations. In cases where the remains of ships are found exposed on the seabed, they are at risk of being erased from the submerged historic landscape by divers looting anything that appears of value.

Another point to focus on is the risk posed by recreational diving organizations working with financial objectives. Unfortunately, various training programmes around the world encourage diving on shipwrecks and archaeological sites by creating a sense of wonder, not 'preservation'. Commercial touristic diving centres also utilize 'archaeological' dives as a significant factor in promoting a greater diversity of underwater adventures. However, the risks to archaeological sites lying in the waters are often ignored. The vast majorities of those who plan these programmes and give the training are divers, not archaeologists or cultural heritage experts. Therefore, such programmes pose an additional risk to UCH that has been preserved for thousands of years without being disturbed by human interference. It is therefore right that divers should focus, not on archaeological dives that might pose risks, but on the reporting of artefacts that they might encounter underwater.

A very small number of UCH sites have been investigated worldwide, owing to the scarcity of scientific research teams and the relative limited availability of resources and funds. Given that 70% of the world is covered by water, the examination and protection phase in this extensive area is still in its infancy. Therefore, sport divers who see shipwrecks or the remains of settlements, or historical artefacts they encounter in the depths of the sea, lakes, and rivers are likely to be the first people to do so. Today, it is more widely recognised that the interest in the underwater world generated by hundreds of thousands of divers, can be turned into a scientific advantage. Through various programmes, it is difficult, but not impossible for all divers to be trained to preserve UCH rather than disturb it. The Turkish Underwater Federation has already trained about 400 CMAS diving instructors in the framework of a special programme. This and similar programmes raise awareness regarding the preservation of UCH in popular dive spots. With greater awareness among divers, the greater the chance that information acquired will be passed on to underwater archaeologists who will have the opportunity to record the sites. Moreover, dive training programmes should take responsibility for encouraging the preservation of UCH under the direction of trained archaeologists with the aim of transferring information to the scientific world.

Fig. 5 Bronze Age Ceramic Grave from Avsa Island (Marmara Sea - Turkey) sunken Necropolis. © Günay Dönmez.

Indirect effects of urbanization: fishing

Much of our food requirements come from the sea, lakes, and rivers. To that end, both traditional fishing methods and marine fish-farms pose indirect risks to UCH. Fishing methods such as beam trawling, that scours the seabed, increases pressure on UCH. Some countries fish with explosives. Such methods lead to hard-to-trace harm to cultural remains. Raising awareness and cooperation among beam trawling fisherpersons would be a significant step in preserving submerged cultural heritage. Legal regulations are needed to mark areas where cultural artefacts are regularly caught in fishing

nets, and to restrict or even ban fishing in these areas, until scientific survey studies have been carried-out. Fishing with explosives should be completely forbidden due to the risk it poses to submerged heritage and the indiscriminate damage caused to the marine environment.

Fish-farms are set up at sea as well as on land with the construction of private industrial pools; a practice dating back to the Roman period. Thousands of kilograms of concrete are used to anchor fish-farm systems that can damage cultural heritage beneath them. Fish-feeding systems can also bring about changes in seafloor flora and fauna and can also result in damage to archaeologically sensitive areas. Therefore, the locations where fish-farms are planned should also be first examined by archaeologists to ensure there is no cultural heritage at risk.

Indirect effects of urbanization: anchoring

The most significant elements that enhance coastal cities are the ports, with most cities growing in the same environment for hundreds, even thousands of years. Today's ships, some hundreds of metres in length, anchor in the same places and use the same areas in the Eastern Mediterranean as more modestly-sized ships used to do in the past (Öniz 2010, 147). During underwater research along the coast of Antalya between 2000 and 2020, many examples were recorded (Öniz 2019a, 3; Öniz 2014b, 13; Öniz 2012, 111). There is no doubt that in the past thousands of storms caused some of these ships to sink in ports, anchorages, or the navigable approaches to them. Today, some modern anchorages are placed directly above these shipwrecks. It is also impossible to accuse a ship's captain of damaging UCH if there isn't a widespread warning system that alerts the captain of the presence of an archaeological site. Archaeological examinations of such places should be undertaken, and important places or shipwrecks that are found should lead to either the prohibition of anchoring or their relocation. Alternatively, the method of anchoring should be switched to fixed mooring anchors and buoyage systems. The location of these mooring anchors can be decided with the assistance of underwater archaeologists. The same applies to privately-owned charter sail and tourism motor cruisers that use safe anchorages. It is entirely possible that every anchor thrown today might be thrown on top of a ship that sank in antiquity. Such areas also need to be investigated by archaeologists and archaeologically sensitive areas protected.

Indirect effects of urbanization: marine accidents and war

Repetitive winds and currents in oceans, seas, and lakes have often endangered ships in the same places for the same seasons. In any region, the incidence of a ship drifting or being forced into shallow coastal waters and sinking by crashing into shoreline reefs or rocks may have been repeated more than once on separate occasions (Öniz 2019b, 179; Bass 1967, 177; Bass 1961, 267). Shallow sea areas, especially those located away from the coastal zone are often invisible from the surface, which might have led to the sinking of many ships in the past.

This situation damages submerged heritage, as well. For example, a freighter that sank in shallow waters off the coast of Mersin Silifke on the coast of Mediterranean Turkey about 25 years ago covered two shipwrecks that had sunk about 2,000 years before, thereby endangering artefacts. Ships deliberately sunk for the purpose of increasing dive tourism can also be regarded in the same context. Disused modern objects such as ships, tanks, aircraft, which are sunk in tourist regions, in order to generate artificial reefs and create a variety of diving may also have the same negative impact.

War damages coastal and UCH just as likely as it damages terrestrial buildings and port structures. The port of Piraeus, which has been connecting Athens with the world for 2,500 years, was bombed in both the First and Second World War, resulting in the destruction of many unrecorded objects of cultural heritage. Non-inhabited islands are used as targets in military exercises where live ordnance is used. It should not be forgotten that valuable cultural heritage can be found around these islands as well (Cherry and Leppard 2015, 10; O'Connor et al. 2018).

Indirect effects of urbanization: dredging

The effects created by humans are undoubtedly varied. There might be other threats to UCH that may occur in the future that we are not aware of today. It should not be forgotten that the construction of dams across rivers have created new artificial lakes where many types of archaeological remains including entire habitations have been inundated. The extraction of marine aggregates from seas, lakes, and rivers is also another direct impact on UCH. Marine aggregates are used globally in the construction industry for concrete, and also used as industrial material, and as a moulding material for metal casting. Operators of dredgers are often unaware of archaeological objects or sites when they are taking aggregates from the marine environment. It is therefore necessary that these areas are first investigated by archaeologists to ensure that proposed dredging areas are not archaeologically sensitive. Where it is suspected that there are archaeological sites, dredging should be prohibited and moved to 'safe' areas. Without this preventive measure it is unrealistic to expect dredging operators to be always aware and alert to the possible presence of UCH in a designated dredging area.

We can also add the effects of heated seawater in the vicinity of outfalls emitted from thermal or nuclear power plants: a

one-degree increase in water temperature can damage cultural objects, especially if the water has a chemical pollutant which can exacerbate corrosive reactions. Polluted waste water from houses and factories can also increase seawater acidity and affect cultural objects, both considered as important impacts of Climate Change. Species such as *Teredo navalis* and *Limnoria,* which are harmful to wooden shipwrecks prefer to live in warm waters, so as ocean temperatures increase the deterioration process will potentially be accelerated.[8]

Conclusions

As the result of expanding city infrastructure and associated industrialization, many direct and indirect factors are increasing pressure on UCH. While UCH sites hidden in oceans, seas, rivers, and lakes may seem unimportant to politicians, government officers, the general public and academics, it is clear that UCH sites have witnessed the existence and interactions of many known and unknown cultures. Unless greater measures are taken it seems likely that many countries of the world will lose even more non-renewable cultural heritage with their important hidden knowledge.

Improved legal and technical methods, and raised public awareness of the importance of UCH are all necessary to protect and preserve it for present scientific studies and for future generations to enjoy.

All underwater remains of human history should be both protected and studied by expert archaeologists. In order to take these steps, individuals, non-governmental organizations, local governments, and states need to take stronger measures. Comprehensive scientific studies that may be implemented should be performed by universities in collaboration with museums. The framework to promote these steps is available within the UNESCO Convention and ICOMOS Charter.

1 Nearly 2.4 billion people (about 40 per cent of the world's population) live within 100 km (60 miles) of the coast because of the socioeconomic advantages related to navigation, tourism, recreation and fisheries. More than 600 million people of them (around 10 per cent of the world's population) live in coastal areas that are less than 10 meters above sea level' https://www.un.org/sustainabledevelopment/wp-content/uploads/2017/05/Ocean-fact-sheet-package.pdf; accessed 30th September 2020.

2 United Nations Education and Science Organisation.

3 International Council on Monuments and Sites.

4 University Twinning and Networking: website http//: underwaterarchaeology.net/;accessed 30th September 2020.

5 CMAS is an Accredited Observer of UNESCO's UniTwin Underwater Archaeology Network

6 A stele, (=Stela, plural stelae) is a free-standing stone or wooden slab, generally taller than it is wide, erected for funerary or commemorative purposes, territorial markers, and to commemorate military victories. They were a common, though independent, cultural manifestation in all the ancient civilizations of the World. https://www.newworldencyclopedia.org/entry/Stele; accessed 30th September 2020.

7 One of the examples of this subject is Pirates of the Caribbean which is a series of fantasy swashbuckler films produced by Jerry Bruckheimer and based on Walt Disney's theme park attraction of the same name. (Wikipedia: 30th September 2020).

8 The last 3 three risks described above are taken from the Hiranur Gültekin's presentation – SOMA 2019 Koper with her kind permission.

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THE MARY ROSE: EXCAVATION, SALVAGE, AND DISPLAY. IS THIS A SOLUTION FOR PRESERVING THE UNDERWATER CULTURAL HERITAGE?

Christopher Dobbs, United Kingdom

Fig. 1 Mary Rose on the seabed during the excavation, viewed from the stern. Only 3 of the 20 airlifts are illustrated and just some of the divers' support grid. Drawing: Jon Adams.

Introduction

The excavation and raising of the *Mary Rose* were seminal events in the development of maritime archaeology both in the United Kingdom (UK) and internationally. In terms of the number of dives to the site and the number of artefacts recovered, it remains the largest underwater archaeological excavation ever undertaken even 40 years later. Of equal importance is that because the ship and collection have been on display since 1983, the results of this archaeological work have now been seen by over 10 million people at the museum in Portsmouth. It is our duty as archaeologists to give people access to our work, not only through publication but also through whatever formats are available or become available in the future. Hence the collection is interpreted in the new museum in a way that is designed to appeal to the widest spectrum of visitors.

But, is it correct or advisable to raise shipwrecks from the bottom of the sea rather than to leave them *in situ*? This is a debate that will continue, but this chapter outlines some of the modern story of the *Mary Rose* to give some background to the decision philosophy and the results, and to give an insight into why this very expensive and drastic ultimate solution was appropriate in this instance. The paper will also introduce readers to some of the access initiatives at the museum and outline how the displays are arranged to reflect the archaeology of the wreck site.

Background: ancient and modern

King Henry VIII ordered the building of the *Mary Rose* in January 1510 not long after he had come to the throne. The first recorded voyage was in 1511 and although she was laid up for some periods during her lifetime, she served Henry very well for 34 years before she finally capsized and sank on 19th July 1545. Apart from a brief period in the 1830s when early pioneer divers rediscovered the ship, she was left alone until 1965 when an English historian called Alexander McKee started a search for ancient ships in this area of the coast (McKee 1982). The first timbers were revealed from beneath the seabed in 1971. Between then and 1978, excavations around the hull showed how much of the ship had survived under the protective mud. After the 1978 diving season, two important meetings were held to discuss the future of the project. One was attended by archaeologists, ship historians, naval architects and museologists to discuss whether the hull should be excavated. The other meeting, with salvage consultants and contractors, structural engineers and naval architects discussed whether it could be raised (Rule 1983, 72). As the answers from the experts to both of these ques-

Keywords: Protection – Excavation – Salvage – Interpretation – Significance – Public Access

tions was 'yes', a charitable foundation called the Mary Rose Trust was formed in January 1979 with the following aims: 'to find, record, excavate, raise, bring ashore, publish, report on, preserve, and display for all time in Portsmouth the *Mary Rose*; all for the education and benefit of the nation'. Over the next 40 years, the Mary Rose Trust has been achieving these aims, the most recent being to finish the active conservation process and to build a permanent museum in which to display the *Mary Rose* for all time.

Fig. 2 The raising of the Mary Rose on 11th October 1982. © C. Dobbs and Mary Rose Trust.

Between 1979 and 1982, the main excavation of the *Mary Rose* was carried out. Up to 50 divers each day worked in shifts on the underwater site, mostly volunteer avocational divers, supervised by professional diving archaeologists and with a small number of paid divers in roles such as Safety Officers and Chief Divers. By the end of the project, over 500 divers had helped with the excavation and contributed enormously to raising the skills base in the UK. A total of 28,000 dives were carried out in this period totalling over 23,000 hours work on the seabed (Rule 1983, 220). Many new techniques were perfected (Fig. 1) and the excavation was also very important for raising public awareness of maritime archaeology and for changing attitudes to the UCH, making people realise that it should be preserved for everybody rather than salvaged for profit for the benefit of a few.

The story of the discovery, excavation, and raising of the *Mary Rose* during the 1970s and 1980s has been well documented, from McKee's accounts of the early years (McKee 1982), Rule's account of the excavations (Rule 1983), and the five-volume publication outlining the five major areas of the project. These are: 1. The loss and recovery (Marsden 2003); 2. The ship (Marsden 2009); 3. The armaments (Hildred 2011); 4. The artefacts and human remains (Gardiner 2005); and 5. The conservation programme (Jones 2003).

To raise or not to raise and the concept of significance

The significance of the decision to raise the *Mary Rose* only after considering the results of the two meetings outlined above cannot be over emphasised. It demonstrates the very responsible nature of the early Mary Rose pioneers and trustees who were keen to ensure that best practice was employed in the excavation and management of the Mary Rose project, years before all the current codes, rules, and conventions were implemented. Since the 1980s, a number of countries have wanted to raise ships in their territorial waters but often the question asked seems to be 'can we do it?' rather than 'should we do it?' Apart from the obvious requirements for substantial resources including finance and trained personnel for both excavation and conservation, a major consideration should be whether the ship in question is the most important example of UCH that will be found in that country in the next 50 years. This raises the question of assessing significance.

To take the example of the *Mary Rose,* a major exercise assessing the significance of the project had to be completed before raising the funds for the £35 million project to finish the conservation of the ship and build a permanent museum. It had to be demonstrated that the ship and collection were of such importance that it should attract funds not only from the Heritage Lottery Fund[1] but also from many other charitable trusts, commercial sponsors, generous donors, and the general public. The basis of this was a presentation to a panel of experts in June 2007 followed by the significance document (Dobbs and Kentley 2007). This outlined how the project had 'layer upon layer of multiple significances'. The significance of the *Mary Rose* comes from her importance in so many different areas. Historically, she dates from a period of history that is pivotal in the development of England and her relationship with the rest of the world. She was Henry VIII's favourite ship serving him for 34 years of his 38-year reign and personally ordered by him and owned by him. She was the 'Key Ship of a Key King'. In terms of naval architecture, she is an outstanding surviving example from a period before detailed ships plans are available. This means that almost everything we discover about the hull is new information that has joined the corpus of material available from ancient ships found around the world. For archaeology the project has been a turning point and inspiration for maritime archaeologists over the world, demonstrating to sceptical academics that the techniques of archaeology can be applied just as well on the seabed as they can on land. For UCH in general, the Mary Rose project, including the dramatic salvage of the ship watched by over 60 million people worldwide, raised awareness amongst the general public of the value of the UCH. It helped with the movement to change the attitudes of many divers from a culture of 'finders' keepers' to a culture of 'look but don't touch'.

But raising an ancient shipwreck is not a decision or task to be undertaken lightly. The raising of the *Mary Rose* took an extraordinary combination of archaeology, engineering, design, fundraising, and above all 'the courage to fail'.

The raising of the *Mary Rose*

Just as the Mary Rose excavation pioneered new techniques for archaeology underwater, so too did the raising of the hull pioneer new techniques and ambitions for the salvage of ancient vessels. One particular problem was that only half the hull had survived, so that the ship itself had little structural strength even though most of the timbers were still extremely solid. This meant that the classic salvage method of lifting a hull on strops positioned under the hull could not be used. Instead, the lift was done by clamping the hull with 170 bolts and wiring 67 of these up to a lifting frame. The raising was done in 3 phases. Firstly, a series of jacks were used for an initial lift of a few centimetres; then the hull was transferred underwater, suspended from a lifting frame into a cradle that had been built to the shape of the hull as surveyed by the dive team prior to 1982. Finally, the whole package was lifted into air (Fig. 2), and the cradle placed on a barge for towing back into Portsmouth (Dobbs 1995).

It is interesting to compare the approaches used by major projects of maritime archaeology over the last 50 years. Whilst the *Vasa*[2] was salvaged complete with her contents using more traditional techniques and then excavated ashore (Cederlund 2006), the *Mary Rose* was excavated underwater *in situ* and then raised when empty, and placed in the museum. In contrast, the Red Bay vessel *San Juan*[3] in Canada was excavated, dismantled underwater, recorded in great detail, and then reburied back on the excavation site (Grenier et al 2007, Vol I). The Yorktown wreck in the USA was excavated in a coffer dam underwater and then left *in situ*. (Broadwater 1992) Other ships have been taken apart underwater and then reassembled ashore. The *La Belle*[4] in Texas USA, had a coffer dam built around her that was then drained so that the excavation could be done dry (Bruseth and Turner 2005). The hull was then dismantled, conserved ashore, reassembled and is now on display in Austin, Texas. Another recent method that has been tried is enclosing an entire vessel and surrounding silts in a box and then raising with all the contents. This was done for the Nan Hai I ship[5] near Yangjiang, China and the entire assemblage was drawn up the beach and straight into a vast pool in a newly built museum (Fig. 3). The final side of the pool and museum were completed after the vessel had been placed there and the pool was filled with water so that the ship was submerged but indoors and in a controlled environment, complete with its surrounding silts. The author had hoped that the wreck would be excavated underwater in these controlled conditions and there was a plan to do this at one stage but in the end the Chinese authorities decided to drain the tank for the excavations to be carried out dry.

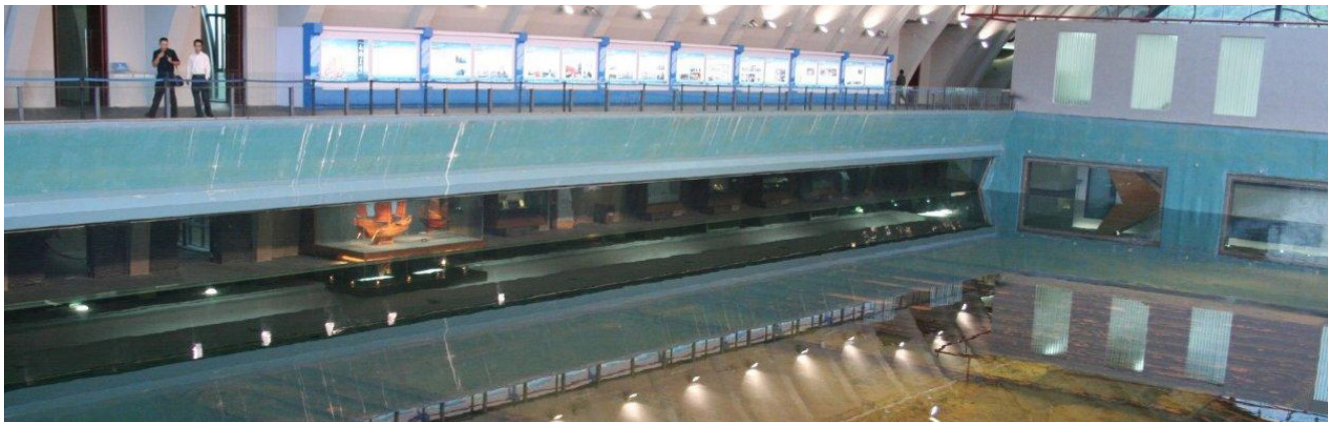

Fig. 3 The Nan Hai I vessel, pictured in the museum pool before it was drained for each excavation season. © C. Dobbs.

I believe that the next great advance in maritime archaeological excavation will be the first project that succeeds in raising a shipwreck intact with all its silts. This could result in an excavation to even higher standards as there need not be the time constraints experienced by the earlier projects. That method was not available to the *Mary Rose* as it requires all the technology, expertise, and significant funding to be available at the start of the project, and maritime archaeology was at its infancy at the time the *Mary Rose* was discovered and excavated. Although the Chinese did not use that method for Nan Hai it is encouraging that projects such as the VOC's *Amsterdam* and HMS *London* are considering this method. It will be fascinating to see if either of them, or other projects around the world, are ever able to raise the funds and resources required for such a project, when the world recovers from the Covid-19 crisis. It is vital that these and future projects learn from the Mary Rose experience and improve the methodology even further, just as the *Mary Rose* benefited from the earlier excavation of the *Vasa* in Stockholm, Sweden.

A new museum

The first museum for the *Mary Rose* housed the hull in a separate building to the collection and welcomed 8 million visitors between 1983 and 2012. The new museum welcomed over 2 million more visitors before the temporary shutdown in March

2020 due to Covid-19. This means that a total of over 10 million visitors have seen the results of the archaeological excavation. At last the *Mary Rose* can now be viewed without the previous obstacles of the piping systems and mist from the 30-year spraying phase of the conservation programme or the large air ducts from the intensive drying programme. This brief chapter can only summarise the current methods we are using to help the objects, the people, and the ship come to life. They show how we approach that final, essential part of the archaeological process — 'disseminating the results' of the work — by displaying the ship and her contents to the widest possible audience. The new museum hopes not just to educate and inform visitors about the UCH but to immerse them in it.

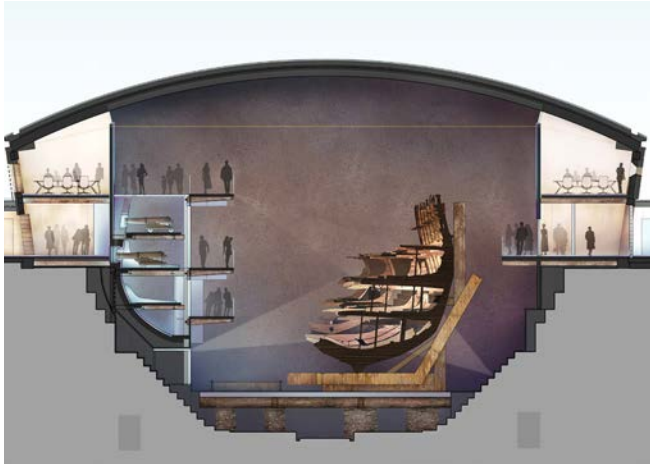

Fig. 4 A vital part of the concept of the Mary Rose Museum is that thousands of objects are displayed on a mirror image, exactly opposite where they were in the ship when she sank. © Perkins + Will and Mary Rose Trust.

Context

Archaeology is about context. Part of our philosophy of authenticity involves using the context in which the artefacts were found. One example of this is how the context of the personal objects — such as those found in chests — is used to inform the stories. During the excavation a number of chests were discovered intact and with their lids closed — representing the possessions of a single individual. These unique groups of objects, together with other items found very close to each other and sometimes with human remains nearby, have enabled us to create a picture of individual lives of members of the crew. These include the master carpenter, the master gunner, the surgeon, the cook, the purser, and individual gentlemen, officers and archers. These 'character cases' enable visitors to empathise with individuals from 500 years ago. Their possessions are displayed in the context in which they were found — the chests that they were in when the ship sank.

Another way in which we apply context is to use the three largest galleries in the museum to display objects opposite where they were found. This was one of the main concepts for the museum (Fig. 4) whereby the hull is displayed on one side of the museum, whilst galleries on three levels display thousands of objects opposite the area where they were located on board. These displays are only possible because the locations of all the objects were well recorded by the divers and archaeologists underwater. It is an example of how archaeology is at the core of the museum but without being over-explained or over-stated. Another example is in the relationships between the objects displayed on each level of the museum in the end galleries. Those on the lowest floor represent the people and functions of the lower deck: the cook and the purser, storage, provisioning, and cooking. Those on the ground floor represent the people and functions of the main deck: the guns and gun furniture on board and displays about the Surgeon, the Master Carpenter, and the Master Gunner as they either had cabins on that deck or chests containing their possessions. Finally, on the top floor there is the 'Men of the Upper Decks' gallery, reflecting the gentlemen and officers of higher status whose accommodation would have been high up on the castle decks of the ship. Other stories related to this high vantage point in the ship are those of the archers with their longbows and arrows, as well as the hand-weapons used by soldiers at their action stations. The fine pewter garnish (dining set) of Sir George Carew the vice admiral who died on board and the high-status musical instruments of his musicians are also displayed at the top level. This reflects both the geographical distribution of the artefacts as well as the level in society of their owners.

Finally, the floor-to-ceiling glass allows visitors to look back at the ship from all nine of the major galleries (Fig. 5) so that there is a constant reminder of the context in which all these objects were found, and from which they were carefully excavated and recovered.

Public access

Giving access to the results of excavations is a core part of what we do as archaeologists. Much has been said in the past about the importance of archaeological publication, and that duty is drilled into us during our academic or avocational training. But how wide an audience does traditional publication reach? Our obligation should also be to make the results of our work accessible to the widest possible audience, and museums should play a key role in this dissemination. In the past, access policies in museums concentrated on the needs of those with more obvious physical disabilities. But access policies in the 21st century should encompass a whole spectrum of special needs and not just those caused by barriers of mobility, sight, hearing, and language. They should broaden out to be more inclusive towards a wider variety of intellectual abilities and the varied learning styles of visitors.

Four accepted learning styles are Visual, Auditory, Reading/Writing preference, and Kinaesthetic. Whilst 20th century museums traditionally coped with the Visual and Read/Write learners, for a 21st century museum to be relevant it should cater for all learning styles, and hence reach a wider audience. So yes, we use the objects themselves with text captions and panels, but we also use audio and video displays, games, interactives, workstations, and hands-on activities and demonstrations. Targeting different senses is another way of broadening access for different learning styles and hence appeal to new audiences. Sight, hearing, and touch are obvious senses to reach but smell is also a very powerful sense for evoking memories and experiences. One very popular exhibit particularly provided for people to smell is a chunk of the anchor cable that was discovered on the wreck that still has a distinct and powerful smell of tar and hemp. It is a genuine smell from 500 years ago not adjusted by any conservation treatment. The idea that smells can survive from the past as well as the physical objects is quite astounding for many visitors. Other evocative smells experienced by the excavation team included menthol discovered in one of the surgeon's jars and tallow candles found in the hold of the ship close to the lanterns that used them. The divers even complained about the very smelly remains around the pork bones as it stayed on their wetsuits for days after they had been excavating them in the storage area near to the ship's galley. A more unusual sense to target is balance. A great deal of effort was taken to replicate the sheer (slope) of the main deck in the flooring opposite that level in the ship. This was to ensure that visitors were level with the deck and able to receive an experience close to walking on the deck of the Tudor warship, but it also affects visitors subconsciously so they feel they are in a different environment. Many visitors will not notice the slope at all, but a few visitors have asked how we get the floor to move beneath them. The answer is that we do not — but if that is their perception, then the whole concept would appear to be working. So, an atmosphere of low light is combined with subtle background ambient sounds of what might be heard on a sailing warship; headspace is reduced on the lower decks to hint at claustrophobia whilst the slope on the floor at main deck level heightens visitors' awareness of a different environment even if they do not realise what it is. Two people out of over two million visitors have reported feeling seasick in the main deck gallery. Whilst that is not a condition that you would wish on any visitor, perhaps if one-in-a-million visitors feels seasick, then the targeting of different senses at a subtle level will be working successfully on many other visitors.

Particularly rewarding access initiatives are those that are originally designed for one group but we then find are used by a variety of audiences who we had not predicted in advance. An example is our large print texts. In each gallery there is a complete written set of the text and illustrations for that gallery, situated at a bench in a better-lit area with a magazine rack that holds the simple A4 booklets. The large texts were originally designed for those who find that the size of text that can be used in the captions and panels is too uncomfortable to read. However, these booklets are used even more frequently by visitors who simply get tired and, as they find rest on the convenient benches, come across the texts and realise they can read the information sitting down. But this is not the same as sitting at home and reading it as they still have the museum atmosphere and they can go over to any display that intrigues them and that they have just read about. Portable fold-up seats have also proved popular for a wide range of visitors who want to sit down closer to the showcases to read the captions or gaze at the objects for a longer period.

Fig. 5 The new museum first opened in 2013 but the final format displaying the Mary Rose unencumbered by the spray system pipework of the conservation programme, opened in 2016. © Hufton + Crow and Mary Rose Trust.

One final aspect of access worth considering is to recognise that visits for those with limiting abilities should not necessarily be identical to those who do not have special needs. But the visit should be comparable in terms of giving visitors an experience or getting a special feeling. We have mentioned above that there are a number of learning styles. Visitors also come with different prior knowledge, different pre-conceptions and different interests. As long as it is possible for all the different visitor types to leave having felt something rather than just having learnt something — having empathised with a Tudor sailor from 500 years ago rather than just having looked at some objects, then our vision will have been fulfilled.

Discussion / conclusions

The Mary Rose project can certainly be considered as an outstanding example of public archaeology, making our shared heritage available to the widest possible audience. However,

the cost of following this particular model of preserving and presenting the UCH for the public is so great that it can only be followed for the most significant examples of heritage that come to light in any region or country.

The entire cost of the excavation and salvage of the *Mary Rose* up until when the hull was brought ashore in October 1982 was £2.3 million (Mary Rose Annual Report and Accounts 1979-1983). This seems very inexpensive, but it has to be realised that this is in 1982 money without allowing for inflation and an enormous amount of the cost was covered by donations 'in kind' and by voluntary labour. A more realistic example of the costing is the £35 million for the final phase of the conservation and the building of the new museum and exhibits in Portsmouth. The enormous cost of projects such as this highlights the importance of assessing significance that was discussed above. However, the benefit to the local economy should not be understated as it is estimated that the 400,000 visitors that we received in 2014 spent over £21 million locally during that year excluding their entry fee (Spend-per-head figures from Tourism Southeast).

Does every nation with a coastline need a *Mary Rose*? Possibly not. But does every nation need at least a centre of excellence to monitor and manage its UCH and a visitor attraction that will inspire the public and increase their understanding of the UCH? The author would say yes. Whether the functions of museum, conservation laboratory, research institution, national archive, UCH management unit, and vocational and professional training are combined or separate will depend on the circumstances of individual nations but there must be many advantages in combining a number of these functions at one location. The UK does not do this at present but countries that are still developing their infrastructure and management systems to support their UCH should certainly consider creating a centre of excellence that would combine some or many of these functions.

Acknowledgements

The Mary Rose Project has been one of amazing human endeavour ever since the first dreams of Alexander McKee to find the *Mary Rose* and the efforts of Dr Margaret Rule to excavate her to the highest possible standards and raise her for the world to see. Their contribution and those of a wide variety of teams cannot be overstated; from archaeologists and amateur divers to engineers, salvage experts, designers, architects, shore staff, fundraisers, sponsors, donors, volunteers, visitors, the Heritage Lottery Fund and the great British public.

It would be impossible to name them all, but in terms of this latest chapter in the development of the project there are two individuals who must be acknowledged individually: my colleague Dr Alexzandra Hildred whose hard work and professionalism have been limitless and Dr Eric Kentley whose advice and experience was a key part in the development of the exhibitions in the new museum.

1 The Heritage Lottery Fund (HLF) was set up in 1994 and provides grants to heritage projects using an allocation from the National Lottery, which is funded by tickets bought by the general public for a twice–weekly draw. In 2018–2019, they allocated more than £500 million to good causes, £50 million going to the HLF.

2 The *Vasa* was a Swedish warship that sank on its first voyage in Stockholm harbour in 1629. It was rediscovered in 1956 and raised using traditional salvage methods in 1961. It was excavated after bringing it to the surface in 1962. Conserved by spraying with polyethylene glycol in a temporary building, it was then moved when dried out into to a purpose-built museum in 1988, opening to the public in 1990. The 2019 visitor numbers were a staggering 1.2 million people.

3 The *San Juan* was a Basque whaler that sank around 1565. It was rediscovered in 1978 and excavated underwater between 1978 and 1985. The hull was dismantled during the excavation programme and the individual timbers were recorded in great detail on the surface before being returned to the seabed where they are being preserved in the silts close to where they were discovered.

4 *La Belle* was the flagship of French explorer La Salle that crossed the Atlantic to start a new colony in the Gulf of Mexico. It was wrecked in present day Matagorda Bay in 1686. The wreck was relocated in 1995 and excavated dry using a cofferdam from 1996. It was dismantled, recorded and conserved in a tank followed by freeze-drying at Texas A&M. An exhibition opened in the Bullock Museum in Austin, Texas in 2015 where visitors were able to watch as it was reconstructed for a second time in the museum.

5 *Nan Hai* 1 was a Chinese trading vessel of the Southern Song dynasty (1127–1279). It was rediscovered in 2007 and salvaged complete with the surrounding silts and placed inside a purpose–built museum. Whilst it is in a pool covered in water, this was drained enough to allow excavation 'dry' in front of visitors from 2013 onwards. This process was nearing completion in 2020 and the Chinese team is currently working on the best way to conserve the ship.

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EXPLORING, DOCUMENTING, AND PROTECTING THE RIVER HERITAGE IN HUNGARY: EXPERIENCES AND CHALLENGES OF CLIMATIC EVENTS AND PUBLIC AWARENESS

Attila Tóth, Hungary

Fig. 1 Map of the Danube River Basin. © Wikimedia commons.

Introduction

The territory of Hungary is situated in the middle of the Danube River Basin (Fig. 1). The catchment area of the Danube and its tributaries, some are themselves huge rivers, covers a substantial area of Europe from the Alps to the Black Sea (817,000 km²). The river opened a channel of communication and trade between different climatic zones, cultures, economies from prehistory to today. V. Gordon Childe titled his monography on the prehistory of Central Europe as the *Danube in Prehistory in 1929*, and he used 'Danubian' as the name for cultural phases (Childe 1929). The river played an important role in the spreading of early agriculture from south east to central Europe (Linearbandkeramik) as well as early metallurgy (Vinča and Vučedol cultures).

The Ripa Pannonica was the frontier of the Roman Empire consisting of a series of legionary and auxiliary camps, forts, and watchtowers and connecting infrastructure such as settlements, baths, amphitheatres, and the Danube river itself with ports had fortified bridgeheads and the *classis* (fleet) (Mócsy 1974; Lőrincz 1990; Visy 2007).

The late mediaeval and early modern periods are better documented. The decisive element of the 15th–17th centuries was the war against the Ottoman Empire. The central part of the Hungarian Kingdom was conquered by the Ottomans, but the whole Middle Danube Basin became the place of continuous military conflicts. The main road of military campaigns followed the Danube from Belgrade to Vienna. Armies consisting tens of thousands to over a hundred thousand soldiers followed the river, supported by galleys and smaller oared warships (nasad, saika). They were supplied by a large number of towed cargo ships transporting supplies (Szentklárai 1886). Emblematic moments of this river's history are the lost 'treasure ships' of Queen Mary during the evacuation of Buda in 1526 (Tóth 2009), and the site of the Battle of Tolna, in 1599. This was a surprise attack by Hungarian naval and land forces on the annual Turkish supply fleet traveling from Belgrade to Buda consisting of 120 transport ships and 13

Keywords: Danube – River Archaeology – Risks – Ship Mill – Community Archaeology

warships moving along the Danube, in the Ottoman hinterland. In the engagement, the Ottoman forces suffered great losses, Christian prisoners were freed and a large war-booty taken (Beszédes 1999). A few years later raids took place on the Ottoman military bridges at Drávatamási, in 1603 (Tóth 2006, 2009b) and at Eszék, today Ossiek in Croatia, in 1664 (Pesić 2011; Surić 2014) on the Drava river.

The pre-railway period of the 18th to 19th centuries was the age of peace and growth. The Middle Danube Basin functioned as a supply base for the Habsburg Empire. Wheat was extensively exported onboard towed cargo ships to the western part of the empire to feed the growing urban population and large armies during the Spanish and Austrian Succession Wars, Seven Years War, and Napoleonic wars (Gráfik 2004). The Danube Basin continued to play its part in the cultural, economic, and political space during the modern period, and traces of this recent past and the study of contemporary processes are subject of recent and actual studies. The most well-known 'literary travel' was written by Claudio Magris in 1986 (Magris 1986), but the work of Nick Thorpe from 2014 (Thorpe 2014), or the DANUrB (Benkő, Pavel, Vitkova 2019) project finished in 2019, should also be mentioned.

Fig. 2 Ice-flood at Pest in 1838. Budapest, Überschwemmungsszene aus 1838. Universitätsbibliothek Salzburg G 208 II. © Wikimedia commons.

The character of river research

In a typical Hungarian river research, the visibility is reduced to an average of 40–60 cm due to floating detritus, transported sediments, and algae. In optimal conditions: low water level, winter, sunny weather, this could be extended to 1 metre. In the case of rising water or flooding, the visibility is zero. These physical conditions characterise other rivers around the world. The Danube and its tributaries have no dangerous animals or microbes and toxic pollution is normally absent.

The most frequently used method for large-scale area subsea exploration is the side-scan sonar. The system used for the survey was a commercial 'fish-finding system'[1] that records swathes of between 2 x 20–25 m wide strips of the riverbed, with a speed of 6–9 km/h providing acceptable quality images of a 2–3 km section during a 2–3 hour survey. The images and coordinates of the sonar anomalies and the continuous sonar files can be saved in the event of scientifically interesting regions or individual sonar anomalies being identified. These sonar files are processed later, producing geo-referenced 'strips'.[2]

A direct underwater survey is carried out utilising individual divers. For dives close to the riverbank, divers use a rope attached to them held by surface support staff. This and the direction of the current help in their orientation in the very poor underwater conditions. When searching in a single position (for example a sonar anomaly) we try to explore in concentric semi-circles, otherwise, we move in lines parallel to the riverbank, surveying in long strips. When the exploration is more than 20 m from the riverbank, it is simpler to dive from an anchored boat. The divers descend using the anchor line and search a 2–3 m wide x 25–30 m long strip following the current, while remaining connected by a rope to the support crew in the boat. When an object is located the rope can be attached to it, while the diver marks the object with a buoy. Due to the current and the reduced visibility only marked positions can be explored and documented later.

The water level of the rivers of the Danube Basin have annual and seasonal movements. In past years, there used to be an early spring and an early summer flood, the first event connected to the rapid melting of the ice (in some catastrophic historical cases blocked at a certain position by ice-barriers like in 1838, when Pest was partly destroyed) (Fig. 2). The summer flood is caused by late-spring rain and the melting of ice in higher mountains. Now in late summer and during winter the water level is low. The difference measured between the two extremities at Budapest is a surprising 858 cm. The highest Danube level was measured in 2013, and the smallest in 2018, within 5 years. The frequency and the level of extreme conditions are evident from observations and could be connected with climatic events. The historically regular changing of the water level has become irregular, meaning that the low-water level can occur at any time of the year.

These hydrological and climatic changes or irregularities influence the protection and the research of underwater cultural heritage. During times of flooding it is not a suitable period for research, due to the strong currents, zero visibility, and large floating objects, but we cannot predict the occurrence of the floods. This means that the planning of large scale, or collaborative projects is harder. Low water levels offer more visibility, and extremely low water level can dry substantial parts of the normally submerged sandbanks, gravel banks, or shoals. In the case of extreme dry periods, it is possible to

find and document sites partially or completely dry that are normally underwater. This feature could be considered a positive, however, it is necessary to take into consideration, that sun, wind, high temperature, and freezing cause significant damage to organic materials. These sites become accessible to unwanted 'guests' too, among them looters and vandals.

The current organisation of the protection of underwater cultural heritage in Hungary

Hungary ratified the 2001 UNESCO Convention on the Protection of Underwater Cultural Heritage in 2014. There is no national organisation for the protection and research of the underwater cultural heritage, and there is no 'underwater archaeologist' as an occupational title. Practically, the Árpád Museum of Ráckeve, a small territorial museum carries out research in its authorised territory and on the basis of cooperative agreements within the district boundaries of other museums, and abroad.

The technical and human resources depend on temporary grants — the most important partner is the National Cultural Fund —, and voluntary aid by individual and organised divers — the Argonauta Research Group is the prime partner supporting organised divers. The Underwater Archaeological Division of the Hungarian Archaeological and Art-historical Society plays an important role in public relations and disseminating scientific news and results.

Typical research can be initiated by a scientific hypothesis — to identify a possible underwater site — or on receipt of civilian information such as from a local fisherperson or a trekker contacting the museum about a possible site. Small groups of 2–3 volunteers are organised to carry the sonar and the small motorboat of the Argonauta Research Group, and in case of diving, their own equipment; the travel and transport using private cars. The group meet and travel in the morning, spend between 2–4 hours on the water, followed by a common dinner as a 'social event'. The report and processing of the sonar data is carried-out the next day. These researches are characterised by minimal cost and are flexible from the organisational side too. Naturally, only limited areas and minimal investigations can be made, but as we organise more surveys in a year, these offer a working possibility for the mapping Hungary's underwater archaeological topography.

2018: a year of challenges

In 2018, the National Cultural Fund granted the Árpad Museum 7 million HUF (ca. 24,000 USD) to carry out a national level survey and documentation project of the underwater cultural heritage. This modest support was by far the greatest financial help received in the last 10 years. Unfortunately, this was only a fraction of the resources required for an extensive, high-tech survey.

The Árpad Museum built a network for the information sharing and research cooperation with other territorial museums, and some national level institutions, such as the Institute and Museum of Military History, Pázmány Péter Catholic University, since 2015. This network helped us in the local organisation of researches. With the financial support, using the network and cooperating with volunteers, the plan was to survey 2 km sections of the Danube and other rivers at 5 locations, and documenting 10 sites which were only recorded as GPS coordinates or other type of information.

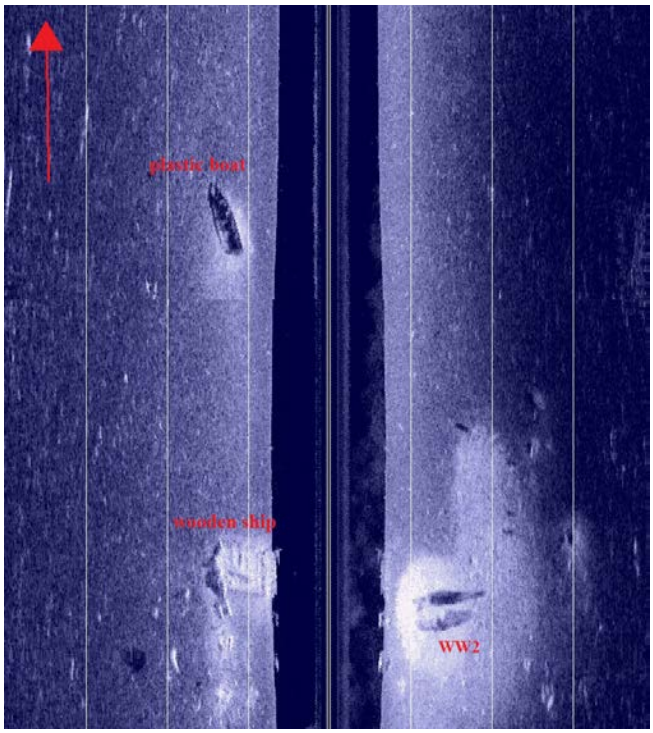

Fig. 3 Sonar mosaic presenting a Second World War metal ship fragment, a modern plastic (fibre-glass) boat and an early 20th c. wooden ship. © Attila Tóth.

The side-scan sonar survey in the Ráckeve-Danube-branch resulted in dozens of sites, some of them consisting of numerous features. As a result of diving the sites, it was possible to identify WWII metal wrecks, modern metal wrecks, wooden and plastic boats as well as historical boats (Fig. 3). The majority of the sonar targets still await underwater archaeological control. At some locations a number of modern boats forming a 'boat cemetery' were found. These sites are testimony of artificial 'fish nests' created by local fisherpersons. Metal lockers or construction debris used as 'fish nests' were also found. This habit demonstrates that 'site formation' is a continuous phenomenon, and local people used the river as a garbage deposit until recently.

The third quarter of 2018 was dry and warm and the water level of the Danube reached the centenary minimum. Large areas of the riverbed became dry, with sand and gravel shoals, previously invisible. A number of known or unknown

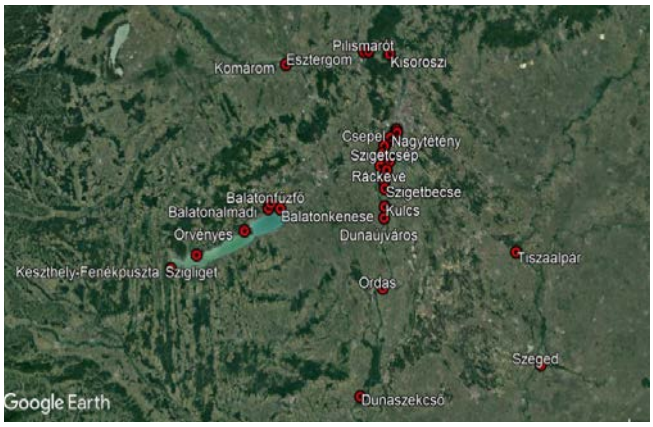

Fig. 4 Places of underwater archaeological research in 2018. © Atilla Tóth.

Fig. 5 Photo from a drone of the wreck of a ship mill at Százhalombatta. © B. Takács, Arpad Museum.

Fig. 6 19th century ship mill at Ordas. © Attila Tóth.

sites emerged from the water. These included large Second World War wrecks or parts of aeroplanes, wooden constructions, historical wrecks and objects, group of objects fallen or thrown into the river. The media recognised the rare natural event and the 'dry Danube bed' was shown in headlines. A number of people influenced by the media went into the river to 'investigate' or to 'discover' something. Many of them were passive observers, posting photos on social media. Emails and phone calls regarding sites found by riverbed-visitors were received by the author, museum, and the Argonauts Research Group. The information in most cases was related to known and registered sites, but new sites were also found. Unfortunately, some people went to the river to find and steal treasures, evidenced by small holes dug in the sediments, recognised as the result of illegal metal detectors.

Low water levels offered a unique possibility to discover new sites, but it was a source of danger too. Our resources were concentrated on surveys in the shallow water environments, instead of diving. As a result, by the end of 2018, the terrain of 28 settlements and the associated research of 44 areas that had been visited was achieved (Fig. 4).

An example of what was found is the less well-known archaeological feature, the ship mill. These special mills consisted of two ships, connected by wooden beams, and fixed on the river by means of an anchor or wooden post. The milling mechanism was installed on the large ship, and the mill-wheel was placed between the two ships. These mills were a common part of the Hungarian river landscape from mediaeval times until the end of the 19th century, and were also frequent on other European rivers. Evlia Çelebi, a Turkish traveller, who visited Hungary in the 1660s mentioned the beautiful ship mills of the Hungarians on the Danube. While there are some graphic historical documents related to ship mills from 18th–19th centuries, only the Ráckeve ship mill was documented, and partly saved by ethnographers. This documentation was the basis of a re-building project made and financed by a group of civilians, the Ship Mill Guild of Ráckeve. There was no data about how the ship mills of Evlia Çelebi looked like, and there was no basis to reconstruct the history of this economically important mill type. It is evident, that ship mills mirror the technologies of local shipbuilders as well.

During the 2018 project, it was possible to identify two ship mills. The earlier after 1645 at Százhalombatta (Fig. 5), the later after 1825 at Ordas (Fig. 6); the dating based on dendrochronology. The most important feature is the existence of L-shaped monoxyl oak elements at the junction of the side and the bottom of the ship. This is the clear evidence that these ships belong to the group of flat bottomed extended-monoxyl constructions. This technology goes back to antiquity (Weerd 1987; Rieth 1981; Ayala 2009) and is widespread during the mediaeval period in rivers (from France, through Germany to Poland and Hungary), but from the 15th century, the fully plank-built ships changed them (Rieth 1981, Ossowsky 2000). The existence of extended-monoxyl technology in an early-modern and modern context is outstanding, and this could be an argument for the continuity of ship(mill)-building technology on the Hungarian Danube.

There were some bad practices related to the activity of treasure hunters and vandals. A ship plank was found lying on a dry pebble near Szigetújfalu, South of Budapest. The plank was too long to transport by the car available at the time. The plank was concealed in a neighbouring bush, covered with leaves. On returning a week later with a larger vehicle the plank was found partly burned in a fireplace (Fig. 7). At Tököl, a late 19th-early 20th century oak barrel was destroyed by unwanted visitors, and in the neighbourhood a part of the wing of a Second World War US B26 bomber that had become visible had to be excavated with the aid of volunteers to avoid the interest of the collectors of military relics.

Fig. 7 Partially burned ship plank, Szigetújfalu. © Attila Tóth.

Conclusions

There are several dangers related to investigating river heritage. The extremely low water levels, caused by more frequent droughts, fast floods in connection to rapidly melting ice from mountains or caused by strong rains are a natural risk, which have occurred more often during the last decade. Human behaviour is a source of dangers too. Water regulation plans (creating a trans-European water highway) doesn't take into account underwater heritage. Treasure hunting and vandalism is not a large-scale risk, but a few people can cause great destruction. It is impossible to place a police-boat on every site and which are often far from frequented places. Therefore, the combination of these natural and human dangers makes the protection of river cultural heritage an acute problem, which needs an instant solution, without which there will be a loss of a high number of heritage elements.

There are good practices too. Community archaeology is a growing theme in Hungary, initiated by the cooperation of divers and underwater archaeologists, and there are good examples in the field of museum-friendly (legal) metal detector searchers, who could go into the river during times of drought, and could control the movements of illegal searchers. The interest of traditional media and the solutions of social media (museum and special pages, as well as blogs) influence the wider society and by means of clear, and regular communication, and public awareness can be raised resulting in the recruitment of 'civilian ambassadors' that can influence policymakers.

1 Humminbird 987 and 997 between 2008–2019, and upgraded to 1,2 GHz and 360 degrees system of the same company in 2020 with the grant of the National Cultural Fund.

2 For the processing of mosaics from the data we used SonarTrx software.

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UNDERWATER CULTURAL HERITAGE IN AOTEAROA NEW ZEALAND: CHALLENGES AND OPPORTUNITIES

Matthew Carter and Kurt Bennett, Aotearoa New Zealand

Introduction

Aotearoa New Zealand is an island nation that, due to its remoteness, was one of the last major landmasses in the world to be settled by humans (Fig. 1). This colonisation occurred twice via the sea: firstly by Polynesian peoples around 1250–1300 BC, and then from 1769 onwards by European maritime cultures (Smith 2019). These two groups navigated in and along the hazardous coastlines leaving behind considerable material evidence of their seafaring ways.

Fig. 1 Location map showing Aotearoa New Zealand. © Matt Carter and Kurt Bennet.

Despite this wealth of underwater cultural heritage and a strong legislative framework for the protection of archaeological sites[1], maritime archaeology remains significantly underdeveloped in Aotearoa New Zealand. In recent years however, there have been a number of projects that have shown the great potential that maritime archaeology has to contribute to our understanding of Aotearoa New Zealand's past and the opportunities and challenges that exist for the future.

Underwater cultural heritage in Aotearoa New Zealand

Surrounded by the Pacific Ocean to the East, the Tasman Sea to the West and bisected by estuaries, rivers, lakes and swamps Aotearoa New Zealand has a diverse range of underwater cultural heritage sites. Significantly, these archaeological sites include those of both Māori (Indigenous New Zealanders) and Pākehā (non-Māori of European origin) provenance. Upon their arrival the Polynesian peoples, who would later become Māori, rapidly settled throughout much of the country, exploiting its natural resources and developing a dynamic culture, combining elements from their Pacific homeland with those of their new circumstances (Smith 2019, 20–37). Archaeological remains relating to Māori culture have been recorded both underwater and in the intertidal zone and have included numerous canoe landings, eel weirs, fish traps, inundated settlements and sunken canoes (Carter and Dodd 2015; Johns, Irwin and Sung 2014).

The underwater cultural resources of Pākehā origin cover the period of the maritime exploration and the colonisation of Aotearoa New Zealand from 1769 onwards, and include around 1,500 historically documented shipwrecks (of which only around 10% have been relocated), military sites, wharves, navigation markers, ballast dumps, slipways, and debris (Dodd 2003, 151). Like Māori before them, Pākehā arrivals adapted their seafaring ways to the new environment and resources at their disposal creating new forms of seafaring material culture distinct from that of their foreign contemporaries (Carter 2019). With the expansion of the British Empire and mercantile commerce, Aotearoa New Zealand was drawn into the global capitalist system and as a result, ships from all over the world are represented in the country's archaeological record. These cultural resources, both Māori and Pākehā, offer significant opportunities for maritime and underwater archaeology. Further, they have potential for advancement of terrestrial archaeology through the provision of comparative assemblages and material culture that does not typically survive in a dry terrestrial environment.

