The Future by the Sea: Engaging with Maritime Archaeological Research during the Climate Emergency

About Access Archaeology

Access Archaeology offers a different publishing model for specialist academic material that might traditionally prove commercially unviable, perhaps due to its sheer extent or volume of colour content, or simply due to its relatively niche field of interest. This could apply, for example, to a PhD dissertation or a catalogue of archaeological data.

All *Access Archaeology* publications are available as a free-to-download pdf eBook and in print format. The free pdf download model supports dissemination in areas of the world where budgets are more severely limited, and also allows individual academics from all over the world the opportunity to access the material privately, rather than relying solely on their university or public library. Print copies, nevertheless, remain available to individuals and institutions who need or prefer them.

The material is refereed and/or peer reviewed. Copy-editing takes place prior to submission of the work for publication and is the responsibility of the author. Academics who are able to supply print-ready material are not charged any fee to publish (including making the material available as a free-to-download pdf). In some instances the material is type-set in-house and in these cases a small charge is passed on for layout work.

Our principal effort goes into promoting the material, both the free-to-download pdf and print edition, where *Access Archaeology* books get the same level of attention as all of our publications which are marketed through e-alerts, print catalogues, displays at academic conferences, and are supported by professional distribution worldwide.

The free pdf download allows for greater dissemination of academic work than traditional print models could ever hope to support. It is common for a free-to-download pdf to be downloaded hundreds or sometimes thousands of times when it first appears on our website. Print sales of such specialist material would take years to match this figure, if indeed they ever would.

This model may well evolve over time, but its ambition will always remain to publish archaeological material that would prove commercially unviable in traditional publishing models, without passing the expense on to the academic (author or reader).

The Future by the Sea

Engaging with Maritime Archaeological Research during the Climate Emergency

Katerina Velentza and Brandon Braun

Access Archaeology

Archaeopress Access Archaeology

Archaeopress Publishing Ltd
13-14 Market Square
Bicester
Oxfordshire OX26 6AD
United Kingdom

www.archaeopress.com

ISBN 978-1-80583-294-2
ISBN 978-1-80583-295-9 (e-Pdf)

Cover: Koufonisia boatyard activity, April 2023 (© Archipelago Network)

This book is available direct from Archaeopress or from our website www.archaeopress.com

Contents

Acknowledgements

This book is an output of the project '*Re-imagining the use of traditional watercraft in the Aegean Sea for a sustainable environment and economy*', which was led by Dr Katerina Velentza in the University of Helsinki with funding from the Kone Foundation (*Koneen Säätiö*, grant no. 202010870). We would like to thank the Kone Foundation for their financial support, as well as their dedication and enthusiasm in supporting bold multidisciplinary, interdisciplinary and transdisciplinary projects that promote academic research, culture and the arts.

Our thanks also go to Professor Kristin Ilves and the team at the Archaeology Unit of the Department of Cultures of the University of Helsinki for hosting the project from 2021 to 2024. Your support and input have been essential in the development of the project and the creation of this book. We are also deeply grateful to our friends and colleagues Dr Veronica Walker Vadillo and Dr Emilia Mataix Ferrándiz for their encouragement in creating this book and inspiration from their thought-provoking interdisciplinary edited volumes. Thank you for all your support in Helsinki.

We would also like to express our gratitude to all the colleagues who peer reviewed the chapters of this book, providing crucial constructive feedback to turn a series of individual papers into this cohesive edited volume that presents cutting-edge maritime archaeological projects during and for the climate emergency that we are all currently experiencing. Your expertise and contribution have been invaluable. This book would not be possible without the assistance of the publishing team in Archaeopress. Thank you, for being extremely supportive and patient with the long process of collating an edited volume.

A big thanks also goes to our current work colleagues, for Katerina at the Energy and Environment Institute of the University of Hull, and for Brandon the Historic Environment Team at Shropshire Council. Our daily work and conversations have shaped our ideas and influenced the creation of this book.

Finally, we are grateful to all our wonderful authors for their hard work. Thank you for your amazing projects and passion in addressing climate change through your archaeological research!

The book editors,

Katerina and Brandon

List of Figures

Chapter 1

Chapter 2

Figure 6.4: Photographic archives of the Fuerte de San José archaeological site between 2017 and 2022. Copyright: Colaborartorio Azul.

