

A RESEARCH FRAMEWORK FOR THE ARCHAEOLOGY OF WALES

MARITIME

VERSION 04 – August 2022

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A special thank you is extended to all participants, especially:

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Professor Martin Bates
Dr Julian Whitewright
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This update of the maritime chapter of the Research Framework for the Archaeology of Wales is dedicated to:

Professor John R L Allen (1932-2020)

Professor John Cole (1930-2020)

Dr David Cecil Jones (1939 -2020)

Professor Sean McGrail (1928-2021)

Rick Turner (1952-2018)

Derek Upton (1941-2005)

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1: Introduction

*Gwlad! Gwlad! Pleidiol wyf i'm
gwlad.*

*Tra môr yn fur i'r bur hoff bau,
O bydded i'r hen iaith barhau.*

Land! Land! I am true to my land!

As long as the sea serves as a wall

For this pure, dear land

May the language endure for ever.

- *Evan James and James, 1856, Mae Hen Wlad Fy Nhadau/Land of My Fathers*

Comprising 32,000 km² of seabed, the National Marine Plan area of Wales is three times larger than the terrestrial area of Wales (20,375 km²).

There is significant potential for the geological archives of the seabed to hold the key to understanding the earliest periods of human history and how our predecessors responded to global warming.

There are over 1400 known shipwreck and downed aircraft sites, each providing a window on the past, and over 5,500 documented losses providing a rich tapestry of evidence for seafaring, trade, and defence.

Our beloved coastline, at 2120 km long, includes many of the finest beaches, coastal towns, and traditional harbours, as well as a vast range of intertidal archaeological sites such as fish traps, landing places, piers, and tidal mills.

It is a rich heritage, and it is our responsibility to see that heritage researched, mapped, conserved, and interpreted for the well-being of the nation and for future generations.

The purpose of this document is to provide a brief summary overview of some of the key themes and topics within our maritime past; to provide an overview of the progress made against previous research priorities, and to present the results of discussion amongst practitioners of their aspirations and priorities for further research.

A selected bibliography for each research theme has been included towards the end of this document.

2: Research Agenda 2021- 2026

The seven overarching research themes identified in the 2016-2021 review are retained for the period of 2021-2026. They have been refined further during the review process and newly described below:

1. **Climate Change and Coastal Change** – There are opportunities to explore how our ancestors responded to global warming through studying the settlement of the changing coastline of Wales as sea levels rose and fell in the Palaeolithic and Holocene periods. Collaborative research with climate and marine scientists will assist in adaption to future trends and the development of appropriate mitigation for impacts on coastal and underwater heritage.
2. **Seafaring and Seascapes (hinterland linkages to the sea)** - We should develop greater understanding of the importance of the wide range of Welsh commodities and the features of the shores that were used for coastal and estuarine navigation, landing places and for the development of ports, harbours, and settlements for trade.
3. **Marine Transport** - There is much to be learned about the development of distinctive types of vessels built in Wales in response to local conditions, availability of materials, and the requirements of specific industries.
4. **Challenges for Conservation Management** – We should foster recognition that maritime historic environment assets should not be seen as separate from the marine natural environment, rather they inhabit the same space and contribute many of the same social, cultural, and economic benefits. There are significant benefits to be gained by more strategic research engagement with offshore development control and curatorial processes. As marine geophysical and geotechnical survey technology moves forward, so should our grasp potential applications to provide unprecedented new access to underwater sites.
5. **Frameworks for Management** – We should develop coherent and well-planned management responses to significant threats, that also reflect the international conventions. We should ensure that the

sites on which future research relies are protected and yet remain accessible.

6. **Material Culture and Preservation by Record** – The Welsh coast has an extensive network of local authority archives and museums services, as well more specialist maritime museums. Their artefact collections and documentary resources contain many maritime related items. Collaborative research can bring mutual benefits especially through increasing and improving online access and ease of searching.
7. **Maritime Identities** – One of the great strengths of maritime archaeological research are its potential global relevance. Hence, opportunities to create greater recognition of the value of international research collaborations should be fostered. Projects which explore the histories of under-represented ethnic groups are welcomed. Knowledge transfer between professional archaeologists, community groups, and sea-users in both directions, is the valuable and rewarding outcome to be constantly sought through the study of the maritime cultural landscape.

Summary of priorities identified by Practitioners as the most pressing for the period 2021-2026:

- Cross-sectoral research aimed at increasing precision in the data available to assess relative sea-level change, since the last glacial maximum and for earlier periods of human history. In particular, focussing on Wales's inter-tidal peats and submerged forests by mapping and sampling for scientific dating, flora, and faunal analysis to gain a better understanding of the coastline evolution;
- Studies of shipwrecks located in the inter-tidal zone. Both as a means to study them in their own right, and as part of mitigation for the impact of climate change;
- Studies which improve the integration of historic environment concerns into offshore development control, and which increase

understanding of those concerns within marine industrial sectors, licensing authorities, and amongst other marine stakeholder groups;

- Research which reviews presently available guidance to appraise the effectiveness of the marine planning system in Wales with regard avoiding, minimising and mitigating impacts on heritage assets.
- Projects which promote the continued development of portals to provide access to data gathered from marine development control scenarios by developers for the archaeological research community;
- Projects which provide training to engage new participants in furthering understanding of the Welsh marine historic environment and its assets.

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3: Thematic Review

The following sections continue the Review under the seven thematic headings.

Theme 1: Climate Change and Coastal Change

'... the last time the earth went through a really decisive condition of global warming... we need to go back to the end of the Ice Age. This took place between 15,000 to 8,000 years ago, when such changes as melting ice, rises in sea-level, the flooding of low-lying land and a general increase in temperature happened.... Archaeology and geology are the sciences which reveal that man has faced the problems of these great climatic changes already... The men and women who lived during the Ice Age and while the subsequent changes were happening had to find ways of coping with the new and probably unwelcome situation. This is where archaeology comes in.'

- Grainger, J D, 2020, *Climate Change: How our prehistoric ancestors responded to Global Warming*, pg3-4

Simple physics confirms that the earth's surface must warm if the amount of CO₂ and other infrared-absorbing gases in the atmosphere is increased. Scientists have been making calculations of global warming for one hundred years. Climate Change Models (mathematical representations of the interaction of climate, oceans, land surfaces, the cryosphere, and the biosphere) have been challenged by the vast spatial scales at which atmospheric processes operate. However, confidence in these models has increased to a level where individuals can now type in their postcodes and read predictions for their local areas from the UK's Met Office based on 12km squares ([What will climate change look like in your area? - BBC News](#)).

The models being used by Welsh Government for its forward planning predict the following:

- Summer temperatures will increase by 3.03°C by 2080;
- Winter precipitation will increase by 9% by 2080;
- Summer precipitation will decrease by 23% by 2080;

- Sea-level is predicted to rise by 34cm in North Wales, 38cm in Mid Wales and 42cm in South Wales by 2080.

The Historic Environment and Climate Change in Wales Sector Adaptation Plan published in 2020 highlight potential impacts on coastal and underwater cultural heritage from the following:

- sea level rise;
- range expansion of more destructive marine species (particularly marine borers) in warming seas;
- ocean acidification;
- loss and inundation of coastal archaeology through flooding and erosion;
- more frequent flooding and storm events;
- changes in development, lifestyle, and leisure patterns.

Understanding the complex interrelationships between the physical, chemical, and biological factors which contribute to the preservation submerged sites and how these will be impacted by climate change is an area of archaeological research very much in its infancy.

A practitioner's survey undertaken by Bangor University in 2021 confirmed that there was significant agreement about this being a priority area for research, along with the following:

- Encouraging the development of National Policies for underwater cultural heritage relating to climate change;
- Ensuring that underwater cultural heritage is fully included in Research Agendas for oceanic climate change;
- Establishing standards for archaeological recording capable of feeding into long-term climate change monitoring.

The gathering of information about actual sites and how they are responding was noted as vital, as well as working with climate scientists to better articulate and describe the changes being observed.

The principles of sustainable adaptation set out in the Historic Environment and Climate Change in Wales Sector Adaptation Plan document are as follows:

- thinking long term;
- prevention by gathering information through cycles of monitoring and evaluation;
- integration of climate change assessment and adaptation into normal working practices;
- developing new and existing partnerships and networks to work towards greater understanding of impacts, priorities and implementation actions, and ongoing commitment from organisations businesses and communities across Wales;
- Increasing our knowledge helps us to increase our capacity and build sectoral resilience.

The report cards produced by the Marine Climate Change Impacts Partnership in 2020 included cultural heritage for the first time. The Royal Commission contributed to this peer review paper, which identified the following priorities ([26 cultural heritage 2020.pdf \(mccip.org.uk\)](#)).

- Gain 'acceptance' of managing loss of heritage assets due to climate change, and the need for more robust systems of valuing and prioritising assets for action;
- Develop long-term datasets to identify climate change impacts on cultural heritage assets (e.g., ocean acidification on shipwreck decay; erosion rates);
- Quantify the impact of multiple climate threats (storms, surge, flooding, wind driven rain) which cumulatively cause major damage to cultural heritage assets.