Historical background

Like in most countries, the introduction of SCUBA in Aotearoa New Zealand in the mid-1950s saw the discovery and subsequent looting of many underwater cultural heritage sites. Unfortunately, this form of interaction between divers and shipwrecks has dominated the majority of diving's history in Aotearoa New Zealand and it has only in relatively recent

Key words: Māori – Pākehā – Aotearoa – New Zealand – Archaeology

years taken on the preservation ethos more commonly experienced on terrestrial archaeological sites. Much of the credit for promoting the protection of underwater cultural heritage sites in Aotearoa New Zealand is due to the volunteer-led Maritime Archaeological Association of New Zealand (MAANZ) established in 1989 (Churchill 1991, 7). Through this association interested members of the recreational diving community have surveyed several underwater and maritime heritage sites, including the Mahanga Bay Wharf (built c. 1885), *Inconstant* project (beached 1849), the shipwreck of *Hydrabad* (1878) and the Armed Constabulary whaleboat sunk in Lake Waikaremoana in 1869 to name some of the higher profile projects (Carter and Dodd 2015).

In addition to the work of MAANZ, since 2002 the Australasian Institute for Maritime Archaeology (AIMA) has run a number of training courses in Aotearoa New Zealand through their partnership with the Nautical Archaeology Society in the United Kingdom. The AIMA/NAS courses are targeted towards providing recreational divers with basic information about underwater archaeology, site recording and conservation. The courses continue to be held annually with increasing interest.

Fig. 2 Recording of the interior of Edwin Fox. © Kurt Bennett.

Recent successes

In recent years, avocational maritime archaeological projects in Aotearoa New Zealand have been supplemented by a number of academic studies undertaken as part of PhD theses. The first of these involves an investigation of two of Aotearoa New Zealand's most iconic maritime cultural resources *Endeavour* (1771–1795), Aotearoa New Zealand's earliest known European shipwreck, and *Edwin Fox* built in 1853 and preserved in a purpose built drydock at the top of the South Island in Picton (Bennett 2020).

The *Endeavour* (formerly *Lord North*) ship, was built for the English East India Company in 1771 and after a lengthy career was abandoned in Facile Harbour, Tamatea Dusky Sound in 1795. Since its abandonment, the hull remains have been subjected to fossicking and illegal salvage with an assortment of *Endeavour's* timbers having made their way into museums around Aotearoa New Zealand. The largest existing collection of such ship timbers was illegally salvaged in the 1970s and today is stored at the Southland Museum and Art Gallery Niho o te Taniwha in Invercargill.

In 2019 these timbers were recorded in detail as part of a wider doctoral study investigating ship hulls of English East Indiamen (Bennett 2020). In addition to recording timbers from *Endeavour* this PhD also investigated *Edwin Fox* another English East Indiamen by design, although of later vintage, having been built in a shipyard on the River Hooghly, Calcutta in 1853. Over a career spanning three decades *Edwin Fox* carried troops during the Crimean War, was employed as a merchant trader between England and India, delivered convicts to Western Australia, and transported immigrants to Aotearoa New Zealand where it finally ended its international sailing career in the 1880s. In 1965 enthusiasts took ownership of the vessel and preserved it in a drydock as a museum display. In 2017 and 2018, the hull was recorded in detail (Fig. 2; Bennett 2018) and through this PhD thesis the results will be compared with the timbers recorded from *Endeavour* to understand the construction, repurposing and connection of English East Indiamen during a period of increasingly globalised interactions (Bennett 2020).

Deptford shipbuilding yard Horeke

As part of a maritime archaeological investigation of Māori-Pākehā relations in pre-colonial Aotearoa New Zealand for his PhD thesis, Carter (2019) excavated the Deptford shipbuilding yard which operated from 1826–1831 at Horeke in the Hokianga Harbour. Established by Sydney based merchants

and using timbers indigenous to their new home these Pākehā shipwrights built three ships at the site, the schooner *Enterprise* (1827), the brigantine *New Zealander* (1828), and the fully-rigged ship *Sir George Murray* (1830). Investigation of the material culture recovered during the excavation revealed that the day-to-day lives of these shipwrights were greatly shaped through their entanglement with local Māori and significantly this research also found that the Pākehā-built ships were quantifiably different from those of their British contemporaries. This research showed that through investigating both the technological and social, maritime archaeology could reveal the physical manifestations of a new culture, that of Pākehā in Aotearoa New Zealand.

Fig. 3 The remains of Daring prior to removal and transport for conservation. © Kurt Bennett.

Schooner *Daring*

In addition to the academic studies described above, one of the most significant maritime archaeological projects in Aotearoa New Zealand is that of the schooner *Daring* (Bennett et al. 2018). Built in Mangawhai north of Auckland in 1863 this small coastal trader became a total loss in 1865 after going ashore at the southern end of the Kaipara Harbour (Ingram 2007, 110). In May 2018 storm action and shifting sands began to expose the hull remains and by June the continued beach erosion revealed the best-preserved example of a mid-nineteenth century New Zealand built vessel (Fig. 2).

Upon first exposure, the remains of the hull included everything except for the two masts, the rudder and the steering mechanism. As more of the ship became exposed, top decking, hatch combings, including the inscribed beam with the registration number and registered tonnage, and railings were removed through environmental and cultural processes. Due to this continued loss of archaeological material, support to remove and preserve the ship increased. Through the combination of generous private funding and supported by additional businesses, government and local groups, *Daring* was excavated and transported from the beach to a storage yard to begin conservation in December 2018. *Daring* is a ship that is the earliest and best-preserved example for the study of early colonial New Zealand shipbuilding. At the time of writing, *Daring* is kept wet while a final conservation treatment plan is prepared. The vessel is lined with lengths of soaking-hoses and watered by an automatic timing device, approximately every 4 hours. This is only to mitigate further deterioration before a more permanent treatment plan is implemented. It is foreseen that once the ship arrives to its final destination for display, that full-conservation treatment will begin.

Challenges

While in recent years considerable progress has been made in the investigation of maritime archaeological sites in Aotearoa New Zealand several significant challenges have been experienced. These difficulties can mainly be seen as stemming from discrepancies between the way in which heritage legislation is applied to terrestrial vs maritime archaeological sites, and the failure of heritage authorities in Aotearoa New Zealand to incorporate international best practice in their management of underwater cultural heritage (Carter and Dodd 2015).

SS *Ventnor*

In 2014, the wreck of SS *Ventnor* was found and dived by a team of technical divers in 147 m of water off the Northland Coast. Built in Scotland in 1901, SS *Ventnor* was on a voyage from Wellington to Hong Kong in 1902 when it was wrecked with a cargo that include the remains of 499 Chinese miners being returned to China for burial. During dives on the vessel a number of artefacts were removed and raised including plates, a porthole and a small bell that the team planned to gift to the Chinese government (Edwards and Jamieson 2014).

In Aotearoa New Zealand the Heritage New Zealand Pouhere Taonga Act (2014) is the primary legislation for heritage management. Through this legislation archaeological sites are defined as any place in Aotearoa New Zealand, that either; (6a) was associated with human activity that occurred before 1900 or is the site of the wreck of any vessel where the wreck occurred before 1900. There is also an additional provision (6b) where HNZPT may, on reasonable grounds, declare any place of post-1900 activity to be an archaeological site.

Under this legislation archaeological sites are legally protected with the provision of criminal conviction and fines for modifying or destroying an archaeological site (Carter and Dodd 2015).

Significantly, as the *Ventnor* was wrecked in 1902 it was not automatically legally protected as an archaeological site and the divers were not breaking any laws by removing the artefacts. However, in addition to the Heritage New Zealand Pouhere Taonga Act (2014), another piece of legislation, The Protected Objects Act (1975), regulates the export of protected New Zealand objects which are defined as 'an object forming part of the movable cultural heritage of New Zealand that is of importance to New Zealand, or to a part of New Zealand, for aesthetic, archaeological, architectural, artistic, cultural, historical, literary, scientific, social, spiritual, technological, or traditional reasons'. As such, while the removal of the artefacts from *Ventnor* was not illegal, their export to China without being granted permission from the Director of the Ministry of Culture and Heritage would be (Ingram 2007, 556–557).
Upon hearing of the discovery of the shipwreck of SS *Ventnor* and the removal of the artefacts there was considerable public outcry. These objections were in relation to the disturbance of the resting place of the 499 Chinese miners, and also the removal and proposed gifting to a foreign country part of Aotearoa New Zealand's underwater cultural heritage. In response to these objections and the high levels of significance of the wreck site Heritage New Zealand Pouhere Taonga under section 6 (b) formally gazetted the wreck as an archaeological site providing it with the legal protections that it would have automatically had were it to have sunk before 1900 a mere two years earlier (Edwards and Jamieson 2014). Additionally, the artefacts that were removed from the wreck were deemed protected objects under the Protected Objects Act (1975) and could not be removed from Aotearoa New Zealand without an export permit issued by the Ministry of Culture and Heritage. Unfortunately, the discovery and removal of artefacts from the SS *Ventnor* shipwreck and the subsequent legal action has led to considerable acrimony between the various parties and future legacy. What could have been a pivotal project in the investigation of underwater cultural heritage in Aotearoa New Zealand has instead descended into mutual distrust between heritage authorities and the other various parties.

RMS *Niagara*

On 19 June 1940 the RMS *Niagara* struck a mine laid by the German auxiliary cruiser *Orion* off Whangarei while bound from Auckland to Vancouver. The vessel sank and today sits at a depth of 121 m in the shipping channel between the Hen and Chicken and Mokohinau Islands. The wreck was salvaged during the Second World War, to remove the secret cargo of gold that it was carrying; it was first dived by technical divers in 1999 (Gordon 2005).
Like SS *Ventnor* the RMS *Niagara* having been sunk after 1900 is not automatically afforded the legal protection of a pre-1900 archaeological site criteria. While its depth has to-date restricted the number of divers who visit the wreck site, the rapid progression of technical diving equipment, personal ROVs and submarines have made deeper sites, like RMS *Niagara* more accessible. Without legal protection and with increasing visitation, the likelihood of the site being modify or destroyed appears to be increasingly likely. Additionally, in recent years the status of RMS *Niagara* has been further complicated through the leaking of its oil fuel into the surrounding marine ecosystem (Gordon 2005, 198–200). Various groups claim that considerable volumes of oil still remain within the bunkers of RMS *Niagara*, however, these are disputed by officials. When releases of oil do occur, they are widely reported and criticised by recreational fisherpersons and conservationists alike. As such, the RMS *Niagara* shipwreck presents a challenge for both heritage and environmental managers that is yet to be addressed.

The 2001 UNESCO Convention

From the above discussion it is apparent that while there is a strong legislative framework for the protection of archaeological sites in Aotearoa New Zealand, its application to underwater cultural heritage sites is yet to be enforced in a systematic or comprehensive way consistent with international best practice (Carter and Dodd 2015; Dodd 2003). This is especially evident in relation to the lack of momentum in working towards ratification of the 2001 UNESCO Convention on the Protection of the Underwater Cultural Heritage (2001 UNESCO Convention) which does not appear to be a priority for Heritage New Zealand Pouhere Taonga. Despite this lack of action, it is apparent that one of the major stumbling blocks to Aotearoa New Zealand ratifying the Convention is adoption of a rolling date with the year 1900 being the cut-off for archaeological sites under the Heritage New Zealand Pouhere Taonga Act (2014). As in the case of SS *Ventnor* and RMS *Niagara* this lack of a rolling date for legal protection means that post-1900 shipwrecks, including those related to the World Wars, are not automatically protected. Therefore, not only is Aotearoa New Zealand lagging behind the countries who have proactively ratified the 2001 UNESCO Convention but our precious underwater cultural heritage is being lost because of it.

Future directions

While the protection and investigation of underwater cultural heritage in Aotearoa New Zealand is critically underdeveloped, there is potential for rapid improvement to this situation

by embracing examples of international best practice. One such initiative would be for Heritage New Zealand, the national historic heritage agency, to employ one or more suitably qualified maritime archaeologists to oversee the management of underwater cultural heritage sites. This role could act as a catalyst by not only improving the protection of these sites but also raising awareness of their importance to other staff within the heritage management sector.

Archaeology is taught at a tertiary level at two universities in Aotearoa New Zealand, the University of Auckland, and the University of Otago. Unfortunately, however, within these programmes there are no courses dedicated to maritime archaeology with prospective students having to study maritime archaeology through overseas universities. The establishment of a tertiary level maritime archaeology programme at either Auckland or Otago University would provide students with the opportunity to study the unique underwater cultural heritage of Aotearoa New Zealand within the same academic tradition as their terrestrial counterparts. This bringing together of terrestrial and maritime archaeology would have the effect of raising awareness about the potential for maritime archaeology to contribute to the understanding of Aotearoa New Zealand's past and provide opportunities for collaboration between the two fields.

Another method for promoting the investigation and protection of underwater cultural heritage would be the running of further AIMA/NAS courses for recreational divers. Internationally, these courses have improved diver appreciation of shipwreck conservation, and may encourage some to seek further education in maritime archaeology. Such courses are also a positive means of promoting a responsible attitude towards wreck diving amongst dive clubs and shops who might see value in promoting the conservation of local shipwreck sites. To date, courses have only been held in a limited number of locations around the country. By ensuring that courses are spread more evenly around New Zealand, more divers will be able to attend and become involved.

Aotearoa New Zealand has a small but increasing number of technical divers who regularly dive shipwrecks at depths of 40–120 m. Collaboration with these highly skilled and trained individuals offers the opportunity to investigate shipwrecks that have only been minimally impacted by the actions of divers. Such cooperation has the potential to not only gain valuable information from these archaeological sites but also to establish a principle of custodianship which would help protect these wrecks for future archaeological investigation.

A further method for promoting the investigation and protection of underwater cultural heritage in Aotearoa New Zealand would be through working with documentary and filmmakers to raise the profile of the discipline with the general public. There are numerous shipwrecks and other forms of underwater cultural heritage around the country that have the potential to capture people's imagination. Such projects could also leverage the increasing connectiveness of social media to further spread the message of conservation and protection.

Conclusion

Aotearoa New Zealand has a wealth of underwater cultural heritage the study of which has yet to reach its full potential. Both volunteer and academic projects have shown the great value of this resource in contributing to our understanding of Aotearoa New Zealand's past. However, recent challenges have also revealed the incompatibility of the management and protection of underwater cultural heritage in Aotearoa New Zealand with those of international best practice. As such, underwater cultural heritage in Aotearoa New Zealand must be viewed as a field in which both considerable opportunities and challenges still exist for the future.

1 Heritage New Zealand Pouhere Taonga Act (2014) http://legislation.govt.nz/act/public/2014/0026/latest/DLM4005414.html; accessed 30th September 2020. Resource Management Act 1991 http://www.legislation.govt.nz/act/public/1991/0069/latest/DLM230265.html; accessed 30th September 2020.

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CAPTURING CULTURAL VALUE: CAN ECONOMIC CONCEPTS PROVIDE SOLUTIONS IN PROMOTING THE PRESERVATION OF UNDERWATER CULTURAL HERITAGE?

Christopher J. Underwood, United Kingdom

Introduction

The preservation of underwater cultural heritage (UCH) continues to be threatened by natural processes such as climate change which will, in many places, inundate and exacerbate the erosion of *in situ* UCH. Human activity such as coastal development, commercial exploitation, and underwater tourism will add to the pressures on this important non-renewable resource. Heritage managers, often lacking adequate resources, are required to make difficult choices, deciding which sites to preserve *in situ*, those left exposed to facilitate public access, with many others left for the elements to decide their fate.

With the above as a backdrop, this chapter introduces economic concepts that calculate Total Economic Value (TEV). This comprises social and economic components that could be used to assist cultural heritage managers in making more informed choices about for example which sites should be preserved *in situ*, and those that should not. The concepts use familiar language that policy makers, governments, and the public might find helpful in explaining and supporting the application of resources on cultural heritage sites which could lay undisturbed for years before being utilised by future generations.

What price heritage

The news item 'What price heritage' discussed the economic value (Firth 2015) of the White Cliffs of Dover, an English natural and cultural coastal landscape, considered a poignant symbol of the country's history (Shukman 2013) The reporter asked the representative of the National Trust[1] - the managing agency of the Cliffs - 'at what point would their economic value, in terms of a hypothetical gold resource seriously challenge their almost sacred' status…£1 million, £1 billion, or £1 trillion pounds?' At £1 trillion the representative admitted that sum would need to be seriously considered, adding that the right process should determine the outcome. Although this example is hypothetical, elsewhere the situation is real and potentially impacts UCH.

The dredging of the Goodwin Sands[2] is part of a plan to expand Dover Harbour's commercial capacity. It threatens the integrity of submerged vessels and aircraft recorded as lost on the Goodwins; many the last resting place of their crews. Although heritage bodies and the local public have vigorously raised their concerns[3] about the impact on this heritage, the economic imperative has taken precedent. The government's decision[4] to proceed is not in ignorance of UCH, but in absence of more compelling reasoning that challenges the economic benefits derived from the port's expansion, the objections have been set aside. Could a more comprehensive economic valuation that includes future economic and social benefits help justify preserving threatened sites *in situ* until such time as resources are available for their research or their incorporation in the heritage tourism industry?

Such assessments have the benefit of being able to base their financial estimates on the expanding number of sites that have been researched or in some cases recovered for public display, such as the shipwrecks of the *Mary Rose* (1545)[5] and the *Vasa* (1628)[6] being among the most notable in Europe, both of which make significant economic contributions to their respective economies. These models can provide valuable data which can inform calculations of economic and socio-cultural values and allow accurate estimates of the associated costs which could help mitigate decisions that are often based on assumptions rather than a comprehensive value assessment.

Heritage value: the archaeologist's view

Archaeologists and anthropologists have expressed the view that 'some objects are endowed with cultural value that is symbolic, and that cannot be reduced to monetary or materialistic worth' (Scott 2007). The text below might give the impression that these words are challenged or even cast aside, but this is not meant to be the case. It is hoped that readers will understand that the suggestions are aimed at providing alternative solutions for placing heritage in a world where value, in its broader sense, usually equates to a monetary value. It should be noted that the reality is that sacred places have already acquired economic value as tourist attractions within an industry valued at >10% of global GDP and employing a similar percentage of the global workforce.[7] Might UCH appear more relevant and even more valuable in the contemporary world if economic terminology and concepts were applied?

Keywords: Cultural Heritage – Cultural Value – Economic Value – Use – Non-use

Heritage value: the economist's view

Broadly speaking the value of cultural heritage should be 'consistent with how we measure value for a private market good' (Ready and Navrud 2002) with value defined as the greatest sum of money a consumer is prepared to pay for a good beyond, for example, an admission fee (Holden 2004, 31). The principle of 'willingness to pay' (WTP) establishes a theoretical economic value based on the individual choices of those who would consume the good. It can apply to an item in an existing market or to one that does not currently exist. In the latter case, 'willingness to pay' is the primary evaluation of the social benefit of the item and can be used to justify taxation. Consideration should be given to wellbeing, which includes aesthetic value. In standard economic theory wellbeing is determined by people's preferences. A benefit is defined as anything that increases human wellbeing and a cost as anything that decreases human wellbeing (Mourato and Mazzanti 2002).

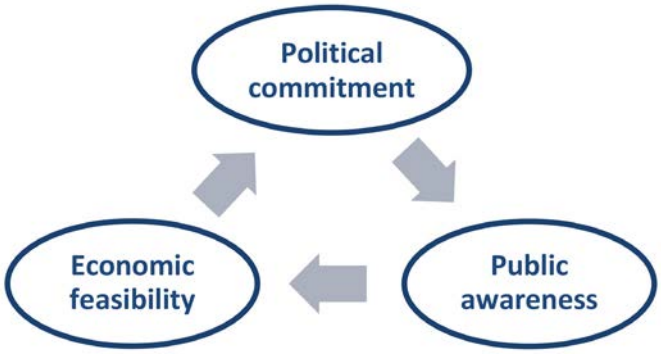

Fig. 1 The Poznań Cycle shows the relationship between public awareness, political commitment, and economic feasibility that together help justify application of resources for protecting, preserving or carrying-out research related to heritage. © Christopher J. Underwood.

Capturing cultural value

These economic concepts emerged in the 1960s, first proposed by Baumol *et al,* when it was proposed that the 'arts were a case of market failure' (Throsby 2003). It was identified that there was a need to determine value resulting from the emergence of heritage from its isolated position where predominantly expert groups decided what constituted heritage, their actions validated by funding bodies. In the early 2000s, United Kingdom ministers found difficulty in expressing the contribution or evaluation of the arts and culture to 'health, education, crime reduction, strong communities, and the nation's wellbeing', which was felt necessary to justify funding (Holden 2004). The Getty Conservation Foundation defined cultural value as 'the importance of a site as determined by the aggregate of values attributed to it [as expressed] by experts, art historians, archaeologists, architects, and others' (De La Torre and Mason 2002, 3). The principles outlined in these publications have beneficial ramifications for how UCH can be presented to the public or stakeholders or government that makes a better case for protection, preservation, or the application of resources for their research. By so doing this would fulfil the three components of the Poznań Cycle shown in figure 1. The cycle represents comments made during the Fourth Asia-Europe Meeting (Poznań 2010), which stated that 'the future perspective of a tangible heritage is determined by political commitment, public awareness, and economic feasibility…[that] without public awareness, political commitment will lose its legitimacy and [without] economic feasibility will lose its sustainability. For that reason, public awareness is of main importance' (ASEM 2010, 2).

Although it is common to think in terms of how a commodity can be utilised with the aim of creating a profit, mechanisms have been developed that allow economic principles to determine social values or apply values to non-market goods, concepts considered 'outside the traditional purview of heritage and conservation professionals' (De La Torre and Mason 2002, 3). Environmental economists identified challenges and choices resulting in providing a framework from which cultural heritage could benefit (Navrud and Ready 2002). This could be on a large geographic scale such as maritime cultural landscapes valued for their marine assets which could include cultural heritage assets, as is the case in the Goodwin Sands mentioned above. It can also be on a micro-scale like an individual shipwreck such as the *London*[8] that has associated historical and archaeological value. Valuations for the utilisation and non-utilisation of a site are essential in exploring the Total Economic Value (TEV) (Table 1) of a heritage site. This is before decisions are made in preference of another specified asset such as fishing, mineral, hydrocarbons, coastal development, wind energy, or dredging, that could ultimately lead to a loss of cultural heritage.

The models and associated terminology were first applied to natural heritage, but are now being used for terrestrial cultural heritage with some examples applied to submerged resources (Whitehead and Finney 2003), marine sanctuaries (Arin and Kramer 2002), artificial reefs for diving (Pendleton, 2005a, b), cave diving (Huth and Morgan 2009), a UK protected wreck (Beattie-Edwards 2013), and the UK's proposed marine protected areas (Kenter et al 2013) and more recently to projects (Evans and Davison 2019). The benefit of social wellbeing derived from enjoying a particular site or sites, with concepts such as 'contingent value', 'willingness to pay', and 'use' and 'non-use' options can be achieved. The following text describes some of the basic principles, terminology, and applications that offer 'non-use' values that could be applied to preservation *in situ* as alternative solutions to the market

Total Economic Value				
Use value		**Option value**	**Non-use value**	
Direct use value	Indirect use value		**Existence values**	**Other non-use values**
Direct benefits Income/revenue	Indirect benefits	Option for future use value supports	Intrinsic value = Preservation *in situ*	Bequest value = Preservation *in situ*
Museums Heritage centres Entertainment Education Heritage trails Research Exploitation	Sense of place Participation Wellbeing Aesthetic quality Valorisation / assessment of existing assets	Preservation *in situ* - Museums Heritage centres Entertainment Education Heritage trails Research Exploitation	Historic Archaeological Artistic Time period – rarity – group value – survival – fragility – vulnerability – diversity	Historic legacy options to future generations
Tangibility of value to individuals decreases as distance from a site increases				

Table 1 An adapted model based on Allen 2005 that illustrates 'use' and 'non-use' options applied to cultural heritage.

valuations that are often used to express the 'use value' of shipwrecks, especially where there are references to precious cargoes.

Ready and Navrud (2002) remarked that organisations tasked with the protection and preservation of cultural heritage will be required to compete for resources and that this competition would extend to choices between 'preservation and restoration'. Although these terms are not defined in the publication, they can be interpreted as management choices. including preservation *in situ.* However, Ransley (2007, 221) points out preservation *in situ* has led to tensions 'such as that between reburial and public and research access to protected sites', adding the issue of how to decide what is valuable and differentiate between one site´s value from another. If government and or the public raised concerns about utilising public resources on heritage assets, is it helpful to use economic principles to show that there is financial justification for preserving UCH for future generations and that applying resources can be justified? The rationale is that ultimately there will be a return on the investment in preserving sites that contribute positively to future government economic and social goals.

Cultural Heritage as a Public Good

Similar to environmental goods, cultural heritage is normally considered a 'public good'. To qualify, the good needs to possess two distinctive properties (Mourato and Mazzanti 2002, 53; Ready and Navrud 2002; Throsby 2007). First, it should be 'non-excludible' which translates into it being 'technically infeasible' to prevent other users of the good from enjoying it. The same authors explain that cultural goods have varying degrees of excludability, using the example of museums as an 'excludible good' because the public can be prevented from entering the museum, whereas casually walking around a historic site in a public place would be considered 'non-excludible' (Ready and Navrud 2002). This is considered an important concept for economists, particularly in capital markets. If it is realistically impossible to prevent people from accessing a site it is unlikely that the public will voluntarily pay for it, ultimately leading to no service and only 'cultural heritage with a high market value would be protected' (Ready and Navrud 2002).

There are near parallels with the difficulty in regulating access to most UCH. Are, for example, shipwrecks public goods? Using the criteria above, sites with unrestricted access probably are equivalent to walking around a historic site in a public place. While for practical reasons it may be difficult to exclude the public, where there is a pre-requisite to obtain a license to visit some of the UK's Protected Sites[9], they are loosely equivalent to a museum, so theoretically a protected site might be considered 'excludable'.

The second characteristic is that the good has to be 'non-rival in consumption', which translates into two people being able to enjoy the good without affecting the enjoyment of the other (Mourato and Mazzanti 2002, 53; Ready and Navrud 2002). If a good is 'non-rival in consumption*'* the same authors state that it will 'always be better for more people to enjoy it than to allow fewer', with the proviso that where visitation causes damage then it could be considered to be a 'congestible public good'.

To avoid excess damage a visitor fee can be applied to reduce the number of visitors and impact. The fees can be invested in caring for the same heritage or possibly other sites, a principle that has been applied in the management of UCH in Croatia, with the additional benefit that fees help to ensure that those who visit will value the opportunity the most.

Non-use options

'Non-use' values are applied to goods that are not traded in markets where a price cannot easily be applied, Holden (2004) stating that 'non-use' values are highly significant for the funding of culture, given that so much cultural value rests on the preservation of assets, practices, knowledge or locations through which it can or could be created in the future' (Holden 2004, 31-33). Such goods are attached to a socio-cultural value 'because it holds meaning for people or social groups due to its age, beauty, artistry, or association with a significant person or event or (otherwise) contributes to processes of cultural affiliation' (Mason 2002, 11). These can be expressed in economic terms because resources can be applied for their protection or acquisition, which has applications for sites where management has opted for preservation *in situ* rather than excavation and recovery.

Three economic 'non-use' values are considered useful: 'existence value', 'option value' and 'bequest value' (Table 1). The first, 'existence value' is described as protection and preservation of a site where a site's existence, even for those members of the public who do not visit it and do not personally consume its services, can be valued. It is a useful concept relating to UCH where it is impractical for the majority of the public to have direct contact.

'Option value' relates to the value associated to a site which can be utilised at a future date, interpreted as being in the short to medium term, while 'bequest value' refers to preserving a site for future generations (Navrud and Steady 2002; Holden 2004). Both of these terms are useful for heritage managers in determining which sites might be initially protected leaving the option to use them for research or tourism, with other sites being preserved *in situ* for a longer period which could span generations.

If the public was aware and understood the reasoning for preservation *in situ* which would mean restricted public access or alternatively those opened with visitor schemes for nationally protected sites, funds could be more readily provided, accepting that government funding is available for both activities in some jurisdictions.

Table 1 shows the various ways value can be expressed for the different outcomes associated with cultural heritage that have been adapted and applied to UCH. Viewing the table from left to right: the first two columns identify *use values,* the middle reserves the right to defer options but replicating the first column, with the remaining two to the right showing 'non-use values' that are considered helpful in promoting and justifying preservation *in situ* with 'bequest value' being particularly appropriate in protecting and preserving heritage for future generations. The arrow from left to right illustrates the general principle that an individual's valuation diminishes the further that person is from a particular site.

If such values were calculated and expressed in monetary terms — and they can and have been — they would counter in similar language to those who use market valuations of UCH to justify the commercial exploitation of a site. Diver trails on designated historic and archaeologically significant sites have trended upwards in recent years. The local economic value of the UK's protected wreck site of the *Coronation*[10] (Beattie-Edwards 2013) or the local value of a project, such as on the Dutch wreck *Rooswijk*[11] (1740) (Evans and Davison 2019, 46) serve as examples. Both reveal contributions to local economies, not to mention the additional benefits of wellbeing and education considered central to various governments' policy. Using even the basic models from these two sites, if the economic value of visits[12] to all of the UK's protected wrecks was calculated it would reveal that UCH, considered of national importance, makes a significant contribution to the national economy. Taking the premise one step further, if all diving activities on submerged cultural heritage was calculated the figure would be many times more and would register on government analysis of visitor attractions that is often measured in millions for national museums, or hundreds of thousands rather than thousands; in other words, their aggregated value would become more apparent.

Final thoughts

It is accepted that archaeologists might consider that the economics-based perspective explored in this chapter does not sit comfortably with them. Fears could include the possibility of a blurring of the edges between the application of the terminology by those seeking to exploit sites and by those who wish to promote the social values for the benefit of all society. Looking more positively, the concepts, and terminology could be used by archaeologists to help justify and quantify grant applications, and assist heritage managers in their decision-making. It might also be an asset for those archaeologists and educators who are engaged with the public to help explain why some sites are left undisturbed for future generations and some are not. What hasn't been addressed here, but is an important related issue, is where sites are left undisturbed under the guise of being preserved *in situ,* when the reality is that many sites are merely left to natural and human impacts to determine their survival. The challenge remains to develop models based on the financial experiences

that have been accumulated during the evolution of the discipline that reveal, not only the costs, but also the significant positive contributions to economic and social development. To achieve this, as stated above, there are project examples which have progressed from search, discovery, excavation, recovery, conservation and display that serve as valuable sources of experience and associated decision making.

1 The National Trust was created in 1895 to preserve for the nation, in perpetuity, places of historic importance and natural beauty.

2 A ten-mile long sandbank located off the south-east coast of England.

3 BBC (2018). Goodwin Sands dredging plans ‚disgusting'. BBC online news 26th July 2018. https://www.bbc.com/news/uk-england-kent-44971642/; accessed 30th September 2020.

4 HM Gov. (2020). Dover dredging application decision: The MMO has approved an application from Dover Harbour Board for aggregate dredging off the Kent coast. https://www.gov.uk/government/news/dover-dredging-application-decision/; accessed 30th September 2020.

5 The hull of the Mary Rose and almost 20,000 artefacts were recovered and are now on display in Portsmouth Historic Dockyard. See also Dobbs in this volume and https://maryrose.org; accessed 24th August 2020.

6 The almost complete wreck of the Vasa and artefacts were recovered from Stockholm Harbour in 1961, and is Sweden's most visited museum. See https://www.vasamuseet.se/en; accessed 30th September 2020.

7 Travel and Tourism Economic Impact (2019). https://www.wttc.org/-/media/files/reports/economic-impact-research/regions-2019/world2019.pdf; accessed 30th September 2020.

8 The wreck of the London, a 76-gun second-rate English vessel lost in 1665, is located in the River Thames.

9 Sites designated by the Protection of Wrecks Act 1973 and the Protection of Military Remains Act 1986.

10 In Beattie-Edwards', study through 2012, visitors to the wreck-site contributed £42,000 to the local economy, an average of £60.00 per visit.

11 During 2017, the project contributed a minimum of £46,000 to the local economy 46), from harbour fees, boat charter, fuel, provision of a conservation facility in the town, materials, supplies and equipment purchased from local shops, food and accommodation and other local recreational activities and attractions (Evans & Davison (2019).

12 There were an estimated 10,000 dives on protected wreck sites in 2018 (James 2018).

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CARIBBEAN MARITIME ARCHAEOLOGY: AN OVERVIEW OF ITS DEVELOPMENT FROM THE MID-TWENTIETH CENTURY

Margaret E. Leshikar-Denton, Cayman Islands

Fig. 1 Map of the Caribbean. Illustration by Piotr Bajawoski © Center for Maritime Archaeology and Conservation, Department of Anthropology, Texas A&M University.

Introduction and Definition

Maritime archaeology in the Caribbean Sea involves the study of past people and cultures through the study of objects and features discovered in the underwater and coastal maritime landscapes of the region. It frequently involves archaeology practiced in underwater environments, such as oceans, seas, bays, lakes, rivers, springs, marshes, and cenotes. These submerged environments require the use of specialized tools, although the archaeological research objectives remain similar to those used on land (Leshikar-Denton and Luna Erreguerena 2008a, b; Leshikar-Denton 2011; Leshikar-Denton and Scott Ireton 2013).

Historical Background

In the Caribbean region, there are prehistoric and historical heritage sites that reveal a tapestry of intercultural experiences (Fig. 1). From the 16th century shifting waves of European explorers, conquerors, and settlers, indigenous and African-enslaved labourers, passing merchants, and colonial powers interacted and influenced the development of the rich, multilingual cultures of today. Among Caribbean maritime heritage sites are settlements and defensive fortifications, fresh water procurement features, lighthouses and navigational aids, fishing areas, anchorages, careening places, ports, harbours, wharves, bridges, shipbuilding sites, shipwrecks, shipwreck

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salvage sites, and aircraft lost at sea. Sites range from cenotes and eroded coastal features to remains of catastrophic shipwrecks and earthquakes, at times with exceptional levels of preservation of cultural material.[1]

The research potential for archaeological sites in the Caribbean is significant, but their heritage value can be overshadowed when commercial interests divert attention to the possibility of treasure on historical shipwrecks that they wish to exploit. The situation poses a constant threat to the archaeological heritage of the Caribbean region, and a challenge to its protection and management.

Key Issues and Current Debates

The Caribbean Sea encompasses English-, Spanish-, French-, and Dutch-speaking countries, some of which are independent while others are in various levels of dependency, resulting in cultural, linguistic, and legislative differences among them. Yet, they share elements of a common maritime heritage. In today's global world, these Caribbean countries are uniting and working toward establishing common goals in many areas, not the least of which is in attention paid to their underwater and maritime cultural heritage, especially for the benefit of Caribbean culture, education, and tourism (Leshikar-Denton 2002, 2011; UNESCO 2004; Leshikar-Denton and Luna Erreguerena 2008a, b; Leshikar-Denton and Scott-Ireton 2013).

In 1997, Caribbean countries formed a technical commission on underwater cultural heritage (UCH) known as the Latin American and Caribbean Group (GRULAC). GRULAC first met in Santo Domingo, Dominican Republic, in 1998 and 1999 — with participants present from Argentina, Barbados, Columbia, Cuba, the Dominican Republic, Ecuador, Haiti, Honduras, Jamaica, Mexico, Panama, Trinidad and Tobago, and Uruguay with the author sent as a representative from UNESCO. The group was formed in preparation for a series of expert meetings held by UNESCO in Paris between 1998 and 2001. At these Santo Domingo meetings the group was introduced to and united in support of the principles of the 1996 ICOMOS International Charter on the Protection and Management of Underwater Cultural Heritage, a charter defining best professional practice (International Council on Monuments and Sites 1996). At the Paris meetings, at which GRULAC was influential, 88 countries adopted the 2001 UNESCO Convention on the Protection of the Underwater Cultural Heritage (2001 UNESCO Convention), which established an international legal framework. Since that time, worldwide regional UNESCO meetings have encouraged countries to ratify the Convention. Jamaica hosted two regional meetings in 2002 and 2011, and a capacity building training course in 2012. Saint Lucia was the first Caribbean nation to ratify the Convention; the country hosted sub-regional UNESCO meetings in 2003 and 2008 to assist and inform Eastern Caribbean countries about the benefits of this international legal instrument. Success in the area is due in part to the efforts of the Saint Lucia Archaeological and Historical Society, an organization with a long history of professionally addressing the island's terrestrial archaeological heritage, and a leader in advocacy for ethical underwater and maritime archaeology in the subregion. Since the Convention entered into force in 2009, there have been seven sessions of the meeting of States Parties in Paris between 2009 and 2019, and ten meetings of the Scientific and Technical Advisory Body appointed by the States Parties to assist in the technical guidance.

Operational Guidelines for implementation of the Convention were adopted internationally at UNESCO meetings in 2013 and 2015. To ensure proper implementation, States Parties are to establish competent authorities, or reinforce existing ones. The UNESCO Secretariat works with a wide network of experts and institutions in Latin America and the Caribbean (LAC) and worldwide that assist member states in development of capacities at regional, national, and local levels. Mexico is a leader in this area, and works to provide workshops and training grounds to assist in further capacity building throughout the LAC region (Leshikar-Denton and Luna Erreguerena 2008a, b).

The 2001 UNESCO Convention entered into force on 2nd January 2009. At present GRULAC countries represent 20 of the 66 ratifications on record: Antigua and Barbuda, Argentina, Barbados, Bolivia, Costa Rica, Cuba, Ecuador, Grenada, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Panama, Paraguay, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, and Trinidad and Tobago. The Caribbean countries are now discussing the benefit of establishing compatible national legislation, and have asked the ICOMOS International Committee on Underwater Cultural Heritage (ICUCH) and UNESCO for guidance. Clearly, the 1996 ICOMOS Charter and the 2001 UNESCO Convention are powerful international instruments that lay the foundation for protection and management of the world's UCH. Their endorsement by a growing number of Latin American and Caribbean countries sets a positive example for countries worldwide to take action to identify, protect, and manage it, regardless of their political and economic situations.

In previous publications referenced below, brief case studies highlighting a unified approach, legislation to protect shipwrecks, heritage management, research, meaning to descendent communities, and the future have featured many Caribbean islands including the British Overseas Territories of Anguilla, the Cayman Islands, and the Turks and Caicos Islands; the French islands of Martinique and Guadeloupe; the Dutch islands of Saint Maarten, Saint Eustatius, Saba,

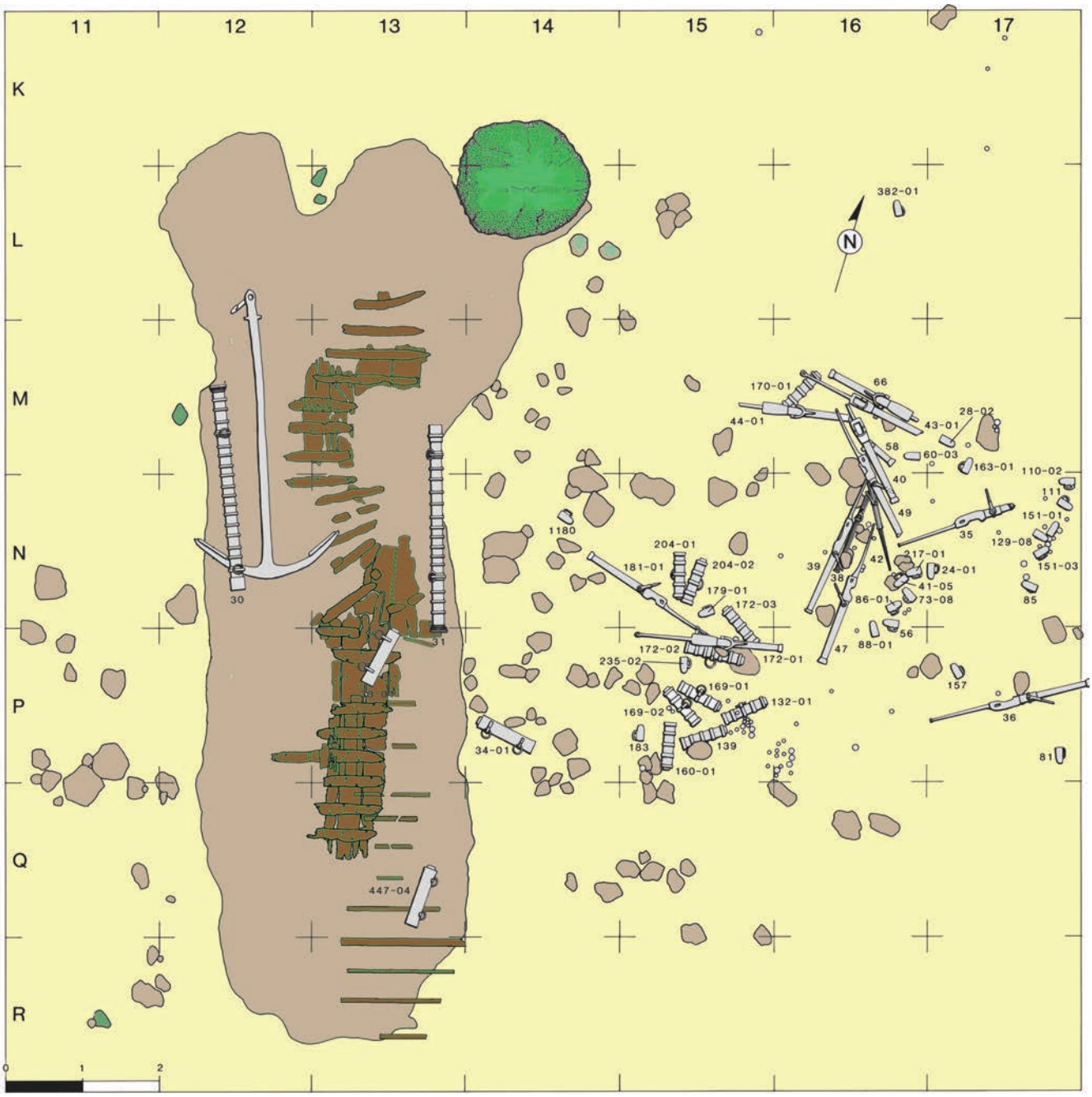

Fig. 2 'Molasses Reef Wreck' plan showing the distribution of ordnance across the site, outline of the ballast mound, hull remains beneath the ballast, and grooves in the seabed corresponding to frame locations. Illustration by Donald Keith © Ships of Discovery.

Curacao, and Bonaire; the Commonwealth of Puerto Rico, a territory affiliated with the United States; independent countries in the Greater Antilles, including the Bahamas, Cuba, the Dominican Republic, Haiti, and Jamaica; and independent countries in the Lesser Antilles, including Barbados, Dominica, Grenada, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, and Trinidad and Tobago (Leshikar-Denton 2002; 2004; 2011; UNESCO 2004; Leshikar-Denton and Luna Erreguerena 2008a, b; Leshikar-Denton and Scott-Ireton 2013).

Emerging Themes

Island nations are working to develop research and preservation programmes to protect, manage, and interpret sites and to promote heritage tourism. They are exploring issues of proper uses of heritage and negotiating approaches from commercial salvors. Emerging themes in Caribbean maritime archaeology include heritage legislation, management, research, meaning to descendent communities, and international perspectives and future directions. Not all Caribbean countries have experience in research, interpretation, protection, and management of UCH, but there is a growing re-

gional concern that commercial exploitation is not beneficial. Caribbean people are exploring and adopting principles creatively in managing cultural resources and are cooperating in sharing knowledge, technical skills, and professional expertise. Many recognize the value of asking for and accepting professional archaeological assistance from outside of the region, but there is a growing understanding that sustainability must come from within the Caribbean islands themselves (Leshikar-Denton and Luna Erreguerena 2008a, b; Leshikar-Denton 2011).

Heritage Legislation

Among Latin American and Caribbean countries, Mexico, Argentina, and the Cayman Islands are exemplary in not having granted permits to salvors in the past quarter-century. Argentina has achieved specific national legislation to protect UCH. In the countries of Bermuda (often grouped with the Caribbean), the Turks and Caicos Islands, Jamaica, and the Dominican Republic, where professional archaeological work has achieved success, the governments have also granted permits to salvors in the past. Bermuda, however, notably enacted the Bermuda Historic Wrecks Act (2001), compatible with the 1996 ICOMOS [Sofia] Charter and 2001 UNESCO Convention. More and more countries are waking up to the need of establishing similar compatible national legislation.[2]

Heritage Management

Political, economic, and social factors in the Caribbean have meant that heritage management is less than ideal. Caribbean countries, nonetheless, are using traditional and creative means to achieve progress, whether through governmental or private means. In addition to using legislative approaches, efforts exist to:

- discourage treasure hunting;
- create site inventories;
- mitigate impact to endangered sites;
- protect and interpret sites *in situ* as a first option;
- excavate when scientific objectives justify it and when there is adequate funding, professional staff, and provisions for documentation, conservation, curation and reporting, and plans to share results of research with the public through museum exhibitions, the media, and publications (Leshikar-Denton and Luna Erreguerena 2008b).

In the Caribbean, sustainable economic and tourism objectives go hand-in-hand with the successful aim of promoting, protecting, and managing heritage sites (Leshikar-Denton and Luna Erreguerena 2008a, b). In the Cayman Islands, for example, a maritime heritage partnership launched the land-based Cayman Islands Maritime Heritage Trail in 2003. It consists of 36 sites located around the coastlines of three islands, highlighting a range of themes — for example early explorers, maritime place-names, historic anchorages, shipwrecks, wrecking practices, lighthouses, seaside forts, shipbuilding, turtle-fishing, and hurricanes. Plans are underway to create shipwreck preserves around the Cayman Islands on robust shipwreck sites. Similar land-based trails primarily along the coast are being created in Jamaica and Anguilla, the wreck of the SS *Mediator* is being interpreted *in situ* in the harbour and adjacent museum in Curacao, while the Dominican Republic has created underwater museums featuring artefacts from shipwrecks that were replaced on the seabed and interpreted for divers and snorkelers (Leshikar-Denton 2020).

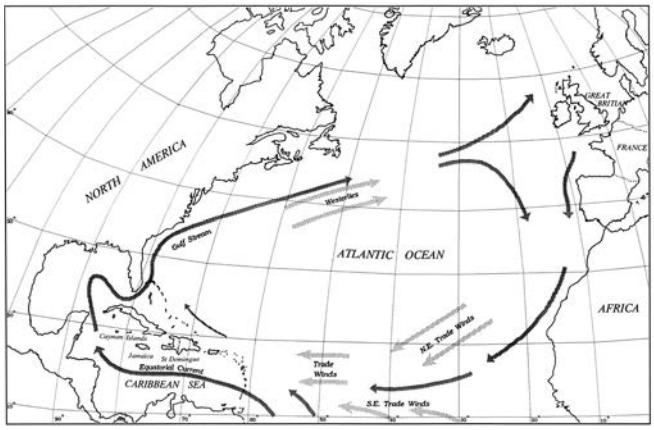

Fig. 3 North Atlantic Basin winds and ocean currents. Illustration by R.L. Craig © Wreck of the Ten Sail Project.

Archaeological Research

Archaeological research is on-going in island countries bordering the Caribbean Sea, as well as in the coastal Caribbean countries of Mexico, Central America, and South America. Work by regional researchers, as well as teams from overseas academic institutions in the United States, Canada, Great Britain, France, the Netherlands, and Spain, among other countries, is contributing to a growing body of knowledge. The following summary provides a glimpse into archaeological work that has been accomplished.[3]

With the probable exception of the Cayman Islands and Bermuda, aceramic and/or ceramic age peoples prehistorically occupied most Caribbean islands. Current archaeological research is providing theories as to their origins and routes of migration into the region. By 1492, when Columbus first sighted land, the people who came to meet him paddled out in dugout canoes. These Caribbean seafarers procured marine resources, as generations had done before them. In 1995, at the request of the government of the Bahamas, the Institute of Archaeology and Anthropology at the University of South Carolina recovered a ceremonial Lucayan canoe found in Stargate blue hole (a submerged cenote) off Andros Island. In 1996, researchers discovered a Lucayan paddle of

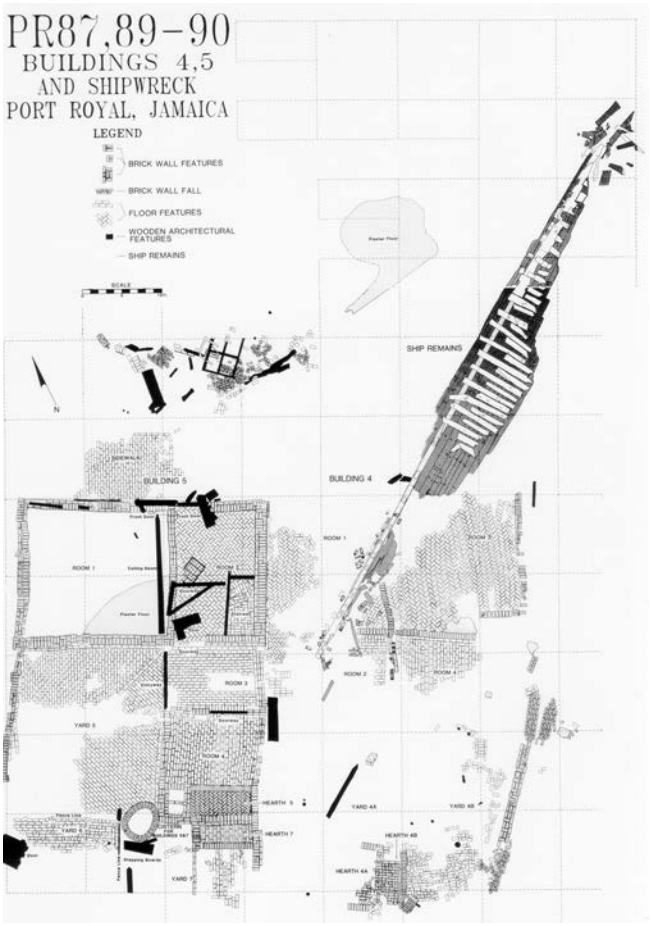

Fig. 4 Port Royal, Jamaica, Building 4/5 excavation plan, showing remains of a ship that crashed into Building 4. © Port Royal Project, Center for Maritime Archaeology and Conservation, Department of Anthropology, Texas A&M University.

about AD 1100 in North Creek, Grand Turk. They assessed its origin to be associated with a nearby outpost of the Taíno from Haiti. The Turks and Caicos National Museum displays this paddle, one of only two such paddles from the Bahamian Archipelago. In the Dominican Republic, Indiana University and Pan-American Consultants investigated a prehistoric plaza and a cenote containing Taíno artefacts at Manantial de la Aleta. In 2008, the Puerto Rican Instituto de Investigaciones Costaneras (IIC), the Centre for Maritime Archaeology and Conservation (CMAC) at TAMU, and the Institute of Nautical Archaeology (INA) surveyed the northern coast of Puerto Rico between Loíza and San Juan Bay. The multiorganizational team located early sites underwater in an area where pre-Columbian settlements existed and over 66 ships were lost.

During four Spanish voyages between 1492 and 1504, Columbus achieved the earliest recorded European explorations of the Caribbean. He lost ships during these journeys: the nao[4] *Santa María* during the first voyage, and the caravels[5] *Mariagalante, Gallega, San Juan,* and *Cardera* during the second, all off the north coast of Hispaniola; and during the fourth voyage, the caravels *Gallega* at Rio Belén and *Vizcaína* at Portobelo, Panama, as well as the caravels *Capitana* and *Santiago de Palos*, both run aground in 1503 in St. Ann's Bay, Jamaica. Since the early 1980s, INA has launched surveys and test-excavations to locate remains of Columbus' ships in Hispaniola, Jamaica, and Panama, while Ships of Discovery has searched for *Gallega* in Panama. Indiana University and Pan-American Consultants have worked cooperatively in a quest for Columbus' ships off Hispaniola.

In the Caribbean, investigators have discovered the unidentified remains of early 16th century ships of exploration and discovery. INA teams investigated three wrecks in the 1980s, all providing clues to a ship-type known as the caravel: the 'Molasses Reef Wreck' in the Turks and Caicos Islands (Fig. 2); the 'Highborn Cay Wreck' in the Bahamas; and cooperatively with the Mexican Instituto Nacional de Antropología e Historia (INAH), the 'Bahía Mujeres Wreck' located off the northeast coast of the Yucatan Peninsula. The 'Molasses Reef Wreck', dating to the 1520s, is presently the earliest shipwreck discovered in the Western Hemisphere. Archaeologists excavated the vessel between 1982 and 1985, and initiated conservation treatments on the artefacts. From 1988 forward, Ships of Discovery took over conservation treatments and, working in cooperation with the Turks and Caicos National Museum, prepared an exhibition that today forms the central exhibition of the National Museum. In cooperation with INAH in the 1990s, they undertook additional excavation on the 'Bahía Mujeres Wreck' (see Barba-Meinecke in this volume). Meanwhile, other investigators discovered the 16th century vessel known as the 'St. Johns Bahamas Wreck' on the Little Bahama Bank. Early colonial shipwrecks are also known to exist in Cuban waters, such as the 'Cayo Ines de Soto Site', thought to have sunk between 1555 and 1556. Researchers from the abovementioned institutions have further investigated a number of the abovementioned sites in recent years.