Chapter 7

Figure 7.1: Kaiki at Linaria, Skyros, in 1928. Copyright: Georgios Vafiadakis, Digital Collections of the Hellenic Literary and Historical Archive (ELIA), CC BY 4.0.

Figure 7.2: Map of the Aegean Sea, in the eastern Mediterranean, between Greece and Türkiye. Copyright: Katerina Velentza.

Figure 7.3: Postcard with photograph of kaikia exiting the port of Kalamata, 1912. Copyright: Digital Collections of the Hellenic Literary and Historical Archive (ELIA), CC BY 4.0.

Figure 7.4: Fishing boat at Stylida, 20th century. Copyright: Digital Collections of the Hellenic Literary and Historical Archive (ELIA), CC BY 4.0.

Figure 7.5: Picture of contemporary fishing kaiki with inboard engine at Ormos Marathokampou, Samos, Greece, in 2022. Copyright: Katerina Velentza.

Figure 7.6: Passengers on a kaiki off the island of Skyros, in 1940. Copyright: Digital Collections of the Hellenic Literary and Historical Archive (ELIA), CC BY 4.0.

Figure 7.7: People on a kaiki. Copyright: United Photojournalists Agency Athens, Pesmazoglou Arcade; from the Digital Collections of the Hellenic Literary and Historical Archive (ELIA), CC BY 4.0.

Figure 7.8: Fishermen loading their nets on a kaiki, 1930. Copyright: Frédéric Boissonnas, Digital Collections of the Hellenic Literary and Historical Archive (ELIA), CC BY 4.0.

Figure 7.9: Greek Orthodox Epiphany celebration (6th of January). Devouts on boats watch the sanctificantion of the waters at Thessaloniki, 1919. Copyright: Digital Collections of the Hellenic Literary and Historical Archive (ELIA), CC BY 4.0.

Figure 7.10: Postcard with photograph of the port of Kavala, 1972. Traditional sailing kaikia, kaikia with inboard engines, and modern ferries visible. Copyright: Public Benefit Organisation of Kavala 'Dimofelia', CC BY-NC-SA 4.0.

Figure 7.11: Destruction of the kaiki 'Alekos' with government subsidies at the island of Syros, Greece, in 2018. Copyright: Georgia Papadimitriou.

Figure 7.12: Destruction of the kaiki 'Analipsi' with government subsidies at the island of Syros, Greece, in 2018. Copyright: Georgia Papadimitriou.

Figure 7.13: Member of the photographer's family travelling on a kaiki, c.1900. Copyright: Michail Veloudios, Digital Collections of the Hellenic Literary and Historical Archive (ELIA), CC BY 4.0.

Figure 7.14: Fishermen on a kaiki, off the island of Psara, 1961. Copyright: Dimitris Papadimos, Digital Collections of the Hellenic Literary and Historical Archive (ELIA), CC BY 4.0.

Figure 7.15: Map of active and old/not active shipyards at Samos. Copyright: Katerina Velentza.

Chapter 8

List of Tables

Authors

Daniela Acosta Romero

Anthropologist and final year student in archaeology at the Externado University of Colombia. She has experience in archaeological and historical research, as well as processes related to the management and protection of cultural heritage, cultural resource management, and community initiatives. Daniela has participated in international courses and projects associated with maritime and underwater cultural heritage.

Jesús Aldana Mendoza

Archaeologist specialising in submerged cultural heritage and underwater archaeology, with experience in research, management, and dissemination of maritime heritage in Colombia. His work focuses on the protection of submerged archaeological contexts, including the development of protocols, safeguarding strategies, and management tools, with growing attention to climate change impacts on maritime and coastal cultural landscapes. He has participated in interdisciplinary projects with national cultural and maritime authorities, contributing to studies of maritime cultural landscapes in the Caribbean. He has published and presented research internationally and has professional diving training (PADI Open Water and Advanced Open Water), supporting fieldwork and climate-related monitoring of submerged heritage.

L.Victoria Báez Santos

Archaeologist with a Master's degree in Techniques, Heritage, and Industrial Territories (TPTI) from Paris 1 Panthéon-Sorbonne University, the University of Padua, and the University of Évora (Erasmus Mundus scholar). Her professional experience focuses on research and management of archaeological and maritime heritage in Colombia, with a strong emphasis on the impacts of climate change on submerged and coastal cultural heritage. She has developed methodologies for documentation, risk assessment, and climate monitoring, integrating digital tools such as photogrammetry for heritage protection. She currently works at the Colombian Institute of Anthropology and History in the field of applied heritage technologies and submerged cultural heritage.