Specifically for the Welsh coast - in 2012, the West Coast Palaeolandscapes/Lost Lands of our Ancestors Project made an important contribution to research relating to submerged landscapes by proving that methodologies which had been developed in the North Sea in pursuit of 'Doggerland' could also be utilised for the Welsh marine areas (Coles 1998

and 1999; Gaffney, Thomson and Fitch 2007). In 2015, Durham University include three sites from the Welsh coast's rich resource of submerged forests and intertidal peats as part of a UK wide initiative. Most recently, archaeological confirmation of the legendary Cantre'r Gwaelod has been pursued by Trinity St David through the exploration of the relict valley of the Afon Dyfi off Ynyslas and Y Borth through the acquisition of sub-bottom profiling data and seabed cores.

However, the location, extent, and character of archaeological deposits which could provide corroborating evidence for Palaeolithic and Holocene climate shifts remains under-researched. For example, the majority of intertidal deposits of peats and submerged forests remain unsampled for the environmental data they contain and, as a consequence, have not been scientifically dated (Pratt 2015).

The three processes contributing to climate and coastal change are:

- Removal of water from the oceans on a global scale as continental icesheets grew or shrank in alternating glacial and interglacial cycles (glacio-eustasy);
- Isostatic lift or subsidence of the earth's crust induced by changes in the weight of the ice sheets;
- Crustal lift or subsidence due to tectonic forces.

There are two methods which have been used with some success for identifying patterns of sea-level change:

- Scientific dating of geological, sedimentological, or biological features with a relationship to past sea-level;
- Numerical models of the Earth's response to ice loading calibrated to observed indicators of past sea-level.

These methods have suggested:

- Peak glacial lowering of sea-levels to around 120m below their level today;
- Peak interglacial high points equivalent to present-day sea-level or even 6-9m higher (Rohling, et al, 2009).

However, Westley, Fleming and Gibbard provided a cautionary note when stating that there are approximately 1250 validated relative sea level index points (RSL) around the coast of the British Isles - the vast majority of these RSLs only provide evidence for sea-level rise during the last 10,000 years. There are very few RSLs calibrated from geological samples gathered from water depths below 20m and the wider UK continental shelf to facilitate the modelling of earlier periods. They also note that observable 'misfits' between predictions of the broad-scale British Isles/northwest Europe models and more regional or local based models (Westley, et al 2013).

Wales still lacks a coherent model for its coastline at 'regional' scale, despite the presence of geological features capable of providing evidence for sea-level change. For example:

- The glacial moraine ridges forming the Sarns of Cardigan Bay;
- The former coastlines and deltaic systems/glacial run-off systems seen in the geotechnical data processed for West Coast Palaeolandscapes Project for Liverpool Bay;
- Relict paleochannels observed in modern bathymetry (e.g., tributaries joining the main paleochannel of the River Severn off Aberthaw and Stackpole);
- Over seventy expanses of intertidal peats and submerged forest deposits.

Conventional seismic survey techniques such as sub-bottom-profiling and boreholes/cores can be used to retrieve data from beneath deposits brought in by transgression and subsequent marine sediment transport systems. The majority of sub-bottom profiling data available for Wales remains restricted to areas of oil and gas exploration (with British Geological Survey retaining very few cores from these explorations); the data gathered by the Bristol Channel BIOMAR survey of 1990s (e.g., one core from off Strumble Head records peat horizons); and data gathered to inform engineering solutions for offshore development.

Whilst the sub-bottom profiling data and core sampling for the Trinity St David project gathered from off the Dyfi estuary is awaiting publication.

Online access to the data and data products produced by the SEACAMS project at Bangor University is being facilitated by the IMarDIS www site ([IMARDIS Portal](#)). This data includes sub bottom profiling data from the Holyhead Deep zone for offshore renewable energy development. Timely access to the data gathered for Welsh offshore developments for the wider archaeological research community remains problematic, despite the Crown Estate's Marine Data Policy which requires the developer to provide The Crown Estate with all environmental (physical, human, and biological) data collected during the entire lifecycle of the development (pre-planning through to post-decommissioning monitoring). The clause also gives the Crown Estate the right to make the data publicly available, subject to consideration being given to the commercial sensitivity (www.thecrownestate.co.uk/media/3218/ei-marine-data-policy.pdf).

Research recommendations for the future include:

- Research which assists in gaining a greater understanding of the interactions between oceanic climate change factors and the physical, chemical, and biological processes which contribute to preservation states of sites underwater;
- Research which takes international-scale oceanic climate change modelling to local scale in relation to individual underwater sites in Welsh waters and which provides more certainty about short-, medium- and long-term impacts;
- Cross-sectoral research aimed at increasing precision in the data available to assess relative sea-level change, since the last glacial maximum and for earlier periods of human history;
- A revisiting of available geotechnical data for Welsh coastal waters to assess its appropriateness for use for submerged landscapes studies, and projects which develop collaboration in the gathering of new data for the Welsh Marine Plan area;
- Maximising the opportunities presented by offshore development control scenarios to unlock the seabed's geological archives through providing up-to-date guidance to developers;

Maritime

- Cross-sectoral research aimed at increasing precision in the data available to assess relative sea-level change, since the last glacial maximum and for earlier periods of human history. In particular, focussing on Wales's inter-tidal peats and submerged forests by mapping and sampling for scientific dating, flora, and faunal analysis to gain a better understanding of the coastline evolution;
- Studies which explore the potential of infilled paleochannels and their margins to contain boats, parts of boats, and structures associated with landing people and cargoes;
- Studies which place Welsh legends associated with the 'lost lands of our ancestors' in the broader context of submergence legends from around the world to help inform present-day climate change research.

Theme 2: Seafaring and Seascapes (hinterland linkages to the sea)

The renewed activity and the search for rich deposits of copper ore on Parys Mountain in the second half of the eighteenth century was partly caused by naval demand. The copper sheathing on British warships was responsible for most of the demand and it proved a good market for high quality copper.

- John Rowlands, 1966, *Copper Mountain*, pg22

The location, methods of extraction and conversion, and transportation to overseas markets is another area of research with strong maritime component. For example, in the late nineteenth and early twentieth centuries, Welsh steam coal powered industrial and transport revolutions across the world. It was arguable Britain's greatest single export representing more than 40% of export trade. The development of canal and railway networks to support the movement of coal to ports are often covered by the industrial themes of Research Frameworks. However, the methods of transfer to onboard ship are sometime less well recorded. The small steam railways of Wales are a lasting reminder of the industries that built them, but some of the transport routes and the small quaysides they served are in danger of being forgotten (e.g., Corris Railway which once served the slate quarries at Corris, Aberllefenni, Ratgoed and those of the Dulas valley linked to quays at Morben and Derwenlas).

The stone trade is one Welsh industry that has received less attention than other, for example slate. However, the archaeological remains of coastal quarries are substantial and include inclined planes, specially developed quays and integral canal networks linking straight to open waterways. They remain an intriguing feature of the Welsh Coastal path for walkers.

The ports and harbours projects undertaken by the Welsh Archaeological Trusts added significant context to historic environment records. Wales has a range of natural, semi-natural and artificial harbours and more research might be undertaken into the principles of harbour design as related to the prevailing weather and sea conditions. There is also the impact of modern technologies such as enclosed docks, cranes, integrated canal and railway transportation on overall design, the allocation of space and significant reclamation of foreshore. The Civil engineers and construction companies that undertook the work have been forgotten. Further research may assist in informing repair and present-day maintenance regimes.

From the eighteenth century onwards, ports and coastal resorts grew side by side, responding to the spread of affluence and aspirations, cycles of fashion and increased mobility. The history of Welsh resorts is often a complicated story of visionary property developers and cashing in on the boom provided by new railway links intended to increase freight traffic to ports (Borsay and Walton 2007: 2). The research interests of Aberystwyth University have included the development of resorts such as Tenby, Aberystwyth and Swansea since 2006 ([Resorts Project : Department of History & Welsh History , Aberystwyth University](#)). The regeneration needs of Welsh coastal towns has the potential to sweep away some of this early resort character. Opportunities might be taken to extend the urban characterisation studies that have already been undertaken to additional seaside resorts to highlight features of particular local importance.

More research might be undertaken into settlement development through urban characterisation techniques for the smaller harbour towns. The wealth of census material that is now available online might be used to highlight which areas were given over to maritime trades and accommodation for seafaring families.

The link between the mills and weaving houses associated with the production of 'Welsh Plains' and the slave trade was highlighted through research prompted by 'Black Lives Matter' campaign ([RCAHMW | Welsh Wool, Slavery, and the Built Environment](#)). This weaving industry comprised home-based outwork, with the rough cloth being purchased and transported for finishing at Shrewsbury and then exported to form a commodity exchange for slaves through Liverpool. John Barham of Cardiff, Rev Henry Barnes of Monmouth, and Joseph Marryat are amongst the Welsh slave owners who were compensated by the Slave Compensation Commission in the 1830s ([Search | Legacies of British Slavery \(ucl.ac.uk\)](#)). More research is needed into connections with recorded shipping losses associated with the 'Triangular Trade' to provide a more honest picture of this part of Welsh history.