16th century European navigators learned that it was advantageous to follow prevailing winds and ocean currents when sailing to and from the New World. Ships entering the Caribbean through the Lesser Antilles could exit through the Windward, Mona, and Anegada Passages, or maintain a westward course to the Leeward Passage, by which ships would exit through the Yucatan Channel, enter the Gulf Stream, and follow the currents through the Straits of Florida out into the Atlantic for the return passage to Europe (Fig. 3). European powers soon established colonies and seaborne trade networks in the West Indies. Until the later 17th century, Spain claimed a monopoly on all New World territories that were sighted during the Spanish voyages. The country depleted the supply of precious metals in the West Indies, and then exploited the gold and silver resources of Mexico, Bolivia, and Peru. Mexico City displaced Santo Domingo on Hispaniola as

Spain's main administrative centre in 1535, and Spain created a second centre in 1544 in Lima, Peru, while Cuba, located adjacent to the Leeward Passage and Straits of Florida, remained strategically valuable.

Single armed merchantmen made the trans-Atlantic passage, but by 1537, Spain organized a convoy system so that merchant ships laden with cargos of gold, silver, and pearls would sail together under the protection of armed vessels to ensure a safe passage back to Spain. Still, treacherous reefs and hurricanes claimed many Spanish treasure ships over the course of three centuries. Archaeologists have investigated Spanish merchantmen, including ships of the 1554 Fleet excavated by the Texas Antiquities Committee off Padre Island, Texas, the 'Cayo Nuevo Wreck' documented by a joint INA/INAH project in the Gulf of Mexico, the 1559 Emanuel Point Shipwreck investigated by the Florida Bureau of Historical Research, Division of Historical Resources and University of West Florida off Pensacola (Smith 2018), the 17th century 'Rincón Astrolabe Wreck' in Puerto Rico, and the 1766 *Nuevo Constante*, investigated offshore by the State of Louisiana, but the majority of sites found have been salvaged by treasure hunters rather than professional archaeologists. Among shipwrecks worked in cooperation with salvors are names such as *San Pedro* and *San Antonio* off Bermuda, *Nuestra Señora de Atocha* in the Florida Keys, *Nuestra Señora de la Pura y Limpia Concepción* (1641) on the Silver Bank of Hispaniola, and *Nuestra Señora de Guadalupe* and *Conde de Tolosa* (1724) off the northeast coast of Hispaniola.

Although treasure hunters compromised vessels of the 1715 Spanish Plate Fleet, discovered off the east coast of Florida, archaeologists investigated the *Urca de Lima*; in 1987, Florida designated the site as Florida's first Underwater Archaeological Preserve. Salvors also impacted the remains of the 1733 Spanish Plate Fleet that wrecked in the Florida Keys, although State of Florida archaeologists are undertaking scientific studies on a number of these vessels.

In the Cayman Islands, archaeologists identified a site thought to be the remains of the inbound *San Miguel*, lost in 1730. In 1996, East Carolina University began a survey of the waters of Anguilla which included assessment of two 1772 inbound Spanish merchantmen, *El Buen Consejo* and *Jesús, María y José*, at the invitation of the Historic Wrecks Advisory Committee. They produced a map and site analysis for the government. In Jamaica, INA assisted the government in the 1980s in surveys on the Pedro Banks for early shipwreck sites. Remoteness, complicated logistics, and nominal funding, however, discourage scientific work on these Pedro Banks sites. In Puerto Rico, archaeologists documented the 'Cerro Gordo' sites in Vega Alta — a Spanish shipyard of the 17th to 19th centuries.

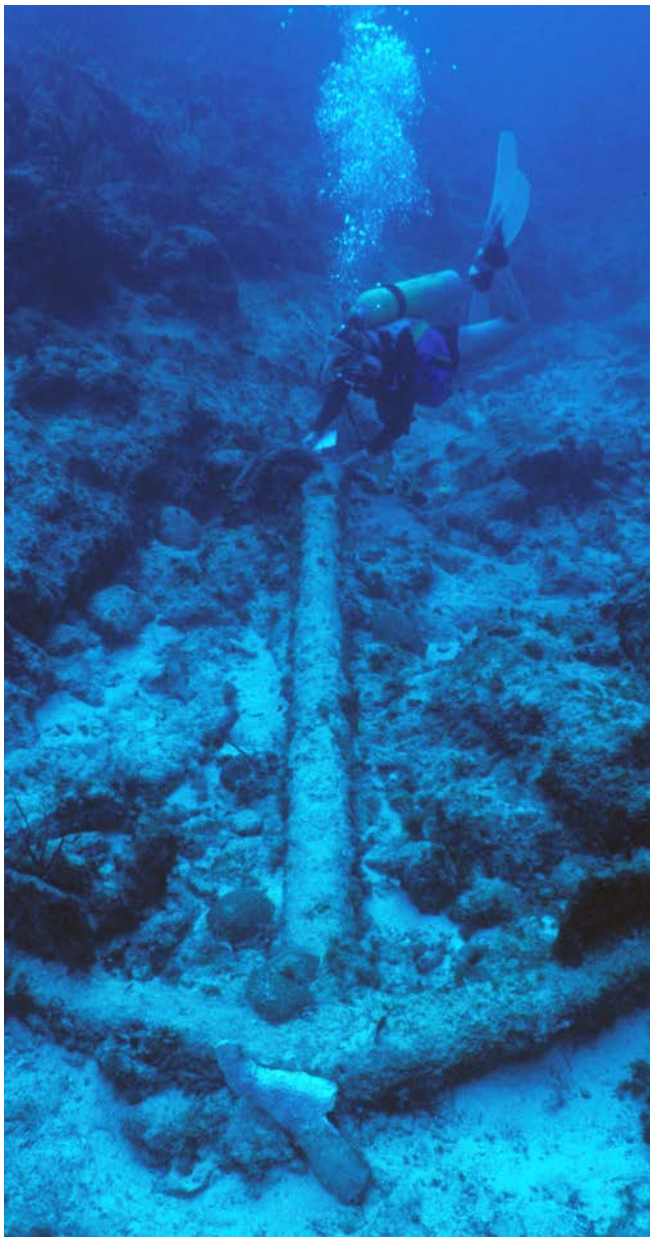

Fig. 5 An encrusted 18th century anchor believed to be associated with the Wreck of the Ten Sail lies exposed upon the seabed of the Cayman Islands. Photograph Mike Guderian © Wreck of the Ten Sail Project.

England, France, and the Netherlands challenged Spain's monopoly in the 16th and 17th centuries through official and entrepreneurial voyages; the Dutch created a wide commercial network, while the English and French began to settle the eastern Caribbean by the early 1600s. Meanwhile, Spanish colonies illicitly imported European products and African slaves from passing foreign merchant ships. In the Dominican Republic, the Pan-American Institute of Maritime Archaeology excavated a 17th century interloper into the Spanish colonies between 1991 and 2005. The investigators believe that the ship, known as the Monti Christi Shipwreck[6], was en route from Europe to North America, via the Caribbean when it wrecked. It appears to be an English-built merchantman carrying

a Dutch cargo of clay tobacco pipes from Amsterdam. It wrecked between 1652 and 1656, off the north coast of Hispaniola. French Louis XIV-period shipwrecks, lost during a 1677 battle with the Dutch in the Eastern Caribbean, were discovered during harbour-dredging activities in Tobago. In response, Trinidad and Tobago enacted the Protection of Wrecks Act (1994), based on the United Kingdom's Protection of Wrecks Act (1973), to safeguard these sites.

England and France established permanent settlements in the western Caribbean during the 17th century. In 1655, England seized Jamaica from Spain, while Spain eventually recognized the English claim in 1670, by the Treaty of Madrid. In 1655, France took Tortuga and progressively occupied all of St. Domingue (the western third of Hispaniola), but it was not until the 1697 Treaty of Ryswick that Spain recognized the French claim. It was an era of pirate and privateer exploits. In 1979, INA investigated the Turtle Wreck, an English turtle-fishing vessel likely burned in 1670 by Spanish privateer, Manuel Rivero Pardal in Little Cayman, and the Duck Pond Careenage used for overhauling vessels for at least three centuries in the Cayman Islands. In 2007, pirate Captain William Kidd's ship *Quedagh Merchant* was discovered in the Dominican Republic by a team from Indiana University; lost in 1699, this shipwreck was scientifically investigated under direction of Frederick H. Hanselmann, and artefacts conserved in cooperation with Dominican Republic institutions. The site is now interpreted for the diving and snorkelling public, with plans underway to create a land-based exhibit (Hanselmann 2019). The Cayman Islands National Museum (CINM) test excavated a turtle-fishing encampment dating to about 1700 on the north coast of Grand Cayman, and excavated an early historic step-well on the island's western waterfront. They have found clues to HMS *Jamaica*, a British sloop on patrol for pirates when it wrecked in 1715 entering the great North Sound.

A catastrophic earthquake hit the thriving English colonial city of Port Royal, Jamaica, in 1692, causing much of it to subside into the liquefied sand of Kingston Harbour. Edwin Link and the National Geographic Society carried out underwater excavations in the 1950s, resulting in a pre-1692 map of Port Royal, while Robert Marx excavated caches of artefacts in the 1960s. Philip Mayes began terrestrial excavations in 1969. Texas A&M University and INA, under the direction of Donny Hamilton, and in association with the Jamaica National Heritage Trust (JNHT) conducted the first scientific underwater archaeological excavations (Fig. 4). Hamilton led field schools from 1981 to 1990 in excavations of eight buildings and a ship that crashed into one building during the earthquake, training at the same time, Jamaica's first underwater archaeologist, Dorrick Gray, who subsequently served as Technical Director of Archaeology at the JNHT. Much of Port Royal remains *in situ*, and as such represents a time-capsule of 17th century life. The Jamaican government is seeking World Heritage status for Port Royal; it is considering management options, and issues of preservation, research, conservation, and disposition of artefacts.

Britain and France dominated control of the Caribbean during the 18th century, protecting their colonies and lucrative sugar trade through naval power. They were opponents during a series of wars, with Spain and the Netherlands inconsistently allied with one or the other country: the War of Spanish Succession (1702–1713), the Seven Years War (1756–1763), the American War of Independence (1775–1783), the French Revolutionary Wars (1792–1802), and the Napoleonic Wars (1803–1815). Not surprisingly, a great number of merchantmen and warships were lost in the 18th century Caribbean. Archaeologists discovered at least six 18th century merchant ships in St. Ann's Bay, Jamaica; Greg Cook and a team from INA/JNHT investigated one British sloop, the Reader's Point Wreck, in the 1990s.

The French islands of Martinique and Guadeloupe compiled an online inventory of at least 73 UCH sites. Among the 19 identified sites are *Notre Dame De Bonne Espérance* (1687), HMS *Raisonable* (1762), and *Le Cygne* (1808). In 2019 Jean-Sébastien Guibert, Max Guérout, Marc Guillarme, and others published a very useful summary of colonial period (17th to 19th century) maritime archaeological projects undertaken in the French Antilles between 1980 and the present (Guilbert et al. 2019). Their overview includes coastal plantations, ports, and micro-islets, as well as shipwrecks related to commercial, naval, and cabotage use. They relate that the nature and distribution of sites provides information on maritime routes and traffic, trade, and conflicts, as well as environmental risks specific to the Antilles in the Colonial period. There is critical capacity building underway presently in Martinique and Guadeloupe. In Saint Kitts and Nevis, the Nevis Maritime Archaeological Group, composed of local and international members, began conducting research in 2011 on HMS *Solebay*, lost on 25th January 1782 during the Battle of Frigate Bay. Established in 1979, the Dominican Republic's Comisión de Rescate Arqueológico Submarino conducted excavations in cooperation with commercial interests on the French warship *Scipión* (1782), and the French ships *Diómedes* and *Imperial* (1806); the Museo de las Reales Atarazanas, the Museo de Arqueología Submarina del Faro a Colón, and the Museo de las Casas Reales display artefacts from these shipwrecks. In the 1990s, Margaret E. Leshikar-Denton, working with Texas A&M University (TAMU) and the CINM, investigated the 1794 Wreck of the Ten Sail: HMS *Convert* and nine ships of

her merchant convoy lost together on the East End reefs of Grand Cayman during the French Revolutionary Wars (Fig. 5). The *Convert* was a captured French-built frigate, formerly called *l'Inconstante*, which retained her original French ordnance. The CINM's special two-hundredth anniversary exhibition commemorated the historical event in 1994, at which time Queen Elizabeth II visited the exhibition; it is being featured again in a new publication (Leshikar-Denton 2020). The Saint Maarten National Heritage Foundation, the Saint Maarten Department of Planning and Environment, and Maritime Archaeology and Research investigated HMS *Proselyte*, the captured Dutch frigate *Jason*, in 1994–95; the ship was lost in 1801. In the 1980s, the Archaeological and Anthropological Institute of the Netherlands Antilles (AAINA) investigated the Dutch frigate *Alphen* which exploded and sank in 1778 in Santa Anna Bay, Curacao; AAINA also recorded the SS *Mediator*, lost in 1884 in Willemstad Harbour. In cooperation with the Maritime Archaeological and Historical Society (MAHS), AAINA surveyed the historical anchorage adjacent to Fort Orange and Kralendijk, the population centre in Bonaire, and identified the Dutch warship *Sirene*, lost in 1831. In Saint Vincent and the Grenadines, with the cooperation of the Government of Saint Vincent and the Organization of American States, a joint team of Florida State University and Institute of Maritime History researchers and students carried out a project in Kingstown Harbour on a late 18th century shipwreck in 1997–1998. In Puerto Rico, archaeologists have recorded an 18th century English warship wrecked on the Laurel Reefs of La Parguera, Lajas.

A significant part of Caribbean history is reflected in the search for the slave ship *Trouvadore*, a Spanish ship that was lost in 1841 with a human cargo of 193 people. Intended for slavery in Cuba, the Africans instead found freedom in the Turks and Caicos Islands and thereby influenced the cultural future of that country. In 2008, Ships of Discovery investigated remains of a vessel believed to be *Trouvadore* and also located remains of the US Navy brig *Chippewa*, lost in 1816 while patrolling the Caribbean on a mission to counter the African slave trade and piracy.

The 19th century brought the end of the Age of Sail and the flourishing of the Age of Steam. In Puerto Rico, the Underwater Archaeology Office of the Consejo para la Conservación y Estudio de Sitios y Recursos Arqueológicos Subacuáticos (council for the conservation and study of sites and underwater archaeological resources) recorded the Spanish steamships *Alicante* wrecked in 1881 and *Antonio López* lost in 1898 during the Spanish-American War. Archaeologists have also assessed Buoy 4 in San Juan to investigate the *Manuela* and *Cristobal Colon*, also casualties during the Spanish-American War. In Anguilla, Lillian Azevedo and a team from the University of Southampton have recorded early historic wrecks and a 19th century shipwreck.

Even 20th century wrecks are subjects of research and ecotourism in the Caribbean. Bert Ho and a team from Florida State University assisted the CINM in documentation of the Norwegian-flagged *Glamis*, lost in 1913, providing the foundation to create a future shipwreck preserve on the robust shipwreck site in the Cayman Islands. *Glamis* had been built in Dundee, Scotland, in 1876. *Geneva Kathleen*, a three-masted schooner wrecked in 1930 loaded with lumber, was documented by Ball State University, also in the Cayman Islands. In Puerto Rico, archaeologists have documented World War II era vessels, including a PT[7] boat in Desecheo Island, and two aircraft – a B-29[8] in Aguadilla and a PBY Catalina flying boat in La Parguera for the US Navy.

Meaning to Descendent Communities

An important theme in the Caribbean is the meaning of maritime and underwater cultural heritage to descendant communities (Leshikar-Denton and Luna Erreguerena 2008a, b). In the Turks and Caicos Islands, the case study of a descendant African community whose ancestors escaped intended slavery in Cuba, through wrecking in the Spanish ship Trouvadore, is remarkable; it provides the opportunity for people to learn more about themselves, where they came from and how they have survived. Maritime themes like shipwrecks, historical shipbuilding of schooners and catboats, place-names, and hurricane-shelter caves, among other topics, are important to the people of the Cayman Islands. Thus, involving all levels of society in the Maritime Heritage Trail engages people in their heritage. In every country there are unique examples that can link communities to their heritage – and this communication provides value and self-esteem to living people.

International Perspectives and Future Directions

Since the mid-20th century, the world's underwater cultural heritage has become more and more accessible, and has become an easier target for commercial exploitation. At the same time, professional underwater and maritime archaeological research has experienced a profound period of growth. It is also becoming clear that UCH has value not only to scientific research, but also has a role to play in cultural, educational, and economic terms. Countries, including those in the Caribbean, are discovering innovative ways to manage and preserve maritime and underwater cultural heritage sites, and to promote them locally, regionally, and internationally. Today is a good day for maritime archaeology in the Caribbean – today we have tools in our kit that have been created through negotiations among countries of the world, including those from Latin America and the Caribbean.

Using the 1996 ICOMOS Charter and the 2001 UNESCO Convention, we can speak the same language in attributing value to UCH and providing for its protection, management, interpretation, and public access and benefit – these documents can guide us in 'best practice' and in establishing compatible national legislation. As Ariel Gonzalez, a brilliant Argentinian lawyer put it during the Paris negotiations, the magic word is 'cooperation' among stakeholders – and so, countries, governments, professionals, and the public who communicate and assist one another through local, regional, and international agreements and through sharing technical and professional resources can shape a positive future.

Acknowledgements

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1 Smith 2000, 2018; Leshikar-Denton 2002, 2004, 2011, 2020; Echeverria 2004; Pateman 2004; UNESCO 2004; Grenier et al. 2006; Guibert et al. 2019; Keegan and Hofman 2017; Keith 2006; Leshikar-Denton and Luna Erreguerena 2008a, b; Gray 2008; Hamilton 2008; Hanselmann 2019; Harris 2008; Leshikar-Denton and Scott-Ireton 2008, 2013; Nagelkerken and Hayes 2008; Nagelkerken et al. 2008; Sadler 2008.

2 A more comprehensive overview is available in Leshikar-Denton and Luna Erreguerena (2008a, b).

3 see footnote 1

4 Naos (or Carrack) are European designed ships from the 14th to 15th centuries. The later ships had three-four masts suitable for ocean navigation. The fore and main were square rigged, the mizzen a lateen sail.

5 Caravels originate from Portugal; developed in the mid-15th century and often related to oceanic explorations, most notably Columbus. They were lateen rigged, lighter and faster than fully rigged ships faster and being shallow drafted allowed for close to shore navigation.

6 Also known as the 'Pipe Wreck' due to the 10,000 un-broken clay pipes found during the excavation.

7 Patrol Torpedo Boat.

8 Boeing B-29 Superfortress: a four-engine bomber which was in active US service from 1944–1960.

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THE LJUBLJANICA RIVER PHENOMENON: RESCUE RESEARCH, CONSERVATION, AND PRESENTATION OF THE LATE 2ND/EARLY 1ST CENTURY BC LOGBOAT FROM THE LJUBLJANICA RIVERBED*

Andrej Gaspari and Irena Šinkovec, Slovenia

Fig. 1 The centre of Vrhnika with Stara pošta and the Ljubljanica River in the area of the log-boat's site. © D. Badovinac.

Introduction

The 23-km-long stretch of the Ljubljanica riverbed and the surrounding floodplain of the Ljubljana Marshes between Vrhnika and Ljubljana represents one of the most complex archaeological phenomena in the territory of present-day Slovenia. The area comprises individual and collective underwater finds, lying exposed on the river bottom or embedded in sand dunes within the channel or forming a part of river bank deposits, as well as the remains of wooden crafts, port infrastructure, water-way regulation interventions, buildings, and control points along the river. The early recognition of the archaeological potential of the riverbed at Vrhnika (ancient *Nauportus*)[1] led to one of the world's first research-orientated underwater investigations, conducted by the Carniolan Provincial Museum in Ljubljana with the support of Austro-Hungarian Navy divers in 1884, followed by systematic surveying, excavations, and integrated research from the 1980s onwards.

The wealth and diversity of underwater finds, ranging from traces of the Mesolithic or even late Palaeolithic hunter-gatherer (stone and bone/antler industry) to the eroded remains of Copper Age pile-dwellings across numerous Bronze Age metalwork and pottery depositions of sacrificial and funeral character, Late Iron Age Celtic-style weaponry, imported Italic bronze ware and silver coinage, an abundance of Roman military equipment. These remains are evidence of the intensive use of the river area in the Mediaeval and early Modern period, and testify to the special importance of the river for the local communities. They also bear witness to the universal value for understanding the multi-facetted interaction between humans and their natural environment.

The small objects of the material culture are made of metal, ceramic, and organic materials. They are characterized by their excellent preservation, unparalleled within the ensembles from dry-land sites, and are presumed to have entered the water either directly as a result of accidental losses or intentional acts, or were eroded by the stream from primary contexts in the banks. The functional structure, spatial distribution, and chronological dynamics of the finds reflect characteristics of a broader European phenomenon, pointing to a structured deposition of at least some part of the discovered objects from the Bronze and Iron Ages, the Roman period and perhaps also the Early and High Mediaeval period (7th to 12th century), especially from the perspective of the objectively low-risk nature of the river, marked by an extremely small course gradient, a box-shaped channel with depths from 3 to 12 m (mostly 4–7 m) and its width, rarely surpassing 25 m.

The underwater finds are supplemented by over 60 finds of simple dugout canoes, paddles/oars, assembled boats, and capable cargo ships from the riverbed and marshy sediments/peat of the surrounding plain. These represent clear evidence of the role of water transportation in the local economy and exploitation of natural resources. They also testify to the area's vitality in acceptance/transfer/innovation of nautical technology in late prehistory and the Early Roman period, continuing in rich shipbuilding traditions of post Mediaeval and historical periods.

Although not protected as a whole until 2002, the above-mentioned elements of the Ljubljanica River archaeological complex have been formally protected as archaeological heritage and State property by the provisions of national laws since

Keywords: Underwater Archaeology – Riverboats – Waterlogged Wood Conservation – Management of Underwater Cultural Heritage – Slovenia – Ljubljanica River

Fig. 2 Late 2nd/early 1st century BC logboat. © A. Hodalič.

1945. Nevertheless, the relatively easy access to the valuable finds, together with the suspension of organized archaeological fieldwork in the mid-1980s, caused large-scale looting of underwater sites and illicit trade in antiquities reaching the international market in the late 1980s and 1990s, which was subsequently reduced by the declaration of the Ljubljanica as a cultural monument of national importance in 2002, imposing controlled, permit-based diving in the protected area and stricter police surveillance, but also the intensification of awareness-raising initiatives and projects for the local population.

The important development of the management of the river's cultural heritage was brought about by the ratification of the European Convention for the Protection of the Archaeological Heritage (revised), also commonly known as the Valletta Treaty or Valletta Convention (1992). In 1999, this resulted in the increase of preventive archaeological research also in the inland rivers of Ljubljanica, but perhaps even more with the new national Cultural Heritage Protection Act in 2008. The latter, among other things, provided the so-called abolition scheme, which enabled the private keepers of archaeological objects to report the finds in their possession and hand them over in return for financial compensation. Such provision ensured the acquisition of three large collections of underwater finds from Ljubljanica for public museums, resulting in a large exhibition of the National Museum of Slovenia in 2009 entitled *The Ljubljanica – a River and its Past*), and a permanent display of the most attractive and informative finds from one of the collections gained in the newly-established Ljubljanica River Experience and Exhibition Centre at Vrhnika.

General protection of the sites is provided by the signs and information boards, notifying the existence of the archaeological monument and safeguarding measures (prohibition of diving with scuba gear without a permit), constant attention of the local community, especially fisherpersons and hunters, as well as police surveillance of the areas exposed to looting.

The presentation of the project

Following the provisions of national legislation and promoting the concepts of the Convention on the Protection of the Underwater Cultural Heritage (UNESCO 2001), a large project focused on sustainable management, safeguarding and promotion of the archaeological heritage of the Ljubljanica River was envisaged and executed in the 2014–2016 period in the partnership with the Museum and Galleries of Ljubljana, the Municipality of Vrhnika, and the Biotechnical Faculty of University of Ljubljana. It was co-financed by the EAA financial mechanism from 2009 to 2014.

The Ljubljanica River Experience and Exhibition Site project was aimed at protecting the most endangered parts of the monument and increasing public accessibility to the heritage. The core of the presented efforts is comprised by:

1. The *in situ* protection and monitoring of a Roman barge in the riverbed near Sinja Gorica, discovered in 2008 during a preventive underwater survey prior to flood-management works, and partially researched in 2012 by the Institute for the Protection of Cultural Heritage of Slovenia.
2. The rescue excavation and recovery of an approximately 14.3 to 14.5-m-long, up to 1.38-m-wide and 0.78-m-deep oak logboat from the riverbed at Vrhnika by the Institute for Underwater Archaeology in Ljubljana and in collaboration with the International Centre for Underwater Archaeology in Zadar – ICUA,[2]
3. establishment and opening of the above-mentioned Centre at Vrhnika with a permanent exhibition on the archaeology of the Ljubljanica River and the planned logboat showcase, enabling the regulation of relative humidity, for the future display of the logboat.

The decisions related to the protection and preservation of the logboat situated in the area of a cultural monument of national importance have been marked by: (a) the progressive erosion of the right bank directly above the site; (b) the uncertainty with regard to its stability and the related issue of water management of the riverbed; and (c) the rehabilitation of the recess in the right bank. In this specific situation, the comprehensive research and moving of the logboat — which was recognized as the only acceptable solution for its permanent preservation — was both in the public interest of protecting the cultural heritage and in the interest of protecting people and property.

In deciding between the possibility of moving the vessel to a safer place on the Ljubljanica riverbed and the possibility of lifting, conserving, and presenting the logboat in the purpose-designed Centre for the Promotion of Natural and Cultural Heritage at Vrhnika, there was uncertainty in relation to the (in)stability of the secondary place of deposition in the riverbed. Furthermore, the realisation of the second option would provide an important contribution to improving heritage accessibility for all social groups. The development of public awareness of the significance of archaeological remains, which is in accordance with the recommendations of the Manual on the Rules Concerning Activities Directed at Underwater Cultural Heritage from the Annex to the UNESCO Convention on the Protection of the Underwater Cultural Heritage, finally prevailed.

The evaluation of the cultural protection issue of protecting and preserving the logboat and the decision for its comprehensive research within the framework of the Ljubljanica River Experience and Exhibition Site project was followed by the creation of the research project plan in accordance with the second chapter of the Annex to the UNESCO Convention on the Protection of the Underwater Cultural Heritage. This required the selection of a qualified contractor and acquisition of relevant consents and permits. Commissioned by the MGML as the competent project partner — responsible for the professional coordination of archaeological and conservation and preservation interventions — and in accordance with the Cultural Protection Consent for Research and Removal of Archaeological Remains, the underwater excavation and documentation of the vessel was carried out by the Institute for Underwater Archaeology in cooperation with the International Centre for Underwater Archaeology from Zadar – UNESCO Category II Centre. After the execution of extensive preparation work, the remains of the logboat were lifted from the riverbed and transported to the conservation workshop of the Restoration Centre of the Institute for the Protection of Cultural Heritage of Slovenia (ZVKDS RC).

Fig. 3 Lift of the logboat's bow section. © J. Gasparič.

Project timeline

Roman barge in the Ljubljanica riverbed near Sinja Gorica

1. Impact assessment of the flood-management measures (2011–2012);
2. Partial excavation and 3D recording (2012);
3. Execution of a protective covering of the exposed part of the barge with sandbags and sediment infill (2012) and
4. Monitoring/analysis of biological and chemical markers of wood degradation and erosion/sedimentation and assessment of processes at the site in regular intervals (2013–2019).

Logboat from the Ljubljanica riverbed at Vrhnika
1. Impact assessment of the flood-management measures (2014);
2. Complete excavation, photo 3D documentation and virtual reconstruction, lift, and transport to the restoration centre in Ljubljana (2015);
3. Conservation with the melamine treatment method (2015–2020) and
4. Exhibition of the logboat at the Ljubljanica Experience centre at Vrhnika (planned 2021).

Fig. 4 The future site of the logboat - the Ljubljanica River Exhibition. © J. Babnik; archives of MGML.

Management plan

The Archaeological site is designated as a monument of national importance under the authority of the Institute for the Protection of Cultural Heritage of Slovenia. The Museum and Galleries of Ljubljana, together with the Restoration Centre of the Institute for the Protection of Cultural Heritage of Slovenia and the Biotechnical Faculty of the University of Ljubljana, carry out regular monitoring and analyses of water and sediment at the *in situ* location of the Roman ship in Verd near Vrhnika. It also oversees the repository for waterlogged wood in the direct vicinity of the monument.

The Ljubljanica River exhibition is managed by the local community in cooperation with the Museum and Galleries of Ljubljana. Programmes, which include workshops and events for different target audiences, are organised at the exhibition area, in public areas, schools, and at the locations of the monument itself. Active involvement of the public, cooperation of the public and the non-government sector, and programme integration in the wider region are of the utmost importance.

The preparation of new projects is carried out as part of the macroregional European Union strategies with the cooperation of national and local authorities, and of scientific, cultural, and development institutions.

Measures for enhancement of public awareness, appreciation and protection of the heritage

The Ljubljanica River Experience and Exhibition Site Project represents the first phase of a broader and integrated project of revitalization of the cultural and natural heritage of the Ljubljanica Basin. Its objective was to protect, preserve, and present the heritage, but also to provide maximum accessibility, and thereby create long-term sustainable social development in the local, national and global context. This includes quality services for the local residents, as well as domestic and international visitors.

Through the Ljubljanica River Experience and Exhibition Site project, its most vulnerable parts were not only protected, but also expertly preserved and made available to a large audience. The Ljubljanica River permanent exhibition is placed right in the centre of Vrhnika, since the monument's actual location is less suitable — near the river — within an environmentally protected area, which poses infrastructural issues. The complex content on the development of the Vrhnika area from the prospective of the Ljubljanica River is presented in a multi-level and multi-layered manner, adjusted to various target groups. Particular emphasis is placed on the dynamics of the visit (image, sound, timing, interaction, light and water effects) and modern museum standards. The visitor experience is multi-layered and, in an abstract way, defined by the river as the carrier vehicle of the exhibition and framed by three worlds: the world below (underwater world, Karst underworld, underwater archaeology, space dedicated to the unknown); the world on the surface — the level in-between, transition from one world to another, the plane/flow of the river-flow of time — ; the world above (world on the river, world of the people, world of the known).

The interactive experience and exhibition site located in downtown Vrhnika has been designed to encourage the public, including vulnerable groups, to actively participate in strengthening the common responsibility for heritage and for the development of tourism, creative industries, and the revival of old crafts and local traditions. All results of the project are aimed at the general public. Raising awareness of the local community was one of the fundamental tasks of the project. The content and programmes that concern the wider Ljubljanica area also created the potential for tourism development and the expansion of target audiences. By bringing together experts, integrating the local public and by networking all those quality programmes, the exchange of knowledge and

skills, values and attitudes as well as long-term integration of local, national and international arena is established. By following various methods of communication (experimental workshops, programmes, events) each age and interest group is addressed. By using customized programmes and encouraging active involvement, special attention is paid to vulnerable groups and visitors with special needs.

The project's main results

Protected, restored and managed unique quality cultural monument of national importance.

Created a distinctive comprehensive identity of the monument, which provides guidance on sustainable development and enables producing long-term strategies in the field of protection and preservation of cultural and natural heritage, as well as their presentation and popularization for the broadest domestic and international audiences.

Improved access to cultural and natural heritage, potential for educational activities, leisure and tourism businesses, developing creative industries, preserving old crafts and intangible heritage, as well as improving the quality of life in the city and the wider region with new employments as a result.

Revitalization of a previously deteriorated urban area, abandoned and lagging behind due to unfavourable economic trends.

Summary and the future

The project enabled us to protect the most threatened segments of the underwater cultural heritage, avoiding the uncontrolled destruction of two ancient watercraft. At the same time, it brought about the consolidation of the collapsing riverbank, limiting the ecological damage and protecting neighbouring real estate.

The founding of the laboratory for the conservation of waterlogged wood enabled regular microbiological monitoring of water and sediments. It also established a permanent state repository for archaeological waterlogged wood and the execution of multi-beam sonar survey and modelling of the riverbed. These tasks provided the constituent solutions for the management of the Ljubljanica riverbed monument.

Opening of the exhibition centre and quality programme scheme for different target groups, — apart from awareness-raising and education — aimed to establish a permanent and sustainable form of co-management of the monument with the inclusion of the public.

Immediately after the completion of the conservation procedure, projected to be 2021, the logboat will be installed in a humidity-controlled showcase in the exhibition centre and the prevised programme scheme will continue. At the location of the *in situ* protected Roman barge, the possible adverse effects will be closely monitored. Moreover, a high-resolution sonar survey of the Ljubljanica riverbed is to be executed as the basis for the planning of supplemental protective measures.

* Extract from the official submission for the example of Best practices in Underwater Cultural Heritage, evaluated and recommended by the Scientific and Technical Advisory Body (STAB) to the Meeting of States Parties to the Convention on the Protection of the Underwater Cultural Heritage (Paris, 2018, 9th; document code: UCH/18/9.STAB/10, Resolution 6).

1 As testified by ample ancient literary accounts, the Nauportus was an important Prehistoric and Early Roman toll and reloading station at the northern foot of the high Dinaric plateau, dividing North-eastern Italian plain from the central part of the South-eastern pre-Alpine area. The site is located in the deep hinterland of the Northern Adriatic, some 70 km from the nearest coast, and on the beginning of navigable Ljubljanica discharging into Sava River that served as major trading route towards the Middle Danubian regions. The site, originally under control of the Celtic Taurisci (2nd to 1st century BC) and continually increased presence of merchants from nearby Latin colony of Aquileia, came under Roman rule around mid-1st century BC and after functioned as an statio and vicus along via publica Aquileia–Emona (modern Ljubljana). The continuation of the road toward the north traced the old route known as Amber route, which connected lands on the southern shores of the Baltic with the Northern Adriatic since deep prehistory (see Šašel Kos 2005).

2 The logboat is currently in conservation at the Restoration Centre of the Institute for the Protection of Cultural Heritage of Slovenia in Ljubljana.

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INTRODUCTION TO THE IMPACT OF CLIMATE CHANGE ON UNDERWATER CULTURAL HERITAGE AND THE DECADE OF OCEAN SCIENCE FOR SUSTAINABLE DEVELOPMENT 2021–2030

Albert Hafner, Switzerland and Christopher J. Underwood, United Kingdom

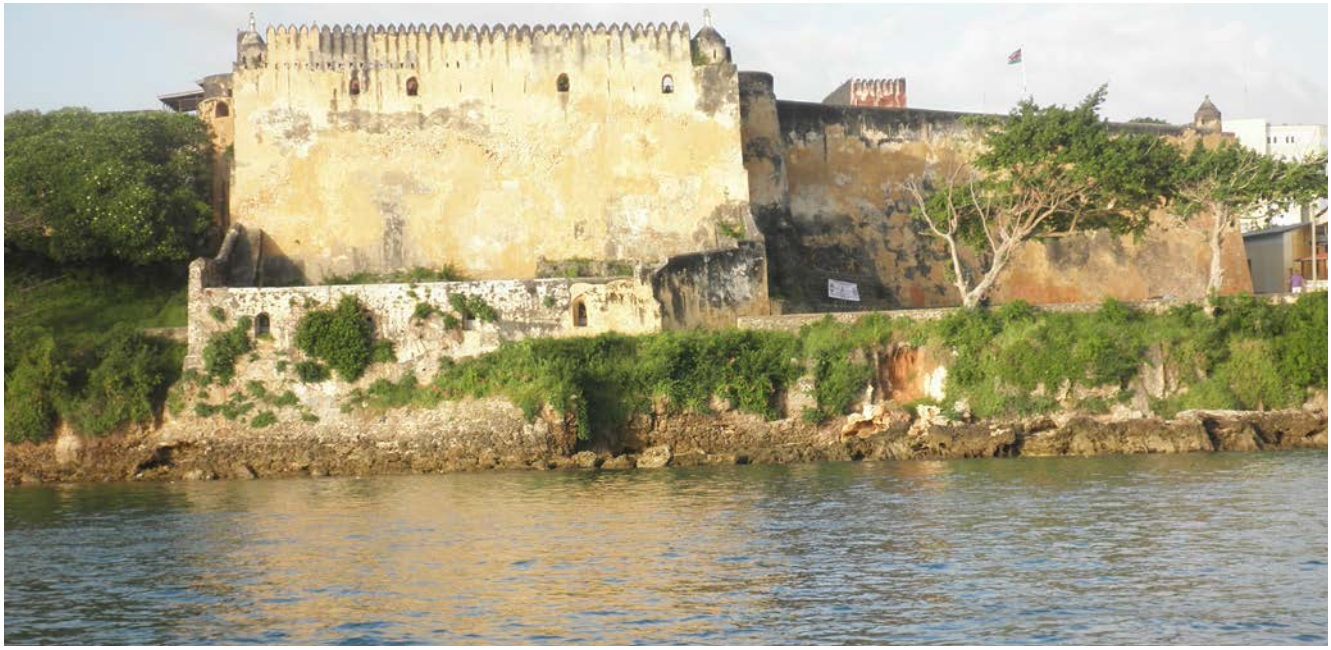

Fig. 1 Fort Jesus, Mombasa, Kenya. Below these walls lies the well-preserved 17th century wreck of Santo Antonio de Tanna. © Christopher J. Underwood.

Introduction

At the time of writing, there are important themes that go beyond the normal range of concerns expressed by archaeologists and cultural heritage managers. Most significantly are the growing awareness of the impact of climate change and the sustainability of the world's oceans. The immediacy and importance of the threats is acknowledged in SDG 13 Climate Action and SDG 14 Life Below Water, which are two of the seventeen United Nations Sustainable Development Goals (UN 2020a). This chapter introduces how climatic changes impacts underwater cultural heritage (UCH) and how the UCH community is responding and supporting the goals of the United Nations Decade of Ocean Science for Sustainable Development 2021–2030 (the Decade) that is providing a framework for supporting the aims of SDG 14 Life Below Water.

Climate change

It seems almost a daily occurrence that the media reports that somewhere in the world a natural weather event has had a dramatic impact, often on a coastal community or aquatic environment. The causes include, among the possibilities, large-scale geographical events such as tsunami or damaging weather event such as hurricanes.[1] Increasingly, they are associated with changes in the global climate. In recent decades increasing public awareness of this existential threat has led to public pressure on domestic governments to take action. It has resulted in a positive momentum to mitigate the accelerating problems at least in some countries.

International concern about climatic changes is reflected in the United Nations Framework Convention on Climate Change of 1992, the 1998 Kyoto Protocol, and the Paris Accord of 2015. These documents underpin a global narrative that highlight the need for a change in human activity aimed at reducing carbon emissions and transitioning to sustainable natural energy resources, such as wind or solar power. Despite increasing political will to change and improve the future environment, the impacts of climate change will remain with us in the longer term. The Intergovernmental Panel on Climate Change (IPCC) was established by the United Nations Environment Programme (UNEP) and the World Meteo-

Keywords: Climate Change – Underwater Cultural Heritage – Decade of Ocean Science Sustainable Development Goals

rological Organization (WMO) in 1988. Since 1990, IPCC has produced numerous assessment reports[2] considered among the most comprehensive scientific reports on climate change, worldwide. While the impact of climate change on human lives, understandably, make the headlines and is the primary concern, in parallel there are increasingly frequent reports of changes to the profiles of coastal and inland waters sometimes revealing a long-lost shipwreck, coastal settlement, or ancient artefact.

Impact of climate change on the marine environment

It is recognised that the predicted changes in climate weather will have a significant impact on coastal and underwater cultural heritage, particularly those sites located in shallow waters.

UNESCO states that:

> 'Environmental changes, such as climate change, stronger erosion, and current change can pose a threat to underwater cultural heritage sites. On the other-hand underwater cultural heritage can however tell us a lot about historic climate change that once impacted the life of our ancestors. Today, tsunamis, coastal erosion, and water warming threaten underwater cultural heritage sites' (UNESCO 2020).

In response, governments and their respective heritage agencies have carried out impact assessments and adaptation reports (Fluck 2016). The assessments provide guidance and indicators on adapting to change, mitigation of impact, resilience, and a drive towards sustainability. As underwater cultural heritage is one theme among a broad range of heritage categories, it remains important to reinforce efforts to raise awareness of the values of UCH. This is often synthesised as sites in marine and freshwater environments being better preserved than in a terrestrial environment, less affected by development, with potential for sustainability and benefits to all society. A frequently mentioned disadvantage — representing a significant challenge — is that UCH is out of sight and out of mind, and as such is physically inaccessible to most of the population. In the following paragraphs there is a brief identification of, and introduction to, the predicted environmental changes and their likely impact on UCH.

Rising sea temperatures and ice-melt

Rising sea temperatures will cause a thermal expansion of the ocean and exacerbate ice-melt. It is predicted by the UK's Marine Monitoring and Assessment Strategy that there will be a rise in sea-level during the 21st century of between 12 to 76 cm (Dunkley 2015, 220). Polar ice-melt will open new zones of exploration leading to the possibility of searching, discovering, and investigating sites previously considered to be much more difficult to access. As the ice-tables have retreated combined with the utilisation of sophisticated equipment such as autonomous underwater vehicles (AUVs) well-funded expeditions have begun to search for iconic wrecks such as Shackleton's Endurance lost during the ill-fated Imperial Trans-Antarctic Expedition, 1914 to 1917. An extensive search failed to locate the site, but had Endurance been discovered the aims of the expedition were limited to recording the site and leaving it undisturbed. There is, however, a concern that the wreck's location would have eventually become public knowledge enabling expeditions with less creditable aims to exploit the site in a zone with limited protective oversight. The melting of glaciers in the high alpine zones of the world's mountain ranges will change the water regime of rivers and lakes and thus influence the cultural heritage of inland waters. A further impact resulting from rising sea temperatures representing a significant threat to UCH is an increased geographic spread of shipworm. The UK has registered the presence of Lyrodus pedicellatus on several wreck sites on the south coast, including in the protected zone of the wreck of the Mary Rose, a species of shipworm that is normally found in warmer southern waters (Dunkley 2015, 221).

Sea level rise and ocean processes

The identified impacts relative to rising sea levels in such places without tidal protection barriers will lead to the flooding of coastal cultural heritage sites, becoming less accessible to archaeologists, tourists, and will, even if practicable, be more expensive to maintain, monitor, and protect. It is believed that the anticipated increases in sea level could 'by 2100 inundate 136 sites considered by UNESCO as cultural and historical treasures' (Perez 2016). This is a concern, because it is likely these important sites, culturally and economically and already inscribed as World Heritage will be prioritised for protection, therefore attracting the major proportion of available funding and support, possibly at the expense of other sites considered less important.

It is expected that there will be an increase in wave strength, with stronger currents and storms, with associated flash flooding exacerbating the erosion of coastal environments and increasing turbidity. More intense storm activity will have a similar increasing impact on previously relatively immune shallow water sites. Some jurisdictions including the United Kingdom (UK) have implemented a programme of shoreline or managed retreat[3], which will result in damage or loss of heritage assets and areas of historic landscape.

The anticipated increasing strength and probable frequency of ocean processes could seriously affect the sustainability of coastal cultural heritage such as Fort Jesus, Mombasa, Kenya; also an important tourist destination. Built by the Portuguese between 1593 and 1596 the fort is an outstanding

example of Renaissance styled construction inscribed as World Heritage in 2011. It is managed by National Museums of Kenya. A further complication is the Portuguese wreck Santo Antonio de Tanna lost in 1697 that lies beneath the seaward walls would be under threat if it is necessary to substantially reinforce the fort's foundations (Fig. 1).

There is a potential positive consequence of climatic changes in that previously unknown cultural sites could be discovered. Although the bronze-age timber circle on the Norfolk coast colloquially named 'Seahenge'[4], first seen in 1998, has not been specifically linked to climate change, its appearance in the intertidal zone is attributed to coastal erosion and exemplifies what could be an increasing future trend. In this instance the 'circle' was recognised as being important, subsequently recovered, conserved, and is now displayed in a Norfolk museum.[5]

Ocean acidification

There are concerns that ocean acidification will increase the rates of corrosion of metal shipwrecks and exacerbate erosion of stone made structures such as submerged ancient harbours.[6] A consequential environmental risk is that natural and cultural heritage will be under increasing risk of pollution from the thousands of wrecks from the First and Second World Wars that still contain fuel oil or other toxic cargoes. It is estimated that the amount of oil within these vessels is in the order of 2.5–20 million tonnes. Acidification combined with other ocean process could exacerbate the erosion of these ships which will increase the risk of structural failure of their fuel bunkers; wrecks described as 'rusting time bombs' (Hamer 2010).

Economic adaptation to low carbon economies

In the transformation to low carbon economies, poor consultation, and weak regulatory frameworks can contribute to the 'heritage' versus 'climate action' dynamic. The possible consequences are inadequate preconstruction desk-based assessments and/or physical inspection of proposed locations for example offshore green energy constructions or coastal protection systems which would threaten the integrity of UCH sites in the affected areas.

Practicalities for the work of underwater marine archaeologists

There are practical implications for working in the marine environment. Stronger water currents and tidal surges combined with the rise in sea level have the potential to reduce available work time for archaeologists and possibly the deployment of remotely-controlled and autonomous vehicles. Increased turbidity will reduce underwater visibility which will impede working on sites and the visualisation of sites for researchers and for the public. As mentioned above while the marine environment often receives more media considerations, other aquatic environments are not immune from the impacts of climate change such as inland water bodies described in the following section.

Alpine spaces: The impact of climate change on inland water bodies

The insight that climate change not only has an impact on human societies and biodiversity, but also affects the preservation of cultural heritage, has become increasingly accepted over the last two decades. This is also expressed by the fact that in 2016–2019 the Horizon 2020 programme of European Union funded projects related to the 'Mitigation of Climate Change Impacts and Natural Hazards on Sites, Structures and Artefacts of Cultural Heritage' (Smith 2014; Lefèvre/Sabbioni 2018; Marzoli et al. 2019; Cordis EU Research Results). The effects of climate change on underwater cultural heritage have so far been much less in the public focus. A broader treatment — and mostly concentrated on maritime environments — has only recently been initiated (Perez-Alvaro 2019).

Freshwater environments cover less than one percent of the earth's surface. However, they contain around 10% of all the species described and therefore form biodiversity hotspots of great importance. They provide numerous ecosystem services such as water supply, transport, and nutrition. They have therefore always been points of attraction for human populations. Today, their remains from prehistoric to modern times are submerged settlements, fluvial offering places, foundation of bridges, fords and watercrafts, and form an important segment of underwater cultural heritage. Climate change is of particular relevance as it increases the anthropogenic pressure on freshwater ecosystems. It is expected that climate change will influence the physical properties of the aquatic environment in a multifactorial way: Rising temperatures and increased precipitation dynamics create potentially new environmental conditions and impact processes in freshwater ecosystems (Goldman et al. 2013; Benateau et al. 2019). Lemmin and Amouroux (2013) state in their study on the influence of climate change on Lake Geneva: 'The most significant features of climate change in the European mid-latitude region are a warming trend in the atmospheric boundary layer and an increasing tendency towards extreme weather events. Continuous warming may increase lake water temperature and extreme events may cause strong fluctuations in lake water temperature.'

In the lakes and bogs of Europe's Alpine Region there are about 1,000 archaeological settlement remains from the Neo-

lithic and Bronze Age. Archaeological sites in bogs have been threatened with drying up since at least 1950. The reasons for this have long been sinking groundwater levels and wetland melioration. Climate change will certainly intensify these processes. Archaeological sites in lakes have been exposed to increased erosion of shallow water zones for several decades as well (Fig. 2). The reason for this is anthropogenic impact in the water bodies, mostly the artificial lowering of lake levels as part of land reclamation or flood protection. Benateau et al. (2019) claim three main physical impacts of climate change on waterbodies in Switzerland: increase of water temperature, altered evaporation, and altered stratification, inflow and mixing regime and reduced freezing.

Fig. 2 Diver during underwater drilling at the archaeological site of Bay of Bones, Lake Ohrid, North Macedonia. © Corinne Staeheli, EXPLO, University of Bern.

How might these factors affect the underwater cultural heritage in the long term? Shipwrecks located at great depths in lakes are unlikely to be affected to a large extent, but damage to archaeological sites in the shallow water zone, near the shore is feared (depth < 5 m). It is conceivable that new plant and animal species will settle as the water temperature increases. Already today, crayfish and certain water birds contribute to the erosion of archaeological sites by building tunnels and searching for food. If reeds or future new invasive plants spread on a large scale, the rhizomes would destroy archaeological layers on the lake floor. If the alpine glaciers continue to melt as is currently observed (and this must be assumed), the altered conditions in the catchment area of the alpine rivers will also affect the lakes in the alpine foreland. Snow that falls during the winter months will no longer be stored in the Alps in the form of ice but will melt completely in spring and lead to increased flooding events. The higher dynamics of the lake levels will lead to more extreme events (floods, low water levels) and it will be associated with increased erosion of the shallow lakeshore zones, which is precisely where submerged prehistoric settlements are located.

Understanding the complex effects of climate change on aquatic ecosystems and their function is therefore of great importance for predicting the impact of climate change on underwater cultural heritage (Fig. 3). In Switzerland for example, and presumably in all alpine countries, the problem is well known, since the larger lakes in the Alpine Region all serve as drinking water, and their water quality is an issue of extraordinary importance (Benateau et al. 2019). Currently, it is difficult to assess the potential consequences of climate change and active measures of mitigation have so far only been taken against the erosion of underwater archaeological sites in lakes (Hafner 2008, 2012; Hafner/Schlichtherle 2008). Presumably, all measures to stabilise the water quality and the water cycle of a lake will also help to protect the submerged archaeological cultural heritage in inland waters.
The second strand of this chapter that relates to the UN's SDGs with special relevance to underwater cultural heritage is SDG 14 Life Below Water and specifically the UN Decade of Ocean Science for Sustainable Development 2021–2030 (the Decade). The following text provides a brief introduction to the Decade and outlines ways in which UCH can contribute to and support its goals.

The Decade for Ocean Science for Sustainable Development 2021–2030

The Decade has been created in recognition of the threat to the Ocean's eco-systems. A key aim is to determine the 'science we need' (UNESCO-IOC 2020a, 5) to help reverse the Ocean's decline moving from the 'ocean we have' to the 'ocean we want' (UNESCO-IOC 2020a, 6). The coordinating organisation is UNESCO's Intergovernmental Oceanographic Commission (IOC) which was tasked in 2018 with creating an Implementation Plan (UNESCO-IOC 2020a) and an Action Plan (UNESCO-IOC 2020b)[7] that would serve as a guide to achieving the goal of the Decade to 'support efforts to reverse the cycle of decline in ocean health and create improved conditions for sustainable development of the ocean, seas, and coasts '(UNESCO-IOC 2018).

Statements that support underwater cultural heritage being considered as an integral component of the Decade are found within the 1982 UN Convention on the Law of the Sea (UNCLOS) includes Article 303(1), which clearly states that 'States have the duty to protect objects of an archaeological

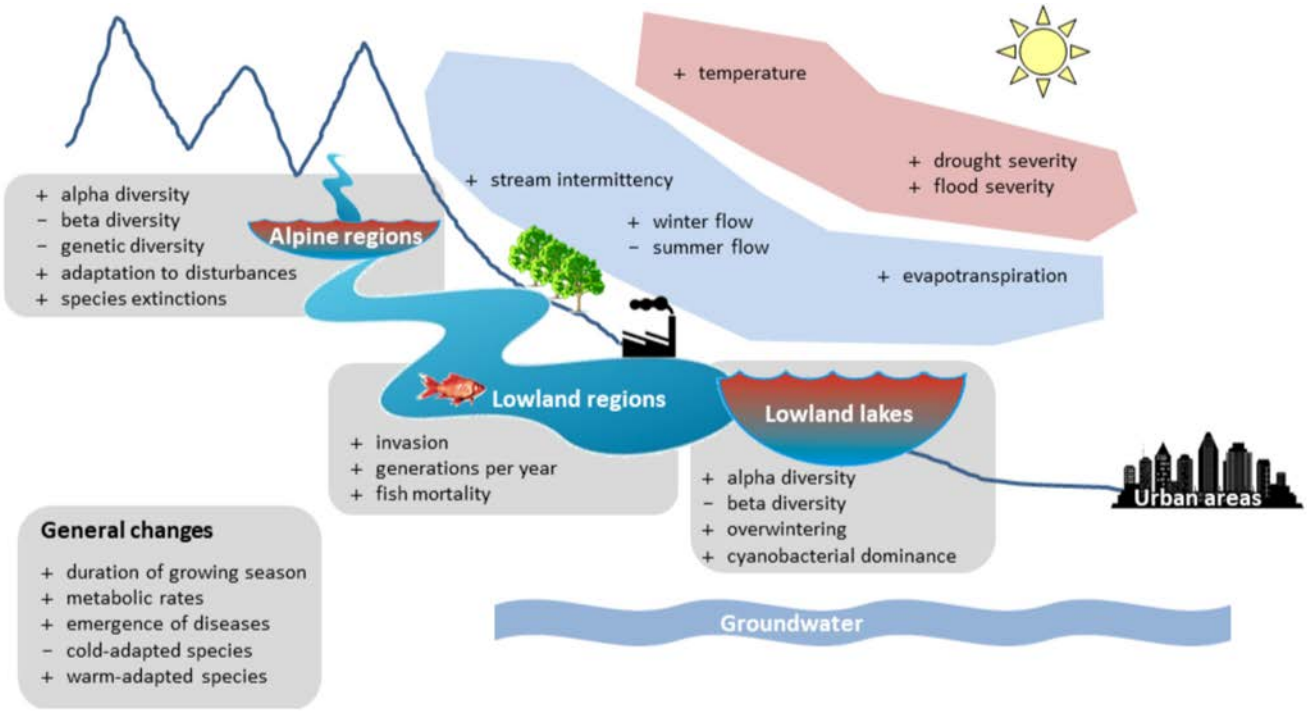

Fig. 3 Visual synthesis of the impacts of climate change relevant to aquatic ecosystems. Plus signs (+) indicate increases of a phenomenon, minus signs (-) indicate decreases of a phenomenon. From: Benateau et al. 2019.

and historical nature found at sea and shall cooperate for this purpose' (UN 1982).