Brandon Braun

Brandon has a PhD in Archaeology from the Cotsen Institute of Archaeology at the University of California, Los Angeles (UCLA). He has worked in academic and development-funded archaeology in Greece, Estonia and the United Kingdom, and is currently a county archaeologist providing expert advice for Shropshire Council in the UK. Brandon's primary research interest is commemoration in landscapes, including maritime cultural landscapes. He is also interested in the impact of climate change on cultural heritage, as well as the potential of heritage-led approaches to support climate adaptations, mitigations, and resilience.

Fernando Cadena Duque

Rescue Diver and Master Diver of the Colombian Navy. Fernando also works as a recreational and technical diving instructor certified by PADI, TDI, SDI, and DAN, with specialisations in deep diving,

decompression diving, diving in marine protected environments, and mixed gases. His work includes coordinating maritime operations at the Rosario and San Bernardo Coral National Natural Park, conducting underwater environmental conservation and research tasks. He is also involved in the design, planning, and installation of underwater signalling elements, as well as research surveys in archaeological sites and areas dedicated to the conservation of submerged cultural heritage.

Gabriela Caro León

Social sciences and cultural heritage professional with five years of experience in research, historical preservation, and participatory archaeology. She has a background in industrial and contemporary heritage in Cartagena de Indias and Bogotá D.C., and holds certifications in Photogrammetry (generation and quality control of cartographic products), GIS Applications for Archaeology with an environmental focus, and Audiovisual Heritage Management. She has contributed to projects on climate change, urban development, and the evolution of industrialisation processes, as well as integrating academic research with community engagement. She is skilled in project coordination, interdisciplinary research, and collaborative teamwork, and currently works as a researcher in museum, urban, and heritage projects.

Carlos Del Cairo Hurtado

Anthropologist and maritime archaeologist with extensive experience in submerged and coastal cultural heritage research, management, and training. His work focuses on maritime cultural landscapes in Colombia, with increasing emphasis on the impacts of climate change on coastal fortifications, shipwrecks, and traditional maritime practices. He has collaborated with national and international institutions, including UNESCO and the Colombian Ocean Commission, contributing to policy, capacity building, and heritage governance. As a professor and graduate coordinator, he promotes climate-aware approaches to maritime archaeology, integrating traditional navigation knowledge, underwater research, and risk assessment to support the long-term protection of vulnerable coastal and submerged heritage.

Sirine Saad ElDine Ghiye

Sirine is an archaeologist at the General Directorate in Antiquity-Lebanon since 2019 working in maritime missions in Lebanon and abroad. In 2023 she's graduated as Diploma student from the Ulster University programme in Remote Sensing and GIS. Her research focuses on studying climate change using different type of satellite and GIS tools in order to monitor and understand how it impacts maritime archaeological sites.

Deanna Groom

Deanna Groom is a maritime archaeologist who returned, as a mature student, to undertake a programme of PhD research at the School of Ocean Sciences, Bangor University in 2020. Her previous work experience includes undertaking historical research to populate shipwreck and aircraft downed at sea records within the maritime sites and monuments records of Scotland and Wales. She has also worked on the Unpath'd Waters Project at Bangor University (e.g., SS Florrieston https://storymaps.arcgis.com/stories/256a6c01665248e796be6a66b1028128) and undertook an update of the Guide to Good Practice in Marine Survey for the Archaeological Data Service (ADS https://guides.archaeologydataservice.ac.uk/marine/).

José Manuel Matés Luque

Luque, as he is widely known, is a maritime archaeologist and, currently, PhD candidate at the University of Basque Country focusing on maritime and intertidal archaeology in the Basque Country. He has directed some projects like the opening of the Deusto Canal or the landing of transatlantic submarine cables in Bizkaia (Spain). He is a NAS tutor and a freelance archaeologist at www.arqueocean.com offering consultant services for civil engineering projects both on land and in the maritime environment.

Jacob Moe

Jacob Moe is a documentarian and heritage professional with a BA in Politics (Pomona College) and an MFA in Social Documentation (UC Santa Cruz). He is Co-founder of the Syros International Film Festival, as well as Founder and Director of Archipelago Network, an initiative for research and documentation of material knowledge and audiovisual culture in the Cyclades islands. His research practice involves community media, radio and film documentary work, with a focus on peer-to-peer methodologies for knowledge building in island communities.