In the descriptions accompanying his marine surveys in 'Plans of harbours, bars, bays and roads in St George's Channel' published in 1743, Lewis Morris noted trade and manufacturing for the ports and refers to farm produce such a grain and cheese being taken by small sailing craft to ports such as Liverpool. Additional research which explores this aspect of 'from farm to table' would be beneficial, possibly linking to the growth of share

ownership amongst farmers which is noted in the Port Shipping Registers in the latter part of the 19th century.

Although shipbuilding centres in Wales are now well-identified, the woodlands managed to supply timber for local shipbuilding and/or export by sea is also a topic lacking detailed research, it is possible that through the study of estate records such woodlands will be identified and the archaeological features within them recorded.

The number of stone or wattle fishtraps (goredi) in Welsh rivers and along the seashore along with associated placenames, provides a significant body of evidence for how important such structures were to the socio-economic history of Wales. Amongst the oldest fish traps are the Gored Beuno, which has been dated to the 13th century, and the trap at Rhosfynach built by the Cistercian monks of Aberconwy in the late 12th century. The River Teifi at Cilgerran had one of the largest – a strong timber structure which crossed the whole river and had six catching pens (Jenkins 1974: 34). Near Llanddewi-Aberath, a dozen fish traps were operating there in 1861 and thirteen stone and wattle fish traps were operating in Swansea bay in the late 19th century. These 'Stop Nets' or 'Kettle Nets' were around 1.8m high, with two arms amounting to 640m long, and comprised stakes driven into the sand. A layer of branches and matting extended some 45m from the conical basket to retain water in the catching end. Sometimes a continuous trap would be formed by the arms of each individual fish trap of 3-5km in length.

Designed to work with the tides, currents and the flow of rivers, the remains of these fish traps show a wealth of evidence for rebuilding, modification, and reuse over time. For example, the Gorad y Git near Bangor was repurposed as oyster beds in the 1850s. It was the Salmon and Freshwater Fisheries Act of 1865 which effectively prevented more locations being used and established a system of licensing. When further restrictions were introduced in 1923, many fish traps passed out of use.

Whilst fish traps have been subject to research activity in the past (e.g., Bannerman and Jones 1999; Jones 1983; James 2003; Lewis 1924), more research into inshore fisheries might be undertaken to include the small rowing boats used for stop-net, compass, seine, and trammel netting.

There are also significant histories relating to the harvesting cockles, whelks, oysters, seaweeds, and salt-making at the coast edge. For example, at Freshwater West, there are remains related to seaweed gathering for the production of laver bread in the late 19th century. The industry employed women from the village of Angle and is evidenced by the remains of the huts used for storing and drying the seaweed. The dried seaweed was subsequently despatched to Pembroke and Swansea. The trade died out at the beginning of World War II, with the one surviving hut now in the ownership of the National Trust and Pembrokeshire Coast National Park. With regard to salt production, the National Monuments Record of Wales contains two records for 16th century (NPRNs 506291 and 182) saltworks and one from the 19th century (NPRN 40734) developed in connection with the herring fisheries. At other locations, there is evidence for cuts through rocky outcrops to ease access for the hand carts, as well as more ancient wattle walkways such as those at Warren Beach (NPRN 421684) and Borth (NPRN 421284). These remains suggest that more research is needed into historic patterns of accessing and harvesting from the foreshore.

The contribution made by Wales to the defence of the British Isles and the pre-eminence of the Royal Navy is considerable. From the eighteenth to 20th centuries, it was the natural harbours such as Milford haven and Pembroke Dock which were vital to defence and naval operations. Wales also had forests to supply timber for shipbuilding and large reserves of copper, iron ore and the highest quality steam coal. Strategically important coastal bases also had to be defended against enemy attack and landings, and the forts and gunnery positions all around the Welsh coast provide invisible yet deadly defensive arcs of fire (Hughes in Redknap et al (ed) 2019: 200-207). Military vessels were lost off the Welsh coasts as casualties of war, particularly during both World Wars. The U-Boat Project 1914-18 provided the opportunity to research some 170 wartime losses and survey 17 sites ([Prosiect Llongau-U 1914-18 | U-boat Project Wales 1914-18 \(uboatproject.wales\)](#)). A similar project exploring the losses associated with World War II would provide an opportunity to undertake further research and survey of important underwater sites such as the destroyer HMS Whirlwind (NPRN 507233) and aircraft downed at sea. It might also further

explore the roles of air bases, gunnery training camps, and armaments testing establishments around the coast.

Research recommendations for the future include:

- Studies encompassing rivers and inland navigation systems, lake transport and rail networks to map the movement of Welsh commodities (e.g., coal, slate, limestone, metal ores, farm produce, timber, etc) from their source to their transportation by sea to final destination;
- Research which surveys wrecks by theme (e.g., transporting Welsh sourced commodities) thereby increasing our understanding of the resource and ensuring the numbers of statutorily protected wrecks are more representative of the resource as a whole;
- Studies which explore the commodities produced in Wales for the Slave Trade, the people who owned slaves, the ships that were involved, and documented losses around the Welsh coast
- Studies which combine coastal pilotage and greater understanding of coastline evolution to identify the likely locations of early landing place and harbours;
- Studies exploring the social and economic drivers to create vernacular harbours, major harbours of refuge and large commercial ports;
- Studies which continue the application of urban characterisation to seaside resorts to identify features linked to the early destination development;
- Studies which review Crew Lists to identify the trading patterns of individual ships and what they can tell us about broader patterns of voyages undertaken by both coastal and deep ocean traders;
- Research into coastal townscapes which provide evidence for maritime trades such a shipbuilding and repair, ropewalks, sail-making, iron founding, etc;
- Research into the technological development of leading lights, lighthouses, and other navigational aids and the role such installations continue to play in the present-day seascapes;

- Studies which explore the exploitation of marine resources (fish, sea mammals, whaling, shellfish, seaweed, salt-making) related to changing patterns of employment in coastal communities;
- Research which identifies local sources of timber used in Welsh shipbuilding, surviving archaeological features within these woodlands, and which makes links to shipbuilding sites;
- Studies which explore the systems of defence established at the coast through differing periods and the ways in which the presence of Armed Services and weapons development sites in Wales, influenced the social life and economy of coastal communities.

Theme 3: Marine Transport

'Britain has been an island for around 10,000 years and is well-endowed with lakes and rivers. Water transport has therefore been an essential feature of life, enabling our predecessor to forage for food, raw materials, and fuel, to explore their surroundings and to trade with their neighbours'

- Sean McGrail, 2019, *Prehistoric and Roman Boats in Wales and the Sea: 10,000 years of Welsh Maritime History*, pg66

The log boat, log raft, hide-boats and plank boats are the forms of early water transport most likely to have been used around the coast and the inland waterways of Wales. These simple craft continue to be made within local traditions even today (e.g., Coracles), but little has been found by way of remains of these early boats or their informal building sites. They were used from beaches and riverbanks; hence no quays or jetties were needed.

Inference of their use still comes from material culture, the geographical provenance of trade goods, and spread of cultural ideas. For example, evidence for Mesolithic seafaring is usually inferred from the identification of sites on islands such as Bardsey, which must have required some form of craft to complete the sea crossing. Skin boats may have been used, but dugout canoes (log boats) are certainly known from mainland Europe during this period. The potential for the Severn Levels to preserve evidence for early plank boats has been attested by the Bronze Age boat finds at Goldcliff and Caldicot. Planking was fastened by continuous sewing using rope plaited from willow. Such a boat could have been taken along and across the tributaries of the upper estuary and along the coast in fair weather.

Dramatic changes in society, technology and economy are well attested in the terrestrial monuments and material culture of the Iron Age, but this another period where very few maritime artefacts and boat finds are presently known.

The Roman occupation of Britain was by accomplished by 'maritime' means, with the *classis Britannica* operating both for exploration and like a state haulage company in the first centuries of occupation. The hoard of Roman coins found at Rogiet, Monmouthshire, in 1998 includes Q-radiates which depict large, multi-oared warships and transports, and small, open-decked,

and mast-less vessels. These coins confirm the importance of the Roman Navy. For example, the classical writer Tacitus recorded that the planned attack on the island of Anglesey by the Roman General Gaius Suetonius Paulinus was made possible by flat-bottomed boats. He also noted that merchants were trading with Ireland. The Roman network of forts and roads provides more key evidence for the location of the deep-water harbours used by contemporary naval and merchant ships.

The sequences of strengthening coastal military sites towards the end the Roman period in Wales indeed implies a strengthening of the naval presence. However, it remains true that, apart from the Barland's Farm boat, no other vessels from the Roman period have been discovered in Wales. Although the inscribed stone found to the west of Chester apparently confirms the age-old navigation dangers of the Dee estuary - 'OPTONIS AD SPEM ORDINUS C LVCILI INGENVI QVI NAVFRAGIO PERIT S E' or 'Optio in the century of Lucilius Inegneus, awaiting promotion to centurion, who died in a shipwreck, is buried' (Wynne-Jones, 2001, 9).