The preamble to the UNESCO Convention on the Protection of the Underwater Cultural Heritage (2001) expresses the social value of underwater cultural heritage:

> 'Acknowledging the importance of underwater cultural heritage as an integral part of the cultural heritage of humanity and a particularly important element in the history of peoples, nations, and their relations with each other concerning their common heritage'.

The Decade's tag has become 'the science we need for the ocean we want' which emphasises the need for a science-based approach. The Decade's Revised Roadmap (IOC-UNESCO 2018) includes the statement — reiterated in the Implementation Plan — that 'ocean science should be interpreted broadly as encompassing social sciences and human dimensions…'.

The Roadmap outlined six societal goals: 'a clean ocean, a healthy and resilient ocean, a predicted ocean, a safe ocean, a sustainably harvested and productive ocean, and a transparent and accessible ocean' (IOC 2018, 7–9). The major anticipated outcomes are to expand knowledge of the oceans by increasing the seabed mapping the ocean, creating an inventory of the ocean's ecosystems, providing open access to data and information — which are of particular relevance to cultural heritage – and expanding ocean observing systems. Capacity building, citizen science, improving ocean literacy, and a focus on Small Island Developing States (SIDS) are also among the priorities.

Resulting from the peer review of the initial version of the Implementation Plan, a seventh societal goal was added to version 2 of the Decade's Implementation Plan (UNESCO 2020a): 'an inspiring and engaging ocean where society understands and values the ocean in relation to human well-being and sustainable development.' This seventh goal is of particular relevance to the UCH community, especially when linked to the additional incentive for the need for public engagement – during the 1st Planning Meeting, Copenhagen 2019 a panellist stated that without the support of the public, the Decade will not be successful.

Ocean literacy

The broader text of the seventh goal (see below) outlines the need for a change in the public's relationship with the ocean. To achieve this, it is necessary to develop ocean literacy programmes, a theme that many organizations within the UCH community, including a number of UNESCO's accredited NGOs, are very well equipped to develop. There are various channels by which the UCH community can contribute to improving ocean literacy among the public through existing educational programmes and projects, the high level of public interest in underwater archaeology and history reflected in the media, and maritime museums (Fig. 4).

'In order to incite behaviour change and ensure the effectiveness of solutions developed under the Decade there needs to

Fig. 4 The graphic illustrates the links between recreational diving including citizen scientists, heritage bodies, museums and the media have a role in increasing the public's awareness of the need to sustainably manage the world's oceans. Design Underwood 2020.

be a step change in society's relationship with the ocean. This can be achieved through ocean literacy approaches, formal and informal educational and awareness raising tools, and through measures to ensure equitable physical access to the ocean. Together these approaches will build a significantly broader understanding of the economic, social, and cultural values of the ocean by society and the plurality of roles that it plays to underpin health, wellbeing and sustainable development. This outcome will highlight the ocean as a place of wonder and inspiration, thus also influencing the next generation of scientists, policy makers, government officials, managers and innovators (IOC 2020, 9).

Environmental concerns: 'a clean ocean'

A central theme of this is to reduce pollution, which comes in various forms. In the text above featuring the impact of climate change, it was mentioned that many 20th century wartime wrecks containing hydro-carbon fuel-oils or other toxic cargoes are potential pollutants. Other sources can be added such as mining waste and other land-based sources that drain into rivers, seas, and oceans (Trakadas et al 2019).

The cultural heritage community can and has partnered with marine stakeholders to improve the understanding of the extent and character of the associated risks of these sites, help identify them through historic and archaeological sources, monitor them, and contribute to the development of mitigation strategies. Cultural heritage scientists are monitoring sites (Fig. 5) and developing corrosion studies to better inform the management of underwater cultural heritage sites, a central theme of the collaborative trans-disciplinary European SASMAP project (Gregory and Manders 2016, 75). These actions can inform government agencies, marine sciences, marine engineering, fishing industry and other relevant marine stakeholders in helping to address the potential pollutant threat from historic shipwrecks. In addition, it is also useful to consider how studies of submerged cultural heritage can contribute to understanding environmental changes such as erosion and scour, as well as the study of and changes to the biological species that often proliferate on UCH.

Citizen science

The Decade planning meetings have emphasised the need for and input from citizen scientists to supplement professional scientific research. On-going marine litter clean-up projects such as the Ghost Net and MareLitt projects[8] are ideally suited to recreational divers who are already contributing to the societal outcome of 'a clean ocean'. However, some of the methods used to recover 'ghost nets' can damage the structures to which they are attached. Many of these structures are likely to be shipwrecks. Some may be historically significant and previously unknown.[9] If archaeologists worked with these diving groups, the selection of techniques applied in the recovery process would take into consideration protecting the integrity of both cultural and natural sites, as far as is reasonably possible. This would extend preservation of sites, and potentially lead to new information on known sites, or the discovery of new ones, thereby fulfilling SDG Target 11.4 which aims to 'strengthen efforts to protect and safeguard the world's cultural and natural heritage' (UN SDGs).

Citizen science programmes can supplement professional site monitoring projects[10] (Fig. 4), while contributing useful data about the condition of sites which would be helpful to natural and cultural heritage managers. Projects such as the Nautical Archaeology Society's 'Adopt a Wreck'[11] scheme and

Fig. 5 A diver with a data-logger. This equipment measures parameters such as conductivity (salinity), dissolved oxygen, and current strength. Diver or remote sensing can also monitor physical changes to sites which can be applied to natural environmental and cultural purposes. It can help us to see the changes in the site and detect or predict threats. Photo: BZN 10 wreck - the Netherlands. © RCE.

the Australian programme 'GIRT'[12] are well suited to being utilised as frameworks for citizen science projects. They can be utlised to monitor UCH sites that include both natural and cultural perspectives, treating individual sites as micro-ecosystems. Site specific projects could be linked to national studies and feed into broader repositories of environmental information, which in turn can assist in the development of management strategies.

Supporting the Decade

It has been proposed that application for project endorsement of 'Decade Actions' at programme and project level will be requested during 'Calls for Action' focusing on topics and geographic areas of priority linked to 'Ocean Decade Challenges' (UNSCO-IOC 2020, 15). A Decade activity is a more concise event that supports a Decade outcome that can be initiated at any time and submitted for endorsement through a web-based platform, as can a Decade contribution. IOC has established a framework for supporting the Decade which enables several levels of commitment:

1. A Decade Programme is expected to be: interdisciplinary, multi-year, global or regional in scale, contributing to a minimum Ocean Decade Challenge.
2. A Decade Project is a smaller study on a regional, national or sub-national basis contributing to a recognised Decade programme.
3. A Decade Activity could be single event activity such as raising awareness, workshop, or capacity building aimed at enabling a Decade Programme, Project or support and Ocean Decade Challenge, and
4. A Decade Contribution is the supply of a resource in support of a Decade Action or financial requirement of the Decade.

It is important that archaeologists and heritage managers involved with underwater cultural heritage recognise the value of integrating or adapting their programmes or policies to align themselves, where appropriate, with the aims the Decade. An important outcome would be a much closer relationship with environmental sciences where collaboration is the norm, which is enshrined in the trans-disciplinary ethos of the SASMAP project mentioned above.

Summary

This chapter has provided a very brief introduction to the impacts of climate change. It is clear that in all aquatic environments there are challenges that must be recognised and where possible, mitigated. It is also clear that in some cases heritage will be lost and that the protection of sites inscribed as World Heritage will most likely take precedent, creating fundraising and resourcing challenges for those heritage managers responsible for other sites under threat.

The other theme of this chapter is the Decade of Ocean Science for Sustainable Development 2021–2030 which has been described as representing a once-in-a-generation opportunity to identify synergies between the underwater archaeological and other marine science communities with the aim, where appropriate, of working in unison in developing an eco-system approach to the study and sustainable management of the oceans of which UCH is a fundamental part.

1 Tropical cyclones are termed hurricane or typhoon depending on their location. For example cyclones in the North Atlantic, central and eastern North Pacific are tagged as a hurricane, whereas a cyclone in the Northwest Pacific is classified as a typhoon.

2 See Intergovernmental Reports https://www.ipcc.ch/reports/; accessed 30th September 2020.

3 The first 'managed retreat' project in the UK was the flooding of an area of 8,000 square metres of Northey Island, Essex — a county in the south-east of the UK — in 1991 http://publications.naturalengland.org.uk/publication/62067 2020; accessed 30th September 2020.

4 The Holme 1 Timber Circle colloquially known as 'Seahenge' was discovered in 1998, its oak timbers dating (Grove 2002) to the 'spring or early summer 2049 BC' – early Bronze Age – with a second 'Seahenge' from the same period found nearby in 2014 (Tyres 2014).

5 Kings Lynn https://www.museums.norfolk.gov.uk/lynn-museum/whats-here/seahenge; accessed 30th September 2020.

6 IPCC reported in 2013 that in the industrial era pH has decreased by 0.1.

7 The Action Pan will develop as a series of calls for action. The first 'Call for Decade Action 01/2020' is available at: https://oceandecade.org/news/75/Call-for-Decade-Actions-No-012020-; accessed 14th October 2020.

8 See https://ec.europa.eu/fisheries/new-proposal-will-tackle-marine-litter-and-"ghost-fishing"_en

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9 An example of this is the discovery of Invincible 1758 in the 1980s. The site located off Portsmouth UK was subsequently designated as a protected wreck.

10 See the pan-European Wreck Protect Project http://wreckprotect.org/index.php?id=12658; Accessed 29th August 2020.

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Covering the site of Rapperswil-Jona, Technikum, at Lake Zurich, Switzerland, with geotextile and gravel.
© Archaeological Service of the Canton of St. Gallen.

SECTION 3
IN SITU PRESERVATION

IN SITU PRESERVATION OF SITES AS AN IMPORTANT PART OF UNDERWATER CULTURAL HERITAGE MANAGEMENT

Martijn R. Manders, The Netherlands

Fig. 1 In saline water the attack of Teredo navalis (shipworm) is an enormous threat to shipwrecks and other wooden structures. Here we can see the devastating effect the shipworm has on historical shipwrecks. The wood has crumbled and almost disappeared. © Paul Voorthuis, High Zone Photography.

Introduction

It is often said that archaeological sites remain in remarkable condition when situated underwater. Indeed, this is often true. However, there are many organisms and processes that threaten this rich archaeological resource. As part of the management options we can preserve sites *in situ*, do nothing, or excavate and even remove sites from their environment. If we preserve a site *in situ*, this often means an active approach. Is it worth managing sites *in situ*? Yes, there are many reasons why we should; each of them requiring a different approach relating to the values we attach to underwater archaeological sites. This chapter explores the management rationale behind *in situ* preservation, the reasoning and the need to choose and how sites should be prioritised.

What do we mean by the *in situ* preservation of a site?

Underwater Cultural Heritage (UCH) is constantly threatened, for example, by strong currents and tides that may be more hostile to some UCH than others. Seabed erosion, abrasion, biological attack by shipworm, fungi and bacteria, and multiple human factors may all occur (Fig. 1). However, it is possible to mitigate these threats, as part of a responsible management strategy. In recent years, it has become increasingly common practice to manage UCH more holistically, for example, by treating the resource as a whole, with a view to the future, and in a proactive way, keeping in mind the different values that a site may have for various stakeholders.

Current international standards state that *in situ* preservation should, when managing a site, be considered as the first option, but what is the reason for this? Why not consider excavation first and foremost? Before we attempt to answer this question from a cultural heritage management perspective, we must ask ourselves what '*in situ* preservation' means. Is it – as is often said – brushing sites under the carpet (of sand)? Or does it serve a higher goal? Can we really physically protect underwater sites from identified threats?

In archaeology, *in situ* means the original place of deposition. However, there are no defined rules about how 'original' this deposition should be. Is it the first deposition, or a deposition (with subsequent related processes) at a later date? As Schiffer (1985) asked: Is it a primary, secondary or de facto refuse? A 'primary refuse' may, for example, have led to reuse or redepositioning. After deposition, post-depositional processes (de facto refuse) alter the place and the objects in it. It is extremely rare to find a terrestrial archaeological site which a community suddenly ceased to inhabit at one point in time, and impossible to find one that has not been altered through post-depositional processes. This is no different for underwater sites. While following the definition of *in situ* as the 'original place of deposition' may give us some headaches in determining whether originality is primary, secondary or de facto; here, *in situ* will simply be defined as the place where we discover the cultural material in or on the seabed.

What do we need to preserve?

Questions such as, what should be preserved and protected and what should not be preserved are difficult to answer from more encompassing geographical and temporal perspectives. Are we focusing on the well-preserved heritage of a specific period or are we interested in the long sequence of use, with its subsequent changes and landscape transforma-

Keywords: Underwater Cultural Heritage Management – *In Situ* – Protection – Value, Enjoyment

tions – a layered heritage? In other words, what belongs to the narratives we want to investigate and/or keep and what does not?

Such questions form the basis of significance assessments, which determine selection and deselection and are an important tool in overall heritage management. In practice, however, not many underwater sites have been explicitly deselected. Primarily, this is because few underwater sites have undergone the extensive research required for such an archaeological significance assessment. Implicitly, sites are often not further investigated by the cultural heritage officers responsible due to the expected low archaeological value. Thus, there might be a lot to gain by making these implicit choices more explicit. The practice of deselecting is consequentially more common in terrestrial archaeology, and means that no further protection or action is undertaken by the authorities. However, this may offer opportunities for others to become involved in on-site archaeological research. What these others (other than archaeologists and cultural heritage managers) would like to do with a site depends on the value they attach to the site or the area.

What archaeologists, cultural heritage managers, or other stakeholders involved would like to investigate, preserve or use in another way, ultimately depends on which value prevails for the specific stakeholder group. It is not a given, but determined by those who wish to 'use' it. This also implies that one site may have various values, promoted by different stakeholders.

Why do we need to preserve *in situ*?

A good starting point for all stakeholders is the question: Why do we want to preserve sites *in situ*? The answer may be very different depending on the individual stakeholder. The choice of *in situ* preservation may be based on different cultural heritage values, which include scientific, aesthetic, enjoyment or commemoration and the economic dimension should not be overlooked; the aim being to strike a balance between these values.

However, values are subjective. Therefore, it is important to consider who is determining this value and who has the right to do so. We also have to keep in mind that the level on which one operates may make a difference to how sites are assessed. For example, a site which is not rated as of high cultural heritage value at a national level may be high at the regional level and vice versa.

In situ protection should also be based on the assessment of threats and should consist of mitigation against these threats, noting the perspectives of the different stakeholders regarding the physical protection of a site.

Differences may arise in relation to how long *in situ* protection should be applied; short or long term? For some stakeholders, *in situ* preservation and protection may even be synonymous with not having to deal physically with sites at all, or stated more positively, entailing considerably lower costs than opting for excavation. As Willems (2012) stated, the *in situ* dogma is led by bureaucratization and commercialization. Money, time, and responsibility seem to be the driving factors. Since the signing of the Valletta Treaty,[1] many European countries have been frenetically holding on to an *in situ* policy, which now has a firm basis in the management of archaeological, including underwater heritage. It has gone so far that the doctrine of *in situ* is the first option to consider has, for many, become 'the preferred option' which fits perfectly in the minds of those for whom *in situ* preservation has become a goal in itself. How can we say that *in situ* is the preferred option in any general sense, without considering the individual situation of each site? Should such assessments not be part of the mitigation process? Considering *in situ* preservation (and active *in situ* protection) as the first option is thus different from it being the preferred option. This is the starting point from which we should all at least begin, and after thoughtful consideration and for the right reasons, we might depart in various directions.

Ultimately, archaeologists want to learn from the past and pass this knowledge on to society, so others may also understand their past, present, and future. Curiosity is thus an important asset to have. However, it will not be satisfied by *in situ* preservation of sites alone. Intrusive research may be necessary for this. Those seeking enjoyment – the incentive for sports diving communities – may profit from an *in situ* pol-

Fig. 2 Sports divers are an important stakeholder group. We often refer to them as the eyes and ears for the archaeologists. A primary aim for them to dive on shipwrecks is enjoyment. Here, divers prepare to dive on one of the many historic shipwrecks in the Oostvoornsemeer. © M. R. Manders.

icy and management as well. However, this will depend on the way we protect sites and present them *in situ*. Therefore, although this stakeholder group might in the first instance be reluctant to support *in situ* preservation and protection, they may easily become the biggest supporter depending on the way it is executed (Fig. 2).

First and foremost, archaeologists consider that the intrinsic value of a particular site should primarily determine the response to the question of why it should be protected and not another. The archaeological value of an individual site is not easy to determine, quantify, or qualify.

There are also other reasons for preserving culturally significant sites *in situ*. In recent years, the issue of *in situ* preservation has been widely debated in the field of archaeology, which has led to confusion within and outside the archaeological community. An often-cited reason for *in situ* protection is that we should preserve some material for future generations. This notion alone has little or no value, and has the capacity to fuel critics who believe that *in situ* preservation is equivalent to out-of-sight and therefore out-of-mind. It is impossible to predict and therefore to decide what values future generations will hold, because we cannot know what they will consider to be their heritage. It may be better to preserve the past for ourselves based on what we consider important to preserve for the short and long-term future, and on what we want to tell future generations — starting with our children — about us and our past. In the first instance, this may sound like a minor rewording of the same idea, but there is a crucial difference: we will decide for ourselves what to give; we will decide from our own perspective what is important or not and will not dictate it to others — the future generation.

For future enjoyment and research

It is commonly held that we must not only aim to preserve a representative part of the maritime past for scientific research, but also for future enjoyment and research. We should, however, keep in mind that the selection of what to preserve is our choice, as part of contemporary society, with our own understanding and set of values. Thus, we are passing on what we think is worth keeping for future generations. Moreover, it is only possible to make a selection of what to preserve because the number of submerged sites of potential archaeological interest is immense. Before we make such a decision, therefore, it is important to know the extent of the archaeological resource. We also have to investigate the likely meaning (significance) of the individual sites for maritime archaeology and for the reconstruction of our past. This can be achieved by assessing each site individually and the archaeological resource in general.

In the past, *in situ* preservation was carried out with the intention of leaving archaeological sites for future generations.

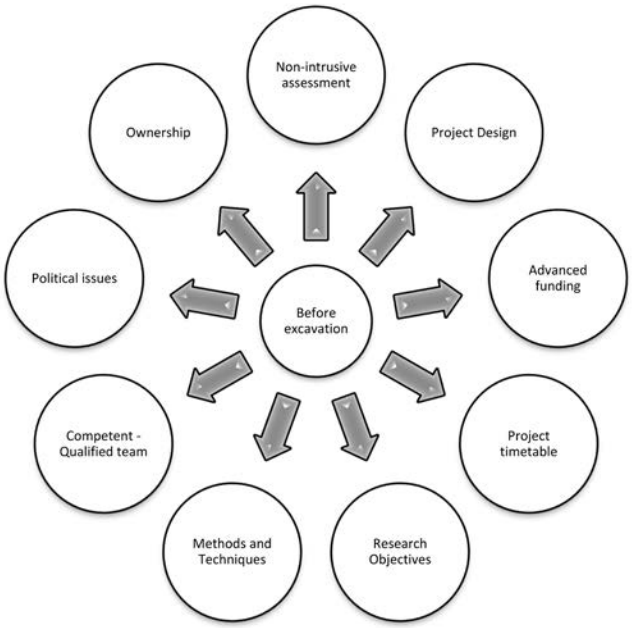

Fig. 3 Before an excavation can be executed in a proper way, many things have to be taken into consideration. This has also been described in the Annex or Code of Good Practice of the UNESCO convention for the Protection of the Underwater Cultural Heritage (Paris, 2001). © M. R. Manders.

Today, we know that protection *in situ* can slow the process of degradation but it is impossible to completely stop it. If we want it to be effective, *in situ* preservation often means active involvement, with the awareness that all efforts are temporary. It is, therefore, important to have some idea about how long certain measures can protect an underwater site. The protective measures should be selected based on their capacity to minimize deterioration of a site but also allow access to the site in the future for archaeological purposes, for other scientific research and sometimes even for the sake of their enjoyment.

It is not only important to save a cross-section of maritime history for future research — when we might have a different view on our past and different questions to ask —; the choices must also be acceptable to the general public.

The aspect of enjoyment, in addition to research, should not solely be focused on future generations. In fact, making sure that the current generation has the opportunity to enjoy its heritage, including UCH, is extremely important. Through this, understanding or awareness can be created, which again is essential for the effective protection and management of the underwater cultural resource (Fig. 3).

A time-gap

Another reason for *in situ* preservation, including mitigatory protection methods, is the fact that there is often a major time gap between discovery and a planned excavation. This means that many sites that have been located, and are await-

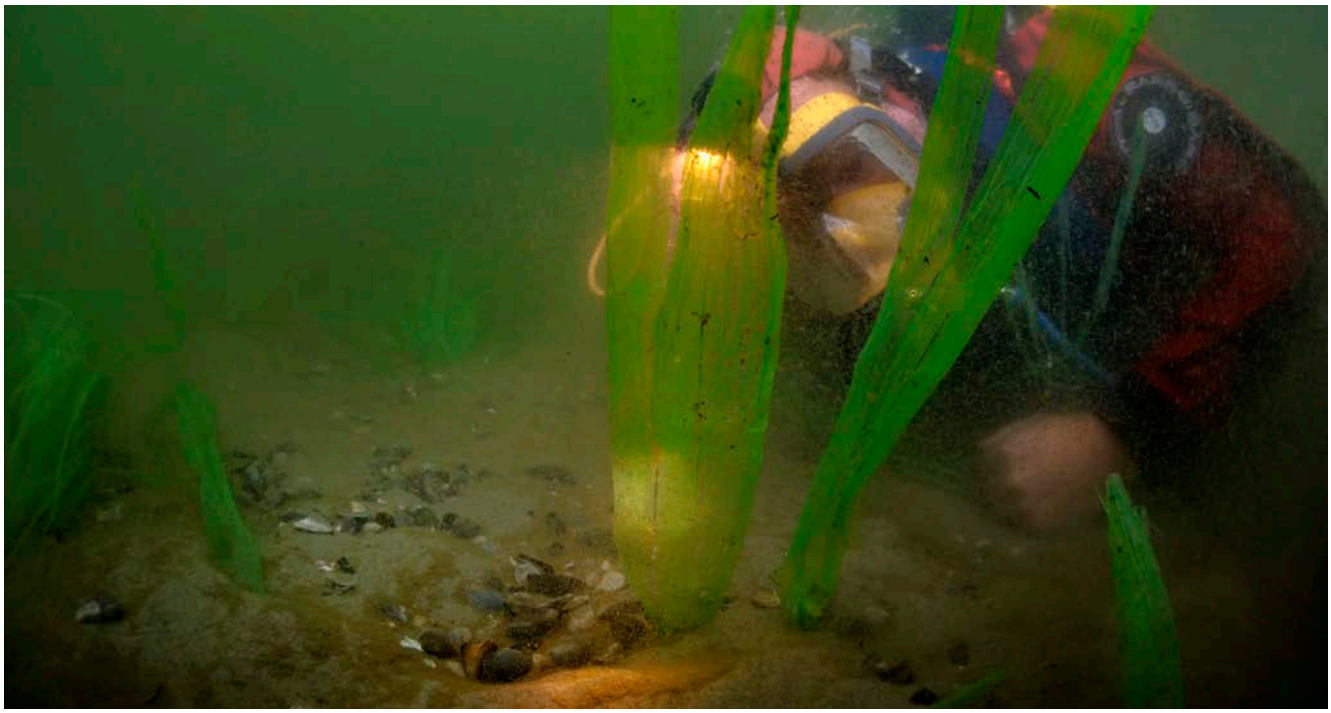

Fig. 4 The Burgzand Noord 10 wreck (BZN10), one of the many 17th century shipwrecks in the former Texel Roads. This whole area is a national monument, consisting of numerous known, but almost certainly many unknown sites. The BZN 10 site has been used as a test case for different protection and monitoring measurements, from the installation of data loggers and wood samples, to the physical protection of sites with polypropylene nets and artificial seagrass. © RCE.

ing investigation, may require protection in the interim in order to maintain the quality of the archaeological information. Decisions about how to manage a single site must be made in relation to other sites. Thus, we aim to develop objective criteria on which to base our decisions regarding whether a site can or should be protected *in situ*. While this takes time, a lack of capacity and financial resources, and the necessity of political commitment, heavily influence these decisions.

The following activities or elements, which sometimes demand considerable time, must be carried out or established before excavation can start: non-intrusive assessment, where possible, project design, advance funding for the whole project, timetable, research objectives: where details of the methodology and techniques to be employed are defined in the project design, a competent, suitable and qualified investigating team must be established, any political or legal issues must be resolved, including ownership of e.g. a shipwreck.

It is essential to establish the research objectives of an excavation. Once an object or site has been excavated it will never be the same. In this sense, excavation is destructive and therefore requires strict regulation.

Difficulties of conservation

Another reason to promote *in situ* preservation of shipwrecks is to keep them in safe underwater storage in their 'natural' environment until new and better conservation methods are developed (Fig. 4). Traditional polyethylene glycol (PEG) conservation treatment has recently been questioned because of problems with increased sulphur and iron concentration, which have been identified in timbers of various wrecks, including *Vasa* in Sweden and *Mary Rose* in the UK.

Current experience and enjoyment

Information from archaeological excavations will flow into the education system, and museums filled with objects produced by such an approach. All of this is valuable, but what is the role of the public and its experience of the past? Museums make an enormous effort to give the public such an experience. However, this is different from the experiences and the enjoyment we have while diving on a real wreck site. Shipwrecks preserved *in situ* may well be used as places to gain this experience and enjoyment. Sites that are fully protected *in situ* and thus covered, may not offer much excitement, while other wrecks that do not need physical protection probably will. This may be an important future selection criterion for *in situ* preservation.

Different values of preservation

Shipwrecks have many different values. They are looked at from different angles and by different people, and are thus also significant for a number of reasons and for a number of different stakeholders. A site may be under threat not only from the perspective of underwater archaeologists, but also from that of ecologists, sports divers, and even fisherpersons.

Quite a few of the identified threats to shipwrecks have negative effects for a number of stakeholders. Shipwrecks contain vital information about our past, that is true, but they are also important for biodiversity and are great places for sport diving. There are mitigation strategies for all these threats; obvious and more creative ones. They range from *in situ* protection methods to keep the soil environment waterlogged and oxygen free, to the setting up of cooperation agreements between different users (stakeholders). The mitigation strategies must therefore be adapted and accepted by a larger group of stakeholders than archaeologists or cultural heritage managers alone. Managing a wreck or the underwater resource in general becomes a task that is not only focused on the cultural value but also on a careful consideration of various values and the creation of support. This becomes especially important in countries where cultural heritage management has been decentralized, as a result of which, even more people are becoming directly involved and different values have to be balanced and protected.

Arguments against *in situ* preservation

Although there are many reasons to preserve UCH *in situ* there are also reasons not to. Obviously, if a site is not considered to be of high archaeological value, there is no reason to protect it for that particular reason. Moreover, sites may be sacrificed in the process of mitigating the effect of works on the broader environment, or other values of a certain location or site will prevail and the archaeological information will be sacrificed. There are, however, other downsides to this concept of *in situ* preservation that are related specifically to cultural heritage management issues. There are also more fundamental reasons: if left *in situ* it will not be included in regional or national identity, there will be no methodological development and capacity building, the sites will continue to deteriorate and there will still be long-term financial consequences.

Conclusion

In situ means 'original place of deposition'. This definition is not straightforward and may lead to discussion about what 'original' means and what belongs to a site. In relation to shipwrecks, it is often clearer what belongs to the site and what is not: a disaster occurred and the ship sank with everything it had on board. Everything on the ship at that specific moment and connected to the event, therefore, belongs to the site. Post-depositional processes may also form part of the site, at least insofar as they may disturb the view we have of the past. This, however, needs to be acknowledged to begin with, and the distinction of what is contemporary and what is not should be made. What we consider to belong to the site *in situ* determines what we preserve and why.

There are several overarching reasons why we preserve sites *in situ*: it may be for future research and enjoyment, showing that we are serious about our responsibility and have a commitment; there is an enormous number of underwater sites and many more are being discovered annually; underwater research is expensive and there is usually a time gap between discovery and investigation of a site. In the meantime, it needs to be cared for and there may be conservation difficulties that force us to maintain a site in an environment that ensures it remains in relatively good condition for many years, rather than changing the environment by removing it, with all the conservation problems that arise as a result. We may also decide to keep a site preserved *in situ* for other reasons, such as the wish and the need to experience and enjoy a site underwater now, or perhaps another value that has been attached to the site by another stakeholder.

Once we know why we want to protect an underwater site, we can start to think of how to do so. The way we protect a site has implications for how we will use it, now and in the near future. This decision should reflect why we, as a society, wish to preserve the sites and therefore what values prevail in relation to them. The different views on *in situ* preservation reveal the need to talk among stakeholder groups, even before actively working together in underwater cultural heritage management, with the aim of creating a more balanced *in situ* policy.

1 The European Convention on the Protection of the Archaeological Heritage (Revised).

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IN SITU PRESERVATION OF SITES AS AN IMPORTANT PART OF UNDERWATER CULTURAL HERITAGE MANAGEMENT: CASE STUDIES

Martijn R. Manders, The Netherlands

Fig. 1 The Wadden Sea is, although a World Heritage Area, actively used by for example by fisherpersons and for mussel farming. © Martijn R. Manders.

Introduction

There are many reasons why underwater sites can be under threat. *In situ* preservation is a way to mitigate against it. But *in situ* preservation may be used for other reasons as well, as was explained in the previous chapter. Below, you will find examples of two areas in the Netherlands, with multiple underwater archaeological sites that have been protected against the main degrading factors in these areas.

Case Study 1: The Western Wadden Sea and the Texel Roads

The western part of the Dutch Wadden Sea (Fig. 1) is the former location of the Texel Roads. Historically, this is where ships were loaded with export goods and unloaded with imports, primarily bound for the Amsterdam market. Intensive archaeological research has been done there, mainly by governmental archaeologists of the Cultural Heritage Agency of the Netherlands (RCE) and its predecessors, who focussed on many well-preserved shipwrecks that were discovered over the decades. Special attention has been paid by historians to the role of this area in the 17th century — often referred to as the Dutch Golden Age — and the Dutch East India Company (Vereenigde Oostindische Compagnie or VOC). However, the importance of the area as a crossroads has been much greater and longer. It was used by ships going to the East and West Indies, warships, merchant ships heading to and from the Baltic, etc., from at least the 16th to the 20th century.

The Wadden Sea is an area influenced by tidal movements of the sea, in the south-eastern part of the North Sea. It stretches out from the northern Netherlands coast to Germany and the western part of Denmark consisting of a shallow body of water with tidal flats and wetlands. The Wadden Sea is separated from the North Sea by a series of barrier islands with tidal inlets in-between. It is also a UNESCO World Heritage Site. The Dutch and German territories were inscribed in 2009, and extended in 2014 to include the Danish territory.

In several areas, the Dutch part of seabed of the Wadden Sea is very dynamic. Processes of sedimentation and erosion alternate with one another at different rates. The gullies can move or change directions over time influenced by tidal currents. These channels leave traces in the landscape down to the Pleistocene sub-strata. In some places, Pleistocene sediments are exposed on the seabed surface, but in others the Pleistocene strata have disappeared and eroded by channels or covered with a layer of Holocene sand, several metres thick.

Besides natural causes, human activity has caused many effects on the seabed as well. A good example of direct and heavy effects of human activities impacting the seabed was the construction of the Afsluitdijk in 1932 between the provinces

Keywords: Underwater Cultural Heritage Management – *In Situ* – Degradation – Wadden Sea – Oostvoornsemeer – The Netherlands

of Noord-Holland and Friesland. The construction blocked the dominant currents, which rapidly changed the pattern of the channels. The dynamics of the mobile Holocene top strata largely determine whether any heritage has been preserved in the sediments, as well as the condition of that heritage at any moment. Erosion determines vulnerability to various degradation processes, biological, chemical, mechanical, and human.

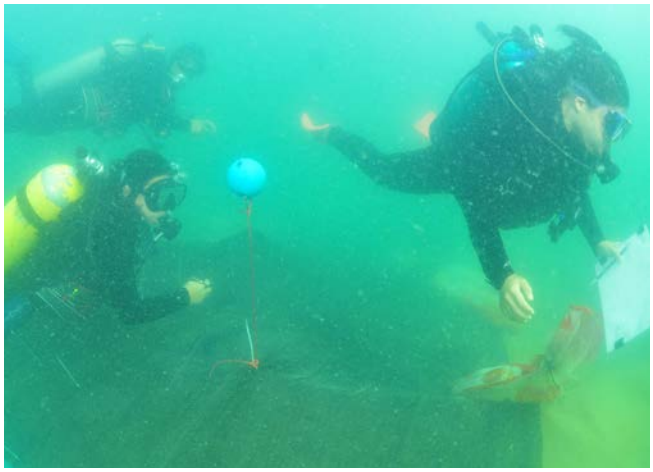

Fig. 2 Shipwrecks in the Wadden Sea have been physically protected by covering them with polypropylene nets to prevent erosion on site; here an example as executed during a UNESCO fieldschool in Thailand. © Martjin R. Manders.

It is therefore important to gain an insight into the condition of the sediments, as well as their mobility. For this reason, the Cultural Heritage Agency of the Netherlands (RCE) invested in sediment-erosion modelling of the area that revealed how the area has evolved throughout the centuries and can predict where wrecks can probably be found.

Human and natural processes in the sea and on the land adjacent to it play an important role in the decision on what and how to manage and when to preserve sites *in situ*. People effect management, land effects water, a site is influenced by its context and vice versa. Making predictive models therefore is a complex matter. It is also not just the truth but an educated guess of the potential of an area.

The huge potential of shipwrecks and their exposure due to erosion of the seabed since long ago has attracted adventurous divers, many from the islands and adjacent mainland. The involvement of local stakeholders is very high because the history of the maritime world and the heritage of maritime ways of life are an integral part of the identity of local communities. Everyone is strongly connected to the sea, a connection often going back many generations. Early divers from the islands discovered numerous shipwrecks in the 1970s and 1980s that formed the basis of the Netherlands' first shipwreck inventory. Many artefacts have been recovered from these wrecks and now form an important part of local museum collections.

In recent years these local interferences and influences in UCH management have been scaled up to a more regional and even national level partly due to the Netherlands' decentralisation of cultural heritage management to municipality level, and partly due to the fact that the Wadden Sea has been granted World Heritage status. For management, many decisions had to be made at a national level on allowing and closing of specific maritime activities in the area. These decisions required input from the local community.

The aim for many of those who focus on the cultural importance of the area is to preserve archaeological remains against the violent natural environment. The way people want to take care of a site differs from person to person and from stakeholder group to stakeholder group. Some prefer to recover all the objects before they deteriorate too much or even disappear, some prefer preservation *in situ*. The latter, especially, has gained ground among archaeologists and cultural heritage managers. Professionally for them *in situ* preservation is the first option to consider and this applies to wrecks discovered in the western Wadden Sea. The centre of the former Texel Roads is called the Burgzand area, an area of only 1,200 by 600 metres, containing fifteen known 17th and 18th century shipwrecks and has become a national monument.

The process of protection started in 1988 with the BZN3 wreck (all wrecks start with the prefix BZN) and that registration was completed in 1991. In 2013, the National Monument area was extended to include more known wrecks. It is unknown how many others there are, still protected under a layer of sand, but with the constant movement of the upper Holocene sand layer eventually more and more wrecks will be discovered. It is a good thing that we have mapped the seabed and predicted its potential for cultural heritage. With the base-line information we have developed better ways of managing the area. However, to stay on top of the management we need to keep monitoring the area. Tidal movements and existing currents move sediments and keep uncovering and covering sites. The ones that are in danger need to be monitored more frequently than others; active protection sometimes needs to be put in place. This can involve installing a protective layer of polypropylene mesh that catches sand suspended in the water column and that basically reburies the site (Fig. 2).

This is what has been executed on most of the high value wrecks on the Burgzand. This active physical protection in return needs to be monitored, the frequency depending on the (natural) environment and activities happening in the area. All these elements: monitoring, assessing, protecting, monitoring again and perhaps excavating need to be included in a management plan. Unfortunately, it does not happen too often that a management plan is made for a wreck site, let alone for a whole area. And that is actually exactly what we should do in order to find the best way to protect our UCH.

Case Study 2: The Oostvoornsemeer

In the 1960s the Oostvoornsemeer (lake) in the Netherlands was formed by closing off of the Brielse Maas — a former sea arm and entrance to the harbour of Rotterdam — from the North Sea (Fig. 3). After that it was used for sand extraction for the extension of the harbour, Maasvlakte 1. The lake has been deepened varying from 20 to 45 metres. During these dredging activities several historical shipwrecks emerged, having remained in a very good condition due to the fact that the original saltwater area was desalinized. This is making the Oostvoornsemeer unique and a popular dive spot too.

In 2008, it was decided to reverse this process again in order to improve the water quality and to make the area a unique brackish water lake. This meant salinizing the lake. Advice received from the RCE was to keep the salinity lower than 8 ppt (parts per trillion). Unfortunately — probably due to a miscommunication — the salinity was finally set to a Chloride level of 8 ppt. This, however, resulted in a salinity level of 14 ppt (parts per thousand), significantly above the recommended minimum levels. As a result, archaeological research executed in 2012 showed attack by shipworm. This was the start of intensive research to investigate the presence of shipworm, its distribution, and influences on the shipwrecks in this area. In July 2014, wood samples taken from 7 sites indicated that 6 of them had been attacked by the shipworm *Teredo navalis*. Only at the deepest site, 35 to 40 metres deep and 8^0 C, no living *Teredo navalis* was found. Investigation of the environment showed that here temperature and depth are the limiting factors. Shipworm is probably the most degrading sea organism on wooden shipwrecks and other submerged wooden structures. A single *Teredo navalis* can consume a 20 cm piece of wood in a year. The continuous damage in the past but also nowadays is enormous and the costs to repair or replace harbour structures are high.

The RCE has mapped the entire lake and investigated several 16th and 17th century shipwrecks. Clearly, quite a few sites remain hidden under the sand and potentially could reveal very well-preserved shipwrecks. The deepest wreck not attacked (by *Teredo*) is possibly that of a whaling ship. Even the ropes of the rigging are preserved. Other wrecks were semi-exposed in the 70s when sand was extracted from the seabed, and are now lying on top of each other.

The heritage potential of the area is thus very high, however, the threats due to the high salinity also remains (Fig. 4). Without doing something about it, all wooden wrecks will soon disappear. The problem however, is that the salinity level was raised because the water had become of poor quality and the lake also had to be used as a compensation for nature due to yet another extension of Rotterdam harbour (Maasvlakte 2). Biologists had concluded that the area had to become a brackish environment. In order to lower the salt-level again in the harbour, it was necessary to consult the province of Zuid-Holland (South-Holland), the municipality of Westvoorne in which the lake is situated and other organisations. This is, unfortunately, a painstakingly slow process which may mean the loss of a number of wrecks before anything happens to remediate the situation. Cultural heritage management remains difficult. Underwater areas contain so many different values: economic, natural, cultural, recreational, on national, and regional level. All are important, but how to choose what will prevail? There is no easy answer to this. The different values need to be kept under consideration and the choices made transparent. Maybe it will be necessary to sacrifice a few wrecks in order to preserve others. Who knows? The story continues during the coming years.

Fig. 3 The Oostvoornsemeer was an inlet of the North Sea. Now, since it was closed off on four sides, the water is calm, has good visibility and consists of multiple well-preserved shipwrecks. It is one of the most popular dive spots in the Netherlands. © Martijn R. Manders.

No inclusion in regional identity building

Through archaeological excavations we can learn more about our past. This understanding helps us to build our current identity. Deciding not to excavate means limiting the amount of information we can extract from a site and therefore limits the amount of information which would potentially rebuild or reshape our identity. A cultural assessment is the next best thing, ignoring the site the worst. Out-of-sight may mean out-of-mind and this may entail less information with which to build collective memory. In addition, learning less about the past may mean that the social role of archaeology — and, in fact, cultural heritage management in general — will be diminished, not to mention the negative economic impact, because '*in situ* management' will still be costly but nothing will be gained in terms of knowledge.

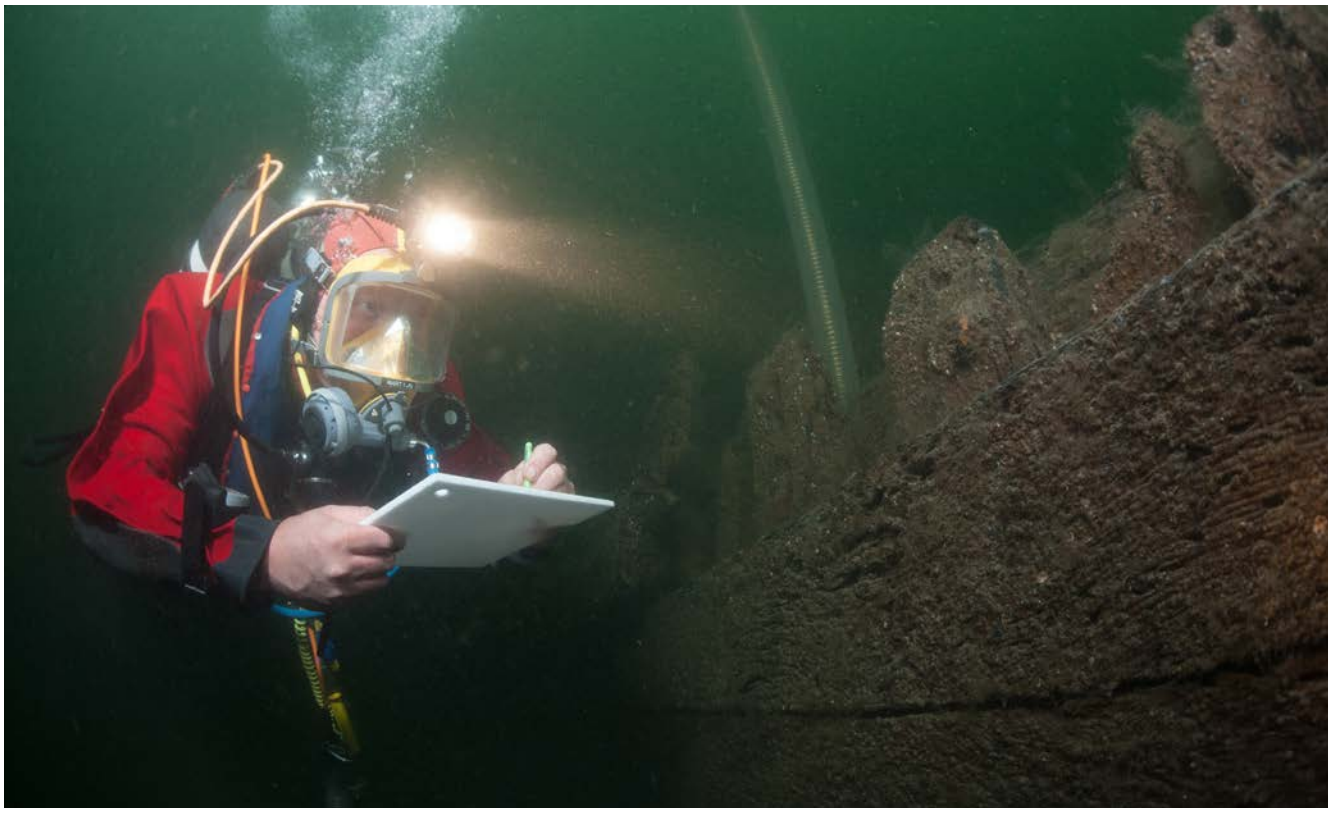

Fig. 4 Quite a few shipwrecks in the Oostvoornsemeer are very well preserved. They only appeared from the seabed after the inlet became a lake and thus became brackish. Now, due to salinity changes these wrecks are under heavy threat. Photo © RCE.

Ongoing degradation

Although we can mitigate against the negative effects of natural and anthropological interventions with *in situ* protection and conservation, we must realize that the process of degradation continues. We may be able to slow down the degradation process and even counter some threats, but others will continue at a slower rate. For example, if we remove oxygen from a site, most biological attack will cease, but erosion bacteria are still able to survive in anoxic environments.

The long-term financial consequences

It is often said that *in situ* preservation is a cheaper option than excavation. This may be true for the initial stage; however, when considering long-term management, this may be somewhat different. This, of course, depends on how the concepts of responsible heritage and *in situ* management are understood in practice. *In situ* preservation requires active involvement, at least in terms of monitoring and the mitigation of negative effects on site, such as repair and maintenance. Why, other than for budgetary reasons, would we proclaim preservation and protection as a policy otherwise? It seems logical that when a site has been determined to be of archaeological value it will — with the prevailing *in situ* policy — be preserved *in situ* and measures will be taken to ensure its value is determined over time. This involvement in the management of *in situ* preserved sites requires long-term budgets to ensure continuity. These budgets will need to grow as more sites are preserved and protected *in situ*.

If we decide to preserve *in situ* for the purpose of investigating them at a later date, can we find a middle ground? We could start by officially including partial excavation as a form of archaeological heritage management. These excavations could be used (carefully) to answer a few obviously significant questions, while the rest of the site is either preserved *in situ* or deselected altogether. This seems to be more in line with the essence of archaeology, which is guided by a curiosity to learn about the past.

The option of only doing partial excavation and preserving the other part *in situ* or deselecting is often still difficult to do explicitly. Implicitly, it has been done often enough. Sometimes the choice may have been triggered by a lack of money (in the long term), sometimes there was a desire to continue but the political support was lacking, or there was a shift in priorities.

Conclusion

There are some visible changes of approach in cultural heritage management: from the almost blind sense of urgency not to excavate to a more pragmatic approach to how best to excavate within the context of cultural heritage management.

Moreover, boundaries are being explored and some rules and regulations are being re-evaluated. For example, does cultural heritage management benefit from the exclusive involvement of highly educated professionals, or should it be more open? Fortunately, there already seems to be wider involvement of professionals other than archaeological stakeholders. At least this shows a wider interest and commitment. More people are becoming involved in the study of the past. However, could they also be more involved in the preservation of this past *in situ*? This depends on the approach. Basically, people want to learn, people are curious. Increasing involvement may also be a good response to critics who claim that *in situ* policy brushes sites under the carpet. Proof of a neglect of sites *in situ*, it is argued, can be found in the fact that active *in situ* preservation activities and the essential monitoring and follow up are in many countries not budgeted structurally over time. This means that in practice they do not form part of the task or daily undertaking of cultural heritage management. This lack of management results in well-known sites falling apart under the eyes of those stakeholders who should be partners in the management exercise, but who can see that the government is failing in its responsibilities.

If *in situ* preservation is taken seriously, would it not be more logical to have an adequate permanent budget available to allow for effective actions to preserve, protect and conserve sites to be taken?

Considerations

The Valletta Treaty (1992)[1] has, at the time of writing, been implemented in most European countries and many other countries have similar legislation. The Valletta Treaty stipulates that the disturber pays for direct disturbance. However, long-term management has never been taken into consideration. Therefore, it is ultimately not the problem of the disturber if a site is merely left *in situ*, insofar as the responsibility for any long-term action is not theirs and will not lead to them incur costs. In the end this means that the management responsibilities come down to the land-owner (often the government) or will not be taken into consideration by anybody, which potentially leads to the neglect of sites.

Why are there so few nationally and internationally (World or European Heritage) labelled as protected underwater archaeological sites in comparison with those on land? Is it because they are less important? Is it because the sites do not need protection? Is there only a limited number of sites underwater? Is it because the process of registration is too complicated and time consuming? Or is there merely a lack of interest? Although the latter would be a logical explanation, it would be the most devastating and negatively charged. It would suggest, first of all, that there is no universal objective way to evaluate an archaeological site — regardless of whether situated on land or under water — such that it leads to a certain kind of protection or not. Moreover, it would also suggest, as a consequence, that archaeological sites are being designated as significant based on an arbitrary and possible personal interest. At the moment protected cultural heritage in general suggests that the current society believes that the past was formed on land and that water only played a minor role in the development of (past-) societies. This cannot be true, but this image can only change if we come to all-inclusive selection criteria of what tangible heritage represents our past. This should be the basis of what we as a society want to preserve and pass to following generations.

The amount of UCH recognized in each country or even worldwide, is certainly not sufficient to consider these to be representative of the role water has played in the past. Nationally and internationally we therefore should strive to enlist more of these sites to become stepping stones of our common maritime heritage: sites that are windows to the past, iconic places, physical leftovers through which we can tell the story about the relationship between humanity and water.

1 Also known as the European Convention on the Protection of the Archaeological Heritage (Revised).

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THE QUESTION OF IN SITU PRESERVATION. SHIPWRECKS AND SUBMERGED SITES PROTECTION METHODS

Vladas Žulkus, Lithuania

Fig. 1 A wooden ship's hull washed ashore near Klaipėda (Lithuania) during a storm in 2014 dendrochronologically dated to between 1838–1839; the origin of the wood origin identified as the Gdansk region in Poland (Pukienė 2018). © Rokas Kraniauskas.

Introduction

The aim of the discussion in the text below is to address the question of how to protect underwater finds: ships sunken during different historical periods and are now submerged prehistoric and historic archaeological sites. According to current data around 100,000 well-preserved shipwrecks are known to lie on the Baltic seabed, however it is acknowledged that not all of the wrecks have yet been discovered. Coastal cliffs during storms are disastrous for ships; it is a matter of fact that according to historical sources the majority of ancient ship accidents have been the result of ships crashing into shores.

Between 1857 and 1864, some 384 ships suffered accidents in the area between Stralsund (Germany) and Šventoji (Lithuania). Out of these, 284 ships were cast ashore, 145 ships were broken up, and the rest were lost at sea (Karte 1865). In addition to this, 100 sailing vessels were beached on the shores of Cape Kolka, Gulf of Riga (Latvia) in the period between 1812 and 1856 (Šuvcāne 2010, 19). This situation is typical of all seas with shallow coastal waters where shipping was intense in ancient times.

As time goes by wrecks are continuously exposed to the forces of the sea (Fig. 1). Shipwrecks lying in less than 15 m water depth have been brought closer to shores, meanwhile those located in the accumulative coastal and littoral zones are being increasingly covered with sand. At the same time those in shallow waters are affected by the strong winds and the sea. In contrast, at greater depths where a wreck's hull may not have suffered significant deterioration, deposits of detached ship parts can still be found scattered around the largely integral hull. Although these sites are not as exposed to natural forces, they are vulnerable to human activities at sea and the irresponsible behaviour of divers.

Preservation of shipwrecks in the littoral zone

In the search for, and in the course of registration and studies of sunken and wrecked ancient wooden ships, we cannot evade the issue of preservation of their remains. On the one hand, the 2001 UNESCO Convention on the Protection of the Underwater Cultural Heritage insistently recommends protecting underwater cultural heritage (UCH) *in situ*. Indeed, wrecks at greater depths are the best protected.

Keywords: *In Situ* – Preservation – Underwater Cultural Heritage – Lithuania – Baltic

On the other hand, shipwreck preservation can also occur through exploration and investigation, by salvaging the remains and conserving them in museums. The conservation and display of wooden ship hulls are highly complicated undertakings, and costly. UCH is under real threat until legislative protection is applied. But before this protection is applied, the wreck may lose many authentic details. In practice, only intact wrecks receive any significant research and preservation efforts, and only a small number of beached hulls and those lying in shallow waters can be housed in museums. As a consequence, a significant number of shipwrecks will be destroyed by human activities and the pounding of the waves and harsh weather conditions.

The dilemma raises two questions, firstly what is the value of the hulls of the ancient ships lying in shallow waters? In this author's opinion, the significance of shipwrecks as heritage has not yet been fully appreciated and the value of historical understanding of the nautical past will only unfold in the future. Secondly, what approach should be taken not only to protect shipwrecks in the littoral zone, but also how to make them attractive objects for underwater tourism?