Carla Riera Andreu

Conservator-restorer of cultural heritage specialising in underwater and maritime archaeology, with a strong focus on *in situ* conservation under changing environmental conditions. Her research addresses the effects of climate change (such as corrosion, sediment dynamics, and biological growth) on submerged archaeological materials, particularly metals and organic remains. She has extensive international training in underwater conservation through the Nautical Archaeology Society. As a lecturer, researcher, and academic coordinator, she leads projects on the protection, monitoring, and sustainable management of coastal and underwater cultural heritage in collaboration with national heritage institutions, integrating climate adaptation strategies into conservation practice.

Bella Romain

Bella is a heritage specialist and consultant based in South Wales. Working across the UK, Bella works directly with professionals and building custodians making decisions on built heritage. Working and living alongside the industrial heritage of Wales, Bella has seen many assets decline due to reducing funding opportunities. For her MSc dissertation, Bella worked to develop a tool to support decision making for heritage at risk, with a focus on coastal heritage under threat due to climate change.

Liliana Rozo Pinzón

Archaeologist from the Externado University of Colombia, with a diploma in Oceanopolitics from the *Escuela Superior de Guerra – Universidad Militar Nueva Granada*. She has completed multiple courses related to underwater cultural heritage and has participated in archaeological projects in both terrestrial and underwater contexts. She is interested in the management and protection of archaeologicalsites and cultural heritage through the implementation of new technologies, cultural policies, and strategic planning processes framed by community participation, capacity-building, development, and sustainability.

Juan David Sarmiento Rodríguez

Anthropologist, archaeologist, and photographer, researcher at the *Fundación Colombia Anfibia* and at the Colombian Institute of Anthropology and History in the Area of Technologies Applied to Heritage and

Underwater Cultural Heritage. He has worked on multiple initiatives related to the research of tangible and intangible heritage associated with shipbuilding, traditional navigation and fishing practices, ethnoarchaeology, and social anthropology, in collaboration with Indigenous, Raizal, Afro-descendant, fishing, and urban communities.

Katerina Velentza

Katerina is a maritime archaeologist and heritage professional, with a PhD in Archaeology from the Centre for Maritime Archaeology of the University of Southampton. She is currently a Postdoctoral Research Associate in Environmental Humanities at the University of Hull, in the UK, contributing with heritage perspectives in the research, teaching and PhD supervision of the Energy and Environment Institute. Katerina's research focuses on the interrelationships between archaeology, heritage, climate change and sustainability with project applications in a variety of watery environments and regions, including the Mediterranean, Britain and the Baltic.

Introduction

Katerina Velentza, L. Victoria Báez Santos and Brandon Braun

Maritime archaeology during the climate emergency

The field of maritime archaeology is concerned with the scientific recording, study, and interpretation of the past through the material culture and remains of human activities located in and around aquatic environments including seas, oceans, lakes, and rivers (Bass 2011; Ford *et al.* 2011; Westerdahl 2011: 754). Heritage management is an integral part of the discipline, which has deep-rooted associations with policy interventions in countries around the world. The 2001 Convention on the Protection of the Underwater Cultural Heritage by UNESCO established a clear framework for best practice (Maarleveld *et al.* 2013), bringing together practitioners from around the globe (e.g., Blue and Breen 2019; Trakadas 2012), and shaping legislation in dozens of states around the world (e.g., Aznar 2014; Sharfman et al. 2016).

In recent years, faced with the threat of climate change, maritime archaeology has taken up the challenge to act to protect the historic environment and cultural heritage assets in the maritime spectrum, while also contributing to a more just and sustainable present and future (e.g., Gregory et al. 2022; Henderson 2019; Henderson et al. 2025; Holly et al. 2025; Perez-Alvaro 2016; Perez-Alvaro 2025; Rey da Silva 2020: 110; Trakadas *et al.* 2019; Velentza 2023; Wright 2016). Initiatives, such as 2019's Ocean Decade Heritage Network (ODHN n.d.), acknowledge the relevance of maritime archaeology to the implementation of the Ocean Decade (UN Decade of Ocean Science for Sustainable Development, 2021–2030), and interdisciplinary projects, such as CHERISH (2025), highlight the possibility of full integration of climate and heritage research in local policies with simultaneous nature-culture benefits.