Following the disintegration of Roman administration, the sea continued to connect coastal communities on the Atlantic fringe and the Mediterranean. Material culture provides the key evidence with clusters of imported finds, such as those found in hinterland of Milford Haven and Red Wharf Bay. Sea-going ships brought wine, oil, ceramic and glass ware from Spain, North Africa, and the Aegean to south Wales in exchange for copper, lead, and tin.

Further into the early medieval period, there is much more evidence for the movement of people by sea-going transport in literary sources. For example, missionaries moving between Ireland and Brittany and scholars, clerics and diplomats traveling to Rome, the courts of continental rulers or Europe's leading monastic institutions (Redknap et al 2019: 89). The types of ship operating around the Welsh coast would have been diverse, from the occasional Mediterranean and European vessel to native craft operating in rivers and from beaches.

Scandinavian vessels would have become increasingly familiar as traders and raiders. Archaeological evidence of Viking-type ships in Wales is limited to boat timbers and boat-graves, but the 10th century chronicler, Asser, noted that a Viking force of twenty-three ships overwintered in Dyfed in

878. Other writers refer to raids on the Welsh coast with the early kings of Wales hired Danish and Norse mercenaries in Ireland to wage war (e.g., Gruffudd ap Cynan lead an Irish-Norse fleet of twenty-four ships up the Severn Estuary in 1087). The discovery of Viking silver hoards, metalwork, burials, and stone carvings suggest heavier contact around the Menai Straits than in other parts of coastal Wales.

Other early literary sources from the Irish sea zone are useful for reconstructing the social context for seafaring. For example, early Irish laws include a special category of marine law (Muirbertha) concerning tributes payable on landing and provision for feeding stranded/shipwrecked mariners. Comparable laws are found in later medieval Wales (Wooding in Redknap et al (ed) 2019: 93).

It was the strategic use of sea-power by the English in the 13th century periods that affirmed Edward I's conquest of Wales. For example, the port of Llan-Fraes at the northern entrance of the Menai Strait conducted significant trade in ale, wine, wool, and hides, and maintained a herring fishery. However, Edward I decided to move the port to his new castle at Beaumaris begun in 1285. Other Welsh settlements such as Chepstow and Newport sought and received borough charter status during this period, with enterprising merchants alert to the benefits of access to water transportation. Not least in the wine trade, where Welsh merchants began to trade with English possessions overseas, such as Gascony and Bordeaux.

Continuing into the later Medieval period and into Modern times, the range of maritime topics and themes to explore increases greatly with the survival of both documentary sources and archaeological remains.

However, a recurring theme from past iterations of the Archaeological Research Framework for Wales is the need to explore how coastal waters, coastal landscapes, and the climate of Wales, together with its inhabitants, their motivations, and talents, influenced Welsh ship and boat building practices.

There are, of course, differentiations to be made between smaller forms of craft and seagoing vessels of considerable size. Smaller vessels may show persistence in their traditional forms (e.g., coracle perfected to fish on Welsh rivers). Whereas ships represent a bigger investment and cannot be

military or commercial failures, so there is a greater need to continually seek improvements in performance.

There is the influence of contact between maritime communities which transferred a method of building or working a vessel which was better than that available locally. There are the crossovers in taking the best capabilities of working craft and refining them in leisure and ceremonial craft. There are also the specialisations, for example, in boats employed to serve larger ships. In latter centuries, these would come to include boats for pilots and lighterage, as well as anchor recovery, lifesaving, salvage services, for hydrographic research and for particular marine industries (e.g., sub-sea cable laying) - not just for the transport of goods and people (McKee 1983, 16).

The key types of vernacular boats operating around the Welsh coast were identified by Owain Roberts in 1997 to include Bristol Channel pilot cutters working from the South Wales ports; fishing vessels such as Mumbles oyster skiffs, Tenby luggers, Conway Nobbys, and the beach boats of places such as Aberdaron and the north Anglesey coast; plus, coastal traders such as Severn Trows (Roberts in Mannering, 1997 (ed)). The losses recorded in the National Monuments Record of Wales confirm spatial overlaps iconic vernacular craft more commonly associated with other regions, such as the Mersey flats of Liverpool's River and connecting canal networks; the ketches and Polacca barges from north Devon; and trawlers/drifters drawn from Brixham and from Scottish ports for the seasonal fishing.

Whilst strong interest in Welsh coracle building continues, there are few Welsh reconstruction/restoration projects for the traditional craft named above – the Pembrokeshire College/West Wales Maritime Heritage Society's Tenby Lugger Project being the notable exception.

The National Register of Historic Vessels records only forty-two vessels based in Wales (<http://www.nationalhistoricships.org.uk/>). These include service craft such as lifeboats (9), light vessels (2), seaplane tenders (2), tugs such as the CANNING and pilot cutters such as the OLGA and CARIAD. The only Welsh shipbuilders featured amongst the surviving craft are A M Dickie & Sons Ltd, Bangor, and Crossfield Brothers, Conway. This clearly suggests an acute under representation of Welsh boat and shipbuilding outputs surviving in private hands or museum ownership.

Wrecks sites with significant bibliographies are less than 1% of the total recorded losses in the National Monuments Record of Wales. These bibliographies reflect Wales's six Designated Historic Wrecks, significant finds in the Severn Estuary, high profile sites associated with large losses of life, the Royal Naval, recovered artefacts, and the First World War, rather than a coherent representation by period, technical development, and vessel function at time of loss.

Iconography, artefact assemblies, and historic documentation can provide much useful evidence, the vast numbers of vessels built, owned, and operated in Welsh waters are represented only in the remains on the seabed and in the intertidal zone. This is where recording and research needs to be focussed.

Survey needs to be combined with the continuing collation of documentary information with regard to losses, to facilitate the identification of the substantial number of 'UNNAMED WRECKS' in the National Monuments Record of Wales (i.e., over 760 wreck and downed aircraft sites, findspots, plus seabed anomalies which may be wrecks, for which there is no confirmed identity). The work undertaken by Dr Innes McCartney, Bournemouth University, and Dr Michael Roberts, Bangor University, to survey 273 wrecks in the Irish Sea is a major contribution - 80% of the unknown shipwrecks now have confirmed identities from their dimensions, locations, and archival descriptions of their sinking (McCartney 2022).

Provision also needs to be made for the survey and the monitoring of named wrecks identified as having importance.

Utilising Cadw's 'Conservation Principles' and methods of assessing importance set out in 'Managing the Marine Historic Environment of Wales', below is a listing of 'named' sites with their NPRNs (National Primary Resource Number) for further targeted survey and research:

Merchant Ships	Fighting Ships	Service Craft
Cargo Vessel: ALICE WILLIAMS (273198), AMAZON (274142); ARTHUR (271989); CASTILLIAN (272190); CHARLES HOLMES (273346); CITY OF BRUSSELS (273749); EDWIN (273354);	Destroyer: HMS TORMENTOR (240752); HMS CLEVELAND (274189); HMS WHIRLWIND (507233) Escort Vessel: HMS ARBUTUS (274844);	Cable Layer: FARADAY (273247) Dredger: REDVERS BULLER (274033)

EMPIRE BEACON (273229); EMPRESS EUGENIE (240646); ENGLISHMAN (273206); FAIRFIELD (271609); FREDERICK (272173); GILBERT THOMPSON (271874); HERMINE (272061); HIGHLAND HOME (273100); HUDIIKSVAL (272066); JOHN (274508); KIRKBY (274829); LEWIS (273059); LEYSIAN (273146); LILY (240679); LOCH SHIEL (273056); LORD ATHLUMNEY (271887); LORD DELAMARE (271637); LOUISA (405916); MALLENY (273882); MARY COLES (272031); MARY JANE LEWIS (240326); MINERVA (271954); MISS MADOCK (518194); MISSOURI (271999); NORMAN COURT (272034); NOTRE DAME DE BOLOGNA (240376); NYDIA (271604); OLINDA (271908); OMNIBUS (506541); PAMELA (240904); PORTLAND (273195); PRESEIDENT HARBITZ (271898); PRIDE OF THE SEA (272458); PRIMOSE HILL (240327); PRINCE CADWGAN (273302); PRINCESS AMELIA (271924); PROGRESS (273277); ROSIE (240325); SAGE (274247); SAINT GEORGE (411); SARAH (240394); STRATHNAIRN (274804); TEVIOTDALE (114200); TRAFALGAR (507216); VAN STIRUM (273138) Emigrant Ship: NEWRY (271713); NIMROD (272921); OCEAN MONARCH (271692) Passenger Vessel: MARY (391); CITY OF BRISTOL (273749); MORNA (272901); QUEEN (272175);	HMS MAJORAM (240873) Landing Craft: LCG no 15 (273231); LCG 16 (240005); LCT 7009 (519173); RIVER LOYNE (240015); UNNAMED LANDING CRAFT (240258) Ships of the Line: HMS LEDA (272589); HMS CONWAY (271611) Submarine: U61 (273399); HMS E39 (273405); U-1024 (274897); U-1302 (273318); U-246 (274463); Naval Support Vessels: Decoy Vessel (Q Ship): HMS ROYAL SCOT (273720); HMS WESTPHALIA (274457) Naval Transport: USAT ROANOAKE (506995) Liberty Ships: DAN BEARD (273246 and 240675); JONAS LIE (273253); SAMTAMPA (274190)	Lightship: SCARWEATHER LIGHTSHIP (274371) Tug: GUIDING STAR (273020); HASWELL (273830)
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SLIEVE BLOOM (272130); SAINT COLUMBA (507213)		
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Suggestions for sites for further research and survey should always be welcomed from individuals, community groups, and marine stakeholders.