This author is of the opinion that the ship's hulls stranded on shoals, currently being slowly taken apart by the forces in shallow coastal waters, and the wrecks cast ashore could be preserved and displayed in deeper water. Wreck relocation to a single location would simultaneously help protect the hulls from further destruction, enable further conservation efforts and create an underwater site for further research and underwater tourism (Žulkus 2010, 43–44). The reasons wooden structures are so well preserved on the Baltic seabed are a lower salt content, cold water, and a lack of shipworm.[1] These conditions enable better preservation of wrecks under water and help protect these cultural assets for the benefit of researchers, tourists, and historians alike.

Practically, the hulls of shipwrecks can be transported up to 15–18 m deep and exhibited on the seabed. At such depths there is already an absence of stronger currents carrying sand, impact of waves, and the water is clearer than in shallow coastal waters. Furthermore, this depth would be accessible for amateur divers of all categories.

In essence, what is suggested is the establishment of an underwater museum on the Baltic Sea bottom, a type of '*skansen*'. This could be a place, where wooden wrecks can be protected, exhibited in natural conditions, and investigated in the future. This place would be a good training site for students and amateur divers. This maritime archaeological site could be accessible to non-divers through technology which would allow them to visualise the sites on a screen on the shore and in museum exhibitions. To further increase public awareness of underwater heritage inter-active websites using 3D technology could be developed.

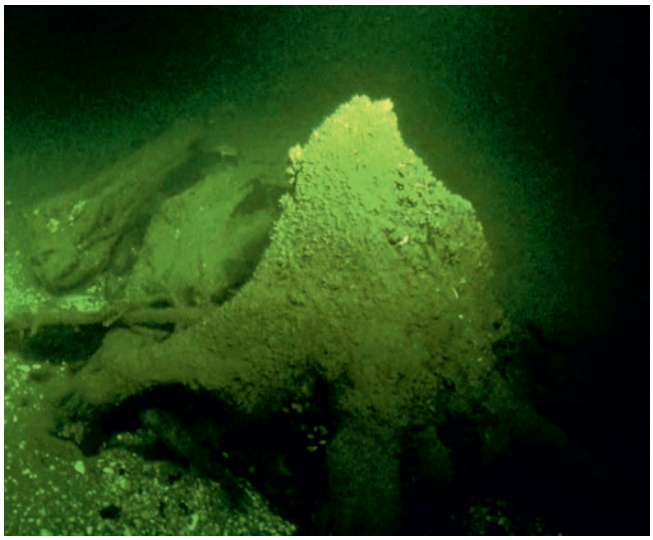

Fig. 2 A pine stump at a depth of 24,5 m, age 9445–9502 cal. BP. © Vladas Žulkus.

Fig. 3 Sawn-off pine tree trunk at a depth of 25 m, age 10590–10170 cal. BP. © Vladas Žulkus.

Submerged prehistoric landscapes and archaeological sites

Submerged prehistoric archaeological sites and finds are known in all European seas: from the Baltic to the Black sea. Around 2,600 prehistoric sites have been found in Europe (Flemming et al. 2017). Identification of areas for seabed landscapes and prehistoric sites often does not suffice for traditional seabed research methods (Missiaen et al. 2017). Research of the submerged landscapes and prehistoric sites must be multidisciplinary and coordinated.

Despite extensive information collected from the western and southwestern parts of the Baltic Sea, for a long time, nobody assumed that remains of prehistoric settlements might be preserved on the seabed in the eastern part of the Baltic Sea

basin. In recent years, exploration has been concentrated on localisation of the former Early Holocene (Yoldia Sea, Ancylus Lake and Early Litorina Sea) coasts, their underwater landscape reconstruction and potential development of Mesolithic-Early Neolithic settlements along the Lithuanian seashore. The Institute of Baltic Sea Region History and Archaeology (Klaipėda University, Lithuania) has been exploring the Baltic Sea bottom using remote sensing and direct research methods (Girininkas and Žulkus 2017).

In 2018, the project Man and Baltic Sea in the Meso–Neolithic: Relict Coasts and Settlements Below and Above Present Sea Level — ReCoasts and People[2] — commenced with the purpose of exploring the habitats of the early Mesolithic and early Neolithic peoples, and the reconstruction of the natural-cultural landscapes of the early Holocene with respect to the present as well as the flooded Baltic Sea coastlines.

The project also seeks to develop an original research methodology that would enable identification of people's habitation sites, and the peculiarities of the climatic vegetation and fauna of the explored period in search of traces of human activities on the current-day seabed. The seabed of the Baltic Sea will be explored with special instruments and through methods of underwater archaeology. Furthermore, archaeological excavations will be conducted on the present coast. The samples will be dated through radiocarbon dating, investigated by biogeochemical, palaeobotanical, dendrochronological, tree DNA, palaeozoological, traseological, and experimental archaeological studies.

During the exploration of the Baltic Sea, ancient coasts in the Yoldia Sea and Ancylus Lake phases, stumps and trunks dating to 11410 – 10170 cal. BP, relict pine forests growing on the ancient (later submerged) coast, were discovered at a depth of 24–30 m (Figs. 2 – 4). The seabed in this area contains relict coast formations and remnants of relict small lagoons and lakes with peat formation (Žulkus and Girininkas 2020).

The ancient Yoldia Sea natural coastal landscape and climate conditions in the transitional time span between Pre-Boreal and Boreal periods offered favourable living conditions for Early Mesolithic communities. The remnants of a fishing weir were found near Klaipeda port (Lithuania) which were dated to 7584–7474 cal. BC (Girininkas and Žulkus 2017). Similar fishing weirs occur in Western Europe, and in Germany on the Baltic coast (Brinkhuizen 1983; Jöns et al. 2007). Archaeological finds, as such, provide opportunities for: (a) the reconstruction of the palaeogeographical situation including the identification of Baltic Sea coastal changes during the Early Holocene; (b) the evaluation of the ecological situation in the investigated sedimentation bodies; (c) the reconstruction of vegetation regime and (d) the identification of areas potentially suitable for the human occupation in the Mesolithic.

There is no doubt that underwater finds are already very valuable, and that their value will increase in the future. Treasure-hunting under water does not damage prehistoric sites. However, other human activities at sea can have major impacts on natural and archaeological heritage, and can cause damage to prehistoric sites underwater and shipwrecks (Fig. 5). These activities are wide ranging and include offshore infrastructure developments, oil and gas drilling operations, marine aggregate dredging, or sand extraction for the replenishment of eroding beaches, fishing with trawl nets, etc. Protection of submerged landscapes, underwater Stone Age sites, and management of their uses require harmonisation of national and international rights.

Fig. 4 3D Photomosaic of the RF-I-B-1 tree trunk. © Janusz Różycki & Krzysztof Kurzyk, National Maritime Museum in Gdansk, Poland.

Fig. 5 German First World War cruiser Friedrich Carl, ship's side lamp © Sabine Kerkau.

One of the long-term European Union strategies is 'Blue Growth', which ensures harmonious and sustainable development of maritime sectors. One of the strategic objectives of 'Blue Growth' is the creation of synergistic existence between different activities and integration of nature, culture, and other scientific research with the aim of avoiding conflicts between sectors. The key task is to achieve a balance between underwater natural and cultural heritage preservation and the needs of other maritime sectors.

If UCH sites are to be protected effectively, marine research must be coordinated and multidisciplinary, while underwater heritage is to be respected, addressed in all documents and strategies related to usage of the marine resources. In addition to this, UCH sites must be accessible to society and sustainable underwater tourism concepts and principles must also to be developed. Legal as well as operational protection is needed, because whichever means of conservation is chosen, UCH objects require periodic monitoring, competent human researchers, and physical resources.

1 Teredo navalis: a marine mollusc.

2 This research was funded by the European Social Fund, grant no. 09.3.3-LMT-K-712-01-0171 from the Research Council of Lithuania.

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IN SITU PROTECTION AND MONITORING OF UNDERWATER PREHISTORIC SETTLEMENT REMAINS: EXAMPLES OF THE PRACTICAL IMPLEMENTATION IN SWITZERLAND

Albert Hafner, Switzerland

Fig. 1 Covering the archaeological site of Rapperswil-Jona, Technikum, in the shallow water zone of Lake Zurich, Switzerland, with geotextile and gravel. Use of a gravel barge and a crane with jib. © Archaeological Service of the Canton of St. Gallen, Simon Vogt, 2011.

Introduction

Nothing lasts forever. Archaeologists who are confronted with the fact that archaeological sites are destroyed in one way or another know this best. Archaeological sites on land are erased from the cities and landscapes through construction work. The loss of archaeological sites caused by agriculture are considerable when ploughing extends into archaeological strata. Underwater, destruction of the archaeological material and substrates by erosion of the lake bottom is even less perceptible, as damage can only be detected when looking under water. In addition, rare and fragile organic objects are usually preserved in underwater sites. Observations must therefore be particularly meticulous in order to be able to detect the changes to submerged archaeological sites at all.

The 1992 European Convention for the Protection of the Archaeological Heritage (also known as the Valletta Convention) requires in one of its first articles that each State Party undertakes measures for the physical protection of the archaeological heritage. Depending on the circumstances the following measures have to be provided. First, the acquisition or protection of land to create archaeological reserves and second, to preserve and care for the archaeological heritage, primarily in its original location. In Switzerland, the awareness of preserving archaeological sites *in situ* has been increased by the European Convention for the Protection of the Archaeological Heritage of 1992. This is certainly related to the fact that the protection of archaeological sources in general is increasingly taken into greater consideration. In the same period, the term 'monitoring' appeared in the terminology of archaeological heritage management. Monitoring, in general, means to describe the systematic recording, observation, or follow-up of an event or process with the aid of technical aids or systems. The central element is a periodic execution in order to draw conclusions on the basis of data comparisons. With regard to underwater archaeology, monitoring activities are all efforts to ensure the long-term physical preservation of underwater archaeological sites. Regular observation may alert cultural heritage management authorities. The knowledge of the origin and the reasons behind problems of conservation may lead to active protection measures such as covering with geotextile[1] and gravel (Fig. 1). These activities need a long-term follow-up to assess the effectiveness of the protection measures carried out. Observations by divers and data acquisition may lead to feedback and necessary adjustments of the protection processes.

Active protective measures applied to extensive prehistoric settlement areas were first implemented in Switzerland in the 1990s. A certain self-generated pressure weighed on the actors involved, since the damage caused by erosion in Neolithic and Bronze Age lakeside settlements (5000–500 BC) of extraordinary scientific value had been evident for some considerable time (Hafner and Schlichtherle 2008). Within a small group of alerted experts, decisions were taken to try to stop this gradual destruction. The aim was to focus on particularly endangered sites and to reduce or eliminate the erosion of archaeological layers containing organic finds. It became increasingly obvious that erosion would lead to the destruction of important archaeological sites. With the support of hydro-engineers and various authorities and institutions inter-

Keywords: *In Situ* Protection – Monitoring – Pile Dwellings – Erosion

ested in shoreline protection, the first measures were taken in Switzerland in Lake Biel at the end of the 1990s. Around the year 2000, the idea emerged to nominate the pile dwellings of the Alpine region as UNESCO World Heritage Site. This idea also arose with the ulterior motive of raising public awareness of the value of these unique sites and creating political pressure to provide more public funds for protective measures.

The Sutz-Lattrigen site of Lake Biel in Switzerland is, since 2011, part of the serial UNESCO World Heritage property 'Prehistoric Lake Dwellings around the Alps'. Here, a cluster of Neolithic settlements dating to around 2800 BC has been known since pile-dwelling research began in 1854. In order to protect the cultural layers from further destruction, a 150 m long breakwater (Fig. 2) made of wood mesh was erected in 1998 (Hafner 2008). This measure was intended as a short-term and inexpensive protection and initially proved its worth. After about 10 years, however, the maintenance work was extremely time-consuming and the breakwater was finally dismantled again. Parallel to the construction of the breakwater, erosion markers were fixed to the bottom of the lake. Solid plastic pipes were driven into the ground for this purpose (Fig. 3). Their position and elevation value are precisely recorded, and in subsequent years the lake bottom erosion relative to the upper edge of the plastic pipes was measured. It is a simple and efficient method for long-term tracking of erosion at the lake bottom. In Sutz-Lattrigen markers showed that between 1998 and 2005 up to 35 cm of lake bottom had been removed by erosion, and in the years 2005 to 2010 up to 20 cm.

Fig. 2 Sutz-Lattrigen, Lake Biel, Switzerland. Aerial view of the eroded field of piles and a breakwater to protect the intact cultural layers of Neolithic settlements from around 2700 BC, which are located landwards. © Archaeological Service of the Canton of Bern, diving team, 1998.

In Sutz-Lattrigen large-scale rescue excavations of the various Neolithic and Bronze Age settlements dating between 3800 und 1600 BC were carried out between 1988 and 2003 in the already eroded settlement areas (Hafner 2012; Stapfer, Hafner and Francuz 2019). Structural parts of houses, path-ways and palisades, in particular thousands of wooden piles, have still been preserved. However, hard finds such as ceramics and stone tools survive the erosion, but in the long term they are also gradually destroyed at the bottom of the lake. The first protective measures and coverings with geotextile and gravel were implemented between 2000 and 2004 (Hafner 2008). A total of 6,000 m^2 of lake bottom and cultural layers were protected in this way. The work was largely pioneering and the long-term effect was desired and hoped for, but not proven. It was also clear that only field trials could bring further progress and experience with active erosion control measures. At that time, two different methods were used. First, thin geotextiles were designed, reinforced and weighted with rebar (metal rods) grids. The grids originated from the construction industry. Based on experience with this method, new methods were sought. With the use of a

Fig. 3 Diver placing an erosion marker at Thun, Schadau, Lake Thun. It is a cost-effective and efficient method to measure the erosion rate of the lake bed over the long term © Archaeological Service of the Canton of Bern, Carlos Pinto, 2016.

Fig. 4 Spreading of heavy geotextile mats with a sand inlay of 5 m width and 30 m length, which are normally used in road construction. The special ship of the Archaeological Service of the Canton of Bern in an operation on Lake Biel. © Archaeological Service of the Canton of Bern, diving team.

Fig. 5 Dumping of gravel over the laid-out geotextile mats at the site of Sutz-Lattrigen, Hauptstation, Lake Biel. With the help of a special ship equipped with an opening bottom, a thin even layer can be spread, which protects the archaeological cultural layers without creating too much load on them. © Archaeological Service of the Canton of Bern, diving team, 2004.

specially constructed catamaran type platform, it was possible from 2003 onwards to lay heavy, self-sinking geotextiles weighing almost 1 tonne (Fig. 4). A metal reinforcing bar grid was no longer necessary.

In both cases, an approximately 20 cm thick gravel layer was poured over the geotextile mats on the lake bottom (Fig. 5). After washing out the sand fraction of the natural gravel, this layer should still be slightly more than half the original thickness. The laying of geotextile and gravel fills in Lake Biel was approved as part of regular building applications, but the builder — in this case the Canton of Bern — is obliged, as with any other building, to maintain it. For this reason, too, a more detailed inspection of the protective measures was necessary after ten years.

The areas covered by the geotextile mats and gravel fills in Sutz-Lattrigen were regularly inspected by divers of the Cantonal Archaeological Service diving team and documented with photo series and videos (Fig. 6). Up to now, it seems that the protection measures work: the gravel layers applied between 2000 and 2004 cover the entire area, are well compacted and covered by vegetation. The edges of the mats are well protected by the gravel. Movements of the gravel layer due to currents at the bottom of the lake cannot be observed. In summary, it can be said that the gravel cover in Sutz-Lattrigen is stable and that the protective measures have had the intended effect and protect the archaeological layers from destructive erosion.

In the meantime, other archaeological heritage management authorities in Switzerland have also begun to take protective measures against the erosion of prehistoric underwater settlement areas and an international research project was carried out between 2008 and 2011. A group of archaeologists and limnologists came together to investigate the causes of the erosion processes more closely, to test ecologically compatible erosion control measures, and to prepare better long-term monitoring of the cultural heritage under water. The project 'Erosion and monument protection at Lake Constance and Lake Zurich' within the framework of Interreg IV 'Alpenrhein - Bodensee - Hochrhein' (ABH) provided the necessary financial support, which was also granted by the European Union, the participating Swiss cantons, and the International Lake Constance Conference (Heumüller 2012; Brem 2013; Leuzinger, Sidell and Williams 2016). The most important result of this project is a certain standardisation of protection measures against erosion and joint monitoring concept to help identify the gradual processes of erosion. The project has laid important foundations for the cooperation of limnologists and monument conservators, and has shown future perspectives for further cooperation.

In the future, climate change may lead to new threats for prehistoric settlements: warming of water bodies, lowering of water tables and increased precipitation seem set to be new alarming factors. In the Alpine region, glaciers retain a large proportion of winter precipitation, and glacier-fed tributaries flow into the large lakes in the Alpine foothills —Lake Constance and Lake Geneva in particular — at a seasonal pace. Which consequences will the complete melting of the glaciers have on the water systems by the end of the 21st century? Will the increase in temperature lead to greater evaporation and contribute to a marked drop in lake levels? It is to be feared that low water levels will lead to even more erosion of shallow water areas? The problems associated with global climate change will pose enormous challenges for the societies of the future. Lake-shore settlements are vulnerable archaeological sources and the substantial threats to them are likely to increase in the future. It is to be hoped that archaeological sites that have survived more than 5,000 years and many human crises will also survive the climate crisis of the 21st century unscathed.

1 Permeable fabric, which, when used in association with soil, has the ability to separate, filter, reinforce, protect, or drain. In archaeological settings, it is often used to protect and stabilize the archaeological layers, including pile dwelling fields or shipwrecks.

Fig. 6 Long-term monitoring of the protective measures is crucial in order to detect and react to negative changes. For the geotextile mats laid in 2000 at the site of Sutz-Lattrigen, Hauptstation, Lake Biel, the gravel layer was removed and the geotextile mats were cut open to check the condition of the underlying archaeological layers. The protective measures were effective and the position of mats and gravel had not changed. In the best case, these measures will last for a 100 years. © Archaeological Service of the Canton of Bern, Daniel Steffen, 2014.

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The Ljubljanica River Exhibition and the future exhibition place of the logboat. © J. Babnik; archives of MGML.

SECTION 4
PUBLIC ENGAGEMENT

NOT JUST DIVERS AND FISHERMEN: INCREASING THE PUBLIC INVOLVEMENT IN THE SAFEGUARDING OF UNDERWATER CULTURAL HERITAGE IN TIERRA DEL FUEGO, ARGENTINA

Dolores Elkin, Argentina

Introduction

Underwater archaeologists often acknowledge the important role played by other people who are in direct contact with water, such as fisherpersons and divers, in many aspects related to underwater cultural heritage. As it is known, submerged sites are quite frequently even discovered by them. In recent years, actors who are less 'obvious' than the ones mentioned above have also emerged to become stakeholders when dealing with underwater cultural heritage. For example, there are now many metal detecting *aficionados* who spend a good deal of time combing intertidal zones in search of finds which frequently have historical significance.

This chapter presents examples of positive experiences regarding the involvement of all-terrain vehicle (ATV) and horseback riders in the coastal heritage of Tierra del Fuego, southern Argentina. It is expected that the gradual and non-linear processes leading to good results can be inspiring in comparable situations in other parts of the world.

Tierra del Fuego is an archipelago located in the southernmost part of the Americas, some 1,000 kilometres north of Antarctica, and it is politically divided into a portion in Chile to the west and Argentina to the east (Fig. 1). The region has a subpolar oceanic climate, with general environmental conditions characterized by a humid cold climate, average annual temperatures below 7°C, and precipitations ranging from 400 mm to more than 3,000 mm per year.

Until the mid-19th century the region was only inhabited permanently by various native groups[1] and the European presence since that time first consisted of small missionary colonies and later of different settlements associated with the respective new Republics. The Chilean locality of Punta Arenas, on the continental shore of the Strait of Magellan, was founded in 1848 as a penal colony, while in 1884 a coastguard office was established in Ushuaia, positioned on the Argentine side of the Beagle Channel on main island of Tierra del Fuego. A penal colony was also established by Argentina that same year on Staten Island, across the Strait of Le Maire. In subsequent years the Chilean and Argentine populations in the region increased to some degree, supplemented by European immigrants who contributed to the colonies and the 'civilization' process.

Fig. 1 Location of Tierra del Fuego, Argentina and of Donata Beach in the eastern portion (in the box). © Geomatics division, Instituto Nacional de Antropología y Pensamiento Latinoamericano.

Well before those times, however, the native population of the archipelago already had direct and indirect contact with Europeans (see, for example, Saletta 2017). Because of the geographical location of Tierra del Fuego, vessels connecting the South Atlantic and South Pacific Oceans have sailed past it continuously since the 16th century, and both the treacherous Cape Horn and the Magellan passages caused many human and material losses. Adventurous sealers and whalers also visited the area periodically, and the few lighthouses built in the region were insufficient. The main change took place with the opening of the Panama Canal in 1914 which led to a significant reduction in nautical passages around Cape Horn.

Keywords: Archaeological Heritage – Public Engagement – Peninsula Mitre – Tierra del Fuego – Argentina

The case presented in this text is a marine archaeological site located on Peninsula Mitre, the easternmost part of the main island of Tierra del Fuego. This is a portion of land of over 3,000 km^2 (approximately 160,000 m^2) surrounded by the Atlantic Ocean, the Strait of Le Maire, and the Beagle Channel.

This remote portion of the island remains extremely isolated, even nowadays. Until the first decades of the 20th century the main — and almost only — economic activity here were a few sheep farming *estancias* (ranches), but they were gradually abandoned due to the competition with other international and domestic producers followed by the decrease in the price of the wool, factors which no longer justified the investment and hardships involved.

At present two unpaved roads approach the Peninsula from the West, but except for a few kilometres along the northern route which allows the circulation of regular vehicles, almost the entire peninsula is only accessible by horse, foot, all-terrain vehicle (ATV) or helicopter. As for ships or any form of watercraft, the only ones which go to Peninsula Mitre are supply vessels from the Argentine Navy which occasionally stop in a natural harbour called Buen Suceso, by the Strait of Le Maire, on their route to Isla de los Estados (Staten Island) or Antarctica.

The point to stress is the remoteness and wilderness of this region, and it is precisely this characteristic which is nowadays attracting an increasing number of visitors. Some are nature-oriented hikers or horseback riders but the vast majority are groups of people who use ATVs to carry out extreme, adventurous expeditions, without speed limits or any other form of control over their activity.

In 2016, during one of these ATV expeditions to Peninsula Mitre, a significant and unusual archaeological discovery took place in Playa Donata, a 2,5 kilometre sandy beach on the Atlantic coast of the peninsula (Fig. 1).

What the group of ATV riders spotted in the intertidal zone consisted of a series of wooden baskets containing large quantities of historic pottery, predominantly whiteware cups and plates (Figs. 2a, b). It is worth noting that this beach had been surveyed on many occasions by different archaeological teams, the last ones conducted by the underwater archaeology unit of the National Institute of Anthropology between 2010 and 2014 (Vázquez et al. 2010, 2013; Elkin et al. 2017), and these type of remains had never been seen before. The baskets were obviously buried during these previous surveys, then over time the overlying sediment had been naturally eroded, and the artefacts had become exposed at the time the ATV group passed along the beach.

The finders collected some material - probably as much as they could - and apparently left some accumulated together to be collected later. Clearly, the archaeological context was severely disturbed not just by the removal of artefacts but because of the displacement and damage done to less attractive pieces such as the baskets themselves. Shortly thereafter some members of the expedition uploaded comments and photographs of the event on social media networks.

Fig. 2a Basket containing whiteware chamber pots – Playa Donata. © Dirección de Patrimonio de la Provincia de Tierra del Fuego (provincial heritage agency).

Fig. 2b Excavation and recording of one of the containers. © Christopher J. Underwood.

Archaeological heritage in Argentina is protected by law at various levels. National law 25.743 defines it as cultural elements over 100 years of age which are in an archaeological context on land or underwater (Law 25.743/2003). The province of Tierra del Fuego has a similar legal framework (Law Nr. 370) with an additional Decree which protects all historic shipwrecks lying within their jurisdictional waters (Decree Nr. 858/98). Finally, since 2010 Argentina is a State Party to the

UNESCO Convention on the Protection of the Underwater Cultural Heritage (UNESCO 2001). Nonetheless, and despite the efforts to create public awareness on the subject and disseminate information on such regulations (Murray et al. 2016) many citizens continue to behave as finders-keepers, particularly with respect to historical material. Shipwreck remains and their cargoes are probably the most vulnerable elements in that sense.

Whether the quad-bikers knew or did not know that they were acting in an illicit manner, representatives of the Secretary of Culture of Tierra del Fuego started a legal process shortly after finding out about what had happened, which resulted in the confiscation of the materials and their (reluctant) restitution to the provincial public domain. Even since, there was a clear confrontation between the heritage authorities, along with several archaeologists, and the loose category of 'the quad-bikers' which more or less encompassed any owner of this type of vehicle going to Peninsula Mitre and who was regarded as a potential destroyer of not only cultural heritage but also the delicate natural environment of the area.

In the course of the following months, rescue archaeological fieldwork was conducted on the site with the support of the provincial authorities on archaeological heritage and the Museo del Fin del Mundo in Ushuaia, revealing that the collection consisted of 19th Century British pottery and glassware. The baskets were interpreted as part of the cargo of a vessel heading to the Pacific Ocean along the Cape Horn route; however, there is no wreck site in the vicinity which can be associated with the baskets, and the process of trying to identify the circumstances by which they were deposited in the Donata beach is still ongoing (Elkin 2019).

In parallel to the archaeological research and the conservation of the materials that has been conducted since 2016 (Elkin 2019; Pousa et al. 2018), it was considered appropriate to implement a series of awareness raising initiatives for Peninsula Mitre in a holistic manner, attempting to reach as many stakeholders as possible. So far, the actions have consisted of the following:

1. Placing permanent informative panels and distributing leaflets at the entrance to the Peninsula with regard to its cultural and natural heritage and the legal framework which protects archaeological remains in the province. The leaflets also indicate the procedure to be followed in case of archaeological discoveries.
2. Setting up museum exhibits with the materials recovered from Playa Donata at the two main cities in the province: Ushuaia and Rio Grande. The exhibits include information on archaeological methodology, the legislation which protects such heritage, the importance of preserving the context, and other relevant awareness raising points.
3. Producing a documentary film on the rescue archaeology work conducted on Playa Donata, with support of the Culture Secretary of the province. It has already been shown in many venues and is now available on the internet (Fernandez Arroyo 2017).
4. Giving periodical public talks and mass media interviews in Ushuaia and Rio Grande with an update on the research and conservation. People related to the fields of tourism, education, diving, fishing, horseback riding, ATV expeditions, science, media, police and military forces, NGOs, rural management, and of course cultural heritage, are regularly invited to the talks. These also provide an opportunity for questions and interaction with the public.
5. More recently, making a special approach to the people who go to Peninsula Mitre through clubs and other associations of ATVs and motorbikes. The first amicable dialogues with individual people who practice these activities are already yielding positive results in terms of reporting archaeological finds to the specialists or the authorities (Fig. 3). There is a major difference between this attitude versus removing or disturbing them, generating legal confrontations, or simply not bothering to notify anyone.

A round-table meeting is planned, with one of the main proposals to discuss will be the possibility of their actual involvement in archaeological projects in the form of logistical support and/or citizen science.

Fig. 3 Image of a ship's timber, probably part of a keel structure, sent by Mr. Gabriel Muñoz, who passed through Playa Donata on his ATV. © G. Muñoz, 2018.

Aside from this change in behaviour of at least some of the ATV expeditioners, other people who have reported archaeological material in the area are hikers, tourism helicopter pilots, law enforcement officers, former ranch owners and the leaders of horseback expeditions. The Ushuaia horse riding club has even put signs referring to the historical, archaeological, and natural resources of the area, encouraging people to respect them. One of the signs is about one of the most emblematic shipwrecks in the area, the British merchant sailing ship *Duchess of Albany*, stranded on the coast in 1893 (Elkin et al. 2017).

There is also a public initiative to create a protected area in Peninsula Mitre and the surrounding marine territory. This is led by conservationist organizations and already has considerable political support. If this is achieved, the natural and cultural resources in Peninsula Mitre will have an effective protection system, with regulations on the different degrees of accessibility, including special layouts of tracks for the usual visitors: horseback riders, hikers and ATV riders. Helicopters will probably be allowed to land only in selected places, and a respectful behaviour will be ensured for visitors in general.

At present there are no recreational diving or fishing activities in Peninsula Mitre, but it is not inconceivable that it will start taking place in the future. If and when that happens, the underwater cultural heritage of this marvellous part of the world will hopefully have more allies in its protection.

Summary

In summary, and with the risk of stating the obvious, our experience revealed that the more stakeholders are involved in activities directed at underwater cultural heritage the greater the chances of successful outcomes. This is something already noted by other authors based on their experiences in different parts of the world revealing that multivocality, participation, and empowerment is the way to move forward (see Scott Ireton 2014). Cultural heritage will only be properly valued and protected when it is clear that it belongs to us all.

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1 These were the Selk´nam, the Haush, the Yaghan and the Alakaluf.

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PUBLIC ENGAGEMENT, COMMUNITY ARCHAEOLOGY AND UNDERWATER CULTURAL HERITAGE MANAGEMENT: AN AUSTRALIAN CASE STUDY

Andrew Viduka, Australia

Introduction

Australia has a rich history of public engagement in maritime archaeology starting in the 1960s in Western Australia and continuing through to present day. This paper outlines the range and diversity of activities by many people within Australia who have actively worked to create a more informed and engaged public, who in turn, have become empowered to articulate their desire to be more engaged in their own heritage. On 24th August 2018 Australia replaced the 42-year-old Historic Shipwrecks Act 1976 (HS Act) with the Underwater Cultural Heritage Act 2018 (UCH Act), which came into force on 1st July 2019.[1] On this occasion, the HSP was renamed the national Underwater Cultural Heritage Program (UCHP). The UCH Act is aligned with the 2001 UNESCO Convention on the Protection of the Underwater Cultural Heritage (the Convention) and like the Convention and associated Annex Rules, supports the inclusion of the public in underwater cultural heritage activities. As such Australia legislated 'to promote public awareness, understanding, appreciation and appropriate use of Australia's underwater cultural heritage' (UCH Act s.3(c)).
This legislated policy position is also a direct outcome of submissions to the 2009 public review of the HS Act, the ultimate recognition of the importance of public engagement and community archaeology.

Background

Australia employs a range of legislative, policy, practical and social approaches to manage and preserve historic shipwrecks from negative cultural interaction. Of Australia's approximately 7,500 protected historic shipwrecks, 28 lie within protected or 'no-entry zones without permit'.[2] The remaining sites can be dived without permit as long as that activity does not cause damage, disturbance, or removal of material from the site. Management of shipwrecks, submerged aircraft, and other underwater cultural heritage in Australia balances protecting sites with maintaining public access for recreational, scientific, and educational purposes. However, this was not always so. Upon the introduction of the HS Act the role of the public was silent. In Australia it took until 1983 for the role of the public to be included as an administered objective of the national Historic Shipwrecks Programme (HSP), which was created to be the vehicle for coordinating national collaborative administration of the HS Act.

Some of the HSP's broader objectives include:

- Support of an informed public for historic shipwrecks as a cultural resource.
- Undertake fieldwork including shipwreck survey, excavation, and monitoring and community engagement.

In Australia, divers are encouraged and can use underwater cultural heritage sites for recreational purposes, but the physical fabric of the wreck must not be disturbed, and artefacts must not be removed from the site without a permit.

Managing Australia's shipwreck heritage

Due to the small number of maritime archaeologists working as underwater cultural heritage managers and the vast amount of coastal waters around Australia (≈34,000 km or 21,126 miles), it has always been obvious that little can be done by these maritime archaeologists singularly. A core reality of underwater cultural heritage management in Australia is that community support and community participation in the monitoring or discovery of vessels is critical to achieving the objectives of protecting underwater cultural heritage. To achieve this, a strong community-based programme that improves the public's access to, knowledge and enjoyment of their underwater heritage is vital.
In 1994, the HSP published The *Guidelines for the Management of Australia's Shipwrecks* (Henderson 1994) and in 1996 the *Historic Shipwrecks Public Access Guidelines* (Australian Government 1996). A key component of the 1994 Guidelines, now largely superseded, was in Part 2 – *Implementation* s.3.4, which outlined how to establish a shipwreck programme. This stated that: 'Responsible community participation should be encouraged'. This was further elaborated in s.10 Public Access, s.11 Volunteer Programmes and in the separate publication *Public Access Guidelines*.
Management agencies around Australia have developed a range of different communication and engagement strategies to facilitate open access and inform the public of their underwater heritage.

Keywords: Australia – Public Archaeology – Community Engagement – Cultural Heritage Management

These strategies include:

- Online databases with detail on the history, location and diving conditions of each site;
- Websites, brochures, posters and books.
- Accurate historical and site data provided to commercial dive charter industries.
- Community based interactive programmes.
- The development of dive trails.

A fundamental element in the strategy of promoting community participation is the development and support for avocational maritime archaeology groups.

Fig. 1a MAAV 2018 Safety Beach Excavation, Victoria. © Maritime Archaeological Association of Victoria.

Fig. 1b MAAV 2018 Safety Beach Excavation, Victoria. © Maritime Archaeological Association of Victoria.

Avocational maritime archaeology groups

Australian management agencies initially put significant time and resources into fostering the establishment of 'volunteer programmes'— effectively creating local maritime archaeological associations. In the 1996 *Public Access Guidelines,* it is specifically stated that community groups can undertake disturbance activities subject to meeting specific criteria in training in maritime archaeology. This extended to private and public groups and institutions including local historical and archaeological societies, regional community museums and affiliated groups under the direction of a person qualified in maritime archaeology (Australian Government 1996).

In Australia permits for the recovery of relics are not issued to individuals or groups without research plans, conservation, and collection management resources. As such, many maritime archaeological associations focus on activities that do not require a permit such as searching for shipwrecks or survey of known wrecks.

Fig. 2 MAAWA 2014 - members surveying the twin-screw steamer Omeo (1905) wreck site, South Fremantle, Western Australia. © Ian McCann.

Over time, many of these maritime archaeological associations not only planned and undertook their own research, but also became the backbone of their state or territory's fieldwork programme, supplying divers with: practical, historical and nautical knowledge; a vast depth of diving experience; boat handling skills; medical and safety skills; and training in archaeological methodology.

Notable amongst these groups is the Maritime Archaeological Association of Victoria[3] (Fig. 1) and the Maritime Archaeological Association of Western Australia[4] (Fig. 2). Other groups existed in Tasmania, such as the Maritime Archaeological Association of Tasmania (no longer in existence); Queensland, Maritime Archaeological Association of Queensland (no longer in existence); South Australia, South Australia Archaeological Society (formerly known as the Society for Underwater Historical Research); and most recently the Norfolk Island Maritime Archaeological Association (no longer in existence). While not all maritime archaeological associations have been continuously active, without this voluntary pool of labour numerous famous underwater excavations conducted in Australia during the 1960s and 1970s would never have been completed (Graeme Henderson 2018 pers. comm.). The rela-

tionship between management agency and community group remains so symbiotic, that the strength of a jurisdiction's management capacity can be indicated by the activity of the local community group (McCarthy and Garratt 1998; Viduka 2012). Over the years avocational groups have been instrumental in discovering, documenting, and protecting shipwrecks around the country. A feature of the last decade or so is that these groups have also produced splinter groups who have a specific area of research interest and are keen technical divers. Southern Ocean Exploration[5] and the Sydney Project[6] are notable examples of groups who like both technical diving and discovering shipwrecks. Other groups such as Wreck Check Incorporated[7] are interested in searching for, locating, and documenting underwater cultural heritage related to or shared with Australia wherever it is (Fig. 3a and 3b).

Fig. 3a Photogrammetry of the engines of JX435. © Wreck Check Inc.

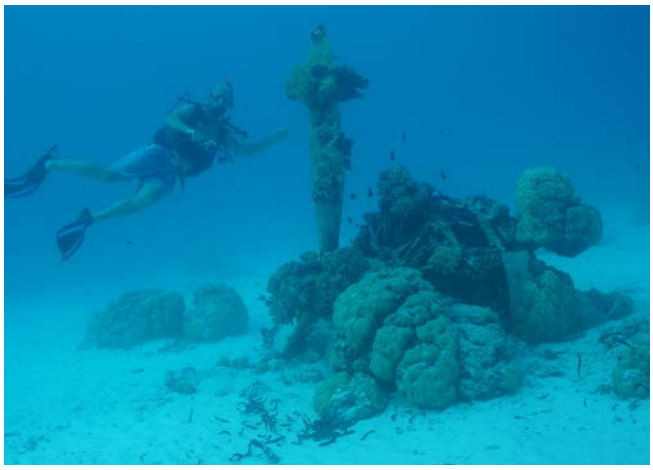

Fig. 3b Wreck Check Inc member James Parkinson documenting Catalina JX 435 Cocos Atoll, Indian Ocean Territories. © Wreck Check Inc.

Overarching many of these avocational groups is the Australasian Institute for Maritime Archaeology (AIMA).[8] AIMA is Australia's pre-eminent non-government organisation for anyone interested in maritime archaeology. AIMA's focus is to promote the protection and research of underwater cultural heritage.

AIMA members Mark Staniforth and Viv Moran adapted the United Kingdom-based Nautical Archaeological Society (NAS) course, for Australia, in 1997 (Moran and Staniforth 1998). Today, AIMA members deliver this internationally recognized AIMA/NAS 4-part course on maritime archaeology throughout Australia and New Zealand. The course aims to introduce the methodologies used in maritime archaeology as well as create a broader and more informed understanding, particularly regarding shipwreck preservation. Participants receive internationally recognised certificates on completion of each of the courses.

Other public engagement strategies

Another key public engagement strategy of several Australian state-based management agencies, most notably Queensland, has been support for the dive tourism industry. By providing these businesses with better information about shipwrecks, supplying site plans and historical information, the businesses are, in turn, better placed to inform the public and to promote the protection of the shipwreck sites as an extension of their business interest (Viduka 2008). Supporting this engagement strategy is research that has been conducted into diver attitudes to protected shipwrecks (Jewell 2002), and into the effectiveness of recreational training for the protection of underwater cultural heritage (Edney 2011).

Where there are several shipwrecks in near proximity to each other, shipwreck trails have been created so that members of the diving public can discover the stories about the local underwater maritime heritage and be informed about conditions, visibility, biology and their responsibility as a diver on shipwreck sites. Regular diving of the sites by the public also greatly facilitates monitoring leading to both better preservation outcomes and a more informed public. In some cases, shipwreck trails include instructions on appropriate ways to moor up near a site and on other restrictions if they exist, such as fishing near a site. Shipwreck trails exist in most states. Interpretation material about near-shore sites is often placed close to the wreck site on the shore or underwater near to the site (Philippou and Staniforth 2003).

The installation of moorings near popularly dived shipwreck sites not only helps prevent physical damage from poor an-

Spotlight on Citizen Science

By Heather Creech

GIRT by sea: Divers wanted for a new Citizen Science project on shipwrecks

THERE are over 7,500 registered shipwreck sites in Australian waters and 2,000+ in New Zealand ... and not nearly enough maritime archeologists to record and monitor their condition. So how do we preserve that heritage? Andy Viduka wants to mobilize divers to adopt a local shipwreck and monitor what is happening to the physical condition of the wreck within its surrounding environment.

Through GIRT – **Gathering Information via Recreational and Technical (GIRT) Scientific Divers**– divers will be trained to assess the shipwreck site they've adopted, including the environmental conditions – currents, ocean temperature, bottom composition, and marine life. These citizen science divers will help to investigate important questions around site formation, the broad scale impacts of climate change, storm events, micro environmental changes, and human activities that may impact the site directly or indirectly – such as pollution, bad anchoring practices, dredging or dumping sediment.

After a half-day of training, divers participating in GIRT will fill in a set of standard forms during each site inspection and forward those forms and associated images/video to be included with the wreck site's official record in the Australian National Shipwrecks Database (ANSD).

Through an online community, members will have a chance to share and review a survey report once it is compiled. GIRT members will be the frontline observers of their adopted wrecks' condition and possibly the first people to witness if that shipwreck is being negatively impacted or threatened by environmental change.

Setting a transect line (Credit: Viduka, nd)

Corrosion survey (Credit: Viduka, nd)

Next month (July 2018) Andy is starting a six-month pilot project in South Australia, open to all divers over the age of 18. He has 25 divers already interested, but he could use more.

Feedback from those participating in the pilot will be used to assess the content and delivery of the training, the data points they have been asked to collect, the method of data collection and the ease of uploading data. Andy is also exploring the motivations of participants in joining the project as part of his related PhD research. Consent from participants will be sought prior to joining GIRT including approval to share data with the ANSD.

GIRT is a project of the not-for-profit research group **WreckCheckInc.org**. A full launch of GIRT is anticipated in early 2019 across Australia and New Zealand. Long term, the plan is to put all the training materials online to make it as easy as possible to engage as many divers as possible. Any group of divers anywhere will be able to learn the process and begin to monitor shipwrecks along their own shorelines.

Andy believes that the best person to understand and lead the preservation of local heritage is a local. In his view, through citizen science people can become informed, empowered and then lead scientific research in their own backyards. With GIRT, citizen science divers will contribute to a greater understanding of the underwater cultural heritage that surrounds us all. We are, after all, GIRT by sea.

For more information or to join the pilot project (July to December 2018), contact: Andy Viduka girtscientificdiver@gmail.com

Six reasons why you should follow GIRT at www.facebook.com/GIRTscientificdivers/

1.To learn more about Australia and New Zealand's unique and irreplaceable underwater cultural heritage.
2.To acquire a number of basic skills in marine archeology, scientific and technical monitoring and reporting.
3.To work with your local diving community to care for a local piece of history. You can start thinking now about whether there is a shipwreck near you that you and your dive club can adopt for GIRT.
4.If you have already completed the Australasian Institute of Maritime Archaeology/Nautical Archaeology Society (AIMA/NAS) program, GIRT is an opportunity to put your training to use with a local shipwreck site.
5.If you live in South Australia, you can get involved right away! This is a great opportunity to get involved from the very start as a GIRT diver.
6.For all other divers: stayed tuned for the launch date: Early in 2019, GIRT will be rolled out nationally and in New Zealand, opening the door to many more divers interested in shipwrecks.

SHIPWRECKS are an incredible lens into the past. To enable our stories to be discovered and told one day, shipwreck sites and other underwater cultural heritage places need to be preserved. Underwater, and buried beneath one meter of sand, organic artifacts are protected from physical and biological deterioration. These artefacts have the potential to tell us much about a wide range of human activity. However, if a micro-environment that is preserving these artifacts is sufficiently disturbed by a storm, a dragged anchor or even sweeping sand off by hand or fin, physical, chemical and biological processes of deterioration can start and lead to the total loss of those artifacts and the information they hold. We need suitably trained divers to monitor shipwreck sites and their stability within their environment, and contribute to record taking so that we all gain a greater understanding of our past and preserve the opportunity for the telling of those lost stories.
Andy Viduka - Member, International Committee on Underwater Cultural Heritage of the International Council on Monuments and Sites (ICOMOS-ICUCH)

Andy Viduka (Credit: Viduka, nd)

Dive Log is committed to citizen science — efforts to engage divers to help with coastal and marine scientific research. Each month we will profile a current project from the Australasian region. If you wish to report on your citizen science initiative, please contact the author, Heather Creech, at inovermyheadagain@gmail.com.

Fig. 4 Article from DIVELOG Magazine June 2018 on GIRT Citizen Science Project. © A. Viduka.

choring practices, it also helps protect the site in other ways, such as easy compliance monitoring, while supporting cultural tourism (Nutley 2006). One of Australia's most popularly dived shipwreck sites is the SS *Yongala* (1911). This shipwreck is in a Protected Zone that is subject to access by permit only. A condition of the permit is no penetration diving of the wreck that sits proud of the seabed and is structurally intact. To facilitate charter boats mooring near the site without their anchor damaging the wreck site or the associated coral, moorings infrastructure was installed around the wreck and diver access points placed near the bow and stern circa 2005. Charter boat operators taking recreational divers to the site and the underwater cultural heritage managers, both want to protect the wreck from damage. Due to this alignment of interests, this site is now very effectively monitored for infringements of the UCH Act by recreational divers. Divers are briefed, either onshore or on the boat prior to diving, of their obligations under the Act. Charter operators will report a breach that is observed, which has resulted in several successful prosecutions and fines for the perpetrators. The protection of the *Yongala* site has been a significant and positive outcome and is an exemplar of the vested interest model of site management (Viduka 2008).

Another type of public engagement model which produces positive site management outcomes is a blend of research, heritage tourism, and diver education (Viduka and Raupp 2008). In this model, maritime archaeologists and dive charter operators combine to develop a dive trip that achieves research and or site management and tourism objectives, which is then sold commercially. Participants on the dive trip are given the opportunity to learn from an expert about the shipwreck sites being inspected. Participants can receive training developed for vocational archaeologists such as the AIMA/NAS course[9] or for participation in an underwater cultural heritage-based citizen science programme. Divers are encouraged to help, where possible, in the given research programme of documentation and/or condition reporting of wreck sites. Aspects of the 'expert participant' model are also used in compliance and enforcement monitoring of charter tourism companies on water behaviour, work practices and appropriate communications to divers.

Public archaeology programmes

A community programme not limited to divers but inclusive of anybody interested in maritime heritage was developed in New South Wales (NSW). This volunteer programme called *Wreck Spotters*[10] has been functioning for over 10 years and has multiple objectives. Its primary role is to 'establish an expanded body of shipwreck enthusiasts to provide first-hand advice on local discoveries and the condition of visible sites'. The programme also strives to improve the management agency knowledge of historic shipwrecks that are uncovered by seasonal weather events or other conditions on known sites. Members are encouraged to be involved in the assessment and interpretation of reported sites.

Queensland is the second largest state in Australia with a coastline that extends for nearly 7,000 kilometres [≈ 4,350 miles] and is Australia's most popular dive destination with 1,310 shipwrecks around its coast. In 2014, Queensland announced a new programme to encourage the public to report discovery of sites – The Queensland Historic Shipwreck Survey.[11] This programme is an ongoing effort, but its success will be directly proportional to its ability to engage Queensland boating and diving public.

Balancing public engagement and site management

To manage a cultural heritage site, an agency must:

- Know where the site is.
- Have documentation of the site, mapping the site and its condition (baseline survey).
- Monitor the site consistently as part of a planned longitudinal programme.
- Manage cultural interactions with the site and mitigate effects, where possible, of cultural and natural events that would cause deterioration.

Site monitoring and compliance enforcement is the necessary counterbalance to a policy of open public access. The management of cultural interactions, as framed by legislation and policy, is achieved in Australia through a tiered compliance and monitoring programme. The first tier is remote monitoring of identified key sites by flyover. This is leveraged off capacities within Australia's customs and border protection agencies. To support these officers near shore, the UCH Act, as with the old HS Act, makes provision for the appointment of Inspectors. Inspectors are appointed from state government officers, typically engaged in compliance and enforcement roles such as marine, fisheries, or parks roles. A key criterion is that their activities require them to work operationally on the water daily. Underwater Cultural Heritage Inspectors are the eyes and ears of everyday compliance monitoring. Next there is monitoring of public compliance by the relevant jurisdictional management agency. The final tier of Australia's compliance monitoring pyramid and the largest is the informed public including tourism operators who hold a vested interest (Viduka 2012).

Deep water shipwrecks

Over the last two decades there has been increasing interest and capacity to discover and document deep-water shipwreck sites. Technical divers now go far deeper than the 30-metre workplace depth limit for most state-employed maritime archaeologists. It has long been recognised that the HSP requires capacity to document sites between 30 – 200 metres to keep pace with technical divers and other technologies (Smith 2006; Viduka 2012). For the moment there is a reliance on members of the public who are technical divers to report on deep water shipwrecks.

Site monitoring with the public

To effectively manage sites regular systematic monitoring must occur. In Australia, even for famous sites that were subject to major excavations, many of these sites are not annually monitored by management agencies due to resource restraints:

- *Batavia* (1629) Western Australia
- *Rapid* (1811) Western Australia
- *Xantho* (1872) Western Australia
- *Zuytdorp* (1712) Western Australia
- *City of Launceston* (1865) Victoria
- HMS *Pandora* (1791) Queensland
- HMS *Sirius* (1790) Norfolk Island
- *James Matthews* (1841) Western Australia
- *Lively* (1811) Western Australia
- *Vergulde Draeck* (1656) Western Australia
- *Clarence* (1850) Victoria
- *William Salthouse* (1841) Victoria
- *Sydney Cove* (1791) Tasmania

If these significant sites are not regularly monitored, what hope of monitoring is there for the other approximately 7,500 shipwrecks that are within our coastal waters?

Today there is some hope for monitoring these other shipwrecks beyond existing programmes such as NSW' Wreckspotters or the Queensland Historic Shipwreck Survey. In July 2018, a new public archaeology/citizen science project called Gathering Information via Recreational and Technical (GIRT) Scientific Divers was launched in Australia.[12] GIRT is a nationwide conservation focussed citizen science project that encourages interested individuals to 'adopt-a-wreck' and commit to annually monitor the site using the GIRT methodology, which is based on the principle of no-impact documentation. Citizens are stimulated to attach the acquired information to the GIRT website (http://www.girtsd.org) as well as potentially to the site's permanent record in the Australasian Underwater Cultural Heritage Database. Overtime and if successful, this process will build a longitudinal understanding of the changing conditions on adopted sites and an understanding of the threat level to those sites from human activity or changing environmental conditions. GIRT members record observable and measurable details in the open water environment and support these data with scaled condition photos of up to ten specific features, a video transect and photogrammetry. A key focus of the research behind GIRT is to test the question discussed in this chapter: 'Can public archaeology inform science based underwater cultural heritage management?' From this research, the value or not of a prioritised public good conservation approach for underwater cultural heritage management may be demonstrated.

Conclusion

This paper set out to show the rich and diverse history of public engagement and community underwater archaeology in Australia. From the examples shown it has been demonstrated that the activity of maritime archaeologists and conservators since the 1960s has supported Australian community based maritime archaeology and directly led to a larger group of vocal and informed public who desire to be more engaged in their own heritage.

The paper also endeavoured to demonstrate that this group are skilled, capable, willing, and have time to be meaningfully engaged in documenting and protecting underwater cultural heritage. With the appropriate framework and active ongoing

engagement by heritage managers, the valuable contributions of these informed community archaeologists can greatly assist underwater cultural heritage managers in their roles to the benefit of future generations. Indeed, the potential of community archaeologists to supply robust and meaningful data has increased with the availability of new technologies such as photogrammetry.

With the introduction of the UCH Act the public now have the legislated right to continue to meaningfully contribute to Australian maritime archaeology.

Acknowledgements

I would like to dedicate this paper to a friend Michael (Mack) McCarthy, ex-Senior Curator Maritime Archaeology at the Western Australian Museum. Mack is one of Australia's earliest proponents of public underwater archaeology and played a significant role in shaping the Historic Shipwrecks Program inclusion of community-based outcomes. The HSP is now known as the National Underwater Cultural Heritage Program. I would also like to acknowledge Dr Chris Underwood as the creator of the 'adopt-a-wreck' concept which I reference in this paper.

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2 Underwater Cultural Heritage Protected Zones, https://www.environment.gov.au/heritage/underwater-heritage/protected-zones; accessed 30th September 2020.

3 Maritime Archaeological Association of Victoria. http://home.vicnet.net.au/~maav/;accessed 30th September 2020.

4 Maritime Archaeological Association of Western Australia. http://www.maawa.net;accessed 30th September 2020.

5 Southern Ocean Exploration. http://www.southernoceanexploration.com; accessed 30th September 2020.

6 Sydney Project. https://sydneyproject.com/; accessed 30th September 2020.

7 Wreck Check Inc. http://wreckcheckinc.org/; accessed 30th September 2020.

8 Australasian Institute for Maritime Archaeology. http://www.aima-underwater.org.au; accessed 30th September 2020.

9 AIMA/NAS Training. http://www.aima-underwater.org.au/parts-i-iv/; accessed 30th September 2020.

10 NSW Wreckspotters. http://www.environment.nsw.gov.au/MaritimeHeritage/whatsnew/wreckspotters.htm; accessed 30th September 2020.

11 Queensland Survey. https://www.qld.gov.au/environment/land/heritage/archaeology/shipwrecks/; accessed 30th September 2020.

12 GIRT Scientific Divers. http://www.girtsd.org/; accessed 30th September 2020.

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ANCIENT SHIPWRECKS IN CYPRUS: REACHING OUT TO THE PUBLIC

Stella Demesticha and Anna Demetriou, Cyprus

Fig. 1 Kyrenia-Liberty visited the Mazotos shipwreck excavation in 2011, during one of its educational trips with undergraduate archaeology students of the University of Cyprus. © Cl. Lozano, MARELab, University of Cyprus.

Introduction

Among testimonies of seaborne trade activities, on land and under the sea, ancient shipwreck sites are the most typical ones (Gibbins and Adams 2001). At the same time, as shipwrecks are connected to the established 'idea of the sea' (Mack 2011, 25) and, hence, to the notions of adventure and discovery (Brown and Humberstone 2016, 22), they trigger imagination, generating a significant impact among the public. This paper discusses two underwater excavations in Cyprus, at the Kyrenia and the Mazotos shipwrecks, that have played an intrinsic role in the current conception of ancient shipwrecks and underwater archaeology on the island.