Despite being more than halfway through the so-called Decade of Action in the push to deliver the UN Sustainable Development Goals, global policies have struggled to mobilise with sufficient speed to deal with climate change, resulting in very pessimistic climate predictions. In the last two years fossil fuel emissions have increased to an all-time high, and the most recent published reports indicate the year 2024 was the warmest on record globally, passing the average global temperature of 1.6ºC above the pre-industrial times (Copernicus Climate Change Service 2025).Despite this stark data, current climate policies have us on track for approximately 2.7°C peak warming by 2100 (Climate Action Tracker 2025; Ripple *et al.* 2024; Romanello *et al.* 2024).

Heritage assets in and around aquatic environments all around the world have already been impacted by climate change effects. Coastal erosion, extreme storminess, storm surges, tidal, fluvial and pluvial flooding, sea-level rise, sea-temperature increase, ocean acidification, frequently in combination with droughts and rising temperatures, and other climate change effects threaten and damage archaeological sites, historic landscapes and buildings. Concurrently, the decline of traditional maritime livelihoods, such as fishing and shipbuilding, and the rise of unsustainable tourism, along with the loss of associated local knowledge within communities and their empirical understanding of maritime regions, have isolated people from their surrounding natural environment and increased their vulnerability to environmental and socio-economic shocks (e.g., Buchan *et al.* 2024; Gillmer 1973; Nadel-Klein 2003). These phenomena are only expected to intensify in the following years. Climate change is here, but

heritage practitioners, stakeholders, heritage management organisations and communities are not necessarily prepared or have adequate resources to deal with these circumstances, especially due to the financial recession that most sectors are experiencing.

The future by the sea

This edited volume features an array of maritime heritage projects that have taken action to record, monitor and protect maritime heritage in the face of the climate emergency. The authors first came together during the online symposium 'The Future by the Sea: Engaging with maritime archaeological research during the climate emergency' in November 2023. It was organised by Katerina Velentza at the University of Helsinki as part of the project *Re-imagining the use of traditional watercraft in the Aegean Sea for a sustainable environment and economy 2021-2024* (n.d.) with the help of L. Victoria Báez Santos from the NGO *Fundación Colombia Anfibia*. The aim of the event was to bring together early career researchers working on innovative projects that link maritime archaeology and climate change around the world. The idea of creating this edited volume came from the lively discussions and the converging points of the projects presented in that event, along with the obvious need to promote the work of early career scholars who, despite their passion and knowledge of the subject, are frequently obstructed from participating in academic and sector-wide discussions, whether due to shrinking job markets or limited availability of resources in the sectors of heritage and archaeology.

This volume presents eight chapters that showcase completed or ongoing projects of early career researchers and practitioners from distinct parts of the world. The projects illustrate how the discipline of maritime archaeology can contribute to climate action, sustainability, adaptation and climate resilience, while also helping to mitigate some of the main risks that heritage linked to aquatic environments is experiencing and will experience due to the climate breakdown. The researchers have not simply recorded tangible heritage assets and archaeological sites that might be impacted by climate change effects, but rather, their work involves understanding, documenting or modelling climate change impacts in their local regions, reviewing local policies and making recommendations, and working closely with local stakeholders and communities to find sustainable solutions that best safeguard tangible and intangible heritage assets. Above all, though, they are determined to preserve heritage for future generations despite the climate emergency. While recognising the limitations and challenges brought up by climate change and its socio-economic implications, as well as the defunding of the archaeology and heritage sectors, the projects presented in this book also show how talented early career scholars and practitioners can make substantial contributions to communities through volunteering work, small grants, and project-specific academic funding. Overall, each chapter of this book proves how small-scale, local initiatives by passionate people can make a large impact.

The volume starts with Chapter 1 and the results of a research programme that explores the impacts of climate change on historic shipwrecks under water and in the intertidal zone of Wales, in the United Kingdom. This interdisciplinary study identifies various climate change impacts that will affect the longevity of many underwater and intertidal cultural heritage assets, while also highlighting the significance of international cross-disciplinary studies combined with stakeholder collaboration to tackle known threats. On a similar note, Chapter 2 presents a variety of climate change effects that are already affecting intertidal archaeological sites in the Basque Country, in Spain. Sea level rise, coastal erosion, changes in water temperatures and pH levels, as well as the presence or absence of different organisms were observed in river, estuarine and coastal shipwrecks in the area. This data can offer

unique local climate data and place-based observations on the impacts of climate change on various types of material culture in the region.