Research recommendations for the future include:

- Studies which review evidence for coastal settlement from early periods and begin to explore the roles that seafaring (e.g., log boats and sewn-plank boats) may have contributed to mixed subsistence practices;
- Studies which make better use of indirect evidence for sea crossings through the provenance of objects and origins of individuals to gain a better understanding of invasion, migration, slavery, and legitimate trade;
- Studies enhancing the understanding of the particularity of vessels designed for specific Welsh environments or industries;
- Experimental studies of handling and abilities of old working boats, particular their rigs and sails, using reconstructions or rebuilt original boats;
- Studies which record the disappearing traditional skills of boat and shipbuilding, and ways of working vessels;
- Studies which address the known post-medieval wrecks and hulks for their potential to inform about technical advances in ship and boat design;
- Studies which target the substantial number of 'Unnamed Wrecks' to help provide confirmed identities and assessments of historic and archaeological importance.

Theme 4: Challenges for Conservation Management

'We should cherish this maritime history and culture and be proud of it. It gives us a sense of place and helps shape our identity. It can also make an important contribution to the social, economic, environmental, and cultural well-being of Wales through many different activities including tourism, learning, and volunteering, and the regeneration of coastal areas. Together, these benefits can help create the Wales we want in the future by meeting the well-being goals set out in the Well-being of Future Generations (Wales) Act 2015.⁸ This means that the evidence of our past preserved under the sea and on the seashore is every bit as valuable as that preserved on land and deserves equal respect and protection.'

- Cadw/Welsh Government, 2020, *Managing the Marine Historic Environment of Wales*, pg2

The development of Marine Planning in Wales is driving forward seabed mapping for both blue energy development and for ecological research to ensure a coherent network of Marine Protected Areas for Wales.

It is vitally important that historic environment research moves forward at the same time, to ensure that a sustainable marine environment promotes healthy, functioning marine ecosystems and protects heritage assets.

The environment within which marine survey and research takes place remains challenging, but now has the added impetus to gain greater understanding of the oceanic climate change impacts.

Action to find out more about the potential aspects of ocean acidification and invasive marine species has been included in the Historic Environment and Climate Change of Wales Sector Adaption Plan published in 2020. Sites continue to be impacted by coastal erosion noted by the coastal surveys undertaken by the Welsh archaeological trusts in the 1990s. Nearly 400 scheduled ancient monuments, listed buildings and other archaeological sites at greatest risk from sea-level rise and flooding in low-lying areas (Pert in Redknap et al (ed) 2019: 267).

Although the German submarine U87 has been added to the list of controlled sites under the Protection of Military Remains Act 1986, the number of Designated Historic Shipwrecks and scheduled maritime remains

has not been increased within this Research Framework period. Conservation Management Plans for each of these protected sites are required to ensure they are regularly monitored, and that appropriate intervention can be implemented as and when required.

Understanding the changes on an ecosystem scale, with wrecks sites forming an integral part, is now believed to be the best approach to gaining greater understanding of the impact of climate change. This is likely to require collaborative projects which involve archaeologists, marine scientists, and marine ecologists.

Marine Licensing

Amongst the challenges faced is the need to foster recognition that marine historic environment assets should not be seen as separate from the marine natural environment, rather they inhabit the same space and contribute many of the same social, cultural, and economic benefits.

The production of a synthesis of sites discovered through offshore development and which continue to be monitored by the provision of marine licensing may also be helpful to improve understanding of the application of best practice. The updating and republication in bilingual form of the guidance notes developed by Wessex Archaeology for the Crown Estate and UK Heritage Agencies continues to be seen as a beneficial by participants (see B4 Frameworks for Management, Offshore Renewables, pg60).

Methods

As the technology of marine geophysical survey moves forward, collaborative research projects which assist in harnessing new, non-destructive methods of investigation for underwater archaeological sites should be pursued (Groom in Redknap et al (ed) 2019: 262-3).

There will be instances where preservation *in situ* is not possible (e.g., Newport Ship). Consequently, capacity in Wales for the conservation of marine artefacts must be kept under review in relation to conservation facilities available UK wide.

Finding a permanent home for the Newport Ship and its associated collections remains pressing. The opportunity should be taken to create

centre of excellence with facilities and expertise to provide conservation for other significant marine finds.

Public Engagement and Outreach

Community groups are undertaking an increasingly amount of welcome survey and research, but such projects require a training as well as creative input to ensure that participation remains welcoming and attractive to new and existing audiences.

Exploring modern technologies to communicate with and especially listen to the needs of people who want to engage with the maritime assets is recognised as being extremely important.

Developing bilingual education resources that will allow teachers to bring local maritime history into the classroom in relation to the requirements of the Welsh National Curriculum remains a priority. The new curriculum for Wales to be rolled out from September 2023 provides new opportunities to develop resources to help learners to become ([Introduction - Hwb \(gov.wales\)](#)):

- ambitious, capable learners, ready to learn throughout their lives
- enterprising, creative contributors, ready to play a full part in life and work
- ethical, informed citizens of Wales and the world
- healthy, confident individuals, ready to lead fulfilling lives as valued members of society

The international links provided by topics relating to seafaring, marine transport and Welsh commodities exported worldwide continue to provide a vehicle for exploring Wales's place and relationships with the wider world.

Data Production and Maritime Archives

The 2009 report 'Securing the future for Maritime Archaeological Archives' highlighted a perceived crisis in archives management and in the conservation of artefact collections. One of the fundamental problems identified was that maritime archives generally do not progress to deposition. The causes were primarily attributed to differing management and legislative regimes have also had an impact on the generation and deposition of archives. The extra conservation requirements of objects from

marine zone may make museums nervous about acquiring maritime material.

Wales cannot be complacent about these issues but must continue to be initiative-taking in liaison with archive producers and the Welsh museums and Archives Wales Network to ensure that key maritime archives are brought into safekeeping in the public domain.

The 'Securing the future for Maritime Archaeological Archives' report recommendations included awareness-raising of processes of archive deposition; developing standards tailored specifically to marine archaeological audiences; ensuring robust archive requirement through legal protection systems and offshore development control; and the encouragement of analysis and publication relating to extant archives to improve access for future research and to inform marine planning. The Royal Commission has progressed accreditation as the historic environment marine Data Archive Centre for Wales with MEDIN and, in 2016, published updated guidelines for the digital archaeological archiving. However, archiving standards and the ease of archiving procedures need to be kept under constant review to ensure that they assist rather than hinder deposition.

The importance of data portals, such as Historic Wales, Archives Network Wales, IMarDIS, and MEDIN, which allow users to search across the holdings of multiple institutions to provide full access to both processed and unprocessed data has again been highlight by participants in this Maritime Chapter update.

A recurring theme throughout this 'Challenges for Conservation' section relates to finding ways to explore what 'maritime heritage' means to the people of Wales and finding innovative approaches to ensuring that it continues to have a relevance and resonance in everyday life.

Research recommendations for the future include:

- Cross sectoral studies which explore the ecological and social and economic value of shipwreck sites, as well their historic and archaeological value, and contribute to the Welsh Marine Evidence Strategy referred in the Welsh National Marine Plan;

- Studies which improve the integration of historic environment concerns into offshore development control, and which increase understanding of those concerns within marine industrial sectors, licensing authorities, and amongst other marine stakeholder groups;
- Research which reviews presently available guidance to appraise the effectiveness of the marine planning system in Wales with regard avoiding, minimising and mitigating impacts on heritage assets;
- Projects which promote the continued development of portals to provide access to data gathered from marine development control scenarios by developers for the archaeological research community;
- Studies which explore an eco-system approach to assessing the impacts of oceanic climate change on underwater cultural heritage;
- Studies which continue to harness hydrographic survey technologies to pursue cost effective exploration and monitoring of offshore heritage assets;
- Studies which raise the profile of Welsh maritime heritage on the international stage as well as at home through interpreting and making maritime archives digital accessible through the worldwide web;
- Projects which provide training to engage new participants in furthering understanding of the Welsh marine historic environment;
- Studies which provide educational resources, in both the sciences and the arts, relevant to the Welsh National Curriculum.

Theme 5: Frameworks for Management

The challenge of law in the future may well be to secure the preservation of hitherto inaccessible wrecks from inappropriate salvage as technology develops yet more capability to discover and reach wrecks off our shores...

However, beyond the UK marine area the international legal regime is very complex and far from being settled law...

- *Mike Williams, 2019, Maritime Heritage and the Law in Wales and the Sea: 10,000 years of Welsh Maritime History, pg281, 287*

The complexity of International Conventions, international law, UK, and Welsh legislation as they relate to shipwreck sites is recognised.