The archaeological record

The Kyrenia shipwreck excavation commenced in 1967, by the University Museum of Pennsylvania, under the direction of Michael Katzev (Swiny and Katzev 1973). It marked a turning point in the history of the field as it brought to light a late 4th to early 3rd century BC ship and her cargo in a very good state of preservation. Retaining approximately 75% of its original structure, the hull of the ship was lifted, conserved, and reconstructed. The project was very successful and by 1973 Cyprus had obtained a significant position within the field of underwater archaeology (Harpster 2015). The Kyrenia ship itself gained an exceptional ranking within the field of nautical archaeology in particular (Steffy 1994), a position she holds up to date.

More than ten scattered shipwreck sites have been located in Cyprus since 1974, dating from the Hellenistic to the Byzantine periods (for an overview see Demesticha 2018). None was excavated or even remotely approached an impact similar to the Kyrenia (see below), and their survey was restricted to their report, inspection, and photographic documentation. The year 2007, however, marked a turning point in the history of shipwreck archaeology on the island. The establishment of a Chair of Maritime Archaeology in the Department of History and Archaeology at the University of Cyprus (UCy) as well as the report to the Authorities of a new, well-preserved, 4th century BC shipwreck, off Mazotos village, on the south coast of the island, were the springboard for the development of the field (Demesticha 2011).

Reaching out to the public

The first contact of the Cypriot society with shipwreck archaeology, was done through the Kyrenia shipwreck project, and it was very successful and influential. As recreational and professional diving was at a very early stage during the late 1960s, the Kyrenia shipwreck project introduced Cypriots to an unknown aspect of the sea. Additionally, the monumentality of the site, as well as the national and international interest it attracted, instantly engaged the public. This was further enhanced by the combined attempts of the Kyrenia Shipwreck Project team and the Department of Antiquities to communicate the results of the project to the local community.

Keywords: Cyprus – Shipwreck Archaeology – Kyrenia Shipwreck – Mazotos Shipwreck – Public Outreach

Fig. 2 The Maritime Archaeological Bus in Cyprus. © MARELab, University of Cyprus, 2017.

A temporary exhibition of the shipwreck finds was organized at the Kyrenia Castle (Katzev 1970, 13) and public lectures were held, achieving 'unprecedented attendance for cultural events'.[1] The response of the public is also evident in numbers; the Kyrenia Castle, where the shipwreck was exhibited, gradually became the second most popular historic monument on the island, after the Roman city of Salamis (Harpster 2015).

Since the Turkish military invasion in 1974 and the dire political situation that followed it at the northern part of Cyprus, the archaeological activities of the Kyrenia Shipwreck Project team came to a standstill. As the exhibition of the ancient ship was not accessible to the Greek Cypriot community after 1974, it ceased to be part of the island's archaeological practice (Demesticha 2018, 67). However, the re-materialization of the Kyrenia ship through the construction of her two replicas, Kyrenia II in 1985 and Kyrenia-Liberty in 2003, generated new channels of communication between the ship and the public. In 2005, thirty years after her launch, Kyrenia II was granted to the Thalassa Museum (Agia Napa, Cyprus) where she has been exhibited ever since. Furthermore, over the years, members of the Kyrenia-Liberty crew have been engaged in teaching ancient sailing techniques (Fig. 1), as well as in organising educational programmes in schools around Cyprus.

These activities formed the public's conception of underwater archaeology and asserted the position of Kyrenia ship within contemporary society, as the only shipwreck site excavated on the island. The initiation of the Mazotos shipwreck project in 2007 changed the established situation. First, the excava-

tion of the Mazotos shipwreck, with qualified human resources and the necessary equipment, marked the first underwater archaeological project on the island undertaken by Cypriot institutions. Moreover, it provided additional evidence, enriching the archaeological material used in public outreach activities, such as lectures, articles in the press, and interviews on radio and television. The public was very receptive and, following the Kyrenia legacy, embraced the new project very quickly (Demesticha 2018).

Fig. 3 Cypriot volunteers are setting up the airlift, during the 2018 excavation season at the Mazotos shipwreck. © S. Demesticha, MARELab, University of Cyprus, 2018.

More importantly, with the establishment of maritime archaeology in the academic sector of Cyprus, a new dimension was added to the public aspect of shipwreck archaeology that went beyond the specific site presentations. Capitalising on this momentum, the Maritime Research Archaeological Laboratory (MARELab) of the UCy, in collaboration with the Maritime Archaeology Trust[2] and with full support from the Honor Frost Foundation[3], organized a tour of the 'Maritime Archaeology Bus: Cyprus' exhibition, in the summer of 2017, built on the successful application of the idea in the UK (Satchell 2017) (Fig. 2). Focusing on the maritime cultural heritage of Cyprus and the important antiquities brought to light by the surveys and excavations undertaken on the island, the exhibition set maritime archaeology in Cyprus in context for the first time in a public event. Hosted in a specially designed and equipped vehicle, the mobile exhibition toured the island, visited not only cities but also remote villages, reaching community groups that rarely had the opportunity to engage in similar cultural events before.

Approaching community groups engaged with shipwreck sites

Ancient shipwreck sites are fused into a multifaceted contemporary social landscape, comprised not of just one abstract group associated to antiquities, but of several groups of people that develop distinct engagements with the sites. Such processes have diverse contexts, as: local communities engage from a distance, fisherpersons do so from the sea surface, and the divers from its depths. For this reason, an effort was made to go beyond the pre-fixed attempts in public archaeological programmes and approach diverse social groups that interact with ancient shipwreck sites distinctively. The objective was to identify the multiple relationships and meanings developed around them, as well as to establish channels of communication between archaeologists and non-professionals.

The first steps towards this direction were made with the initiation of the Mazotos shipwreck project. Stemming from the necessity to create a Cyprus-based team that would be able to support archaeologists and undertake the technical aspect of an underwater field project, the participation of local divers was encouraged since the beginning of the project (Fig. 3). Thus, the collaboration between archaeologists and divers transformed the Mazotos shipwreck into a shared space of interaction among the official and non-official approaches, as far as ancient shipwreck sites were concerned. On one hand, divers had the opportunity to be actively involved in the archaeological procedures and understand the scientific significance of the site. The archaeologists, on the other hand, had the opportunity to familiarize themselves with the feelings and meanings that ancient shipwreck sites create among divers.

The incentive to approach the diving community of the island was mainly the attraction of volunteers. In this respect, MARELab people organised presentations to diving associations around Cyprus, focusing on the maritime cultural heritage and the significance of its protection. Following the same line of activities, on several occasions, divers that were not members of the excavation team, were hosted on the Mazotos shipwreck project's research boat and were able to witness the archaeological procedures on board. All the above activities, although engaging, were confined to a distant interaction with the site. Aiming to add another experiential dimension to these endeavours, during the 2019 field season divers from around Cyprus were invited to dive at the Mazotos shipwreck. In total, 28 visitors had the opportunity to develop an embodied interaction with the site and meet the wreck within its contemporary surroundings, both as regards to the people working on the site, but also the several procedures taking place during excavation on board as well as underwater. This initiative was carried out in collaboration with the Nautical

Fig. 4 The Mazotos shipwreck as depicted by seven 3rd Grade pupils of the Mazotos Primary School: © Angela Kaimakliotou, Mazotos School Master.

Archaeological Society (NAS), UK, and was fully funded by the Honor Frost Foundation (HFF).

MARELab's activities were also directed towards the community of the Mazotos village. Although related to the site spatially, locals did not immediately develop any networks of interaction with the shipwreck. Since 2015, school presentations have been organized, which included activities in the classrooms and visits at the project's camp. The children were informed about the documentation procedures followed during the shipwreck excavation, and they were also given the opportunity to see the finds lifted from the site. Furthermore, at the end of each field season, illustrated presentations were organized in collaboration with the Mazotos Community Council. In parallel, an ethnographic survey began at the village, aiming to locate the contemporary social contexts of the Mazotos shipwreck (Demetriou 2019). Focusing on identifying the locals' associations with the sea and the site itself, the survey brought to the fore the multiple and complex meanings developed locally, around the Mazotos shipwreck.

As a result of the community-based activities, the shipwreck became widely known, and meanings and significations started to develop around it. For example, the local schoolmaster initiated a very successful artwork project, and the community used the children's paintings as a theme for the village's 2019 printed calendar (Fig. 4). Another outcome of the public outreach initiatives, was the gradual strengthening of the bonds between the team and the village. For example, during the event that marked the end of the 2019 field-season, members of the MARELab team worked in close collaboration with the school teachers and students to present the different roles that the sea played in the local history, through the years. The event concluded with a communal fish-soup preparation, a revival of an old custom, recorded during the ethnographic survey.

Lessons learnt and future plans

Cyprus has only recently established the grounds for the institutional development of shipwreck archaeology. Nonetheless and despite the limited extent of research undertaken in the field, the experience gained through the excavation of two well-preserved shipwreck sites highlights the grounds on which public outreach programmes should develop.

Ancient shipwreck sites have an unquestionable strong impact on society. However, the public is not a homogeneous group of people; it is composed of separate community groups whose distinct social and/or spatial background

as well as their separate encounters with the sea accords to shipwreck sites different roles and meanings within contemporary society. Research cannot overlook the existing complexities. Instead, long-term strategies in shipwreck archaeological research should focus on the identification of the characteristics of each community group, and proceed to plan outreach activities that would respond to their respective particularities and needs.

There is little doubt that this approach adds further intricacies to an already demanding venture such as a shipwreck excavation. However, the examples of the Kyrenia and Mazotos shipwrecks indicate that extra effort for targeted public outreach activities is counterbalanced by their outcome. The different types of public archaeology programmes developed around the sites, ranging from educational presentations and museum exhibitions to hands-on experience, have clearly contributed to raising awareness. In addition, the development of alternative ways of experiencing the site, either through public visits or through developing a closer interaction with the archaeological team, generates a deeper understanding and appreciation of underwater sites. Hence, such endeavours demonstrate that the development of channels of communication among archaeologists and non-professionals discloses a glimpse of the shipwrecks' multiple importance and significance within a contemporary world.

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1 Quote from Eleftheria Newspaper (1968) 'Αναχωρεί σήμερον ο αρχηγός αρχαιολογικής αποστολής εις Κυρήνειαν [Today the director of the archaeological expedition at Kyrenia today]', 28th August, p. 1.

2 The Maritime Archaeology Trust is a UK based charity, which focuses on developing research and public outreach programmes around maritime cultural heritage https://www.maritimearchaeologytrust.org/; accessed 30th September 2020.

3 The UK based Honor Frost Foundation, focuses on research, promotion and advancement of maritime archaeology with particular but not exclusive focus on the eastern Mediterranean https://honorfrostfoundation.org/; accessed 30th September 2020.

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TREASURE HUNTING AND LOOTING: ISSUES OF PUBLIC ENGAGEMENT IN VIETNAM

Le Thi Lien, Vietnam

Introduction

It is apparent to the author that hunting for and looting antiquities or ancient remains is not a longstanding Vietnamese tradition, but nonetheless the practices do constitute a significant contemporary threat to Vietnam's cultural heritage. By talking and interviewing people from several sites in Vietnam, I have tried to understand the situation and suggest ways to limit the looting of cultural heritage treasures. Generally, people respect their history and what is left behind by their ancestors. However, the lack of awareness about the historical value of underwater cultural heritage (UCH) and the uncontrolled development of antique dealers has created opportunities for the treasure hunters and looters. Public education aimed at raising awareness of the social values of UCH and engaging people in the protection and conservation of underwater sites and artefacts will be a good way to limit looting. It is also clear that the role of the government is important, and the efforts of researchers is also necessary.

Treasure hunting and looting, particularly on shipwreck sites has become a serious situation in recent years in Vietnam. Serious conflicts have happened linked to the Binh Chau shipwreck site (Quang Ngai province).[1] As a researcher working in many archaeological sites in Vietnam, I have tried to understand what the people know about the archaeological sites and cultural heritage, and how they evaluate ancestral remains. This chapter represents the results of talking with and interviewing people linked to various sites in Vietnam. While trying to understand how looting happens, I have also tried to know what the people expect and what the researchers and government can do to limit looting activity, and in particular to let the people engage in the protection and management of underwater cultural heritage sites and artefacts.

Who first found underwater cultural heritage in Vietnam?

The first local people to find underwater artefacts in Vietnam were fishermen. For example, the Quan Lan people (in Van Don ancient port, Quang Ninh province) discovered a stone tool and a bronze sword in the waters of the Mang river. Every day, when they step on the river's shore, they are likely to find many ceramics including pieces of stoneware scattered along the river banks. These surface finds include some Chinese products, but mainly those that originated from Vietnam, datable from the Ly-Tran period (11th to 14th century) to much later periods (17th to 19th century).[2] Their specific places of manufacture are not yet defined clearly, although kiln sites have been found in several areas in northern Vietnam.

Fig. 1 Nam Tran – 124 Tran Cao Van, one of the shops that sell the Chu Dau pottery from the Hoi An wreck. © Mark Staniforth.

Many beautiful blue and white ceramics have been found in the fishing nets of the Hoi An people when they are working in the seas around Cham Island (named as Dai Chiem Hai khau – Great Cham Estuary, Quang Nam province). They originated mainly from China and Vietnam and have a wide chronological range. Those dating from the 15th to 16th century, such as from the Cu Lao Cham shipwreck, were manufactured in the Chu Dau kilns situated in northern Vietnam.[3] The Management Board of the World Biosphere Reserve of Cu Loa Cham – Hoi An is responsible for the protection and conservation of natural resources. At the same time, the Hoi An Centre for Cultural Heritage Management and Conservation

Keywords: Underwater Cultural Heritage – Cultural Value – Looting – Public Engagement – Government Legislation

is responsible for the cultural heritage in Hoi An and Cham Island. However, due to the lack of human resources and capacity, it is difficult for them to manage their UCH. The lack of legislation also makes it difficult for them to work together. However, recent international underwater archaeology projects have created the first opportunities for these institutions[4] to cooperate (Looram et al. 2015; Le and Bui 2019).

Fig. 2 Ceramics in the collection of Mr Le Ba Nhu, Quang Ngai province. © Le Thi Lien, 2019.

Fig. 3 Conglomerates containing metal and ceramic shards are respected in Mr. Lam Du Xenh's House. © Le Thi Lien.

The Hue people (in Thuan, an ancient port) recently found cannons under water and a wooden anchor not far from the coast. Four cannons were recovered, taken back and preserved in Thua Thien-Hue Revolution Museum. The cannons represent the technique and form of the Netherlands style, with several decorated motifs from the Vietnamese tradition. The wood anchor is of typical Asian style.[5] Artefacts were also found under water by farmers when they dug canals or fish ponds. For example, the Gian Gua people (Kien Giang province) found wood timbers of a lashed-lug ship from the 8th to the 9th century representing the Southeast Asian ship style while digging a canal in a rice field.[6] Many wooden stakes of the Bach Dang Naval battle field (believed to have been placed there in 1288 to fight and repel the invading Mongolian navy) were found by the Quang Yen people (Quang Ninh province) while digging fish ponds and building the dykes in the Bach Dang river, etc.[7] In these ways, a very rich variety of underwater cultural heritage has been discovered in the sea, canals, rivers, and fish ponds of Vietnam.

How are the finds treated by the finders?

Usually, fishermen and farmers consider potsherds, coins, and wood timbers as things discarded by people who believe them to have no value, and they throw away the ceramic shards. Metal artefacts from shipwrecks such as cannons, metal anchors, hull plates, and machinery are sold to dealers of scrap-metal. The timbers can often be re-used for building their houses (in Bach Dang), or for the construction of river watering places (in Gian Gua). Other examples included a stone axe found from Quan Lan being used by local people[8] as a grinder, with water, to make medicines. Some people have preserved extraordinary things, such as colourful beads and have also kept beautiful ceramics in their houses for their personal enjoyment. Others who have knowledge of their local history and who are proud of their homeland will respect and preserve things in their houses as remembrances of their ancestors. In general, the local people have no or very limited knowledge of the cultural value of the artefacts, with their understanding being limited only to their local history.

While diving for lobster Mr. Xa found in the seas around Cham Island several artefacts from shipwrecks. The metal objects were sold, while a stone anchor and several bricks were left intact *in situ* in the sea, as they believe these items have no value.[9] Mr. Nguyen of Yen in Quan Lan island has kept many things in his house that he and other people found from foreshore landing places. Like many Quan Lan people, he is very proud of living in the area that had been a part of the ancient Van Don international port.[10]

> Mr. Nguyen of Yen commented 'If we have a display room on [the] Van Don ancient port in my commune, I will donate these artefacts.'

In some cases, the knowledgeable and affluent people collect and exchange artefacts for enlarging their personal collections and try to interpret them. One of them is Mr. Lam Du Xenh in Chau O town (Quang Ngai province). In his house, he keeps hundreds of boxes of ceramics from the Chau Tan shipwreck and others, dating from the 8th to the 9th century to 17th to the 18th century.[11] Anchors, ship's timbers, bronze co-

ins, a book in very poor condition[12], conglomerates containing metal and ceramic shards etc. are respected and stored in his buildings and garden (Fig. 1).

> Mr. Lam Du Xenh commented 'I have not enough money to buy the valuable things, which are always sold to the collectors [who] come from Ho Chi Minh city or other areas. Therefore, I buy what other collectors did not like. Local people also give me the broken ones…The local people [are] very poor. I help them by paying money for what they [have] found from the sea'.[13]

However, their activities have also benefited people who look for antiquities to sell.

> 'I sell the ceramics found from the sea and I can pay school fees, books, foods etc. for my children', a fisher–person from Binh Chau commented' (Quang Ngai province).

How local people who seek underwater cultural heritage became looters?

Until the 1980s, gold hunting and looting activities happened in many sites in southern Vietnam. Gold and beautiful beads were sold, mainly to the jewellery shops, without recording their location, form, or meaning. In northern Vietnam, bronze drums which were looted are liked as antiques and sold for a high price. By comparison, not much attention was paid to most underwater artefacts, except for some beautiful Chinese ceramics, such as the Tang *sancai* ceramic (7th–9th centuries), Ding ware (11th–14th centuries), Longquan celadons (10th–13th centuries), blue and white ceramics (14th–17th centuries). Whenever the ceramic found by Hoi An or Binh Chau fishermen, the broken ones are thrown away, the complete ones are kept in their houses for enjoyment or sold to antique-loving collectors in the town. They did not think these actions were illegal. Since the 1990s together with the development of tourism, many antique shops were opened in Hoi An and Ho Chi Minh city (Fig. 3). Underwater artefacts, mainly ceramics are sold at a high price.

> 'The people found things in the sea and can sell at high price. Therefore, we also go there [the shipwreck[s] in Cham Island area] to find the windfall. It is more than 50 metres deep. Each dive we can get a pile of celadon dishes or bowls[14]. We earn about 400 million Vietnam Dong (app. $1,700 US Dollars) for that[15]' Mr. Pham Thanh (Binh Chau commune, Quang Ngai province) (Fig. 4).

During this period, several shipwrecks have been found, mainly by fishermen and have been continually looted. Six shipwrecks have been salvaged and excavated by the Vietnamese government in cooperation with private companies. The artefacts, mainly ceramics, are divided to be preserved in provincial and national museums. A part of them were sold by auctions in the international markets. Economically, it is said that in theory, overseas auctions of Vietnam's cultural heritage are successful but actually the result is the opposite. Culturally, it should be considered as a failure when hundreds of fishermen rushed to salvage antiques of a shipwreck in Chau Thuan Bien hamlet (Binh Chau commune, Binh Son district, Quang Ngai province). They even obstructed the authorities from exploring the wreck, preferring to consider ancient wrecks that contain antiquities as the 'fortune' from the sea.[16]

Fig. 4 Mr. Pham Thanh a diver in Sa Ky, Quang Ngai province. © Le Thi Lien, 2018.

What can be done to limit looting, raise responsibility and respect for the social value of underwater cultural heritage?

> 'Some people come by my car and ask me to sell the wood stakes, 1 million Vietnam Dong (app/ $40 US Dollars) for one. I refused and said that these stakes are vestiges of a Tran Hung Dao General. They have been studied by the archaeologists from Hanoi' Author.

It is the story of the land owner of Dong Ma Ngua's 'stake yard' (an archaeological site of Bach Dang Naval Battle field, Quang Yen town, Quang Ninh province). He has a small house and a fish pond, where many wood stakes were found. For him, remains of the majestic history of the ancestors are more valuable than selling for money.

> 'If I know the meaning of the symbols on the gold sheets that are found in my field, I will not sell them, even [if] at that time I was very poor' Anon.

Fig. 5 The ship timbers in Lam Du Xenh's Collection are cleaned for 3D recording by the VMAP Team in 2015. © Le Thi Lien.

One farmer from Go Hang site (Long An province) said, after listening to our explanation on the historical meaning of archaeological artefacts.

> 'I build this house to preserve the shipwreck's wood timbers and ceramics found from Chau Tan shipwreck…'. Mr. Lam Du Senh.
>
> 'But they will disappear after sometime. You'd better protect and conserve them in the sea', we explained.

Our conversation with Mr. Lam Du Xenh who does not have enough knowledge to undertake conservation, leads to questions about how we can help him and other true collectors. Many other questions on how to protect underwater cultural heritage in Vietnam are raised, where there may be thousands of shipwrecks, many ancient ports and other types of submerged or intertidal sites. In recent years, underwater archaeologists of the Vietnam Maritime Archaeology Project (VMAP) continue to work on several underwater sites in Vietnam. They also try to take opportunities to help local government and local collectors of cultural heritage to record and conserve what has been discovered (Fig. 5).

Summary

It is obvious that hunting for and looting of antiquities or ancestral remains is not a Vietnamese tradition. While talking with local people, we understand that most of them are proud of their homeland and culture. However, not many people understand the value of archaeological artefacts, and underwater cultural heritage in particular. The artefacts are generally evaluated by a price offered by the antique dealers. We, the archaeologists and other cultural heritage managers, should let people know their value by telling the stories related to artefacts.

At the sites where we conducted our fieldwork, people were shown what kind of cultural heritage they have, and it was explained what they (or local cultural managers) can do. A simple exhibition room in a specific site will be attractive for people, such as the Museum of Trading Ceramics in the ancient town of Hoi An. An exhibition room is also eagerly wanted and requested by the people in Quan Lan Island and also in many other sites.

How to run and manage an on-site exhibition, and provide something for private collections, is another question. Public engagement with people knowledgeable of conservation and interpretation is necessary. The role of government at different levels is needed, both in term of management, legislation, and technical support.

The story associated to a site is attractive in several ways: orally as stories and memories handed down among local people, the involvement of social networks, which have become very powerful nowadays, and other media such as newspapers etc. To provide correct information and scientific interpretation, we need to have proper publications, TV documentaries, video programmes, and firstly on-site explanations for local people and younger generations. This work has

been successfully done in some areas but will need greater and more sustained efforts from all stakeholders and government institutions. Once the people understood and love the history of their homeland, they will protect their cultural treasures from looting.

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1 Vietnamnet, (10 September 2012). Quang Ngai: Hundreds of fishermen collect shipwreck antiques, https://english.vietnamnet.vn; accessed 30th September 2020; Vietnamnet, (15th October 2012). People stone policemen to prevent exploration of ancient wreck, https://english.vietnamnet.vn; accessed 30th September 2020.

2 Results of the Vietnam Maritime Archaeology Project (VMAP) surveys during 2012–2014. The excavation in this area in 2016 uncovered a large number of artefacts and vestiges of constructions (Le et. al. 2017)

3 Guy 2001

4 By organising field work and NAS training in Vietnam, Prof. Mark Staniforth and other VMAP core members also created opportunities, including the MaP Fund, for many international young students to be trained and develop their careers.

5 According to Dr Martijn Manders, the cannons could be locally manufactured following Netherlands 1660's style or are copies of Netherlands style in a later period. Dr Jun Kimura has dated the wood anchor from the middle of the 18th to the early 19th century (Le et. al 2015).

6 Personal survey in 2014.

7 Information provided by the people made it possible for researchers to discover and study at least three stake yard sites in Quang Yen, Quang Ninh province. Particularly, the international researchers lead by Prof. Mark Staniforth (ICUCH member) conducted extensive field works, researches and trainings during 2009–2014 (Staniforth et. al. 2014; Sasaki and Kimura 2010; Le et al. 2011, 2018; Kimura 2011; Kimura et. al. 2013). These are the pioneer steps for developing the underwater archaeology in Vietnam and the setting up of the Vietnam Maritime Archaeology Project (VMAP) which is remains in operation every year in various underwater and terrestrial sites of Vietnam.

8 Local people believe that grinding the stone axe with water and drying it, will prevent decease.

9 Interview of the VMAP Team with Mr. Xa in Cham Island during 2015 survey.

10 Van Don international port was established by King Ly Anh Tong in 1149 for controlling maritime trading in Hai Dong (Tongkin Bay). Historical documents record the ships of several Southeast Asian countries coming to trade. Archaeological remains have been discovered in several islands in a large area of about 200 km2, including Quan Lan Island. Pottery, stone ware and ceramics, particularly the exported varieties are the main archaeological finds.

11 Artefacts from this shipwreck have been studied firstly by Nishimura Mashanari and followed by others (Noriko et. al 2017).

12 No letters from the book can be recognised. The book has been sent to the Nara Institute to attempt to recover the letters, but this has not been successful (personal communication with Mr. Lam Du Senh).

13 Personal communication with Mr. Lam Du Senh in 2015.

14 According to Mr. Thanh's description, these can be the Chinese Longquan celadons, datable to 14th to 17th century.

15 More than $200 US dollars.

16 Vietnamnet (11th September 2012; 15th October 2012).

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Presentation of the Mary Rose wreck at the Mary Rose Museum in Portsmouth, United Kingdom. © Hufton + Crow and Mary Rose Trust

SECTION 5
CAPACITY BUILDING

STANDARDIZING CAPACITY DEVELOPMENT IN UNDERWATER ARCHAEOLOGY: A STRATEGY FOR THE CENTRAL ASIAN AND CASPIAN SEA REGION

Arturo Rey da Silva, Spain

Introduction

In May 2019, UNESCO organized the first Regional Meeting on the Protection and Management of the Underwater Cultural Heritage for the Central Asian and Caspian Sea regions (Regional Meeting 2019) in Almaty, Kazakhstan. The meeting came in response to the absence of any provision related to the Caspian Sea's underwater cultural heritage (UCH) in the recent Convention on the Legal Status of the Caspian Sea (Kadir 2019), adopted on 12 August 2018 and signed by the five coastal states.[1] At the same time, the region's UCH, the potential of which was already highlighted during the Soviet period[2], had not been taken into consideration when designing relevant national laws. Their nature, as mainly landlocked countries, prevented the region's member states from considering ratifying the 2001 UNESCO Convention on the Protection of the Underwater Cultural Heritage (2001 UNESCO Convention).

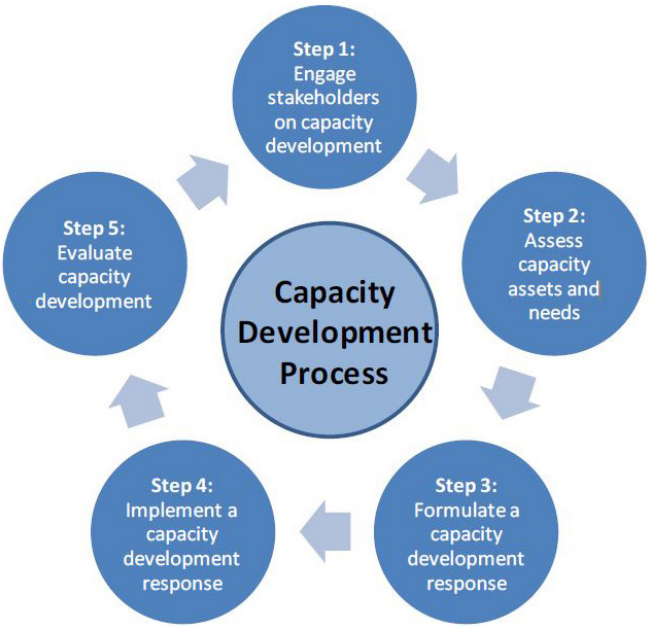

Fig. 1 The UNDP capacity development process. © UNDP 2008, 8.

The meeting's participants encouraged states 'to consider taking all necessary measures to adopt or integrate into their national legislation specific definitions, terms and regulations to enhance the protection of their UCH, notably in interior waters, in accordance with the provisions of the 2001 UNESCO Convention 'as well as to encourage their respective authorities to study and consider the ratification of the 2001 UNESCO Convention'. State representatives and participants also requested UNESCO to design a capacity building strategy to provide the basic necessary tools and knowledge to identify, study, manage and protect UCH.

As a response, a strategy was designed where three key priority areas were identified: Technical capacities in the identification, research, evaluation and management of UCH; legal advice and guidelines for the adaptation of National Laws to the international principles set out by the 2001 UNESCO Convention; and raising public awareness for the protection of UCH. The strategy was structured following the United Nations Development Programme (UNDP) guidelines for capacity development processes and based on previous training experiences coordinated by UNESCO. The main target groups were archaeologists and cultural heritage managers working within competent authorities, in addition to academics and university students, as well as the general public.
This chapter presents the framework of this strategy for the Central Asian and Caspian Sea region with the aim of serving as a model to standardise future capacity development initiatives carried out in the international context.

Capacity development in underwater archaeology. A United Nations approach

The Organization for Economic Cooperation and Development (OECD) defines capacity development as 'the process whereby people, organizations and society as a whole unleash, strengthen, create, adapt and maintain capacity over time' (OECD 2006) whereas the UNDP defines it as 'the ability of individuals, institutions and societies to perform functions, solve problems and set and achieve objectives in a sustainable manner' (UNDP 2006). Here 'capacity' is understood as 'the ability of people, organizations and society as a whole to manage their affairs successfully'. Therefore, capacity development is a process that allows for an individual, institution, or communities to participate in the sharing or transfer of

Keywords: Underwater Cultural Heritage – Central Asia – Caspian Sea – Capacity Building – UNESCO

knowledge and capabilities in order to more effectively carry out work and projects (Recinos and Blue 2019).

Capacity building is a process linked to capacity development 'that supports only the initial stages of building or creating capacities and alludes to an assumption that there are no existing capacities to start from' (UNDP 2008). A capacity building strategy should be framed in a wider development context. Training and workshops aimed at developing individual, social, and institutional capacities should be part of a bigger development strategy that seeks to improve the framework conditions of specific local, national or regional systems. As several authors have already pointed out, although capacity development theoretical frameworks have been extensively used in cultural heritage management, rarely do we find them linked to maritime or UCH (Recinos and Blue 2019). The study by Demesticha, Semaan and Morsy on how the development of maritime archaeology practice in the Eastern Mediterranean would have had benefitted from applying this approach is an illustrative example (Demesticha et al. 2019). The previous UNESCO initiatives aimed at building capacity in the protection of UCH were delivered in the framework of the 2001 UNESCO Convention. They were not part of a strategy or a larger capacity development framework. The 2001 UNESCO Convention explicitly mandates that all State Parties develop capacity building opportunities in the field of underwater archaeology (Article 21) as well as information sharing (Article 19) and raising public awareness (Article 20). Individuals, organizations, and societies increase their capabilities, or reinforce their existing ones, achieving their own development objectives by a capacity development process. It is about transforming the current situation at different levels to bring change, improving ways of living and sustainability.

Following UNDP's guidelines, there are three interconnected levels of capacity development. First, we have the 'enabling environment', which is the set of regulations and relations that make the environment where individuals, institutions, and government function. Then, there is the 'organization level', which refers to how different actors, aligned within the internal structure of an organization, act in an effective way to increase the potential for capacity development within a given environment. Finally, there is the 'individual level' where all the knowledge that allows each person to take action is embedded.

> 'Access to resources and experiences that can develop individual capacity are largely shaped by the organizational and environmental factors described above, which in turn are influenced by the degree of capacity development in each individual' (UNDP 2009).

The capacity development framework establishes a five-step process that can be adapted for UCH (Fig. 1). The first step requires the involvement of all stakeholders concerned with the awareness, research and protection of UCH. This would be followed by an assessment of pre-existing capacities through engagement with stakeholders. Once the need for capacity has been identified, a capacity building response must be defined and agreed among all stakeholders and then implemented. Effective implementation involves coordination of local, national and regional partners, and requires continuous reassessment of the strategy. The final step is the evaluation of its results and the measurement of the change occurred in the institutions performance (UNDP 2008). In the case of UCH, change will happen if the competent authorities are able to identify, study, evaluate, protect, and manage their own submerged archaeological sites, assuring long-term sustainability, at the three interconnected levels underlined above.

Fig. 2 Participants of the UNESCO Regional Meeting on the Protection of the Maritime, Coastal and Underwater Cultural Heritage of Central Asia, held in Almaty, Kazakhstan, between 21–23 May 2019. © UNESCO Almaty.

Engagement with stakeholders for capacity development

The Regional Meeting organized by UNESCO in Almaty in May 2019 gathered all stakeholders and administrations, potentially involved with UCH protection, to highlight the need for change and capacity development (Fig. 2). The participants highlighted the 'importance of the research and preservation of UCH […] as sources for knowledge, international cooperation, consolidation of our historical identities and as a driver for sustainable development, regional cohesion and building of peace', and recognized the capital contribution of UCH to the United Nations Sustainable Development Agenda 2030, notably through 'the development of sustainable tourism and economic growth'. The interrelationship of UCH with its intan-

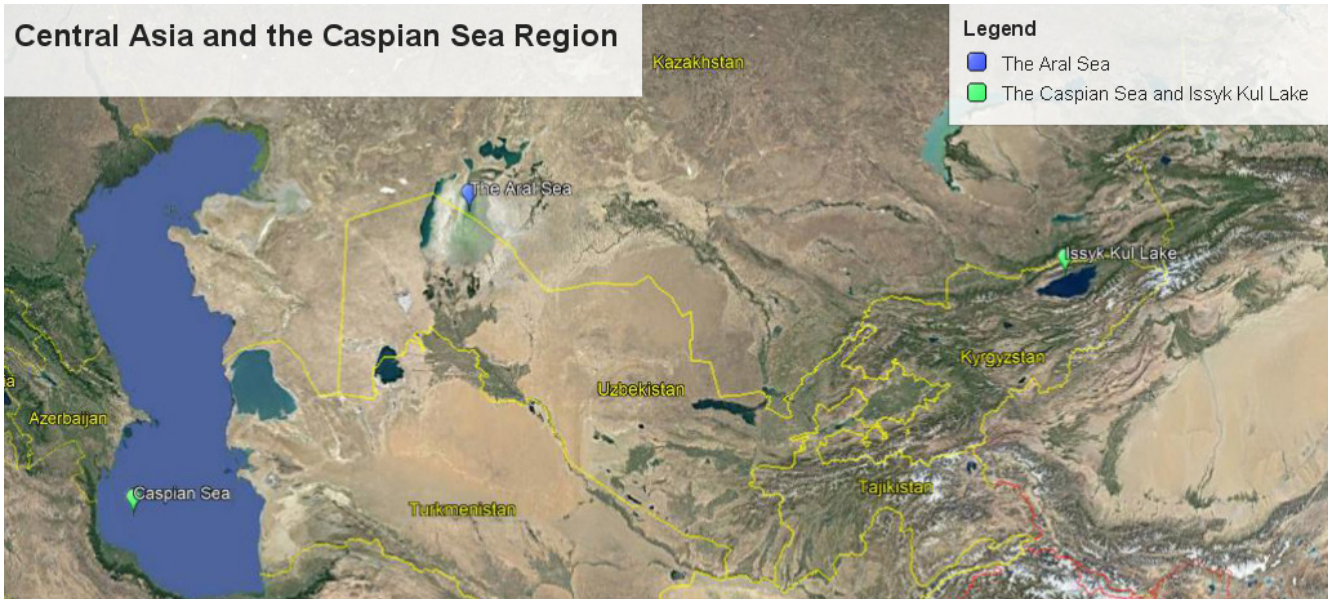

Fig. 3 Map of the Region showing the main bodies of water, notably the Caspian Sea and Issyk Kul Lake, where underwater archaeological explorations have taken place. Google Map data: US Dept. of State Geographer © 2020 Google & Image Landsat / Copernicus. © 2020 Basarsoft.

gible traces was also mentioned as crucial for strengthening local identities, regional cohesion, and intercultural dialogue. The need for building capacity was frequently mentioned throughout the discussions. The participants agreed to 'continue working and mobilizing national and regional efforts towards the creation of capacities and infrastructures', as well as to encourage partners to look for funding possibilities to allow students from the region to take specialized academic training in universities from the UNESCO UniTwin Network of Underwater Archaeology.

Underwater archaeology in Central Asia and the Caspian Sea

Although the region has several important bodies of water[3], the most illustrative cases concerning previous UCH studies — without counting the archaeological sites found in the desiccated bottom of the Aral Sea — are the Caspian Sea and the Issyk Kul Lake (Fig. 3).

Despite the historical importance of the Caspian Sea in the trade routes of the Silk Road, the UCH of the region is largely unknown (Kvachidze and Anichenko 2008). Along with the Russian Federation and the Islamic Republic of Iran, Azerbaijan is the only other country bordering the Caspian Sea that was engaged in UCH exploration between 1968 to 1986 by Viktor Kvachidze and the National Museum of History (Figs. 4 and 5). The fact that no research continued after the fall of the Soviet Union emphasises the urgency to develop capacity building opportunities (Kvachidze 1989; Anichenko 2006; Kvachidze and Anichenko 2008).[4]

In Iran, a State Party to the 2001 UNESCO Convention since 2009, the Iranian Centre for Archaeological Research carried out investigations on the coast of the Caspian Sea, in the Gilan Province, which identified tangible and intangible traces of the maritime culture shores-line dwellings, from Astara to Rudsar.[5] The project also recorded traditional watercraft and boatyards, fishing traditions and archaeological remains of several shipwrecks (Hossien and Adibi 2017).[6]

Concerning Issyk Kul lake, Kirgizstan, it has been an important geographic location for all nomadic traffic between East and West since prehistoric times, notably for traders and caravans of the Silk Road[7]. The archaeological sites found around its shores — from petroglyphs and 3,000-year-old nomadic burial mounds (*kurgans*) to Christian monasteries and mediaeval cities — have been studied since the end of the 19th century. The lake, currently an important touristic destination, saw the beginnings of underwater exploration in the region since the 1860s with the studies of the palace built by the Mongol leader Tamerlane (15th century AD) by the Russian historian G.A. Kolpakosky. The existence of such an important building influenced the development of several research initiatives.

From the early 20th century, when the historian V.V. Bartold linked the site to the mediaeval records of the Arab historian Ibn Arab Sheikh, to the underwater mapping of P.P. Ivanoc in 1926–27, published in 1957, and the systematic survey carried out by the Kyrgyz Institute of History and Professor Dmittri Vinnick in 1959, the great importance of UCH in the lake was already underlined. The large water-level fluctuations of the lake have caused, as in the Caspian Sea, the submersion of several settlements and cities established around its shorelines. Research could not continue until 1985, when

Fig. 4 Underwater Explorations carried out by the National Museum of History of Azerbaijan. © Archives of S.M. Fazlullin.

a team from the Kyrgyz Academy of Science lead by Vladimir Ploskikh[8] conducted underwater surveys and excavations. In 2007, divers from Tomks State University identified a Saka settlement dated to 2,500 years before present, as well as Scythian burials mounds and pottery fragments with Armenian and Syrian scripts which points to the existence of an Armenian monastery at Issyk Kul Lake.[9] In 2010 and 2012, a team from National Geographic joined Professor Ploskikh to explore the so-called palace of Tamerlane, conducting visual and remote sensing surveys.[10] Although they could not find evidence to link the site to the Mongol Tamerlane, numerous archaeological sites were explored.[11] Most of the sites have not been fully inventoried and only some have been surveyed and studied.

Needs assessment

During the meeting a Needs Assessment Review took place which helped to analyse the desired capacities against the existing ones, generating an understanding of assets and needs that served as an input to a questionnaire sent to experts and competent authorities, formulating the Strategy.

According to Article 22 of the 2001 UNESCO Convention, the national competent authorities shall provide for 'the establishment, maintenance and updating of an inventory of underwater cultural heritage, the effective protection, conservation, presentation and management of underwater cultural heritage, as well as research and education' (UNESCO 2001). These obligations require the mastery of skills and a holistic knowledge typical of a range of disciplines varying from maritime and underwater archaeology to conservation and heritage management. Whereas most of the culture administrations in the region have specialists in terrestrial archaeology, history, cultural heritage management, and conservation, they lack experience and capabilities to deal with the sites associated with underwater contexts. From diving and identifying UCH to registering the nautical architecture of shipwreck remains, interpreting submerged prehistoric landscapes or applying preservation techniques on *in situ* archaeological contexts, the variety of skills needed to successfully manage underwater cultural heritage requires several years of academic training and working experience.

Other duties that are entrusted to the national competent authorities and also require specific competences are the prevention of the illicit trafficking and pillaging of underwater archaeological sites (Articles 14 to 17). This implies that law enforcement bodies, including national police, customs, and coast guards, are familiar with the regulations that safeguard

UCH and pursue any criminal action that endangers its preservation.

To complement existing mechanisms outlined in the 1970 Convention on the Means of Prohibiting and Preventing the Illicit Import, Export and Transfer of Ownership of Cultural Property or the 1995 UNIDROIT Convention on the Stolen or Illegally Imported Cultural Objects, the 2001 UNESCO Convention sets out a series of provisions that reinforce the work of states in the protection of their cultural heritage, in cooperation with other organizations like INTERPOL or the World Customs Organisation.

Looting, industrial activities, urban development — notably around the shores of lakes — and the lack of adequate study and governing frameworks are seen as the major threats for UCH according to the Needs Assessment exercise. The shortage of funding for cultural heritage protection was also highlighted as well as the need to strengthen regional cooperation in this regard. Capacities to deal with underwater archaeological sites are very rare or practically non-existent in the region. Currently, only the Kyrgyz Academy of Science undertakes underwater archaeological field campaigns each summer in Issyk Kul Lake.

Formulating a response

The capacity building strategy shall be implemented through concerted efforts at all levels, and across different administrations. It is of ultimate importance that collaborative measures among all stakeholders involved can lead towards an integrated and coherent approach to supporting the capacity building phases within a major development process in each of the Member States. A Steering Committee, formed by UNESCO and key specialists, would guide and promote its implementation, as well as oversee and ensure its effective application while monitoring and evaluating its results, reporting back to Member States and suggesting changes when needed.

Technical Capacities in Underwater Archaeology

Due to the different technical specificities and concepts involved with the understanding of UCH and the implementation of the 2001 UNESCO Convention, it is important to identify in the first phase all relevant actors and stakeholders in each country in order to establish the basis for a national coordination team. This first engagement with national stakeholders should have as a priority, the understanding of what UCH is, what its study and protection entails and how it can be achieved, as well as what are the main epistemological frameworks and recording methods utilised in the discipline of underwater archaeology. The knowledge of the international scientific standards, as well as the understanding of the different provisions set by the international agreements will be one of the main focuses of this first phase.[12]

A second phase foresaw conducting a Regional Foundation Course for competent culture authorities or candidates selected according to preestablished criteria. The Foundation Courses were designed and established as a response to the recommendations of the first UNESCO Regional Workshop for the Asia-Pacific, held in Hong Kong in 2003. Subsequent courses helped to build capacities as well as identified site managers and national experts that formed the basis of the present day regional network (Favis 2011). The programme also published a specific *Training Manual for the UNESCO Foundation Course on the Protection and Management of the Underwater Cultural Heritage* (UNESCO 2012) that has been adapted for the Latin American and Caribbean region (UNESCO in press), and is anticipated that it will be translated into Spanish.

Fig. 5 Team from the Underwater Archaeology Unit from National Museum of History of Azerbaijan inspecting archaeological finds on the surface. © Kvachidze 1989.

The main goals of this Foundation Course are to provide heritage managers and cultural authorities with the necessary skills to identify, evaluate, and register underwater archaeological sites as well as to develop management plans. In this case, special focus should be given to the archaeology of river and lake areas. The Foundation Course can help participants to develop new sustainable tourism strategies where underwater and coastal cultural heritage is presented to the public. The course can also contribute to fostering peace and cohesion by enhancing international cooperation and establishing a regional network of experts that share knowledge, experiences, and best practices (Favis 2011). The minimum duration for this training would be two weeks, although four to six weeks is recommended to allow sufficient time to include theory and practice.

As it has been presented by its main designers (Underwood and Manders 2019) the usual layout of the Foundation Course is divided into three different phases: pre-fieldwork modules, underwater or coastal heritage fieldwork, and post-fieldwork

modules (see Van Tilburg in this volume). Participants are tasked to design a management plan for the specific site used during the course, including its registration, and *in situ* evaluation. It is important to highlight the need to introduce modules taught by local experts on the potential of the UCH of the region as well as on significant historical background and the use of its diverse waterways (e.g. trade routes of the Caspian Sea, the Silk Road Influence, previous research campaigns in the Caspian Sea and Issyk Kul Lake, etc.). An important component is the engagement with the local community by gathering their views, values and information concerning their maritime and UCH through a series of interviews. The assistance of local culture authorities, as well as the support of local diving operators is crucial for logistics, safety, and community engagement, and can help determine the selection of an appropriate training venue.

After competent authorities and local experts have gained knowledge and experience, it is very important that they can apply them in the context of their national inventories. Development will be sustainable once change has come to the institutional framework dealing with the protection of the cultural heritage — so UCH is included — as well as to the individuals and experts acting for its safeguarding. The competent authorities and decision makers have to make all the necessary institutional arrangements, within the extent of their possibilities, so their personnel can start the inventory of their UCH. This is where monitoring and evaluating become essential while measuring change in the UCH situation. Gaps in knowledge and experience will need to be addressed through specific advanced courses in areas not extensively covered during the Foundation Course.

It is of paramount importance to translate the relevant existing publications and training manuals into Russian and national languages. This will facilitate the establishment of future national training initiatives that will self-sustain the development of underwater archaeology and related disciplines. The encouragement to publish and to establish a specific academic journal dealing with the UCH of the region was highlighted in the preparation of the strategy.

Legal advice and law enforcement

Member States also identified the harmonization of their national laws in-line with the provisions of the 2001 UNESCO Convention as one of the main issues to allow for its ratification and its implementation. UNESCO has a long history of cooperation with Member States in advising how best to adapt their national laws in order to better protect their cultural and natural heritage.

Whereas 'Law Adaptation' can be a specific session within the short national trainings, a dedicated workshop or national (or regional) consultation is considered more useful to deal more profoundly with the issues identified by government experts and UNESCO in desk-based assessments. An 'Action Plan' is usually adopted with UNESCO remaining ready to assist the Member State and monitor its implementation.

For instance, Small Islands Developing States of the Caribbean (SIDS) approved, in a legal focused meeting, a model of a National Act for the Protection of Cultural Heritage where UCH was included, for all SIDS countries of the region to have as a reference when revising their national legal frameworks (UNESCO 2013).

The concern relating to the looting of cultural heritage was often brought up as one of the major threats to its preservation. The UNESCO 2001 Convention gives very clear provisions and obligations in this regard. International cooperation and information sharing are pillars in the development of successful mechanisms to protect cultural heritage. It is important that national laws and penal code are adapted to integrate crimes against cultural heritage, where this takes into account also UCH.

Awareness raising and social involvement

Whereas the public in the region is highly concerned with the preservation of their cultural heritage, people are mostly unaware of the existence of UCH or its potential. Very often, the research of archaeological remains found submerged in inland waters allow for the development of new narratives in the archaeology science, increasing current society's identity and links to those of the ancient dwellers. Explanatory brochures, travelling photo-exhibitions or promotional videos and media articles can help to raise public awareness, as happens in other landlocked countries that have ratified the 2001 UNESCO Convention (i.e. Bolivia, Paraguay or Switzerland).

UNESCO and its partners have already developed several educative initiatives which can be perfectly adapted to the Central Asian and Caspian Sea region. This ranges from a cartoon series for children and a digital App to a Manual for Teachers based on the UCH from the First World War and its potential for promoting peace and reconciliation (Timmermans, Guérin and Rey da Silva 2015). The UNESCO Associated School Network (ASpNet) has proven to be a useful platform for the distribution of some of these initiatives, and to measure their impact.

Synergies and partners

One of the biggest challenges is the need to understand UCH as an integral part of cultural heritage in general. UNESCO Field Offices, as well as competent cultural authorities, do not normally have enough financial and human resources to devote a specific action line to the promotion of the 2001 UNESCO Convention. It is, therefore, important to identify common goals that can be achieved when implementing other critical

programmes like World Heritage, the fight against illicit trafficking, the safeguarding of intangible cultural heritage, the success of the SDGs, the UN Decade of Ocean Science for Sustainable Development, the IOC programme on Marine Spatial Planning and Ocean Literacy, etc.

For the strategy implementation phase, UNESCO and Members States count also on the support of the UniTwin Network of Underwater Archaeology, the UNESCO Chairs on UCH and the Accredited NGOs. These could facilitate, for instance, the exchange of students and researchers, joint research programmes as well as the organization of specialised seminars. The ICOMOS International Scientific Committee on Underwater Cultural Heritage (ICUCH) has had a pivotal role in the establishment of international standards in underwater archaeology and the development of training manuals and in the delivery of previous UNESCO courses.

Evaluation and monitoring

Measurement of the success is key to see how Member States are developing the necessary skills to protect their UCH. Monitoring and evaluating during and after each proposed phase are capital for the effective application of the strategy.

Indicators to measure the scale of implementation could take into account the outputs of the strategy as for instance the amount of funds disbursed to the research and protection of UCH, the number of workshops organized or the number of people trained, number of national initiatives towards the inventorying of underwater archaeological sites, number of ratifications of the 2001 UNESCO Convention, etc. Change has to come across different levels of governance when implementing the strategy. However, success should not be based only in measuring the number of students or training activities accomplished, which only gives an indication that the strategy is being followed, but not if it is being successful.

More difficult to measure are the outcomes of the impact caused by the capacity building strategy. Progress and effective results in the protection of UCH are reflected by changes in the performance at institutional and individual level. This can be measured in terms of efficiency and effectiveness, and on how the knowledge and skills provided are used to achieve change so cultural heritage is fully studied and protected by the country, complying with their international standards and commitments. Tools like questionnaires to participants and competent authorities, evaluation forms during the execution of the activities, and interviews between UNESCO and National Commissions could help to analyse transformation over time, adapting the steps accordingly to the implementation results (UNDP 2009).

Conclusion

A successful strategy to develop capacity in the research and protection of UCH should be adapted to the specificities of each State's framework conditions and contexts (Mackintosh 2019). The initiatives and proposals briefly presented respond to the need to have a strategic document to start creating capacities in the field of UCH in the Central Asian and Caspian Sea region. This came as a request from State representatives during the Almaty Regional Meeting of May 2019 to initiate a comprehensive capacity building programme to allow national competent authorities to look into their cultural heritage as a whole, wherever the heritage is found.

A capacity building strategy should not be understood as a static and inflexible document. On the contrary, although the implementation of the activities should follow a logical process, their duration and their contents can be adapted to the different geographical, political and social circumstances at any given moment, as well as to the funding available for its implementation. Its major focus is the provision of technical skills in the identification, research and management of the UCH. It also serves as a model of action to orientate stakeholders to establish complementary capacity building actions. It is hoped this can contribute to establish an international standardised development-based framework process to build capacities in underwater cultural heritage.

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1 Azerbaijan, Iran, Kazakhstan, Russia, and Turkmenistan.

2 1922–1991

3 Apart from the Caspian Sea, the Aral Sea or Issyk Kul Lake, other lakes like Sarygamysh Lake, between Uzbekistan and Turkmenistan, Aydar Lake in Uzbekistan, Lake Balkhash and Lake Alaqol in Kazakhstan or Karakul Lake in Tajikistan, among other smaller ones and river courses, may provide important archaeological evidence.

4 In 1998 the National Museum of History of Azerbaijan sponsored the 30th anniversary of Maritime Explorations of the Caspian Sea (Kvachidze, 2006), which was an occasion to reflect on what had been achieved during the period in which the underwater archaeology unit was active.

5 In the Persian Gulf, Iran carried out research from the 1990s, starting underwater surveys around the port of Siraf in 2000, continuing to sites from 'Shushtar's Band-e Mizan' (Shushtar barrier), 'Takht-e Suleiman' Lake, and the Amir Abad and 'Zaghmarz' shipwrecks; the 'Tammīsheh and Gorgān' Underwater Walls, and the 'Ghorogh' and 'Rudsar' shipwrecks. http://www.themua.org/collections/collections/show/45; accessed 30th September 2020.

6 In 2016, UNESCO organized a national training workshop in Teheran while another advanced course is proposed to be carried out by UNESCO's Teheran Office in the future.

7 Issyk Kul Lake, a name that means 'warm water', is one of the deepest (averaging 278 metres) and largest (178 km long and 60 km wide) lakes in Central Asia.

8 http://siberiantimes.com/science/casestudy/features/f0147-one-more-ancient-civilisation-found-underwater-in-lake-issyk-kul-could-this-be-where-matthew-the-apostle-is-buried/; accessed 30th September 2020.