In Chapter 3, the focus of the book shifts to methodological approaches that could be used to track and predict impacts of climate change on coastal archaeological sites. Through a case study from northern Lebanon, this project uses data from satellite imagery, including associated measurements of Sea Surface Temperature (SST) and Sea Surface Salinity (SSS), as well as observations and mapping of coastal changes over long periods of time, to track noticeable impacts of climate change, and also model potential repercussions and future vulnerabilities for coastal heritage assets. Subsequently, Chapter 4 presents another innovative methodological approach, the use of Multi-Attribute Value Theory (MAVT) that could be applied to conservation management strategies for heritage at risk. The case study of Whitford Point Lighthouse in Gower, Swansea, Wales, UK, demonstrates how MAVT could be used in practice to support decision making for managing complex heritage assets during the climate emergency.

Chapter 5 introduces the work carried out by the NGO *Fundación Colombia Anfibia* in Colombia. In this paper, the transdisciplinary methodology used in Cartagena de Indias to assess the effects of climate change on the city's tangible and intangible heritage is presented. As the preliminary results of the project show, this methodology has created a low-cost transdisciplinary and co-created understanding of climate change in Cartagena de Indias and initiated contact and dialogue between significant members of the city. Following up on these observations, Chapter 6 presents in more detail aspects of the project *Colaboratorio Azul* of the *Fundación Colombia Anfibia.* Through a case study focusing on the island of Tierrabomba (*Isla de Tierrabomba*) in Cartagena de Indias, the approaches used to instigate cooperation, co-production and active participation of community members and stakeholders are explained. The co-production and participatory research of the project have been enhancing the community's decision-making capacity and increasing opportunities for knowledge exchange through public mechanisms that address the current global climate emergency.

In Chapter 7 intangible maritime heritage is brought to the fore. A summary of the observations from the project *Re-imagining the use of traditional watercraft in the Aegean Sea for a sustainable environment and economy* highlights the potential of maritime heritage to assist in restoring the balance between humans and nature in the dynamic environment of the eastern Mediterranean. Historical, archaeological and ethnographic approaches can assist communities to build environmental awareness and realise sustainability opportunities from their past, their culture and tradition that could help populations adapt in the face of the current climate emergency and environmental deterioration. Chapter 8 presents the project *Cycladic Maritime Trades*, carried out also in the Aegean Sea, Greece, which proposes maritime heritage documentation as a catalyst for pursuing future sustainable development in island communities facing accelerating social and environmental change in the first quarter of the 21st century.

Throughout the eight chapters of the book, the authors underpin the need for better dialogue between heritage, environmental and climate change practitioners, communities and policymakers at a local, regional and international level to simultaneously preserve natural and cultural heritage, as described in the United Nations Sustainable Development Goal Target 11.4. The projects presented in this book from the UK, Spain, Lebanon, Colombia and Greece all follow interdisciplinary or transdisciplinary perspectives in an attempt to bridge policy and practice, while forging meaningful collaborations between communities, NGOs, academics and stakeholders. All projects highlight how, as archaeologists and

heritage professionals, we possess significant tools and skills that can assist in assessing risk, responding to heritage loss, but also initiating actionable recommendations and policy advice that could have an impact on both a local and global scale. We hope that our work presented in this edited collection will inspire and encourage more climate-change-related actions in the field of archaeology and heritage.

References

Aznar, M.J. 2014. The Contiguous Zone as an Archaeological Maritime Zone. *International Journal of Marine and Coastal Law* 29: 1–51.

Bass, G. 2011. The Development of Maritime Archaeology, in B. Ford, D.L. Hamilton and A. Catsambis (eds) *The Oxford Handbook of Maritime Archaeology*: 3–24. Oxford: Oxford University Press. <https://doi.org/10.1093/oxfordhb/9780199336005.013.0000>

Blue, L. and C. Breen. 2019. Maritime Archaeology and Capacity Development in the Global South. *Journal of Maritime Archaeology* 14: 321–332. <https://doi.org/10.1007/s11457-019-09244-x>

Buchan, P.M., L.D. Glithero, E. McKinley, M. Strand, G. Champion, S. Kochalski, K. Velentza, R.A. Praptiwi, J. Jung, M.C. Márquez, M.V. Marra, L.M. Abels, A.L. Neilson, J. Spavieri, K.E. Whittey, M.M. Samuel, R. Hale, A. Čermák, D. Whyte, L. West, M. Stithou, T.J. Hegland, E.S. Morris-Webb, V. Flander-Putrle, P. Schiefer, S. Sutton, C. Onwubiko, O. Adeoye, A. Akpan and D.L. Payne 2024. A transdisciplinary co-conceptualisation of marine identity. *People And Nature*. <https://doi.org/10.1002/pan3.10715>

CHERISH (Climate Change and Coastal Heritage), viewed 10 September 2025, <https://cherishproject.eu/en/>.