In the spirit of the UNESCO Convention on Underwater Cultural Heritage 2001, a study which collates information about Welsh shipping losses overseas would assist in fostering international collaboration in protection and conservation. There are now a considerable number of countries maintaining maritime sites and monuments records, and the maritime record of the National Monuments Record of Wales now contains losses originating from thirty overseas countries (William in Redknap et al (ed) 2019: 287).

It is also important that opportunities are taken to keep legislative and licensing frameworks under review to introduce greater transparency and simplification. The publication of the Cadw guidance note 'Managing the Marine Historic Environment of Wales' in 2020 was a major step forward in offering best practice guidance for the protection and management of the marine historic environment.

Advisory Committee on Historic Wreck Sites which formerly advised the four devolved UK administrations regarding policy and practice relating to wreck sites in UK waters was dissolved in 2011. Hence, it is important that the Advisory Panel for the Welsh Historic Environment established as part of The Historic Environment (Wales) Act 2016 includes underwater cultural heritage as an integral part of its remit. The former

Advice to developers needs to be consistent and robust to ensure that aspirations of the Welsh Marine Plan are successfully delivered, namely:

SOC_05: Historic assets

Proposals should demonstrate how potential impacts on historic assets and their settings have been taken into consideration and should, in order of preference:

a. avoid adverse impacts on historic assets and their settings;

and/or b. minimise impacts where they cannot be avoided;

and/ or c. mitigate impacts where they cannot be minimised.

If significant adverse impacts cannot be avoided, minimised, or mitigated, proposals must present a clear and convincing case for proceeding.

Opportunities to enhance historic assets are encouraged

- Welsh Government, 2019, Welsh National Marine Plan, pg33-34*

The bibliography for this theme contains an overview of present legislation and best practice guidance.

Recommendation for future research priorities include:

- Studies which explore the potential benefit for areas specified for the protection of Designated Historic Wrecks as 'no take' zones where fish populations can grow with limited human interference and potentially 'spill-over' to replenish fished populations outside;
- Studies which identify Welsh shipping casualties in the coastal waters of other countries to assist in the gauging of rarity of surviving wrecks in Welsh waters;
- Projects which provide training to engage new participants in furthering understanding of the Welsh marine historic environment and its assets.

Theme 6: Material Culture and Preservation by Record

Item a barell with some tarre... Item two emptie spruse cofers lockes brok[en]... Item Cloves... Item one glasse bottle... Item two boxes of marmalade... Item a silver whissell with a peece of a chaine ... Item a Walkinge staffe...

- *Extract from inventory of items recovered from the Anne Francis which shore near Port Talbot on 28 December 1583. National Library of Wales Document Reference: Penrice and Margam 5278 (NPRN 300035)*

Implementing a 'material culture approach' is to accept that each artifact has:

- a history,
- a maker and a place of origin;
- was made from chosen material(s);
- was made in a specific way;
- looks the way it does because of intentional choices by its maker;
- has an intended use or uses.

The coast of Wales has with an extensive network of local authority and independent museums and archives with maritime collections. Objects may range from fine art and photography to figureheads, fishing tackle, elements of rigging, personal items treasured by mariners, clothing, and vessels. The finds associated with the Newport Ship are as fascinating as the vessel itself.

Advances in collection management software and digital technology makes possible improved searching and access to individual items. The 'Gathering the Jewels' initiative, which made available photographs of items from museum and private collections, has been superseded by the Casgliad y Werin Cymru/People's Collection Wales. However, there is scope for further digitisation of maritime related objects in collections with research into their use and provenance.

Recommendations for future research include:

- Studies which explore and make links between material culture and artefacts in museum collections and archaeological remains;
- Studies which address the information with regard to Welsh vernacular boatbuilding in iconography representation such as painting, drawing, carvings, models, etc.;
- Studies which research, catalogue and photograph the partial and/or complete vessels in museum ownership in Wales;
- Studies which identify maritime archaeological archives and quantify paper and digital resources and artefact collections not presently curated within the Welsh museum and archives network, and which work towards providing clear guidance to potential depositors of appropriate formats and materials for long term preservation.

Theme 7: Maritime Identities

Holaf ym mhob llong ar hyd yr harbwr	<i>I ask at every ship along the harbour Can they take a boy to be a sailor?</i>
Oes 'na le i hogyn fynd yn llongwr?	<i>And to splice the ropes and knot them</i>
A chael spleinsio rhaff a rhiffio	<i>And to learn to steer</i>
A chael dysgu llywio	<i>And go out in a boat to scull</i>
A chael mynd mewn cwch i sgwlio	<i>Oh why can't I be a sailor</i>
O na chawn i fynd yn llongwr	<i>With all those ships loading in the</i>
A'r holl longau'n llwytho yn yr harbwr?	<i>harbour?</i>

- John Glyn Davies, 1936, *Llongau Caernarfon (Ships of Caernarfon)*

There is a wide range of research which can be undertaken in the maritime sphere to shed light in the formation of Welsh identity.

Approaches include exploring the lives of variety of people who interacted with the sea in diverse ways – from merchant sailors to naval officers, from dock workers to those who took part in sailing regattas.

Archaeological science can also play a role. For example, the application of oxygen and strontium isotope analysis to identify the likely childhood places of origin. For example, the skeleton of a man found at Llanbedr Goch has been radiocarbon 14 dated to 680-880AD, with the oxygen isotope values being compatible to the western seaboard of France and Spain (Redknap in Redknap et al (eds) 2019: 89).

The List of Historic Place Names being compiled under provisions contained the Historic Environment (Wales) Act 2016 provides a mean of combining placename research to explore coastal place names and the extent of maritime influence into the interior ([RCAHMW | Search Our Records | List of Historic Place Names](#)). For example, Scandinavian placenames in Wales relate to prominent coastal navigational points along the route from the north to the Severn estuary (e.g., 'sker' meaning isolated rock as in Skerries and Tusker) and combine settlement and personal names from Viking settlers (e.g., Haroldston combining the name Scandinavian Haraldr with the English 'tun' for village or farmstead).

This theme also allows the topics of immigration and emigration to be explored through shipwreck information and the contributions of Welsh

pioneer settlers overseas (e.g., Great Plains Welsh Heritage Project [Croeso! Welcome! | Great Plains Welsh Heritage Project](#)). Emigrant ships lost in Welsh waters include the Lockwoods (NPRN 240567) and the Ocean Monarch (NPRN 271692).

It also promotes research into the significant contributions made to Welsh seafaring by our Black, Asian and Ethnic Minority communities. Merchant ships lost in Welsh waters with large numbers of BAME crewmembers onboard include the Apapa (NPRN 272124) and Renfrew (NPRN 240293).

The role of women in ship-ownership and ship finance can also be pursued. For example, the acquisition of the sloop Eliza Beynon by Rosetta Marks of Swansea is noted in Register of Shipping documentation. The Eliza Beynon was one of the vessels driven ashore during the Royal Charter Gale 25-26 October 1859 (NPRN 525281).

The power of the sea has always had a profound impact on the creative arts and the human imagination for poets, artists, musicians and in the creation of myths and legends. Under the influence of the romantic movement in the late eighteenth century many artists sought the 'spirit of place', literary associations and emotional responses in response to the sublime power of nature. Some artists intended to create a record of a scene they had observed. Others were in search of the saleable images for clients. Others still made paintings of ships for their owners or masters, who expected them to be accurate. (Wakelin in Redknap et al (ed) 2019: 26-27). The museum and archives network of Wales contains a wealth of imagery to inspire and spark artistic responses. Projects which further connectivity between collections and ease searching are welcomed.

Other artistry finds expression in music. For example, the loss of the Frodsham flat Ann on the St Tudwal's Islands in October 1858 is the real-life vessel behind the Welsh rhyme and shanty 'Fflat Huw Puw' (NPRN 271580). There are significant sound and oral testimony archives in the National Library of Wales and National Museum of Wales. Projects which continue to make these resources digitally available and provide online access will inspire new voyages of discovery and creative responses.

Recommendations for future research include;

Maritime

- Studies exploring the development of different marine-based industries within coastal settlements, and their impact on the overall character of towns and villages;
- The lives of individual mariners or generations of seafarers belonging to single or extended families which can illuminate the day-to-day life of Welsh mariners, shipowners, merchants, etc;
- Studies exploring the changing role of Customs Officers (e.g., reeves, Receivers of Wreck, etc.) and from the time of rife piracy in the 16-17th century up to the present day;
- Studies exploring the role of the Lloyd's agents around the coast of Wales, who they were, their attendance at shipwreck incident, and the services they provided/co-ordinated;
- Studies which continue the ethnographic tradition of gathering and assessing the recollections and oral traditions of Welsh people who make their living from the sea (including the roles of women and BAME communities);
- Studies which explore Mariners' rescue and lifesaving services and the role played by philanthropic individuals and societies, the architecture of lifeboat houses and the continuing role played by lifeboat services in communities today;
- Research which provides improved access to sound and visual art archives to promote creative responses on maritime themes;
- Studies which identify the resonance of shipwreck incidents in Welsh art and literature.