9 http://www.worldcat.org/identities/lccn-n83-63085/; accessed 30th September 2020.

10 https://blog.nationalgeographic.org/2012/09/06/2012-issyk-kul-expedition-search-for-a-sunken-palace/; accessed 30th September 2020.

11 The Kyrgyz authorities even submitted the Lake to the World Heritage List in 2004 based on its natural Outstanding Universal Values (OUV). The candidature was eventually withdrawn by the State Party after the recommendations of the advisory bodies to be reformulated and to present it as a cultural landscape rather than a natural landscape. A profound research of the UCH of the lake would definitely increase its potential OUV and strengthen a future nomination https://whc.unesco.org/en/activities/764/; accessed 30th September 2020.

12 This first phase can be executed in the form of a series of national workshops, where practical and theoretical sessions guide participants to the achievement of the foreseen goals.

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CAPACITY BUILDING: THE UNESCO UNDERWATER CULTURAL HERITAGE FOUNDATION COURSE

Hans K. Van Tilburg, United States of America

Fig. 1 Chanthaburi's Regional Maritime Archaeology Training Centre. © H Van Tilburg.

Introduction

The adoption of the UNESCO Convention on the Protection of the Underwater Cultural Heritage in 2001 highlighted the need for increased capacity in site survey and assessment and underwater cultural heritage (UCH) resource management among member states. An international collaborative effort was organized to design a comprehensive curriculum and training programme featuring both classroom and in-water practical experience. This collaboration produced the *Training Manual for the UNESCO Foundation Course on the Protection and Management of Underwater Cultural Heritage*, suitable for adaptation by different regions, and supported a series of foundation training courses across the world. The UNESCO capacity building programme is continuing to grow, and has had a positive influence on non-UNESCO programmes and academic institutions as well. This collaborative effort by a broad array of international professionals has become an international standard, a very positive note in the field of resource preservation and UCH.

The need for capacity building

The final draft of the 2001 UNESCO Convention on the Protection of the Underwater Cultural Heritage (2001 UNESCO Convention) that entered into force in 2009 represents years of collaborative work in refining policy and practice, all aimed at the protective management of the UCH, a worthy accomplishment. Nevertheless, something was still missing. As early as the 2003 Asia-Pacific Regional Workshop in Hong Kong, delegates recognized the need for a capacity building programme for the effective implementation of the Convention. Now that states were actively ratifying the finalized 2001 Convention, how were they to be expected to carry out its mandates? How would regional and global capacity in UCH management and protection actually be built?

The initial UCH foundation course training series

To meet this need, UNESCO formed a programme steering committee and collaborated with experts from both ICOMOS-International Committee on Underwater Cultural Heritage (ICUCH) and from the Nautical Archaeology Society (NAS) to assist in designing the initial curriculum for the first regional UCH Foundation course series. Training for prospective trainers in the Asia-Pacific region was initiated in Sri Lanka in 2008. With the completion of the regional training centre in Chanthaburi (Fig. 1), delivery of the initial courses shifted to Thailand. UNESCO Bangkok implemented 'Safeguarding the

Keywords: 2001 UNESCO Convention – Capacity Building – Training – Foundation Course

Underwater Cultural Heritage in Asia and the Pacific', funded by the UNESCO-Norway Funds-in-Trust Cooperation. As designed, the programme focused on a broad holistic approach to the protection and management of UCH, archaeological methods being one tool or choice among others, to be employed by site managers. This would require both classroom and in-water hands-on practical training. Seventeen international trainers (many from ICUCH) who could contribute broad expertise and additional perspectives and knowledge were contacted to assist in drafting the Foundation Course manual's chapters and conducting the courses.

Foundation course trainer criteria

- The trainer must be an established specialist in the assigned topic(s).
- The trainer must have extensive experience in the protection and management of UCH, in accordance with the principles of the 2001 Convention and the Rules of its Annex.
- The trainer must possess excellent communication, writing, and comprehension skills in the languages of the course.
- The trainer must have prior teaching experience and the ability to deliver their training units in ways that are easily understood by the target students.

Course applicants were drawn from archaeologists in scientific institutions, site managers, conservators or other specialists with specific UCH interests, or those authorized by their ministries to play a lead role in the management of UCH. Basic open-water diving skills were required prior to the course. The training format initially provided for a six-week programme: four weeks for the classroom and theoretical aspects, and two weeks for the practical diving survey exercise, simulating as closely as possible the challenges of full maritime archaeology/resource management projects. Given the range of familiarity among course applicants, NAS introductory-level courses were featured during the initial week to establish a common level of understanding of fundamental archaeological concepts and methodology.

UCH foundation manual chapter/unit organization

- Title/Author
- Core Knowledge/Learning Objective Statement.
- Introduction to the Unit.
- Unit Contents.
- Unit Summary.
- Suggested Timetable.
- Teaching Suggestions.
- Suggested Reading List.

The first UCH Foundation Course was held October-December 2009 at the regional training centre in Chanthaburi, Thailand. This facility is centrally located in the Asia-Pacific region, and benefits from the shared capacity of Thailand's Underwater Archaeology Department. The nearby Mannok wreck site provided the in-water training location. The second planned UCH Foundation Courses was held at Thailand's regional training centre (February–March 2010), with a third being added by popular demand (February–March 2011). Participants were asked to nominate topics beyond the scope of the basic curriculum, and subsequently UNESCO supported two advanced Foundation UCH courses as well: the Application of GIS (Geographic Information System) in UCH Management (September 2010), and In Situ Preservation of UCH (19–26 October 2011). The regional training centre, development of the manual, and first UCH Foundation training series was generously supported by the Government of Norway.
Following each course, feedback from organizers, trainers and students was elicited and the curriculum continued to be refined and revised. Trainers brought their own particular expertise into the defined elements of the course, revised initial drafts and added a broader range of notes and references and images throughout each course. Following the conclusion of this first series, the revised *Training Manual for the UNESCO Foundation Course on the Protection and Management of Underwater Cultural Heritage in Asia and the Pacific* was compiled, published in 2012, and made available free online[1].

Units and appendices of the Asia-Pacific UCH foundation course manual

- The 2001 Convention on the Protection of the Underwater Cultural Heritage.
- Back to Basics: Introduction to the Principles and Practice of Foreshore and Underwater Archaeology.
- Management of Underwater Cultural Heritage.
- Underwater Archaeological Resources.
- Desk-based Assessment.
- Significance Assessment.
- Data Management in Maritime and Underwater Archaeology.
- Geographical Information Systems (GIS) in Underwater Archaeology.
- In Situ Preservation.
- Intrusive Techniques in Underwater Archaeology.
- Conservation and Finds Handling.
- Practical Dive Session of the Foundation Course: The *Mannok* Shipwreck Site, Gulf of Thailand.
- Asian Ceramics.
- Asian Shipbuilding Technology
- Material Culture Analysis.
- Museology.

Fig. 2 UNESCO Africa Regional Training Programme in Kemer (2015) Akdeniz University. © Hakan Öniz.

- Public Archaeology, Raising Awareness and Public Participation Projects in Underwater and Maritime Archaeology.
- Archaeological Publication.
- Appendix A: Ethnographic Boat Recording Practicum.
- Appendix B: Basic Terminology of Shipbuilding.
- Appendix C: Introduction to Metal Shipbuilding Technology.
- Appendix D: How to Use Site Recorder.
- Appendix E: Management Plan.
- Appendix F: Suggested Timetable for the Foundation Course.

Dissemination of the UCH foundation course

UNESCO regional meetings and workshops focusing on the 2001 Convention and on UCH capacity building have been conducted in numerous locations since 2001 (Figs. 1-3). These contributed towards completion of the full UCH Foundation Course format and curriculum. The initial UCH Foundation series (Chanthaburi, Thailand 2009–2011) trained a total of 70 candidates from 15 different countries (Bangladesh, Brunei, Cambodia, Fiji, India, Indonesia, Kenya, Kyrgyzstan, Laos, Malaysia, Pakistan, Philippines, Sri Lanka, Thailand, and Vietnam). This represented a tangible and significant boost in UCH management for the Asia-Pacific region and a proof-of-concept for the capacity building programme. Other state members and institutions were quick to adopt the more extensive UNESCO UCH Foundation Course format:

Campeche, Mexico (2010): organized by UNESCO in cooperation with the Mexican *Instituto Nacional de Antropologia e Historia* (INAH) and supported by the Spanish Agency for International Cooperation and Development (AECID)[2], the first regional training course included 25 participants (archaeologists, heritage experts, historians, marine biologists or conservationists working in governmental institutions) from 14 countries (Cuba, Chile, Colombia, Argentina, México, Ecuador, Guatemala, Paraguay, Perú, Uruguay, Panamá, Nicaragua, Dominican Republic, and El Salvador). The two-week-long course took place after a Regional Meeting on the Convention in Cozumel.

Kingston, Jamaica (November-December 2012): organized by UNESCO in collaboration with the Maritime Programme of Cultural Heritage Agency of the Netherlands (RCE), AECID, and the Jamaican National Heritage Trust (JNHT). Twenty participants from 15 different Latin American and Caribbean countries (Aruba, Bahamas, Barbados, Belize, Caymans, Dominica, Dominican Republic, Grenada, Guyana, Jamaica, Saba, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, and Tobago and Trinidad), engaged in coursework featuring Jamaica's maritime heritage and the diving survey and management potential for Jamaica's most famous underwater site, Port Royal, the colonial city devastated by a massive earthquake in 1692 (Fig. 3).

Guanabo, Cuba (2012): Funding from Spain's AECID and the Cultural Heritage Agency of the Netherlands, RCE facilitated an advanced foundation training course on survey and registration techniques of UCH. Trainers from Argentina, Cuba, UNESCO HQ, and the Regional Office for Culture for Latin America and the Caribbean (Havana) were joined by 20 students from various Latin American states including Cuba, Colombia, Costa Rica, El Salvador, Honduras, Guatemala and the Dominican Republic. That same year the UNESCO Havana Office hosted a photo exhibition on global UCH at world heritage sites in Havana and Santiago de Cuba.

Fig. 3 Students at Port Royal returning to the dive boat, UCH Foundation Course 2012. © H Van Tilburg.

Buenos Aires, Argentina (November-December 2013): organized by UNESCO with the support of Instituto Nacional de Antropología y Pensamiento Latinoamericano, Secretaría de la Cultura de la Nación (PROAS-INAPL) and funded by Spain. The first Foundation course to be held in South America, the programme supported ten students from Brazil, Chile, Colombia, Ecuador, Peru, Uruguay, Paraguay, and Argentina.

St Eustatius, Netherlands (November-December 2014): organized by UNESCO in collaboration with the Maritime Programme of the Cultural Heritage Agency of the Netherlands (RCE), Leiden University, and the Netherlands National Commission, and hosted by the Centre for Archaeological Research on the Island of St Eustatius. The 16 participants represented Belize, Bonaire, Curacao, Cuba, Dominican Republic, Haiti, Netherlands, Saba, St Eustatius, Surinam, Venezuela, and South Africa.

Makassar, South Sulawesi, Indonesia (September-October 2014): organized by UNESCO with the Indonesian Directorate of Cultural Properties and Museums, Directorate General of Culture, Ministry of Education and Culture. The participants included 19 Indonesian nationals and 8 ASEAN participants from Cambodia, the Philippines, Laos and Thailand.

Kemer, Turkey (May 2015): Following up on recommendations from the First African Regional Meeting on the Protection of Underwater Cultural Heritage (Nigeria 2013), an intensive 15-day training course was organized by UNESCO and Selçuk University under the framework of the UniTwin network. Although it was inside the framework of the UNESCO Foundation course it was extended beyond its course syllabus. The 15 international participants came from Namibia, Nigeria, Madagascar, the Algeria, Egypt, Libya and Morocco (Arab Magreb Union), South Africa, and from Turkey (Fig. 2).

Hoi An, Vietnam (June-July 2015): organized by UNESCO with the Southeast Asian Regional Centre for Archaeology and Fine Arts (SEAMEO-SPAFA) and the Cultural Heritage Agency of the Netherlands (RCE). Twenty students from 6 countries (Vietnam, Japan, Sri Lanka, Indonesia, Australia and Philippines) took part in the management, research and protection of the underwater heritage training.

Cartegena de Indias, Colombia (2015): organized by UNESCO, the Colombian Institute of Anthropology and History (ICANH) and the Terra Firme Foundation, with the support of the Ministry of Culture, the General Maritime Department, the Colombian Ocean Commission and the Externado University of Colombia. Some 20 professionals, students of archaeology from Colombia, cultural and heritage managers, as well as personnel from the Oceanographic and Hydrographic Research Centre of the Caribbean (CIOH), participated in the course.

Mombasa, Kenya (December 2015): organized by UNESCO, together in partnership with the National Museum of Kenya. Cultural officials and experts from Kenya, Madagascar, Mozambique, Namibia, Nigeria, Senegal, and South Africa took part in the training, following the format of the UNESCO Foundation Course Manual on the Protection and Management of the Underwater Cultural Heritage and the UNESCO Manual for Activities directed at Underwater Cultural Heritage.

Salary Bay, Tulear, Madagascar (October 2016): organized by UNESCO with the support of the Ministry of Culture of Madagascar. The course was addressed to the Malagasy Ministry of Culture responsible for heritage protection. The national training programme followed aspects of the UNESCO training manual for the management of UCH, adapted to the specific needs of participants. The training was attended by 8 participants from the Ministry of Culture and the Handy Crafts and university students. It focused on underwater archaeological sites in the Bay of Salary, notably the wrecks of *Winterton* (1792), *Nossa Senhora do Monte do Carmo* (1774) and *Surprise* (1885).

Campeche, Mexico (July 2019): organized by UNESCO and the Mexican National Institute of Anthropology and History (INAH) and its Subdirectorate for Underwater Archaeology (SAS). The course was supported by the Spanish Agency for International Cooperation and Development (AECID). Trainers came from UNESCO, Mexico and from Spain (the University of Cádiz and the National Museum of Underwater Archaeology ARQVA). There were 19 participants from 15 Latin American and Caribbean countries.

The UNESCO UCH Foundation Course may also have influenced a number of non-UNESCO training initiatives hosted by independent institutions. In 2017, the Confédération Mondiale des Activités Subaquatiques (CMAS) conducted week-long UCH training courses in both Pozzouli and Calabria, Italy. The Maritime Archaeology Sea Trust (MAST) has supported UCH diving courses in the United Kingdom, including

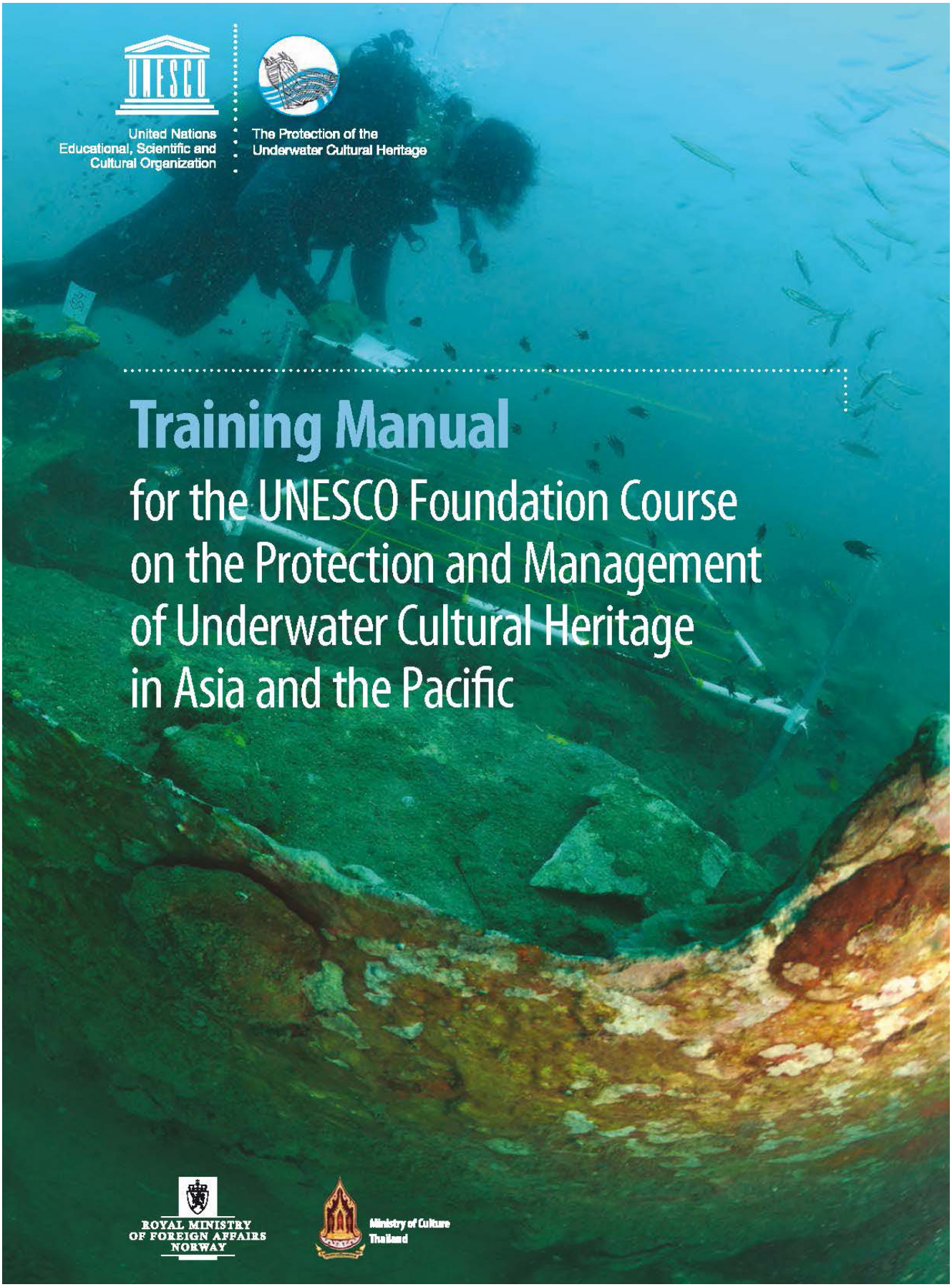

Fig. 4 The 654-page Training Manual for the UNESCO Foundation Course on the Protection and Management of Underwater Cultural Heritage in Asia and the Pacific http://unesdoc.unesco.org/images/0021/002172/217234e.pdf/; accessed 30th September 2020.

PADI (Professional Association of Diving Instructors) specialty certifications. Academic programmes, like the University of Hawaii's Maritime Archaeology Survey Techniques course (also MAST) and the University of Guam's Maritime Archaeology Program have benefitted directly from the consolidation of information provided by the free online UCH Foundation curriculum.

Sometimes these independent UCH capacity building efforts closely mirror the Foundation Course organization and content. In 2017, Chinese Taipei's Bureau of Cultural Heritage (BOCH) supported an intensive four-week UCH Foundation-style workshop in the small fishing village of Badouzi, near Keelung. The course was hosted by Chinese Taipei's National Museum of Marine Science and Technology. Nineteen candidates from Chinese Taipei participated in the classroom and in-water skills training taught by international instructors. Substantial portions of the course manual were also translated into Mandarin.

The UNESCO training course in Jamaica 2012 was the first to use the Foundation manual developed from the Asia-Pacific region (Fig. 4), revising and adapting content specifically for UCH capacity building in the Caribbean. In the subsequent cases above, course presentations were all tailored or modified to better represent different locations by trainers engaged from those regions. The formal revision and translation of the Asia-Pacific manual for the Latin American and Caribbean (LAC) region is currently underway, to be published first in English and, subject to available funds translated into Spanish.

Future

The development and implementation of the UCH Foundation capacity building programme is not without challenges. Funding for courses is neither permanent nor sustainable, but is often on an 'as-available' basis. Basic diving instruction (as opposed to UCH survey methods instruction) remains the responsibility of the host institutions, and course candidates are often new to the underwater world. Some programmes have raised the issue of how to credit the training certificate at the conclusion of the intensive course, relative to their own academic degrees or skills assessments, but so far this level of accreditation has not been achieved.

The capacity building programme has, nonetheless, been successfully established and is continuing to grow. There are other reference works on maritime archaeology and site management, and UCH curricula and training programmes available at different levels, but none have been specifically designed for global audiences at an international level, or dedicated to regional translation and adaptation.

In the context of the relatively new field of maritime archaeology, one for which the management and protection of generally unseen resources has proven so challenging, the establishment of a clear international training standard, created by a broad array of international professionals in the field of maritime archaeology and heritage preservation, is a remarkable achievement. UNESCO's UCH Foundation Course curriculum has become a standard for maritime archaeology and for resource management courses throughout the world.

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1 The UNESCO Foundation Course manual can be downloaded from: https://unesdoc.unesco.org/ark:/48223/pf0000217234; accessed 30th September 2020.

2 Agencia Española de Cooperación Internacional para el Desarrollo.

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CAPACITY BUILDING MODELS AND INITIATIVES IN REGIONS WITH LIMITED CULTURAL HERITAGE RESOURCES: THE CASE OF LEBANON

Lucy Semaan, Lebanon

Introduction: The Nature and Scope of Maritime Archaeology and Research in Lebanon

Popularly known as the homeland of the Phoenicians, Lebanon's intrinsic relationship with the Mediterranean Sea testifies to its rich maritime archaeological and cultural heritage. The wide range of sites includes coastal, urban and rural settlements; infilled and submerged harbour structures; maritime quarry sites; riverbeds and mouths with archaeological potential; as well as shipwrecks.[1]

Maritime archaeology is a nascent discipline in Lebanon, despite that preliminary interests and research in coastal and submerged sites date back to the 17th century.[2] Important figures that significantly contributed to the field include French Jesuit Father Antoine Poidebard who applied aerial photography to the study of submerged structures in the 1930s, and British pioneer of underwater archaeology Honor Frost who worked intermittently in Lebanon from the 1950s through to the early 2000s (Semaan 2018a, 84–93). More recently, the discipline has started to shift from a reactive and harbour-centred practice to a more proactive approach with an increasing number of local specialised researchers (Harpster 2018, 60). Research and in-house capacity building initiatives have also gained momentum in the past six years with the advent of the Honor Frost Foundation (HFF)[3] and its support for developing the field in the country. Indeed, the HFF established a team in Lebanon in 2019, in response to the recent growing coastal development which is threatening the maritime archaeological and cultural resource of the country.[4]

Fig. 1 The poster advertising the lecture tour undertaken at several Lebanese University (UL) campuses. © Wissam Khalil.

Challenges to and legal frameworks of UCH

The rich maritime archaeological and cultural heritage of Lebanon faces, however, substantial challenges that range between an extensive coastal urbanisation, land reclamation, wanton destruction, fishing and diving practices, looting and pillaging, the absence of strategic planning, and the general indifference of the population towards their underwater cultural heritage to name a few.[5] Mitigating these threats through legal courses of action does not suffer from a lack of national or international instruments but from the failure of implementing such laws. Indeed, Lebanon became a signatory of the United Nations Convention on the Law of the Sea (UNCLOS) in 1984, and the UNESCO Convention on the Protection of the Underwater Cultural Heritage (UNESCO 2001) in 2007.[6]

Capacity building initiatives to date

In the face of the many challenges threatening the preservation and conservation of the maritime cultural heritage of Lebanon a sustainable and staged approach for capacity building is in dire need in order to develop the archaeological skill base and raise awareness of the significance of Lebanon's underwater cultural heritage (UCH). This would be a multi-faceted approach involving the education of the different stakehold-

Keywords: Capacity Building – Maritime Archaeology – Eastern Mediterranean – Lebanon

ers; encouraging and developing research; documenting and inventorying existing sites to determine the nature, breadth and scope of the resource; as well as public archaeology.

The following will discuss a few of the initiatives undertaken in recent years that aim at building capacity among Lebanese professional archaeologists, students of archaeology, members of relevant authorities, and the wider population.

Education at university level

Higher education in maritime archaeology is absent from universities' curricula in the country. There are no related courses in undergraduate programmes, neither are there specialised master's programmes. Lebanese students who have an interest in the field are obliged to attend courses abroad. Moreover, local universities that offer courses in mainstream archaeology have seen their registered student numbers decrease and some departments were forced to shut down their programmes (Abdul Massih 2010, 71). This is the result of a general lack of interest in archaeology and a great gap in funding opportunities and job offers (Demesticha et al. 2019, 281). Such a trend discourages still-running departments to venture into establishing MA programmes in maritime archaeology. A timid attempt to mitigate such a lack was undertaken by the History and Archaeology Department at the American University of Beirut (AUB) when it granted the Whittlesey Chair Visiting Assistant Professor to nautical archaeologist Dr Ralph Pedersen who taught relevant courses for two years in 2007 and 2008. Such courses were offered to archaeology students, as well as being elective courses in other majors.

A more recent initiative is the establishment, in the fall of 2019, of a Minor in Marine Sciences and Culture at the AUB with the support of the HFF. It is an interdisciplinary course that draws on maritime archaeology, geology, and marine geophysics. It is being taught by professors from several departments at AUB, in collaboration with visiting lecturers from the University of Patras, Greece, the HFF, as well as international experts. The course culminates with a practical field school that offers students hands-on experience and practical application of the theories and methods learnt.[7]

Otherwise archaeology students have the ability to apply to scholarship schemes offered by HFF and the Said Foundation: The Said Foundation, through the British Council offered the first full scholarship to the author in 2006 for her to attend the MA programme in maritime archaeology at the University of Southampton. HFF funded four Lebanese archaeology students since 2013 to complete their MA and/or PhD in maritime archaeology at the University of Southampton.

In terms of early career research, HFF helped establish and majorly fund the first postdoctoral fellowship in maritime archaeology in Lebanon at the Department of Archaeology and Museology at the University of Balamand for a period of three years (2015–2018) (Semaan 2018b). The main research theme of this postdoc considers the seascape of the site of Anfeh, North Lebanon[8] and results are expected to be published in a future monograph.

In order for local undergraduate students in archaeology to grasp a sense of maritime archaeology, a lecture tour was undertaken at three branches of the Lebanese University by the author with Dr Lucy Blue from the University of Southampton and the Maritime Archaeological Director of HFF in April 2017 titled: Maritime Archaeology and the role of the Honor Frost Foundation (HFF) in Lebanon: 'New Horizons and Opportunities' (Fig. 1). These university campuses are located in three coastal sites Tripoli, Beirut, and Sidon with enduring maritime communities. Students were introduced to the scope, approaches, and broader understanding of maritime archaeology, the nature of the resource, the early developments of the field in Lebanon, the range of local maritime sites, and the scope of research thus far in the field in the country. They also learnt about the Foundation's activities in terms of research, education and training, capacity building, management and protection of maritime sites and culture, as well as dissemination and publication. Finally, students were introduced to the modalities of applying to the MA/PHD scholarships schemes offered by HFF.

Research, documentation, and inventorying

In 2015, HFF granted the author a one-year bursary to undertake the compilation of a desk-based assessment (DBA) for maritime archaeology in the country that will be made available for interested students and researchers alike. The field still lacked, thus far, a nation-wide DBA that would provide the proper scientific and archaeological context for ongoing and future work. The DBA accounted for ongoing research projects and archaeological potential at a number of coastal and underwater sites in Lebanon. This inventory constitutes a base-line of knowledge and informed assessment on which we can base further strategies. In doing so, targeted areas would be identified for further surveying and prioritising in relation to their preservation status, that is, if these sites are directly affected by urban and offshore development and other threats. The DBA essentially aimed at gauging the maritime archaeological potential of sites in Lebanon in order to study them, protect them, think of and develop management strategies and raise awareness about the maritime cultural heritage of the country. The DBA included researching published archaeological books and articles; unpublished theses, dissertations, and reports; archaeological databases; historical documents; cartographic and pictorial documents; aerial photographs; geotechnical information; as well as informal communication with fisherpersons and sports divers.[9]

Since its creation in 2011, HFF has also supported a sub-

stantial number of research projects throughout the country as part of its mission to develop the field in Lebanon and advance research. Projects include the areas in Northern Lebanon, Batroun, Byblos, Beirut, Sidon, Kharayeb, and Tyre.[10] Such projects are either directed by local archaeologists or in collaboration with foreign missions. They constitute an important opportunity for Lebanese and regional students of archaeology to gain hands-on fieldwork experience in the field.

Fig. 2 The author lecturing participants during the NAS field school at Anfeh, Lebanon. © Malvern Archaeological Diving Unit.

Training courses, workshops, field schools

Training courses and other theoretical and practical sessions have proven to be an essential component of building capacity worldwide (See other chapters in this book). These events are still modest in Lebanon but they are paving the way for more future endeavours of this type.

NAS training

Two NAS[11] field schools were recently funded by HFF in September 2017 and 2018 at two archaeological sites in Lebanon: Anfeh in the north and Sidon in the south.[12] They were organized respectively by the University of Balamand and the Lebanese University-Sidon Branch (Fig. 2). A total of 17 Lebanese, Syrian, and Palestinian participants, including archaeologists, students of archaeology, divers, and employees from the antiquity department underwent training in surveying and recording methods underwater. The participants with no prior dive experience were granted further financial support to obtain their Open Water diving licence and all participants were offered the possibility to undertake several refresher dives ahead of the field schools.

Conservation training

To date, Lebanon suffers from a lack of conservation facilities and destined for artefacts retrieved from underwater environments. In the light of recent developments in maritime archaeology and more specifically the impetus that underwater surveys and excavations have been gaining in the last few years in Lebanon, more artefacts are being retrieved from the seabed for research purposes. However, local archaeologists struggle at times to find available and specialised experts that would provide the necessary conservation treatments for underwater cultural material. Indeed, there is a lack of national expertise in handling and preserving such artefacts, and a dire absence of an infrastructure dedicated to such a purpose. Hence, a first-aid conservation lab would be a first step towards mitigating these shortcomings, as it will be specialization-oriented, accessible to all teams operating locally should they need to, and in accordance with the General Directorate of Antiquities rules and regulations. In the meantime, a couple of modest initiatives help in mitigating this issue.

In 2015, the author attended the training seminar entitled 'Introductory Courses on Conservation and Restoration of Archaeological Finds' in Zadar, Croatia. It was organized by the International Centre for Underwater Archaeology (ICUA), Zadar[13], with the support of the UNESCO Regional Bureau for Science and Culture in Europe, Venice (Italy).

Moreover, two Lebanese practising conservators were invited to attend a one-week workshop on the Conservation of Underwater Finds, which took place in December 2018 at the Laboratory for the Conservation of Underwater Finds, of the Cypriot Department of Antiquities in Larnaca. The workshop was organised by the Department of Antiquities Cyprus, in collaboration with the HFF. They joined other attendees from the region mainly Egypt and Cyprus and were funded by the HFF.

Governmental workshops

In Lebanon, the General Directorate of Antiquities (DGA) is the governmental authority responsible for archaeology and heritage in Lebanon under the authority of the Ministry of Culture. Currently, none of its employees are maritime archaeologists by trade but some have a broad understanding of the field and participate in related informative or training sessions. As such and in collaboration with UNESCO, Lebanese maritime archaeologist Dr Ibrahim Noureddine delivered a short introductory course on maritime archaeology in May 2012 to a number of DGA employees joined by professional archaeologists. The two-day course focused on the general development of the discipline along with theoretical techniques on how to conduct a survey underwater, document and excavate an underwater site. Six of the participants were divers and could apply the acquired knowledge in underwater surveying. In addition, the DGA participates in several workshops related to maritime archaeology in Lebanon and abroad.

Fig. 3 Participants of the field school interviewing retired fisherpersons in Anfeh. © Julian Jansen van Rensburg.

Targeted field schools

In 2014, a maritime ethnography field school was organized by the UOB, supported by HFF, and led by maritime archaeologist Dr Julian Jansen van Rensburg. The aims of this project were to conduct a maritime ethnography workshop to train Lebanese participants in the methods of maritime ethnographic recording and to document the tangible and intangible maritime heritage of the Anfeh seafaring community. The free two-day workshop was attended by 25 participants coming from four different institutions in Lebanon (Fig. 2). This was followed by a three-week practical that aimed at gathering information about the maritime traditions of the fishermen of Anfeh with over 20 fishermen having been interviewed (Jansen Van Rensburg 2014, 7). The importance of the fishing traditions in Anfeh had also attracted the interest of a small group of dedicated volunteers from a local NGO 'The Anfeh and Neighbourhood Heritage Committee'. This NGO works on the preservation of many aspects of Anfeh's heritage and they were keen on having the maritime traditions of the Anfeh fishermen recorded.[14] Indeed, members of this committee played an essential role throughout the fieldwork practical, enabling access to members of the fishing community, including members of their own family (Jansen Van Rensburg 2014, 7).

Public archaeology

In his book on the social and economic benefits of marine and maritime cultural heritage Anthony Firth argues that building capacity in a sustainable manner can be achieved through promoting and implementing ways in which maritime cultural heritage actively generates socio-economic and environmental benefits (Firth 2015, 10). A way to achieve this is through investing in eco-tourism or cultural tourism exemplified by guided underwater cultural trails that were implemented at the two legally declared marine protected areas in Tyre in South Lebanon in 2015 and Tripoli in North Lebanon in 2016. Such trails can be implemented at different coastal archaeological sites with UCH potential, as well as on modern and historical wrecks in collaboration with dive centres and fishermen familiar with the area. An added value and good way to increase access can be the use of glass-bottom boats for the non-diving/snorkelling tourists, as is common practice worldwide.[15] Public access to underwater archaeology, in the form of museums or dive trails, ensures the protection and preservation of the underwater cultural heritage concerned, while promising a lasting financial return.

Such initiatives would enrich the discipline and contribute to the protection and conservation of sites. They also allow to evaluate and quantify the local socio-economic benefits of UCH. Indeed, they would promote diving tourism economies that ensure responsible and controlled access to sites (Rey da Silva 2014, 751–52, 755). They would also build a marine and maritime cultural heritage community that can collaborate with policy makers and heritage practitioners to enhance such benefits and enable a heritage of this nature to contribute to sustainable growth.

As Marriner and Morhange state (2008, 434) 'Not only does this have direct cumulative ramifications for the local economy, but it would also be an effective means of policing the area and generating funds for future research'.

A final example of public archaeology are two short educational documentaries funded by HFF that exemplify good practice at the two archaeological sites of Anfeh and Ain el Mreisseh-Beirut. [16] In the course of 10 minutes, these documentaries presented to the public a pedagogic approach when studying an underwater site in order to grasp the significance and benefits of underwater and wider maritime archaeology

for the country. They aimed at breaching the gap between both the academic and non-specialist worlds, and tackle the lack of public awareness and education *vis-a-vis* of the field. By exposing the scientific approach of maritime archaeologists towards the coastal and submerged national cultural heritage, these documentaries challenged the perception of archaeological artefacts, which is always exaggerated, such as stories related to gold and treasures. They are a positive step towards raising awareness and better target information dissemination about maritime archaeology in Lebanon.

In conclusion, building capacity in a staged approach and from the ground up contribute towards mitigating the severe challenges that the UCH is facing in Lebanon. By educating and training the different stakeholders, whether archaeologists themselves, concerned officials, fisherpersons and divers, providing a solid skill set to document the UCH, and breaching the gap between academics and the different communities we could reach a better understanding of the resources and ensure its preservation for future generations.

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1 These sites were studied in a desk-based assessment put together by the author and funded by the Honor Frost Foundation.

2 For the diachronic development of the field in Lebanon see Semaan (2018a) and Haddad (2010).

3 The Honor Frost Foundation is a UK registered charity dedicated to promoting the advancement, research, and publication of maritime archaeology in the Eastern Mediterranean. See https://honorfrostfoundation.org/; accessed 30th September 2020.

4 https://honorfrostfoundation.org/grants-awarded/small-grants/lebanon/hff-lebanon-team/; accessed 30th September 2020.

5 These were detailed elsewhere, see Semaan (2020).

6 For details on national and international legal frameworks directing the UCL in Lebanon see Semaan (2020).

7 https://www.aub.edu.lb/fas/Documents/Minor%20in%20Marine%20Sciences%20and%20Culture%20-%20Leaflet.pdf; accessed 30th September 2020.

8 Anfeh is a coastal town located in North Lebanon some 70km north of Beirut. For the site see Panayot-Haroun et al. 2016 and Semaan 2016.

9 The publication of this DBA is under consideration by the HFF.

10 https://honorfrostfoundation.org/lebanon-projects/; accessed 30th September 2020.

11 The Nautical Archaeology Society (NAS) is a UK based charity committed to the research, conservation and preservation of maritime cultural heritage. https://www.nauticalarchaeologysociety.org/; accessed 30th September 2020.

12 https://www.nauticalarchaeologysociety.org/lebanon-training/; accessed 30th September 2020.

13 ICUA was founded in 2007 in the frame of the Croatian Conservation Institute. It became an independent public institution and gained the status of a UNESCO Category II centre in 2009. See https://icua.hr/en/ ; accessed 30th September 2020.

14 See https://honorfrostfoundation.org/anfeh-recording-the-tangible-and-intangible-maritime-heritage-of-the-anfeh-seafaring-community-j-jansen-van-rensburg/; accessed 30th September 2020.

15 More information on dive trails and dry-access tourism can be found at http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/CLT/pdf/UNESCO_UCH_Development_Study.pdf/; accessed 30th September 2020.

16 To view these documentaries, see https://honorfrostfoundation.org/?s=documentary/; accessed 30th September 2020.

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Diving in the Bay of Bones, Lake Ohrid (North Macedonia), with the pile-dwelling reconstructions in the background. The diver is setting up the excavation grid.
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APPENDICES

APPENDIX I: ICOMOS CHARTER ON THE PROTECTION AND MANAGEMENT OF UNDERWATER CULTURAL HERITAGE (SOFIA 1996)

ICOMOS

Charter on the Protection and Management of Underwater Cultural Heritage (ratified by the 11th ICOMOS General Assembly, held in Sofia, Bulgaria, from 5th to 9th October 1996)

This Charter is intended to encourage the protection and management of underwater cultural heritage in inland and inshore waters, in shallow seas and in the deep oceans.
It focuses on the specific attributes and circumstances of cultural heritage under water and should be understood as a supplement to the ICOMOS Charter for the Protection and Management of Archaeological Heritage, 1990. The 1990 Charter defines the 'archaeological heritage' as that part of the material heritage in respect of which archaeological methods provide primary information, comprising all vestiges of human existence and consisting of places relating to all manifestations of human activity, abandoned structures, and remains of all kinds, together with all the portable cultural material associated with them. For the purposes of this Charter underwater cultural heritage is understood to mean the archaeological heritage which is in, or has been removed from, an underwater environment. It includes submerged sites and structures, wreck sites and wreckage and their archaeological and natural context.

By its very character the underwater cultural heritage is an international resource. A large part of the underwater cultural heritage is located in an international setting and derives from international trade and communication in which ships and their contents are lost at a distance from their origin or destination.
Archaeology is concerned with environmental conservation; in the language of resource management, underwater cultural heritage is both finite and non-renewable. If underwater cultural heritage is to contribute to our appreciation of the environment in the future, then we have to take individual and collective responsibility in the present for ensuring its continued survival.
Archaeology is a public activity; everybody is entitled to draw upon the past in informing their own lives, and every effort to curtail knowledge of the past is an infringement of personal autonomy.
Underwater cultural heritage contributes to the formation of identity and can be important to people's sense of community. If managed sensitively, underwater cultural heritage can play a positive role in the promotion of recreation and tourism.
Archaeology is driven by research; it adds to knowledge of the diversity of human culture through the ages and it provides new and challenging ideas about life in the past.
Such knowledge and ideas contribute to understanding life today and, thereby, to anticipating future challenges.
Many marine activities, which are themselves beneficial and desirable, can have unfortunate consequences for underwater cultural heritage if their effects are not foreseen.
Underwater cultural heritage may be threatened by construction work that alters the shore and seabed or alters the flow of current, sediment and pollutants. Underwater cultural heritage may also be threatened by insensitive exploitation of living and non-living resources. Furthermore, inappropriate forms of access and the incremental impact of removing 'souvenirs can have a deleterious effect.
Many of these threats can be removed or substantially reduced by early consultation with archaeologists and by implementing mitigatory projects. This Charter is intended to assist in bringing a high standard of archaeological expertise to bear on such threats to underwater cultural heritage in a prompt and efficient manner.

Underwater cultural heritage is also threatened by activities that are wholly undesirable because they are intended to profit few at the expense of many. Commercial exploitation of underwater cultural heritage for trade or speculation is fundamentally incompatible with the protection and management of the heritage. This Charter is intended to ensure that all investigations are explicit in their aims, methodology and anticipated results so that the intention of each project is transparent to all.

Article 1 - Fundamental Principles
The preservation of underwater cultural heritage *in situ* should be considered as a first option.
Public access should be encouraged.
Non-destructive techniques, non-intrusive survey and sampling should be encouraged in preference to excavation.
Investigation must not adversely impact the underwater cultural heritage more than is necessary for the mitigatory or

research objectives of the project.
Investigation must avoid unnecessary disturbance of human remains or venerated sites.
Investigation must be accompanied by adequate documentation.

Article 2 - Project Design
Prior to investigation a project must be prepared, taking into account:

- the mitigatory or research objectives of the project;
- the methodology to be used and the techniques to be employed;
- anticipated funding;
- the time-table for completing the project;
- the composition, qualifications, responsibility and experience of the investigating team;
- material conservation;
- site management and maintenance;
- arrangements for collaboration with museums and other institutions;
- documentation;
- health and safety;
- report preparation;
- deposition of archives, including underwater cultural heritage removed during investigation and
- dissemination, including public participation.
- The project design should be revised and amended as necessary.
- Investigation must be carried out in accordance with the project design. The project design should be made available to the archaeological community.

Article 3 - Funding
Adequate funds must be assured in advance of investigation to complete all stages of the project design including conservation, report preparation and dissemination. The project design should include contingency plans that will ensure conservation of underwater cultural heritage and supporting documentation in the event of any interruption in anticipated funding.
Project funding must not require the sale of underwater cultural heritage or the use of any strategy that will cause underwater cultural heritage and supporting documentation to be irretrievably dispersed.

Article 4 - Time-table
Adequate time must be assured in advance of investigation to complete all stages of the project design including conservation, report preparation and dissemination. The project design should include contingency plans that will ensure conservation of underwater cultural heritage and supporting documentation in the event of any interruption in anticipated timings.

Article 5 - Research objectives, methodology, and techniques
Research objectives and the details of the methodology and techniques to be employed must be set down in the project design. The methodology should accord with the research objectives of the investigation and the techniques employed must be as unintrusive as possible.
Post-fieldwork analysis of artefacts and documentation is integral to all investigation; adequate provision for this analysis must be made in the project design.

Article 6 - Qualifications, responsibility and experience
All persons on the investigating team must be suitably qualified and experienced for their project roles. They must be fully briefed and understand the work required.
All intrusive investigations of underwater cultural heritage will only be undertaken under the direction and control of a named underwater archaeologist with recognised qualifications and experience appropriate to the investigation.

Article 7 - Preliminary investigation
All intrusive investigations of underwater cultural heritage must be preceded and informed by a site assessment that evaluates the vulnerability, significance and potential of the site.
The site assessment must encompass background studies of available historical and archaeological evidence, the archaeological and environmental characteristics of the site and the consequences of the intrusion for the long-term stability of the area affected by investigations.

Article 8 - Documentation
All investigation must be thoroughly documented in accordance with current professional standards of archaeological documentation.
Documentation must provide a comprehensive record of the site, which includes the provenance of underwater cultural heritage moved or removed in the course of investigation, field notes, plans and drawings, photographs and records in other media.

Article 9 - Material conservation
The material conservation programme must provide for treatment of archaeological remains during investigation, in transit and in the long term.
Material conservation must be carried out in accordance with current professional standards.

Article 10 - Site management and maintenance

A programme of site management must be prepared, detailing measures for protecting and managing *in situ* underwater cultural heritage in the course of an upon termination of fieldwork. The programme should include public information, reasonable provision for site stabilisation, monitoring and protection against interference. Public access to *in situ* underwater cultural heritage should be promoted, except where access is incompatible with protection and management.

Article 11 - Health and safety

The health and safety of the investigating team and third parties is paramount. All persons on the investigating team must work according to a safety policy that satisfies relevant statutory and professional requirements and is set out in the project design.

Article 12 - Reporting

Interim reports should be made available according to a time-table set out in the project design, and deposited in relevant public records.

Reports should include:

an account of the objectives;

an account of the methodology and techniques employed;

an account of the results achieved;

recommendations concerning future research, site management and curation of underwater cultural heritage removed during the investigation.

Article 13 - Curation

The project archive, which includes underwater cultural heritage removed during investigation and a copy of all supporting documentation, must be deposited in an institution that can provide for public access and permanent curation of the archive. Arrangements for deposition of the archive should be agreed before investigation commences, and should be set out in the project design. The archive should be prepared in accordance with current professional standards.

The scientific integrity of the project archive must be assured; deposition in a number of institutions must not preclude reassembly to allow further research. Underwater cultural heritage is not to be traded as items of commercial value.

Article 14 - Dissemination

Public awareness of the results of investigations and the significance of underwater cultural heritage should be promoted through popular presentation in a range of media. Access to such presentations by a wide audience should not be prejudiced by high charges.

Co-operation with local communities and groups is to be encouraged, as is co-operation with communities and groups that are particularly associated with the underwater cultural heritage concerned. It is desirable that investigations proceed with the consent and endorsement of such communities and groups.

The investigation team will seek to involve communities and interest groups in investigations to the extent that such involvement is compatible with protection and management. Where practical, the investigation team should provide opportunities for the public to develop archaeological skills through training and education.

Collaboration with museums and other institutions is to be encouraged. Provision for visits, research and reports by collaborating institutions should be made in advance of investigation.

A final synthesis of the investigation must be made available as soon as possible, having regard to the complexity of the research, and deposited in relevant public records.

Article 15 - International co-operation

International co-operation is essential for protection and management of underwater cultural heritage and should be promoted in the interests of high standards of investigation and research. International co-operation should be encouraged in order to make effective use of archaeologists and other professionals who are specialised in investigations of underwater cultural heritage. Programmes for exchange of professionals should be considered as a means of disseminating best practice.

APPENDIX II: UNESCO CONVENTION ON THE PROTECTION OF THE UNDERWATER CULTURAL HERITAGE (PARIS 2001)

UNESCO

The General Conference of the United Nations Educational, Scientific and Cultural Organization, meeting in Paris from 15 October to 3 November 2001, at its 31st session,

Acknowledging the importance of underwater cultural heritage as an integral part of the cultural heritage of humanity and a particularly important element in the history of peoples, nations, and their relations with each other concerning their common heritage,

Realizing the importance of protecting and preserving the underwater cultural heritage and that responsibility therefor rests with all States,

Noting growing public interest in and public appreciation of underwater cultural heritage,

Convinced of the importance of research, information and education to the protection and preservation of underwater cultural heritage,

Convinced of the public's right to enjoy the educational and recreational benefits of responsible non-intrusive access to *in situ* underwater cultural heritage, and of the value of public education to contribute to awareness, appreciation and protection of that heritage,

Aware of the fact that underwater cultural heritage is threatened by unauthorized activities directed at it, and of the need for stronger measures to prevent such activities,

Conscious of the need to respond appropriately to the possible negative impact on underwater cultural heritage of legitimate activities that may incidentally affect it,

Deeply concerned by the increasing commercial exploitation of underwater cultural heritage, and in particular by certain activities aimed at the sale, acquisition or barter of underwater cultural heritage,

Aware of the availability of advanced technology that enhances discovery of and access to underwater cultural heritage,

Believing that cooperation among States, international organizations, scientific institutions, professional organizations, archaeologists, divers, other interested parties and the public at large is essential for the protection of underwater cultural heritage,

Considering that survey, excavation and protection of underwater cultural heritage necessitate the availability and application of special scientific methods and the use of suitable techniques and equipment as well as a high degree of professional specialization, all of which indicate a need for uniform governing criteria,

Realizing the need to codify and progressively develop rules relating to the protection and preservation of underwater cultural heritage in conformity with international law and practice, including the UNESCO Convention on the Means of Prohibiting and Preventing the Illicit Import, Export and Transfer of Ownership of Cultural Property of 14 November 1970, the UNESCO Convention for the Protection of the World Cultural and Natural Heritage of 16 November 1972 and the United Nations Convention on the Law of the Sea of 10 December 1982,

Committed to improving the effectiveness of measures at international, regional and national levels for the preservation *in situ* or, if necessary, for scientific or protective purposes, the careful recovery of underwater cultural heritage,

Having decided at its twenty-ninth session that this question should be made the subject of an international convention,

Adopts this second day of November 2001 this Convention.

Article 1 – Definitions

For the purposes of this Convention:

1. (a)'Underwater cultural heritage' means all traces of human existence having a cultural, historical or archaeological character which have been partially or totally under water, periodically or continuously, for at least 100 years such as:

(i) sites, structures, buildings, artefacts and human remains, together with their archaeological and natural context;
(ii) vessels, aircraft, other vehicles or any part thereof, their cargo or other contents, together with their archaeological and natural context; and
(iii) objects of prehistoric character.

(b) Pipelines and cables placed on the seabed shall not be considered as underwater cultural heritage.

(c) Installations other than pipelines and cables, placed on the seabed and still in use, shall not be considered as underwater cultural heritage.

2. (a) 'States Parties' means States which have consented to be bound by this Convention and for which this Convention is in force.

(b) This Convention applies mutatis mutandis to those territories referred to in Article 26, paragraph 2(b), which become Parties to this Convention in accordance with the conditions set out in that paragraph, and to that extent 'States Parties' refers to those territories.

3. 'UNESCO' means the United Nations Educational, Scientific and Cultural Organization.
4. 'Director-General' means the Director-General of UNESCO.
5. 'Area' means the seabed and ocean floor and subsoil thereof, beyond the limits of national jurisdiction.
6. 'Activities directed at underwater cultural heritage' means activities having underwater cultural heritage as their primary object and which may, directly or indirectly, physically disturb or otherwise damage underwater cultural heritage.
7. 'Activities incidentally affecting underwater cultural heritage' means activities which, despite not having underwater cultural heritage as their primary object or one of their objects, may physically disturb or otherwise damage underwater cultural heritage.
8. 'State vessels and aircraft' means warships, and other vessels or aircraft that were owned or operated by a State and used, at the time of sinking, only for government non-commercial purposes, that are identified as such and that meet the definition of underwater cultural heritage.
9. 'Rules' means the Rules concerning activities directed at underwater cultural heritage, as referred to in Article 33 of this Convention.

Article 2 – Objectives and general principles

1. This Convention aims to ensure and strengthen the protection of underwater cultural heritage.
2. States Parties shall cooperate in the protection of underwater cultural heritage.
3. States Parties shall preserve underwater cultural heritage for the benefit of humanity in conformity with the provisions of this Convention.
4. States Parties shall, individually or jointly as appropriate, take all appropriate measures in conformity with this Convention and with international law that are necessary to protect underwater cultural heritage, using for this purpose the best practicable means at their disposal and in accordance with their capabilities.
5. The preservation *in situ* of underwater cultural heritage shall be considered as the first option before allowing or engaging in any activities directed at this heritage.
6. Recovered underwater cultural heritage shall be deposited, conserved and managed in a manner that ensures its long-term preservation.
7. Underwater cultural heritage shall not be commercially exploited.
8. Consistent with State practice and international law, including the United Nations Convention on the Law of the Sea, nothing in this Convention shall be interpreted as modifying the rules of international law and State practice pertaining to sovereign immunities, nor any State's rights with respect to its State vessels and aircraft.
9. States Parties shall ensure that proper respect is given to all human remains located in maritime waters.
10. Responsible non-intrusive access to observe or document *in situ* underwater cultural heritage shall be encouraged to create public awareness, appreciation, and protection of the heritage except where such access is incompatible with its protection and management.
11. No act or activity undertaken on the basis of this Convention shall constitute grounds for claiming, contending or disputing any claim to national sovereignty or jurisdiction.

Article 3 – Relationship between this Convention and the United Nations Convention on the Law of the Sea

Nothing in this Convention shall prejudice the rights, jurisdiction and duties of States under international law, including the United Nations Convention on the Law of the Sea. This Convention shall be interpreted and applied in the context of and in a manner consistent with international law, including the United Nations Convention on the Law of the Sea.

Article 4 – Relationship to law of salvage and law of finds

Any activity relating to underwater cultural heritage to which this Convention applies shall not be subject to the law of salvage or law of finds, unless it:

(a) is authorized by the competent authorities, and

(b) is in full conformity with this Convention, and

(c) ensures that any recovery of the underwater cultural heritage achieves its maximum protection.

Article 5 – Activities incidentally affecting underwater cultural heritage

Each State Party shall use the best practicable means at its disposal to prevent or mitigate any adverse effects that might arise from activities under its jurisdiction incidentally affecting underwater cultural heritage.

Article 6 – Bilateral, regional or other multilateral agreements

1. States Parties are encouraged to enter into bilateral, regional or other multilateral agreements or develop existing agreements, for the preservation of underwater cultural heritage. All such agreements shall be in full conformity with the provisions of this Convention and shall not dilute its universal character. States may, in such agreements, adopt rules and regulations which would ensure better protection of underwater cultural heritage than those adopted in this Convention.
2. The Parties to such bilateral, regional or other multilateral agreements may invite States with a verifiable link, especially a cultural, historical or archaeological link, to the underwater cultural heritage concerned to join such agreements.
3. This Convention shall not alter the rights and obligations of States Parties regarding the protection of sunken vessels, arising from other bilateral, regional or other multilateral agreements concluded before its adoption, and, in particular, those that are in conformity with the purposes of this Convention.