Climate Action Tracker, The CAT Thermometer, November 2025, viewed 10 December 2025, <https://climateactiontracker.org/global/cat-thermometer/>.

Copernicus Climate Change Service, The 2024 Annual Climate Summary, Global Climate Highlights 2024, viewed 10 September 2025, <https://climate.copernicus.eu/global-climate-highlights-2024>.

Ford, B., D. Hamilton and A. Catsambis 2011. *The Oxford Handbook of Maritime Archaeology*. Oxford: Oxford University Press. <https://doi.org/10.1093/oxfordhb/9780199336005.001.0001>

Gillmer, T. 1973. *Working Watercraft: A Survey of the Surviving Local Boats of Europe and America*. London: Patrick Stephens.

Gregory, D., T. Dawson, D. Elkin, H. Van Tilburg, C. Underwood, V. Richards, A. Viduka, K. Westley, J. Wright and J. Hollesen 2022. Of time and tide: the complex impacts of climate change on coastal and underwater cultural heritage. *Antiquity* 96.390: 1396–1411. <https://doi.org/10.15184/aqy.2022.115>

Henderson, J. 2019. Oceans without History? Marine Cultural Heritage and the Sustainable Development Agenda. *Sustainability* 11.18: 5080. <https://doi.org/10.3390/su11185080>

Henderson, J., G. Holly, A. Rey da Silva and A. Trakadas 2025. The Cultural Heritage Framework Programme: Highlighting the contribution of Marine Cultural Heritage to the UN decade of Ocean Science for sustainable development (2021–2030). *Oceans* 6.1: 1-19. <https://doi.org/10.3390/oceans6010001>

Holly, G., J. Henderson, A. Edwards and H. Cocks 2025. Marine Cultural Heritage as a Catalyst for Sustainable Ocean Practices. One Ocean Science Congress 2025, Nice, France, 3–6 Jun 2025, OOS2025-981. <https://doi.org/10.5194/oos2025-981>

Maarleveld, T., U. Guérin and B. Egger 2013. *Manual for Activities directed at Underwater Cultural Heritage: Guidelines to the Annex of the UNESCO 2001 Convention*. Paris: United Nations Educational, Scientific and Cultural Organization.

Nadel-Klein, J. 2003. *Fishing for heritage: Modernity and loss along the Scottish coast*. Abingdon: Routledge.

Ocean Decade Heritage Network – A Global Initiative, viewed 10 September 2025, <https://www.oceandecadeheritage.org/>.

Perez-Alvaro, E. 2016. Climate Change and Underwater Cultural Heritage: Impacts and Challenges. *Journal of Cultural Heritage* 21: 842–848. <https://doi.org/10. 1016/j.culher.2016.03.006>

Perez-Alvaro, E. 2025. Preserving the past, shaping the future: the impact of underwater cultural heritage on global development. *Journal of Cultural Heritage Management and Sustainable Development*. <https://doi.org/10.1108/JCHMSD-03-2023-0033>

Re-imagining the Use of Traditional Watercraft in the Aegean Sea for a Sustainable Environment and Economy, viewed 10 September 2025, <https://traditionalwatercraftaegeansea.wordpress.com/>.

Rey da Silva, A. 2020. Sailing the Waters of Sustainability: Reflections on the Future of Maritime Cultural Heritage Protection in the Global Sea of Development. Post- Classical Archaeologies 10: 107–34.