4: Achievements relating to priorities identified in previous versions of the Maritime Chapter of the Research Framework

The commemorative period for the First World War saw a significant upsurge in research into wartime losses. The U-Boat Project Wales 1914-18 was amongst the many outreach projects which involved community groups in the exploration of the experiences of their maritime ancestors. This HLF-funded project also contributed eighteen new multi-beam wreck surveys, 3D digital models for online exploration over eight hundred images, photographs, and stories to the People's Collections Wales. Two underwater field schools were also undertaken by the Nautical Archaeology Society focussing on the wrecks of the LEYSIAN and CARTEGENA. Over one hundred sports divers participated in the collection of survey and ecological data.

Project Z took the exploration of the war at sea around the coast of Wales to the air exploring the role of airships in defending the shipping routes for the transportation of goods and supplies, troops, and naval convoys. It shed light on the pioneering work of E T Willows who designed, built, and flew his first airships from Splott in Cardiff.

Cartooning the First World War Project brought together all the wartime newspaper cartoons of Joseph Morewood Staniforth ('JMS'), which originally appeared in the British Sunday paper the News of the World and the Cardiff daily paper the Western Mail. Many of which comment on submarine warfare and its impact on the home front.

Welsh mariners also featured in the research undertaken by individuals, community groups and universities relating to local war memorials (e.g., West Wales Memorial Project; Welsh Memorials to the Great War; Flintshire War Memorials).

SEACAMS and Bangor University were also involved in two further projects with their research vessels and multi-beam echosounder survey capability. The O Dan y Dwr – Hidden Seascapes of Wales Project has produced a series of surveys placing wrecks in their wider environmental context of rocky outcrops, sand waves and scour patterns. The 'Echoes from the Deep: Modern Reflections on our Maritime Past' Project was funded by the Leverhulme Trust Early Career Fellowship fund as a collaboration between

the School of Ocean Sciences at Bangor University and archaeologist Dr Innes McCartney from Bournemouth University. The project has undertaken surveys of vessels from both World Wars, notably confirming the identity and location of LCT 326 off Bardsey. It has also provided identities for many of the 'UNNAMED WRECKS' in the Irish Sea.

The CHERISH Project (Climate, Heritage and Environments of Reefs, Islands and Headlands) has begun to address the strategic priorities identified in the Historic Environment and Climate Change Sector Adaptation plan. Using innovative technologies to analyse coastal and island archaeology and heritage sites most affected by climate change, coastal erosion, storminess and rising sea levels, the partners are the Royal Commission on the Ancient and Historical Monuments of Wales, Aberystwyth University, Geological Survey Ireland, and Discovery Project Ireland. Begun in 2017, this 5-year project is funded by the EU from the Ireland Wales Co-operation Programme 2014-2020, Priority Axis 2 – Adaptation of the Irish Sea and Coastal Communities to Climate Change.

The participation of the University of Wales Trinity St David in 'Europe's Lost Frontiers Project' enabled an area of seabed adjacent to the well-known submerged forest at Borth to be explored using the Marine Institute of Ireland survey vessels. The geophysical survey and coring data recovered has helped to shed light on the former watercourse of the Dyfi across the drowned landscapes of Cardigan Bay. The 'Layers in the Landscape: Deep Mapping in Cardigan Bay Project contributed towards media outputs and outreach activities relating to the lost lands of Cantref Gwaleod involving the skull and antlers of a deer recovered from Borth beach in 2016.

During the period of COVID lockdown restrictions, the Nautical Archaeology Society made available a database of 453 shipwrecks in the northern end of Cardigan Bay to allow its members to participate in online research. The project has involved seventy-five volunteer researchers from around the world in exploring the stories of 332 documented wrecks and the production of 214 reports on the online archive research undertaken.

The conservation of the Newport Ship has continued. Currently in around three hundred pieces, the timbers have been freeze-dried and are now stored in a series of climate-controlled rooms. The aspiration remains for a

new museum, displaying the ship alongside other artefacts charting Newport's history.

Making the Link: Lloyd's Casualty Returns and the National Monuments Record of Wales was a collaborative heritage project which enhanced Welsh shipwreck records with Lloyd's Casualty Returns. The partnership project between Lloyd's Register Foundation and the Royal Commission on the Ancient and Historical Monuments of Wales added over one hundred new shipwrecks to the Commission's records, the National Monuments Record of Wales, in addition to enriching existing records with added information. The updated version of Coflein, the online access to National Monuments Record of Wales, now include hyperlinks to the Casualty Returns, enabling users and researchers to seamlessly sift from one resource to the other. The project has also linked with contemporary newspapers for many of the shipwrecks, ensuring that the Commission's records include an additional avenue of research for users ([RCAHMW | Locating Welsh shipwrecks](#)).

Over the past 5 years, much progress has been made in clarifying Welsh Government policy regarding maritime heritage assets. The development of the Welsh National Marine Plan and implementation guidance now provides a robust set of guidance for developers regarding appropriate mitigation.

The publication of the 2020 Guidance Note *Managing the Marine Historic Environment of Wales* has greatly helped to clarify the criteria for selection and their application for future protective status designations.

Welsh Government also appointed a Task and Finish Group to audit the public monuments, street and building names in Wales associated with the slave trade and the British Empire and also touching on the historical contributions to Welsh life of people of Black Heritage ([The Slave Trade and the British Empire: An audit of commemoration in Wales \(gov.wales\)](#)).

The Royal Commission has adopted the digital archiving facilities and procedures to comply with international standards, namely the Open Archival Information System (OAIS) reference model – OAIS (ISO 14721) and is now utilising the standard digital archive package, produced by Preservica, as part of its current data platform. This is allowing OAIS compliant workflows, active preservation of digital content, and public access to digital records. To ensure that the reception and ingest of digital

accessions into this system is as efficient as possible, and sustainable with a limited staff capacity, RCAHMW has created digital archive guidelines. These set out the organisation, description and format of digital archaeological archives required from data producers in the sector who intend to deposit records with the NMR ([RCAHMW | RCAHMW Guidelines for Digital Archaeological Archives – A Sustainable Approach to Digital Preservation](#)). The Royal Commission has ingested digital multi-beam survey data and from databases of measurements and imagery captured and ordered by the Site Surveyor software from the U-Boat Project Wales 1914-18 evaluating these new procedures.

Bangor University have developed a marine data portal to make available the data, products and services derived from the collaborative research carried out between Welsh marine industries and Bangor University at Marine Centre Wales ([The Integrated Marine Data and Information System \(imardis.org\)](#)).

The 'Ports, Past and Present' project explored the history and cultural heritage of the ports of Fishguard, Holyhead and Pembroke Dock in Wales, and Dublin and Rosslare in Ireland as part of a major EU-funded project for Aberystwyth University aimed at driving economic growth. As part of a wide range of cultural activities, a media company produced a series of documentary films to promote the five port towns and the three ferry routes which link them.

The adoption of Welsh Language Standard (No7) Regulations 2018 has been progressed through projects undertaken under the umbrella of the Research Framework, such as the CHERISH, U-Boat Project Wales 1914-18, the Ports Past and Present project and the IMarDIS portal.

An exciting development for 2020 is the 'Unpath'd Waters' project which is a three-year research project aiming to unite the UK's maritime Collections. The School of Ocean Sciences, Bangor University, the Royal Commission on the Ancient and Historical Monuments of Wales, are engaged in researching and exploring shipwrecks in the Irish Sea in collaboration with the University of Belfast and the Manx Heritage. The wider project, with twenty-one participating organisations including Cadw, will improve the connectivity between relevant scientific data, historic archives, and associated collections.

This review of the projects undertaken or begun in the past five years suggests that some twelve of the thirty-six recommendations for future research have begun to be addressed from the previous version of the Maritime Chapter.

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Trust Reports 79, 198, 251, 253

GAT, 2010-13, Arfordir – Coastal Heritage
(<http://www.heneb.co.uk/arfordir/arfordirprojects2012-13.html>)

GGAT 1996, 1997, 1998 Coastal Erosion Surveys, GGAT Reports 96/015,
97/011, 98/010

Wessex Archaeology, 2005, Strategic Environmental Assessment SEA 6:
Irish Sea Maritime Archaeology
(https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/197296/SEA6_Archaeology_Wessex.pdf)

Wessex Archaeology, 2004, Diamond, Sarn Badrig, Cardigan Bay,
Designated Site Assessment: Preliminary Report, report ref: 53111.02u,
NA/ME/2005/002e

Wessex Archaeology, 2006, Diamond, Cardigan Bay, Designated Site
Assessment: Full Report, report ref: 53311.03u. NA/Gen/2006/009e

Wessex Archaeology, 2007, Pwll Fanog, Menai Strait, Designated Site
Assessment: Full Report, AENT21/07

Wignal, S. 1979, The Bronze Bell Wreck: Archaeological Survey of a late
17th century shipwreck lying in Cardigan Bay, unpublished Licensee
report. Document within NA/GEN/2005/002e.