Article 7 – Underwater cultural heritage in internal waters, archipelagic waters and territorial sea

1. States Parties, in the exercise of their sovereignty, have the exclusive right to regulate and authorize activities directed at underwater cultural heritage in their internal waters, archipelagic waters and territorial sea.
2. Without prejudice to other international agreements and rules of international law regarding the protection of underwater cultural heritage, States Parties shall require that the Rules be applied to activities directed at underwater cultural heritage in their internal waters, archipelagic waters and territorial sea.
3. Within their archipelagic waters and territorial sea, in the exercise of their sovereignty and in recognition of general practice among States, States Parties, with a view to cooperating on the best methods of protecting State vessels and aircraft, should inform the flag State Party to this Convention and, if applicable, other States with a verifiable link, especially a cultural, historical or archaeological link, with respect to the discovery of such identifiable State vessels and aircraft.

Article 8 – Underwater cultural heritage in the contiguous zone

Without prejudice to and in addition to Articles 9 and 10, and in accordance with Article 303, paragraph 2, of the United Nations Convention on the Law of the Sea, States Parties may regulate and authorize activities directed at underwater cultural heritage within their contiguous zone. In so doing, they shall require that the Rules be applied.

Article 9 – Reporting and notification in the exclusive economic zone and on the continental shelf

1. All States Parties have a responsibility to protect underwater cultural heritage in the exclusive economic zone and on the continental shelf in conformity with this Convention.
   Accordingly:
   (a) a State Party shall require that when its national, or a vessel flying its flag, discovers or intends to engage in activities directed at underwater cultural heritage located in its exclusive economic zone or on its continental shelf, the national or the master of the vessel shall report such discovery or activity to it;
   (b) in the exclusive economic zone or on the continental shelf of another State Party:
   (i) States Parties shall require the national or the master of the vessel to report such discovery or activity to them and to that other State Party;
   (ii) alternatively, a State Party shall require the national or master of the vessel to report such discovery or activity to it and shall ensure the rapid and effective transmission of such reports to all other States Parties.

2-3. On depositing its instrument of ratification, acceptance, approval or accession, a State Party shall declare the manner in which reports will be transmitted under paragraph 1(b) of this Article.

3. A State Party shall notify the Director-General of discoveries or activities reported to it under paragraph 1 of this Article.
4. The Director-General shall promptly make available to all States Parties any information notified to him under paragraph 3 of this Article.
5. Any State Party may declare to the State Party in whose exclusive economic zone or on whose continental shelf the underwater cultural heritage is located its interest in being consulted on how to ensure the effective protection of that underwater cultural heritage. Such declaration shall be based on a verifiable link, especially a cultural, historical or archaeological link, to the underwater cultural heritage concerned.

Article 10 – Protection of underwater cultural heritage in the exclusive economic zone and on the continental shelf

1. No authorization shall be granted for an activity directed at underwater cultural heritage located in the exclusive economic zone or on the continental shelf except in conformity with the provisions of this Article.
2. A State Party in whose exclusive economic zone or on whose continental shelf underwater cultural heritage is located has the right to prohibit or authorize any activity directed at such heritage to prevent interference with its sovereign rights or jurisdiction as provided for by international law including the United Nations Convention on the Law of the Sea.
3. Where there is a discovery of underwater cultural heritage or it is intended that activity shall be directed at underwater cultural heritage in a State Party's exclusive economic zone or on its continental shelf, that State Party shall:
   (a) consult all other States Parties which have declared an interest under Article 9, paragraph 5, on how best to protect the underwater cultural heritage;
   (b) coordinate such consultations as 'Coordinating State', unless it expressly declares that it does not wish to do so, in which case the States Parties which have declared an interest under Article 9, paragraph 5, shall appoint a Coordinating State.
4. Without prejudice to the duty of all States Parties to protect underwater cultural heritage by way of all practicable measures taken in accordance with international law to prevent immediate danger to the underwater cultural heritage, including looting, the Coordinating State may take all practicable measures, and/or issue any necessary authorizations in conformity with this Convention and, if necessary prior to consultations, to prevent any immediate danger to the underwater cultural heritage, whether arising from human activities or any other cause, including looting. In taking such measures assistance may be requested from other States Parties.
5. The Coordinating State:
   (a) shall implement measures of protection which have been agreed by the consulting States, which include the Coordinating State, unless the consulting States, which include the Coordinating State, agree that another State Party shall implement those measures;
   (b) shall issue all necessary authorizations for such agreed measures in conformity with the Rules, unless the consulting States, which include the Coordinating State, agree that another State Party shall issue those authorizations;
   (c) may conduct any necessary preliminary research on the underwater cultural heritage and shall issue all necessary authorizations therefor, and shall promptly inform the Director-General of the results, who in turn will make such information promptly available to other States Parties.
6. In coordinating consultations, taking measures, conducting preliminary research and/or issuing authorizations pursuant to this Article, the Coordinating State shall act on behalf of the States Parties as a whole and not in its own interest. Any such action shall not in itself constitute a basis for the assertion of any preferential or jurisdictional rights not provided for in international law, including the United Nations Convention on the Law of the Sea.
7. Subject to the provisions of paragraphs 2 and 4 of this Article, no activity directed at State vessels and aircraft shall be conducted without the agreement of the flag State and the collaboration of the Coordinating State.

Article 11 – Reporting and notification in the Area

1. States Parties have a responsibility to protect underwater cultural heritage in the Area in conformity with this Convention and Article 149 of the United Nations Convention on the Law of the Sea. Accordingly, when a national, or a vessel flying the flag of a State Party, discovers or intends to engage in activities directed at underwater cultural heritage located in the Area, that State Party shall require its national, or the master of the vessel, to report such discovery or activity to it.
2. States Parties shall notify the Director-General and the Secretary-General of the International Seabed Authority of such discoveries or activities reported to them.
3. The Director-General shall promptly make available to all States Parties any such information supplied by States Parties.
4. Any State Party may declare to the Director-General its interest in being consulted on how to ensure the effective protection of that underwater cultural heritage. Such declaration shall be based on a verifiable link to the underwater cultural heritage concerned, particular regard being paid to the preferential rights of States of cultural, historical or archaeological origin.

Article 12 – Protection of underwater cultural heritage in the Area

1. No authorization shall be granted for any activity directed at underwater cultural heritage located in the Area except in conformity with the provisions of this Article.
2. The Director-General shall invite all States Parties which have declared an interest under Article 11, paragraph 4, to consult on how best to protect the underwater cultural heritage, and to appoint a State Party to coordinate such

consultations as the 'Coordinating State'. The Director-General shall also invite the International Seabed Authority to participate in such consultations.

3. All States Parties may take all practicable measures in conformity with this Convention, if necessary, prior to consultations, to prevent any immediate danger to the underwater cultural heritage, whether arising from human activity or any other cause including looting.
4. The Coordinating State shall:
   (a) implement measures of protection which have been agreed by the consulting States, which include the Coordinating State, unless the consulting States, which include the Coordinating State, agree that another State Party shall implement those measures; and
   (b) issue all necessary authorizations for such agreed measures, in conformity with this Convention, unless the consulting States, which include the Coordinating State, agree that another State Party shall issue those authorizations.
5. The Coordinating State may conduct any necessary preliminary research on the underwater cultural heritage and shall issue all necessary authorizations therefor, and shall promptly inform the Director-General of the results, who in turn shall make such information available to other States Parties.
6. In coordinating consultations, taking measures, conducting preliminary research, and/or issuing authorizations pursuant to this Article, the Coordinating State shall act for the benefit of humanity as a whole, on behalf of all States Parties. Particular regard shall be paid to the preferential rights of States of cultural, historical or archaeological origin in respect of the underwater cultural heritage concerned.
7. No State Party shall undertake or authorize activities directed at State vessels and aircraft in the Area without the consent of the flag State.

Article 13 – Sovereign immunity

Warships and other government ships or military aircraft with sovereign immunity, operated for non-commercial purposes, undertaking their normal mode of operations, and not engaged in activities directed at underwater cultural heritage, shall not be obliged to report discoveries of underwater cultural heritage under Articles 9, 10, 11 and 12 of this Convention. However States Parties shall ensure, by the adoption of appropriate measures not impairing the operations or operational capabilities of their warships or other government ships or military aircraft with sovereign immunity operated for non-commercial purposes, that they comply, as far as is reasonable and practicable, with Articles 9, 10, 11 and 12 of this Convention.

Article 14 – Control of entry into the territory, dealing and possession

States Parties shall take measures to prevent the entry into their territory, the dealing in, or the possession of, underwater cultural heritage illicitly exported and/or recovered, where recovery was contrary to this Convention.

Article 15 – Non-use of areas under the jurisdiction of States Parties

States Parties shall take measures to prohibit the use of their territory, including their maritime ports, as well as artificial islands, installations and structures under their exclusive jurisdiction or control, in support of any activity directed at underwater cultural heritage which is not in conformity with this Convention.

Article 16 – Measures relating to nationals and vessels

States Parties shall take all practicable measures to ensure that their nationals and vessels flying their flag do not engage in any activity directed at underwater cultural heritage in a manner not in conformity with this Convention.

Article 17 – Sanctions

1. Each State Party shall impose sanctions for violations of measures it has taken to implement this Convention.
2. Sanctions applicable in respect of violations shall be adequate in severity to be effective in securing compliance with this Convention and to discourage violations wherever they occur and shall deprive offenders of the benefit deriving from their illegal activities.
3. States Parties shall cooperate to ensure enforcement of sanctions imposed under this Article.

Article 18 – Seizure and disposition of underwater cultural heritage

1. Each State Party shall take measures providing for the seizure of underwater cultural heritage in its territory that has been recovered in a manner not in conformity with this Convention.
2. Each State Party shall record, protect and take all reasonable measures to stabilize underwater cultural heritage seized under this Convention.
3. Each State Party shall notify the Director-General and any other State with a verifiable link, especially a cultural, historical or archaeological link, to the underwater cultural heritage concerned of any seizure of underwater cultural heritage that it has made under this Convention.

4. A State Party which has seized underwater cultural heritage shall ensure that its disposition be for the public benefit, taking into account the need for conservation and research; the need for reassembly of a dispersed collection; the need for public access, exhibition and education; and the interests of any State with a verifiable link, especially a cultural, historical or archaeological link, in respect of the underwater cultural heritage concerned.

Article 19 – Cooperation and information-sharing

1. States Parties shall cooperate and assist each other in the protection and management of underwater cultural heritage under this Convention, including, where practicable, collaborating in the investigation, excavation, documentation, conservation, study and presentation of such heritage.
2. To the extent compatible with the purposes of this Convention, each State Party undertakes to share information with other States Parties concerning underwater cultural heritage, including discovery of heritage, location of heritage, heritage excavated or recovered contrary to this Convention or otherwise in violation of international law, pertinent scientific methodology and technology, and legal developments relating to such heritage.
3. Information shared between States Parties, or between UNESCO and States Parties, regarding the discovery or location of underwater cultural heritage shall, to the extent compatible with their national legislation, be kept confidential and reserved to competent authorities of States Parties as long as the disclosure of such information might endanger or otherwise put at risk the preservation of such underwater cultural heritage.
4. Each State Party shall take all practicable measures to disseminate information, including where feasible through appropriate international databases, about underwater cultural heritage excavated or recovered contrary to this Convention or otherwise in violation of international law.

Article 20 – Public awareness

Each State Party shall take all practicable measures to raise public awareness regarding the value and significance of underwater cultural heritage and the importance of protecting it under this Convention.

Article 21 – Training in underwater archaeology

States Parties shall cooperate in the provision of training in underwater archaeology, in techniques for the conservation of underwater cultural heritage and, on agreed terms, in the transfer of technology relating to underwater cultural heritage.

Article 22 – Competent authorities

1. In order to ensure the proper implementation of this Convention, States Parties shall establish competent authorities or reinforce the existing ones where appropriate, with the aim of providing for the establishment, maintenance and updating of an inventory of underwater cultural heritage, the effective protection, conservation, presentation and management of underwater cultural heritage, as well as research and education.
2. States Parties shall communicate to the Director-General the names and addresses of their competent authorities relating to underwater cultural heritage.

Article 23 – Meetings of States Parties

1. The Director-General shall convene a Meeting of States Parties within one year of the entry into force of this Convention and thereafter at least once every two years. At the request of a majority of States Parties, the Director-General shall convene an Extraordinary Meeting of States Parties.
2. The Meeting of States Parties shall decide on its functions and responsibilities.
3. The Meeting of States Parties shall adopt its own Rules of Procedure.
4. The Meeting of States Parties may establish a Scientific and Technical Advisory Body composed of experts nominated by the States Parties with due regard to the principle of equitable geographical distribution and the desirability of a gender balance.
5. The Scientific and Technical Advisory Body shall appropriately assist the Meeting of States Parties in questions of a scientific or technical nature regarding the implementation of the Rules.

Article 24 – Secretariat for this Convention

1. The Director-General shall be responsible for the functions of the Secretariat for this Convention.
2. The duties of the Secretariat shall include:
   (a) organizing Meetings of States Parties as provided for in Article 23, paragraph 1; and
   (b) assisting States Parties in implementing the decisions of the Meetings of States Parties.

Article 25 – Peaceful settlement of disputes

1. Any dispute between two or more States Parties concerning the interpretation or application of this Convention shall be subject to negotiations in good faith or other peaceful means of settlement of their own choice.

2. If those negotiations do not settle the dispute within a reasonable period of time, it may be submitted to UNESCO for mediation, by agreement between the States Parties concerned.
3. If mediation is not undertaken or if there is no settlement by mediation, the provisions relating to the settlement of disputes set out in Part XV of the United Nations Convention on the Law of the Sea apply mutatis mutandis to any dispute between States Parties to this Convention concerning the interpretation or application of this Convention, whether or not they are also Parties to the United Nations Convention on the Law of the Sea.
4. Any procedure chosen by a State Party to this Convention and to the United Nations Convention on the Law of the Sea pursuant to Article 287 of the latter shall apply to the settlement of disputes under this Article, unless that State Party, when ratifying, accepting, approving or acceding to this Convention, or at any time thereafter, chooses another procedure pursuant to Article 287 for the purpose of the settlement of disputes arising out of this Convention.
5. A State Party to this Convention which is not a Party to the United Nations Convention on the Law of the Sea, when ratifying, accepting, approving or acceding to this Convention or at any time thereafter shall be free to choose, by means of a written declaration, one or more of the means set out in Article 287, paragraph 1, of the United Nations Convention on the Law of the Sea for the purpose of settlement of disputes under this Article. Article 287 shall apply to such a declaration, as well as to any dispute to which such State is party, which is not covered by a declaration in force. For the purpose of conciliation and arbitration, in accordance with Annexes V and VII of the United Nations Convention on the Law of the Sea, such State shall be entitled to nominate conciliators and arbitrators to be included in the lists referred to in Annex V, Article 2, and Annex VII, Article 2, for the settlement of disputes arising out of this Convention.

Article 26 – Ratification, acceptance, approval or accession

1. This Convention shall be subject to ratification, acceptance or approval by Member States of UNESCO.
2. This Convention shall be subject to accession:
   (a) by States that are not members of UNESCO but are members of the United Nations or of a specialized agency within the United Nations system or of the International Atomic Energy Agency, as well as by States Parties to the Statute of the International Court of Justice and any other State invited to accede to this Convention by the General Conference of UNESCO;
   (b) by territories which enjoy full internal self-government, recognized as such by the United Nations, but have not attained full independence in accordance with General Assembly resolution 1514 (XV) and which have competence over the matters governed by this Convention, including the competence to enter into treaties in respect of those matters.
3. The instruments of ratification, acceptance, approval or accession shall be deposited with the Director-General.

Article 27 – Entry into force

This Convention shall enter into force three months after the date of the deposit of the twentieth instrument referred to in Article 26, but solely with respect to the twenty States or territories that have so deposited their instruments. It shall enter into force for each other State or territory three months after the date on which that State or territory has deposited its instrument.

Article 28 – Declaration as to inland waters

When ratifying, accepting, approving or acceding to this Convention or at any time thereafter, any State or territory may declare that the Rules shall apply to inland waters not of a maritime character.

Article 29 – Limitations to geographical scope

At the time of ratifying, accepting, approving or acceding to this Convention, a State or territory may make a declaration to the depositary that this Convention shall not be applicable to specific parts of its territory, internal waters, archipelagic waters or territorial sea, and shall identify therein the reasons for such declaration. Such State shall, to the extent practicable and as quickly as possible, promote conditions under which this Convention will apply to the areas specified in its declaration, and to that end shall also withdraw its declaration in whole or in part as soon as that has been achieved.

Article 30 – Reservations

With the exception of Article 29, no reservations may be made to this Convention.

Article 31 – Amendments

1. A State Party may, by written communication addressed to the Director-General, propose amendments to this Convention. The Director-General shall circulate such communication to all States Parties. If, within six months from the date of the circulation of the communication, not less than

one half of the States Parties reply favourably to the request, the Director-General shall present such proposal to the next Meeting of States Parties for discussion and possible adoption.

2. Amendments shall be adopted by a two-thirds majority of States Parties present and voting.
3. Once adopted, amendments to this Convention shall be subject to ratification, acceptance, approval or accession by the States Parties.
4. Amendments shall enter into force, but solely with respect to the States Parties that have ratified, accepted, approved or acceded to them, three months after the deposit of the instruments referred to in paragraph 3 of this Article by two thirds of the States Parties. Thereafter, for each State or territory that ratifies, accepts, approves or accedes to it, the amendment shall enter into force three months after the date of deposit by that Party of its instrument of ratification, acceptance, approval or accession.
5. A State or territory which becomes a Party to this Convention after the entry into force of amendments in conformity with paragraph 4 of this Article shall, failing an expression of different intention by that State or territory, be considered:
   (a) as a Party to this Convention as so amended; and
   (b) as a Party to the unamended Convention in relation to any State Party not bound by the amendment.

Article 32 – Denunciation

1. A State Party may, by written notification addressed to the Director-General, denounce this Convention.
2. The denunciation shall take effect twelve months after the date of receipt of the notification, unless the notification specifies a later date.
3. The denunciation shall not in any way affect the duty of any State Party to fulfil any obligation embodied in this Convention to which it would be subject under international law independently of this Convention.

Article 33 – The Rules

The Rules annexed to this Convention form an integral part of it and, unless expressly provided otherwise, a reference to this Convention includes a reference to the Rules.

Article 34 – Registration with the United Nations

In conformity with Article 102 of the Charter of the United Nations, this Convention shall be registered with the Secretariat of the United Nations at the request of the Director-General.

Article 35 – Authoritative texts

This Convention has been drawn up in Arabic, Chinese, English, French, Russian and Spanish, the six texts being equally authoritative.

Annex

Rules concerning activities directed at underwater cultural heritage

I. General principles

Rule 1. The protection of underwater cultural heritage through *in situ* preservation shall be considered as the first option. Accordingly, activities directed at underwater cultural heritage shall be authorized in a manner consistent with the protection of that heritage, and subject to that requirement may be authorized for the purpose of making a significant contribution to protection or knowledge or enhancement of underwater cultural heritage.

Rule 2. The commercial exploitation of underwater cultural heritage for trade or speculation or its irretrievable dispersal is fundamentally incompatible with the protection and proper management of underwater cultural heritage. Underwater cultural heritage shall not be traded, sold, bought or bartered as commercial goods.

This Rule cannot be interpreted as preventing:

(a) the provision of professional archaeological services or necessary services incidental thereto whose nature and purpose are in full conformity with this Convention and are subject to the authorization of the competent authorities;

(b) the deposition of underwater cultural heritage, recovered in the course of a research project in conformity with this Convention, provided such deposition does not prejudice the scientific or cultural interest or integrity of the recovered material or result in its irretrievable dispersal; is in accordance with the provisions of Rules 33 and 34; and is subject to the authorization of the competent authorities.

Rule 3. Activities directed at underwater cultural heritage shall not adversely affect the underwater cultural heritage more than is necessary for the objectives of the project.

Rule 4. Activities directed at underwater cultural heritage must use non-destructive techniques and survey methods in preference to recovery of objects. If excavation or recovery is necessary for the purpose of scientific studies or for the ultimate protection of the underwater cultural heritage, the methods and techniques used must be as non-destructive as possible and contribute to the preservation of the remains.

Rule 5. Activities directed at underwater cultural heritage shall avoid the unnecessary disturbance of human remains or venerated sites.

Rule 6. Activities directed at underwater cultural heritage shall be strictly regulated to ensure proper recording of cultural, historical and archaeological information.

Rule 7. Public access to *in situ* underwater cultural heritage shall be promoted, except where such access is incompatible with protection and management.

Rule 8. International cooperation in the conduct of activities directed at underwater cultural heritage shall be encouraged in order to further the effective exchange or use of archaeologists and other relevant professionals.

II. Project design

Rule 9. Prior to any activity directed at underwater cultural heritage, a project design for the activity shall be developed and submitted to the competent authorities for authorization and appropriate peer review.

Rule 10. The project design shall include:

(a) an evaluation of previous or preliminary studies;

(b) the project statement and objectives;

(c) the methodology to be used and the techniques to be employed;

(d) the anticipated funding;

(e) an expected timetable for completion of the project;

(f) the composition of the team and the qualifications, responsibilities and experience of each team member;

(g) plans for post-fieldwork analysis and other activities;

(h) a conservation programme for artefacts and the site in close cooperation with the competent authorities;

(i) a site management and maintenance policy for the whole duration of the project;

(j) a documentation programme;

(k) a safety policy

(l) an environmental policy;

(m) arrangements for collaboration with museums and other institutions, in particular scientific institutions;

(n) report preparation;

(o) deposition of archives, including underwater cultural heritage removed; and

(p) a programme for publication.

Rule 11. Activities directed at underwater cultural heritage shall be carried out in accordance with the project design approved by the competent authorities

Rule 12. Where unexpected discoveries are made or circumstances change, the project design shall be reviewed and amended with the approval of the competent authorities.

Rule 13. In cases of urgency or chance discoveries, activities directed at the underwater cultural heritage, including conservation measures or activities for a period of short duration, in particular site stabilization, may be authorized in the absence of a project design in order to protect the underwater cultural heritage.

III. Preliminary work

Rule 14. The preliminary work referred to in Rule 10 (a) shall include an assessment that evaluates the significance and vulnerability of the underwater cultural heritage and the surrounding natural environment to damage by the proposed project, and the potential to obtain data that would meet the project objectives.

Rule 15. The assessment shall also include background studies of available historical and archaeological evidence, the archaeological and environmental characteristics of the site, and the consequences of any potential intrusion for the long-term stability of the underwater cultural heritage affected by the activities.

IV. Project objective, methodology and techniques

Rule 16. The methodology shall comply with the project objectives, and the techniques employed shall be as non-intrusive as possible.

V. Funding

Rule 17. Except in cases of emergency to protect underwater cultural heritage, an adequate funding base shall be assured in advance of any activity, sufficient to complete all stages of the project design, including conservation, documentation and curation of recovered artefacts, and report preparation and dissemination.

Rule 18. The project design shall demonstrate an ability, such as by securing a bond, to fund the project through to completion.

Rule 19. The project design shall include a contingency plan that will ensure conservation of underwater cultural heritage and supporting documentation in the event of any interruption of anticipated funding.

VI. Project duration - timetable

Rule 20. An adequate timetable shall be developed to assure in advance of any activity directed at underwater cultural heritage the completion of all stages of the project design, including conservation, documentation and curation of recovered underwater cultural heritage, as well as report preparation and dissemination.

Rule 21. The project design shall include a contingency plan that will ensure conservation of underwater cultural heritage and supporting documentation in the event of any interruption or termination of the project.

VII. Competence and qualifications

Rule 22. Activities directed at underwater cultural heritage shall only be undertaken under the direction and control of, and in the regular presence of, a qualified underwater archaeologist with scientific competence appropriate to the project.

Rule 23. All persons on the project team shall be qualified and have demonstrated competence appropriate to their roles in the project.

VIII. Conservation and site management

Rule 24. The conservation programme shall provide for the treatment of the archaeological remains during the activities directed at underwater cultural heritage, during transit and in the long term. Conservation shall be carried out in accordance with current professional standards.

Rule 25. The site management programme shall provide for the protection and management *in situ* of underwater cultural heritage, in the course of and upon termination of fieldwork. The programme shall include public information, reasonable provision for site stabilization, monitoring, and protection against interference.

IX. Documentation

Rule 26. The documentation programme shall set out thorough documentation including a progress report of activities directed at underwater cultural heritage, in accordance with current professional standards of archaeological documentation.

Rule 27. Documentation shall include, at a minimum, a comprehensive record of the site, including the provenance of underwater cultural heritage moved or removed in the course of the activities directed at underwater cultural heritage, field notes, plans, drawings, sections, and photographs or recording in other media.

X. Safety

Rule 28. A safety policy shall be prepared that is adequate to ensure the safety and health of the project team and third parties and that is in conformity with any applicable statutory and professional requirements.

XI. Environment

Rule 29. An environmental policy shall be prepared that is adequate to ensure that the seabed and marine life are not unduly disturbed.

XII. Reporting

Rule 30. Interim and final reports shall be made available according to the timetable set out in the project design, and deposited in relevant public records.

Rule 31. Reports shall include:

(a) an account of the objectives;

(b) an account of the methods and techniques employed;

(c) an account of the results achieved;

(d) basic graphic and photographic documentation on all phases of the activity;

(e) recommendations concerning conservation and curation of the site and of any underwater cultural heritage removed; and

(f) recommendations for future activities.

XIII. Curation of project archives

Rule 32. Arrangements for curation of the project archives shall be agreed to before any activity commences, and shall be set out in the project design.

Rule 33. The project archives, including any underwater cultural heritage removed and a copy of all supporting documentation shall, as far as possible, be kept together and intact as a collection in a manner that is available for professional and public access as well as for the curation of the archives. This should be done as rapidly as possible and, in any case, not later than ten years from the completion of the project, in so far as may be compatible with conservation of the underwater cultural heritage.

Rule 34. The project archives shall be managed according to international professional standards, and subject to the authorization of the competent authorities.

XIV. Dissemination

Rule 35. Projects shall provide for public education and popular presentation of the project results where appropriate.

Rule 36. A final synthesis of a project shall be:

(a) made public as soon as possible, having regard to the complexity of the project and the confidential or sensitive nature of the information; and

(b) deposited in relevant public record

The foregoing is the authentic text of the Convention duly adopted by the General Conference of the United Nations Educational, Scientific and Cultural Organization during its thirty-first session, which was held in Paris and declared closed the third day of November 2001.
IN WITNESS WHEREOF we have appended our signatures this 6th day of November 2001.
Done in Paris this 6th day of November 2001 in two authentic copies bearing the signature of the President of the thirty-first session of the General Conference and of the Director-General of the United Nations Educational, Scientific and Cultural Organization, which shall be deposited in the archives of the United Nations Educational, Scientific and Cultural Organization and certified true copies of which shall be delivered to all the States and territories referred to in Article 26 as well as to the United Nations.

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Le texte qui précède est le texte authentique de la Convention dûment adoptée par la Conférence générale de l'Organisation des Nations Unies pour l'éducation, la science et la culture à sa trente-et-unième session, qui s'est tenue à Paris et qui a été déclarée close le troisième jour de novembre 2001.
EN FOI DE QUOI ont apposé leur signature, ce 6ème jour de novembre 2001.
Fait à Paris ce sixième jour de novembre 2001, en deux exemplaires authentiques portant la signature du Président de la Conférence générale réunie en sa trente-et-unième session, et du Directeur général de l'Organisation des Nations Unies pour l'éducation, la science et la culture, qui seront déposés dans les archives de l'Organisation des Nations Unies pour l'éducation, la science et la culture, et dont les copies certifiées conformes seront remises à tous les États et territoires visés à l'article 26 ainsi qu'à l'Organisation des Nations Unies.

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Lo anterior es el texto auténtico de la Convención aprobada en buena y debida forma por la Conferencia General de la Organización de las Naciones Unidas para la Educación, la Ciencia y la Cultura, en su trigésimo primera reunión, celebrada en París y terminada el tres de noviembre de 2001.
EN FE DE LO CUAL estampan sus firmas, en este día 6 de noviembre de 2001.
Hecho en París en este día seis de noviembre de 2001, en dos ejemplares auténticos que llevan la firma del Presidente de la Conferencia General, en su trigésimo primera reunión, y del Director General de la Organización de las Naciones Unidas para la Educación, la Ciencia y la Cultura, ejemplares que se depositarán en los archivos de esta Organización, y cuyas copias certificadas conformes se remitirán a todos los Estados y territorios a que se refiere el Artículo 26, así como a las Naciones Unidas.

APPENDIX III: AUTHORS‘ BIOGRAPHIES AND CONTACT EMAILS

Mariano J. Aznar, Spain

Mariano J. Aznar is Professor of Public International Law at the University Jaume I. His interest in UCH began when Spain faced the first international judicial cases against treasure hunters, which coincided with negotiations leading to the adoption of the UNESCO Convention on the Protection of the Underwear Cultural Heritage in 2001. He has advocated and counselled Spain before the International Tribunal for the Law of the Sea in the M/V Louisa case; published and lectured widely aimed at improving legal and policy frameworks; represented Spain during UNESCO Meetings of States Parties; participated in UNESCO meetings and missions and co-authored the 2001 Convention’s Operational Guidelines and the Green Book for the Protection of Spanish Underwater Cultural Heritage. He is also a Patron of the Spanish National Museum of Underwater Cultural Heritage and member of ICOMOS/ICUCH.

Contact e-mail: maznar[at]uji.es

Helena Barba Meinecke, Mexico

Helena Barba Meinecke is a Mexican archaeologist who graduated from the National School of Anthropology and History (ENAH) of the National Institute of Anthropology and History (INAH). She has a Master‘s Degree in Nautical and Underwater Archaeology from the International School for the Doctorate in Sea Studies (EIDEMAR), University of Cadiz (UCA), Spain. She is a researcher at the Sub-direction of Underwater Archaeology, responsible for the Yucatan Peninsula office (SAS-INAH); Mexico representative to the 2001 UNESCO Convention on the Protection of the Underwater Cultural Heritage; a member of its Scientific and Technical Advisory Board (STAB), having previously been its president. She is also a member of the Bureau of the International Committee on the Underwater Cultural Heritage (ICOMOS-ICUCH) and coordinator of the Scientific Committee on Underwater Cultural Heritage of the Mexican ICOMOS A.C.

Contact e-mail: helena_barba[at]inah.gob.mx

Kurt Bennett, New Zealand

Kurt Bennett holds an MA in maritime archaeology and is a PhD candidate at Flinders University, South Australia. He has wide ranging experience working in the Australasian region, both in consulting and academic research, and has collaborated on several different international maritime projects. Kurt is an active member of the archaeological community in Australasia, serving as a council member for the Australasian Institute for Maritime Archaeology as well as a previous council member for the New Zealand Archaeological Association. Kurt's research more generally focuses on watercraft from the eighteenth to nineteenth centuries, with specific interests in shipwright behaviour, technology, hull assembly, vessel development and abandonment studies.

Contact e-mail: kurt.bennett[at]flinders.edu.au

Matthew Carter, New Zealand

Matthew Carter is a marine archaeologist and holds a PhD, MA and BA in archaeology. He is the Research Director for the Major Projects Foundation, a Vice-President of the Australasian Institute for Maritime Archaeology and an Honorary Associate of the Department of Archaeology and History at La Trobe University. Matt is also an International Fellow of the Explorers Club and has worked on commercial and academic archaeological projects in 12 different countries around the world. Today Matt's work sees him combining his archaeological training and commercial and technical diving qualifications to protect marine ecosystems threatened by legacy shipwrecks in the Pacific Ocean. He is also an Associate member of ICOMOS-ICUCH and represents ICUCH on ICOMOS' Emerging Professionals Working Group.

Contact e-mail: matt.carter[at]majorprojects.org.au

Christophe Delaere, Belgium

Christophe Delaere is a researcher with a PhD in Archaeology from the Université libre de Bruxelles - ULB. He is currently a Junior Research Fellow at the Oxford Centre for Maritime Archaeology (OCMA) of the University of Oxford and a research associate at the Centre de Recherches en Archéologie et Ratrimoine (CReA). Since 2007 he has been conducting research in the Bolivian and Peruvian Andes where from 2012 has been the Principal Investigator leading an underwater archaeological excavation project at Lake Titicaca. He also specializes in the archaeology of inland waters — lakes and rivers — and collaborates in coastal and inland water archaeology programmes in different cultural contexts.

Contact e-mail: cdelaere[at]ulb.ac.be

Stella Demesticha, Cyprus

Stella Demesticha is an Associate Professor of Maritime Archaeology at the Department of History and Archaeology, University of Cyprus. She specializes in maritime archaeology, with a focus on shipwrecks, maritime transport containers, ancient seaborne trade routes and economy in the eastern Mediterranean. In 2011 she created the Maritime Archaeological Research Laboratory (MARELab) at the Archaeological Research Unit of the University of Cyprus, through which she conducts her fieldwork. She has worked for more than 20 years in Greece and Cyprus where she has directed many underwater field projects. She is Cyprus's representative in ICOMOS/ICUCH.

Contact e-mail: demesticha[at]ucy.ac.cy

Anna Demetriou, Cyprus

Anna Demetriou is a Research Fellow at the Maritime Research Laboratory (MARELab) of the University of Cyprus. She holds a BA in Archaeology, a MA in Management of Archaeological Sites, and a PhD in Maritime Archaeology. She has participated in terrestrial archaeological projects in Cyprus and Greece, and has undertaken the preparation of museum exhibitions in Cyprus and the United Kingdom. Since 2008, she has been involved in different aspects of maritime cultural heritage through her engagement in several underwater archaeological projects in Cyprus, and the development and implementation of a number of educational and community programmes. Her particular research interests focus on the examination of ancient shipwreck sites as places of interaction and engagements in contemporary society.

Contact e-mail: ademet18[at]ucy.ac.cy

Somasiri Devendra, Sri Lanka

After University (1955), a career in the Sri Lanka Navy and in mercantile service Somasiri Devendra introduced maritime archaeology to Sri Lanka, serving as National Team leader in every activity in the country. He was appointed to ICUCH, and participated in drafting the ICOMOS Charter and the UNESCO Convention, conducting international workshops and served on UNESCO and ICUCH activities internationally. He was Archaeologist on Feasibility and Environmental Impact Studies into all major port development and also researched vernacular watercraft. He was awarded the title of "Guardian of the Heritage" by the Ministry of National Heritage (2014) and the inaugural "Roland Silva Memorial Medal" for his contribution to the Cultural Heritage by ICOMOS Sri Lanka (2020).

Contact e-mail: somasiridevendra1[at]gmail.com

Christopher Dobbs, United Kingdom

Christopher Dobbs started his career in 1978 on the Kennemerland and Salcombe sites, moving to the Mary Rose in 1979 where he was one of the main archaeological supervisors. He transferred to the Salvage Diving Team in 1982 to carry out the raising, successfully achieved in 1982. For the last 15 years he has been working on the re-opening museum as Head of Interpretation and Maritime Archaeology at the Mary Rose Trust.
He has been lecturing on Museology for over 20 years, both at universities and for UNESCO workshops including in China, Chinese Taipei, Egypt Cambodia and Peru. He was instrumental to the expansion of the NAS Training Scheme in the early years. He is the UK representative on ICUCH and a Vice-President of the NAS.

Contact e-mail: chrisdobbs[at]talktalk.net

Dolores Elkin, Argentina

Dolores Elkin is an Argentinean archaeologist and a professional scientific diver who holds a research position at the country's national research agency (CONICET). She graduated with a doctoral degree from the University of Buenos Aires in 1996, and since then has developed the first underwater archaeology programme in the country, based at the National Institute of Anthropology and Latin American Thought (INAPL). She is a professor at the University of Buenos Aires where she teaches a Seminar on Costal and Underwater Archaeology. She is a member of ICUCH as well as the Scientific and Technical Advisory Body to the UNESCO 2001 Convention.

Contact e-mail: lolielkin[at]hotmail.com

Albert Hafner, Switzerland

Albert Hafner is Professor for Prehistoric Archaeology at the Institute of Archaeological Sciences of the University of Bern. He holds a PhD in prehistoric archaeology of the University of Freiburg, Germany, and a habilitation from the University of Zurich, Switzerland. Between 1988 and 2011, he was member of the diving team of the Archaeological Service of the Canton of Bern. He led numerous large-scale rescue excavations and in-situ protective measures in threatened lakeshore settlements of the Neolithic and Bronze Age in lakes of the Swiss Plateau. In 2011, he played a leading role in the successful submission of the UNESCO World Heritage candidacy „Prehistoric Pile Dwellings around the Alps". In recent years, Albert Hafner carried out several third-party funded (SNSF, ERC) research projects in the field of underwater and wetland archaeology as well as dendrochronology, in cooperation with institutions from Russia, Ukraine, Greece, Albania and North Macedonia. He is the ICUCH representative of ICOMOS Switzerland.

Contact e-mail: albert.hafner[at]iaw.unibe.ch

Andrej Gaspari, Slovenia

Andrej Gaspari is a PhD in archaeological sciences. As an experienced archaeologist-diver and the head of the expert Underwater archaeology workgroup at the Institute for the protection of Cultural Heritage of Slovenia, he intensively engaged in the research and management of underwater sites in continental water and maritime domain. Currently holds a position as an associate professor for the Roman Archaeology at the Department of Archaeology at the University of Ljubljana. His tasks during previous employment at the Ministry of Culture included the assessment of challenges in the field of preventive archaeology and the development of the sectoral policies. His bibliography counts over 180 scientific and professional publications and public lectures from different fields, including the ancient Mediterranean and continental shipbuilding traditions, Late Prehistoric and Roman votive practices, and management of (underwater) archaeological heritage. From 2007 he is a slovenian representative in the ICOMOS/ICUCH.

Contact e-mail: andrej.gaspari[at]ff.uni-lj.si

Akifumi Iwabuchi, Japan

Akifumi Iwabuchi is professor of maritime anthropology and archaeology at Tokyo University of Marine Science and Technology in Japan, which is a member institution of the UNESCO UNITWIN Network for Underwater Archaeology. He holds a PhD from the University of Oxford, U.K. He is the ICOMOS/ICUCH national representative for Japan, officially acknowledged by ICOMOS Japan. He is also the vice-president of the Japan Society for Nautical Research, a director of the Asian Research Institute of Underwater Archaeology, or a director of the Japan Maritime Promotion Forum. He has published numerous books and papers upon cultural heritage in English, in Bahasa Indonesia, and in Japanese, including the first introductory book to the 2001 UNESCO Convention in his native language.

Contact e-mail: iwabuchi[at]kaiyodai.ac.jp

Jun Kimura, Japan

Dr. Jun Kimura is a maritime archaeologist and a member of the faculty of the Dept. of Maritime Civilizations at Tokai University; Research Fellow of the Asia Research Centre at Murdoch University, 2012 -2014 and of the Field Museum, Chicago, 2014-2015. He is a member of Japan's national advisory committee for the investigation and protection of underwater archaeological sites. His extensive field experience includes naval battlefields related to the Kublai Khan's 13th century invasions of Japan and Vietnam. His current research interests include the shipwreck archaeology of the Maritime Silk Routes and leading a project about the San Francisco, a Manila Galleon sunken in Japanese waters. Kimura's major publications are *Naval Battlefield Archaeology of the Lost Kublai Khan Fleets* and *Archaeology of East Asian Shipbuilding Tradition*.

Contact e-mail: junkimura[at]tsc.u-tokai.ac.jp

CAYMAN ISLANDS NATIONAL MUSEUM

Margaret E. Leshikar-Denton, Cayman Islands

Margaret E. Leshikar-Denton is Director of the Cayman Islands National Museum. She holds a BFA, an MA, and a PhD in anthropology (nautical archaeology). She is past chair of the SHA UNESCO Committee, and a research associate with Ships of Discovery and INA. She serves on ICOMOS ICUCH (former Secretary) and as emeritus ACUA member. Margaret served on the ICOMOS delegation during development of the 2001 UNESCO Convention. She co-edited *Underwater and Maritime Archaeology in Latin America and the Caribbean* (WAC 2008) and contributed to the *Oxford Handbook of Underwater Archaeology* (2011), *Caribbean Heritage* (UWI 2012), and *Encyclopedia of Caribbean Archaeology* (UPF 2014). Her most recent book is *Cayman's 1794 Wreck of the Ten Sail: Peace, War, and Peril in the Caribbean* (UAP 2020).

Contact e-mail: leshikar[at]candw.ky

Le Thi Lien, Vietnam

Le Thi Lien, holding a MA in Indian Archaeology and ancient history, and PhD in Vietnamese archaeology, worked in the Institute of Archaeology (VASS) from 1985 to 2017. She is now scientific advisor for IA and executive member of VAA. As Cultural Officer of UNESCO Office Hanoi (2008), founding head of Underwater Archaeology Department of IA (2013), executive member of IPPA (2009-2018) and ICUCH-ICOMOS, editing board member of SPAFA Journal and member of VMAP, she contributes great efforts in collaboration with international institutions and researchers to organize research, training, conference and publication activities on underwater archaeology and maritime cultural heritage in Vietnam and Southeast Asia. Her publications focused mainly on Buddhist and Hindu art, early state formation and maritime archaeology in Vietnam.

Contact e-mail: lelienthi10[at]gmail.com

Rijksdienst voor het Cultureel Erfgoed
Ministerie van Onderwijs, Cultuur en Wetenschap

Martijn R. Manders, The Netherlands

Dr Martijn R. Manders is a maritime archaeologist and heritage manager for the Dutch government as well as an associate professor at the University of Leiden in the Netherlands. He is involved in the protection and management of the underwater cultural heritage for 30 years. Lately, a lot of his time is spent in the discussions about the commercial salvaging and looting of Second World War shipwrecks and the sovereignty of state-owned shipwrecks. As head of the maritime programme, he is leading a team of specialists that coordinate almost 1,600 shipwrecks outside of the Netherlands territory.

Contact e-mail: M.Manders[at]cultureelerfgoed.nl

Hakan Öniz, Turkey

Associate Professor Dr. Hakan Öniz graduated from the Department of Art History and Archaeology of the Eastern Mediterranean University, completing his Masters and PhD on Underwater Archaeology at Selcuk University of Konya-Turkey. He is a founder member and the first coordinator of the UNESCO UNITWIN Underwater Archaeology Network between 2012 and 2015. He is the head of the Mediterranean Underwater Cultural Heritage Division in the Mediterranean Civilizations Research Institute; head of the Department of Restoration and Conservation of Cultural Heritage and Director of the Underwater Archaeology Research Centre in Akdeniz University of Turkey. He is also secretary and bureau member of ICOMOS-ICUCH, nominated member of ICOMOS Turkey; a member of UNESCO-Turkey National Observation Committee on Underwater Archaeology and a member of CMAS' Scientific Committee.

Contact e-mail: hakan.oniz[at]gmail.com

Marnix Pieters, Belgium

Marnix Pieters, archaeologist and soil scientist, is currently research director of archaeology at the Flanders Heritage Agency (Agentschap Onroerend Erfgoed based in Brussels). He obtained his PhD at the Free University of Brussels (VUB) in 2002 with a dissertation on the material aspects of life in late medieval fishing communities in the southern part of the North Sea. From 2002 onwards a large part of his further scientific work is devoted to maritime archaeology in and along the Belgian part of the North Sea. Since 2013, he is Guest Professor at the Free University of Brussels with a master course on 'archaeology of coast and sea'. Member of ICUCH since 2007.

Contact e-mail: marnix.pieters[at]vlaanderen.be

James K. Reap, United States of America

James Reap holds a JD degree and is currently Professor and Coordinator of the Historic Preservation Program at the University of Georgia. He has served as both President and Secretary General of the ICOMOS International Committee on Legal, Administrative, and Financial issues and as an Officer of the ICOMOS Scientific Council. He is a board member of the U.S. Committee of the Blue Shield and past Board member of the Lawyers' Committee on Cultural Heritage Preservation, and the National Alliance of Preservation Commissions. He was a Fulbright Scholar in Jordan. His research interests include the legal, administrative and financial aspects of heritage conservation and he has conducted research in Central Asia, Africa, the Middle East and Southern Europe.

Contact e-mail: jreap[at]uga.edu

Lucy Semaan, Lebanon

Lucy Semaan is a maritime archaeologist in Lebanon. Involved in archaeology since 1996, Lucy was introduced to maritime archaeology primarily through the work and research of Honor Frost. She has been collaborating with the Honor Frost Foundation (HFF) in its capacity building initiatives, combining efforts with the Directorate of Antiquities, Ministry of Culture, Lebanon in order to contribute to the study, inventory, protection, conservation, and management of the country's maritime heritage. Over two decades, Lucy has participated in and run archaeological projects in Lebanon, Syria, Egypt, Cyprus, and Saudi Arabia. She also taught and lectured in maritime archaeology in Lebanon and abroad.

In 2015, Lucy was awarded a post-doctoral fellowship at the University of Balamand, Lebanon. Her post-doctoral research analysed the development and significance of the seascape of the ancient site of Anfeh, in North Lebanon. In 2017, she helped organise, set up, and teach in the first Nautical Archaeology Society (NAS) fieldschool held in Lebanon.

She holds a Bachelor's degree in Arts and Archaeology from the Lebanese University, a Master's degree in Maritime Archaeology from the University of Southampton (2007) and a PhD in Arab and Islamic studies with a focus on maritime archaeology from the University of Exeter (2014). She is currently a member of the bureau of the International Committee on the Underwater Cultural Heritage (ICUCH-ICOMOS).

Contact e-mail: lucysemaan[at]gmail.com

Arturo Rey da Silva, Spain

Arturo Rey da Silva is an international expert in management and protection of cultural heritage specialized in Maritime and Underwater Archeology at the University of Southampton (United Kingdom). Since 2011 he has worked for UNESCO either for the Secretariat of the 2001 Convention on the Protection of Underwater Cultural Heritage in Paris (France), or for several UNESCO Field Offices (notably in Africa, the Arab region, Central Asia and Latin America) giving technical assistance to Member States as well as coordinating regional workshops, and capacity-building activities in maritime and underwater cultural heritage research, management and protection. A. Rey da Silva is also a guest lecturer in several University programmes and is involved in several international projects focusing on the importance of maritime and underwater cultural heritage in the establishment of sustainable development policies and regional capacity development processes. Currently, he combines this teaching and technical assistance work, with doctoral research at the University of Paris I Panthéon-Sorbonne (France), carrying out a research fellowship at the Spanish School for History and Archaeology in Rome (Italy).

Contact e-mail: a.reydasilva[at]gmail.com

Irena Šinkovec, Slovenia

Irena Šinkovec is an archaeologist and a curator at the Museum and Galleries of Ljubljana and the head of the Ljubljanica River project, which was co-financed by the EEA Grants (Vrhnika, 2015-2016). Her special topics are the pre-urban settlement of the Ljubljana basin, the pile dwellings from the Ljubljana Marshes, the underwater heritage of the Ljubljanica River and the museum underwater collections. Her work is marked by more complex projects of cultural heritage presentation, especially in connecting cultural and natural heritage with sustainable development, active involvement of civil society and environmental protection. Among exhibition projects stand out *Slovenian history at Ljubljana Castle* (2010), *The wheel/5.200 years* (2013) and *Voda/Water* (2015) in City museum of Ljubljana and *The Ljubljanica River at Vrhnika* (2016).

Contact e-mail: irena.sinkovec[at]mgml.si

Hans K. Van Tilburg, United States of America

Hans Van Tilburg is the maritime heritage coordinator for NOAA's Marine Sanctuary Office in the Pacific Islands region, as well as a NOAA unit diving supervisor. He has served as principal investigator for over 30 UCH site projects throughout the Hawaiian archipelago, American Samoa and Alaska, including diving, ROV and manned submersible operations. Hans Van Tilburg has a BA in geography, MA in Maritime History and Nautical Archaeology, and PhD in history (Asia-Pacific region), and ran the graduate certificate program in maritime archaeology at the University of Hawaii for six years. Internationally, he has served as a co-instructor for UNESCO UCH Foundation courses and co-chairs the Asia Pacific Regional Conference on Underwater Cultural Heritage series. He is a member of US ICOMOS/ICUCH.

Contact e-mail: hans.vantilburg[at]noaa.gov

ÁRPÁD MÚZEUM
RÁCKEVE

Attila Tóth, Hungary

Attila Tóth is an archaeologist of the Árpád Museum of Ráckeve and visiting lecturer at the Peter Pázmány Catholic University. He holds a PhD in archaeology and has experiences in the field of inland water archaeology (rivers and lakes). He coordinates activities of civilian organisations through community archaeology, public meetings, festivals through the Hungarian Archaeological and Art Historical Society, the Argonauts Research Group and the ICOMOS Hungarian National Commission. His prime field of interest is the research of rivers under the water and in a wider river environment, study of river islands, shipmills, traces of river (and lake) environmental changes and their relation to local communities. Attila is also an expert member of ICUCH.

Contact e-mail: roncsok[at]yahoo.com

Assam University
Silchar (India)

Alok Tripathi, India

Prof. Alok Tripathi is a distinguished archaeologist and pioneer underwater archaeologist in India. He founded the Underwater Archaeology Wing in the Archaeological Survey of India and has directed several underwater archaeological excavations in the Arabian Sea as well as in the Bay of Bengal. The most experienced underwater archaeologist in the country, he has worked as resource person in UNESCO Asia-Pacific field schools for underwater archaeology in Sri Lanka. He holds equal authority in museology, art-history, heritage management, art and architecture, remote sensing, and laws, and is the only social-scientist, listed among the ten brightest young scientists in the country. Since 2009, he is a Professor at Assam University, Silchar and presently the Director at Centre for Archaeology and Museology. Since 2003, he is representing India in ICOMOS/ICUCH.

Contact e-mail: alok.asi[at]gmail.com

Christopher J. Underwood, United Kingdom

Dr Chris Underwood is a maritime archaeologist and member of Argentina's National Institute of Anthropology's underwater archaeology research team. His current interests are focused on projects in Tierra del Fuego, southern Argentina; in particular the search for and identification of the wreck site of the Spanish vessel Purisima Concepción lost in 1765. Chris is also consultant to the Center for Ocean and Undersea Technology Research, Tamkang University, Chinese Taipei providing advice on the development of underwater archaeology capacity building programmes; currently President of ICOMOS' International Committee on the Underwater Cultural Heritage (ICUCH); visiting lecturer at the University of Buenos Aires; member of the editorial board of the peer reviewed *Journal of Maritime Archaeology,* and is a Fellow of the Nautical Archaeology Society.

Contact e-mail: cju[at]hotmail.co.uk

Andrew Viduka, Australia

Andrew Viduka is a maritime archaeologist and archaeological objects conservator who is a PhD candidate at the University of New England and a Research Associate of Flinders University. He is employed by the Australian Government as the Assistant Director Maritime and Commonwealth Heritage and co-drafted the Australian Government's Underwater Cultural Heritage Act 2018 and leads Australia's consideration of ratification of the UNESCO 2001 Convention on the Protection of the Underwater Cultural Heritage. As the Australian Government senior maritime heritage manager, Andrew leads Australia's national underwater cultural heritage program which protects approximately 8000 sites in Australian waters. Andrew's research interest revolves around linking community outcomes with the discovery and protection of underwater cultural heritage. In 2018, he founded the citizen science project *Gathering Information via Recreational and Technical* (GIRT) Scientific Divers. Andrew is a keen diver, an ICOMOS – ICUCH member, and a Fellow of the Society of Antiquaries.

Contact e-mail: aviduka[at]myune.edu.au

Vladas Žulkus, Lithuania

Vladas Žulkus is an underwater archaeologist, the principal research fellow and professor at the Institute of Baltic Region History and Archaeology of Klaipėda University. He was a member of the Scientific and Technical Advisory Body of the 2001 Convention (2010-2019), member of the Working group of Underwater Cultural heritage–Baltic Sea Region (2011-2019). He is a member of the ICOMOS/ICUCH, member of the UN Pool of Experts for the second cycle of the Regular Process for Global Reporting and Assessment of the State of the Marine Environment (2016-2020), since 2018. He has published many articles in the field of underwater archaeology.

Contact e-mail: vladas.maritime[at]gmail.com

ICOMOS

ICOMOS is a non-governmental, not-for-profit international organization committed to furthering the conservation, protection, use and enhancement of the world's cultural heritage.
Founded in 1965, ICOMOS is dedicated to the development of common doctrines, the evolution and circulation of knowledge, the creation of improved conservation techniques, and the promotion of cultural heritage significance.

ICOMOS has built a solid philosophical, doctrinal, and managerial framework for the sustainable conservation of heritage around the world. As an official advisory body to the World Heritage Committee for the implementation of the UNESCO World Heritage Convention, ICOMOS evaluates nominations and advises on the state of conservation of properties inscribed on the World Heritage List. ICOMOS' world-wide network of individual and institutional members, covering a broad range of professions and specializations in its field of work, is organized into National Committees and International Scientific Committees.

ICOMOS

international council on monuments and sites