Ripple, W.J., C. Wolf, J.W, Gregg, J. Rockström, M.E. Mann, N. Oreskes, T.M, Lenton, S. Rahmstorf, T.M. Newsome, C. Xu, J.C. Svenning, C. Cardoso Pereira, B.E. Law and T.W. Crowther 2024. The 2024 state of the climate report: Perilous times on planet Earth. *BioScience* 74.12: 812–824. <https://doi.org/10.1093/biosci/biae087>

Romanello M., M. Walawender, S.C. Hsu, A. Moskeland, Y. Palmeiro-Silva, D. Scamman, Z. Ali, N. Ameli, D. Angelova, S. Ayeb-Karlsson, S. Basart, J. Beagley. P.J. Beggs, L. Blanco-Villafuerte, W. Cai, M. Callaghan, D. Campbell-Lendrum, J.D. Chambers, V. Chicmana-Zapata, L. Chu, T.J. Cross, K.R. van Daalen, C. Dalin, N. Dasandi, S. Dasgupta, M. Davies, R. Dubrow, M.J. Eckelman, J.D. Ford, C. Freyberg, O. Gasparyan, G. Gordon-Strachan, M. Grubb, S.H. Gunther, I. Hamilton, Y. Hang, R. Hänninen, S. Hartinger, K. He, J. Heidecke, J.J. Hess, L. Jamart, S. Jankin, H. Jatkar, O. Jay, I. Kelman, H. Kennard, G. Kiesewetter, P. Kinney, D. Kniveton, R. Kouznetsov, P. Lampard, J.K.W. Lee, B. Lemke, B. Li, Y. Liu, Z. Liu , A. Llabrés-Brustenga, M. Lott, R. Lowe, J. Martinez-Urtaza, M. Maslin, L. McAllister, C. McMichael, Z. Mi, J. Milner, K. Minor, J. Minx, N. Mohajeri, N.C. Momen, M. Moradi-Lakeh, K. Morrisey, S. Munzert, K.A. Murray, N. Obradovich, M.B. O'Hare, C. Oliveira, T. Oreszczyn, M. Otto, F. Owfi, O.L. Pearman, F. Pega, A.J. Perishing, A.C. Pinho-Gomes, J. Ponmattam, M. Rabbaniha, J. Rickman, E. Robinson, J. Rocklöv, D. Rojas-Rueda, R.N. Salas, J.C. Semenza, J.D. Sherman, J. Shumake-Guillemot, P. Singh, H. Sjödin, J. Slater, M. Sofiev, C. Sorensen, M. Springmann, Z. Stalhandske, J.D. Stowell, M. Tabatabaei, J. Taylor, D. Tong, C. Tonne, M. Treskova, J.A. Trinanes, A. Uppstu, F.Wagner, L. Warnecke, H. Whitcombe, P. Xian, C. Zavaleta-Cortijo, C. Zhang ,R. Zhang, S. Zhang, Y. Zhang, Q. Zhu, P. Gong, H. Montgomery and A. Costello 2024. The 2024 report of the Lancet Countdown on health and climate change: facing record-breaking threats from delayed action. *Lancet* 404.10465: 1847–1896.

Sharfman, J., J. Boshoff and J. Gribble 2017. Benefits, Burdens, and Opportunities in South Africa: The Implications of Ratifying the 2001 UNESCO Convention on the Protection of Underwater Cultural

Heritage, in L. Harris (ed.) *Sea Ports and Sea Power*. Cham: Springer. <https://doi.org/10.1007/978-3-319-46985-0_9>

Trakadas, A. 2012. Maritime Archaeology and Mitigation in Africa: Endangered Resources, Policies, and Practice. *Journal of Maritime Archaeology* 7: 3–8. <https://doi.org/10.1007/s11457-012-9100-2>

Trakadas, A., A. Firth, D. Gregory, D. Elkin, U. Guerin, J. Henderson, J. Kimura, D. Scott-Ireton, Y. Shashoua, C. Underwood and A. Viduka. 2019. The Ocean Decade Heritage Network: Integrating Cultural Heritage Within the UN Decade of Ocean Science 2021–2030. *Journal of Maritime Archaeology* 14: 153–65. <https://doi.org/10.1007/s11457-019-09241-0>

Velentza, K. 2023. Maritime Archaeological Research, Sustainability, and Climate Resilience. *European Journal of Archaeology* 26.3: 359–377. <https://doi.org/10.1017/eaa.2022.48.>

Westerdahl, C. 2011 The Maritime Cultural Landscape, in B. Ford, D.L. Hamilton and A. Catsambis (eds) *The Oxford Handbook of Maritime Archaeology*: 735–762. Oxford: Oxford University Press. <https://doi.org/10.1093/oxfordhb/9780199336005.013.0032>

Wright, J. 2016. Maritime Archaeology and Climate Change: An Invitation. *Journal of Maritime Archaeology* 11: 255–270. <https://doi.org/10.1007/s11457-016-9164-5>