B5: Frameworks for Management

International Conventions

UNESCO Convention on the Protection of Underwater Heritage 2001 - sets out basic principles for the protection of Underwater Cultural Heritage (UCH); provides a framework for countries to cooperate, share information and promote public awareness; and, with the Annex, sets out widely recognized practical rules for survey and research. The convention defines UCH as traces of human existence which have been partially or underwater, periodically, or continuously for at least one hundred years, forming an integral part of a common global archaeological and historical heritage. The UK has adopted 'The Rules' contained in the Annex to the Convention which includes the principle that UCH should not be commercially exploited. In the determination of marine licences, this policy suggests that projects should comply with 'The Rules'.

<http://www.unesco.org/new/en/culture/themes/underwater-cultural-heritage/2001-convention/official-text/>

The European Convention on the Protection of the Archaeological Heritage 1991 (Valletta, January 1992) - countries being party to the convention (including the UK) agree to seven priorities amongst which are the institution of a legal system to protect the archaeological heritage, including the maintenance of an inventory and the designation of protected monuments and areas; to establish archaeological reserves, even without any visible remains on the ground or under water, for the preservation of material evidence to be studied by next generations; to institute the mandatory reporting to the competent authorities by finders of chance discoveries of elements of the archaeological heritage and making them available for examination; and to prevent any illicit excavation or removal of elements of the archaeological heritage.

<http://www.coe.int/en/web/culture-and-heritage/valletta-convention>

Principal UK Legislation

Protection of Wrecks Act 1973 - Section One: Wrecks and wreckage assessed to be of historical, archaeological, or artistic importance can be

protected by way of site-specific designation. It is an offence to conduct certain activities within a defined area surrounding a designated wreck unless a licence for those activities has been obtained through Cadw. Section Two: Wrecks considered as being potentially dangerous and is administered by the Receiver of Wreck through the MCA. In the interest of safety, there is a strict no-entry policy for wrecks considered dangerous because of their contents. These wrecks have a prohibited zone around them.

<https://www.legislation.gov.uk/ukpga/1973/33>

Ancient Monuments and Archaeological Areas Act 1979 - (as amended by the Historic Environment Act (Wales) 2016) - This Act is primarily used to protect terrestrial sites but has also been used to protect underwater sites. Scheduled Monuments and Areas of Archaeological Importance are afforded statutory protection by the Secretary of State, and consent is required for any major works. The law is administered by Cadw.

<https://www.legislation.gov.uk/anaw/2016/4/contents>

Protection of Military Remains Act 1986 - Regardless of nationality, all aircraft which have been in the military service of any country, and which lie in UK territorial waters are protected under the Protection of Military Remains Act 1986. Maritime vessels (e.g., ships and boats) lost during military service are not automatically protected. The Ministry of Defence can, however, designate wrecks lost within the last two hundred years, whose position is known, as 'controlled sites', and can designate named vessels lost on or after 4 August 1914 (Britain's entry into World War I), whose location is unknown, as 'protected places'. It is not necessary to demonstrate the presence of human remains for wrecks to be designated as either 'controlled sites' or 'protected places'.

<https://www.legislation.gov.uk/ukpga/1986/35>

Merchant Shipping Act 1995 - This Act sets out the procedures for determining the ownership of underwater finds classified as 'wreck'; defined as any flotsam, jetsam, derelict, and lagan found in or on the shores of the sea or any tidal water. It includes ship, aircraft, hovercraft, parts of these, their cargo or equipment. If any finds are brought ashore, the salvor is required to give notice to the Receiver of Wreck that he/she

has found or taken possession of them and as directed by the Receiver, either hold them pending the Receiver's order or deliver them to the Receiver. The Act is administered by the Maritime and Coastguard Agency.

<http://www.legislation.gov.uk/ukpga/1995/21/contents>

Treasure Act 1996 - This Act replaces the common law of treasure trove in England, Wales, and Northern Ireland and, although primarily terrestrial, applies within the intertidal zone to low water, provided the finds do not constitute 'wreck', in which case the Merchant Shipping Act applies. Under the Act all finders of 'treasure' have a legal obligation to report such items. The Act addresses the definition of treasure, along with the payment of rewards in relation to permitted metal detecting. Items which are not defined as treasure and found during metal detecting are in principle also owned by the landowner. The Portable Antiquities Scheme, co-funded by the National Museum of Wales, Cadw and the Museums, Archives and Libraries Division (MALD), Welsh Government, is a mechanism to record and publish archaeological finds made by members of the public with a central coordinator based at the National Museum of Wales.

<https://finds.org.uk>

Marine and Coastal Access Act 2009 – The Marine and Coastal Access Act 2009²⁹ set out a requirement for a national marine plan and established the Welsh Ministers as the marine planning authority for Wales. Marine planning aims to ensure that development below mean high water spring tides is sustainable and considered, and that it contributes towards 'blue growth'. The Marine and Coastal Access Act 2009 also introduced a requirement for marine licences for many types of activity below the mean high water springs mark. Natural Resources Wales is responsible for considering applications for marine licences in Wales on behalf of the Welsh Ministers. It considers a range of factors, including the impact of any proposed activity on the marine historic environment.³⁰ Enforcement of licence conditions or enforcement actions related to non-compliance with a marine licence is the responsibility of the Welsh Government.

<https://www.legislation.gov.uk/ukpga/2009/23/>

Historic Environment (Wales) Act 2016- this Act updates and amends existing laws relating to statutory protection of both terrestrial and maritime heritage to strengthen protection and remove inconsistencies.

<https://www.legislation.gov.uk/anaw/2016/4/contents>

Welsh Best Practice Guidance:

Cadw, 1999, Caring for Coastal Heritage

<https://cadw.gov.wales/advice-support/historic-assets/scheduled-monuments/best-practice-guidance#sectioncaring-for-coastal-heritage>

Cadw, 2009, Caring for Military Sites

<https://cadw.gov.wales/advice-support/historic-assets/scheduled-monuments/best-practice-guidance#section-caring-for-military-sites-of-the-twentieth-century>

Cadw, 2011, Conservation Principles for the Sustainable Management of the Historic Environment in Wales

<https://cadw.gov.wales/advice-support/conservation-principles/conservation-principles>

Cadw, 2020, Managing the Marine Historic Environment of Wales

<https://cadw.gov.wales/sites/default/files/2020-03/39705%20Managing%20Marine%20E%20WEB.pdf>

Welsh Government, 2019, Welsh National Marine Plan

https://gov.wales/sites/default/files/publications/2019-11/welsh-national-marine-plan-document_0.pdf

Examples UK Policy and Guidance:

Archaeological Remains

Department of Culture, Media and Sport and Ministry of Defence, 2014, Protection and Management of Historic Military Wrecks outside UK

Territorial Waters Guidance on how existing policies and legislation apply to historic military wreck sites

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/307961/Protection_and_Management_of_Historic_Military_Wrecks_outside_UK_Territorial_Waters__April_2014.pdf

Ministry of Defence, Service Personnel and Veterans Agency, 2010, Crashed Military Aircraft of Historical Interest, Licensing of Excavations in the UK, Notes for Guidance of Recovery Groups

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/28264/POMRACTBOOKLET_Jun11.pdf

English Heritage, 2002, Military Aircraft Crash Sites – Archaeological guidance on their significance and future management

<https://content.historicengland.org.uk/images-books/publications/military-aircraft-crash-sites/milaircsites.pdf/>

Chartered Institute for Archaeologists (CIFA) have produced a series of codes, standards and guidelines which are used as benchmarks for archaeological best practice. This S&G nautical archaeological recording is designed as a high-level document that sets down standard for levels of recording within which specific strategies for individual sites and situations can be developed.

<http://www.archaeologists.net/codes/cifa>

http://www.archaeologists.net/sites/default/files/CIfAS&GNautical_1.pdf

Historic England, 2012, Designation Selection Guides: Ships and Boats Prehistory to the Present

Historic England, 2016, Introductions to Heritage Assets: Ships and Boats Prehistory to 1840

Historic England, 2016, Introductions to Heritage Assets: Ships and Boats 1840 to 1950

<https://www.historicengland.org.uk/images-books/publications/dsg-ships-boats/>

Historic England, 2013, Designation Scheduling Selection Guides: Maritime and Naval

<https://www.historicengland.org.uk/images-books/publications/dssg-maritime-naval/>

Joint Nautical Archaeology Policy Committee, 1998, Underwater Finds: Guidance for Divers - prepared by the Joint Nautical Archaeology Policy Committee, the British Sub-Aqua Club, the Professional Association of Diving Instructors, and the Sub Aqua Association.

<http://www.jnapc.org.uk/Underwater%20Finds%20Booklet.pdf>

Marine Scotland, 2020, Productive: Recreation and Cultural Heritage

http://marine.gov.scot/sma/sites/default/files/sma2020_-_historic_environment_and_cultural_heritage_-_productive.pdf

Northern Ireland Department of Agriculture, Environment and Rural Affairs

<https://www.daera-ni.gov.uk/articles/marine-historic-environment>

Marine Planning and Offshore Industry Sectors:

HM Government, Northern Ireland Executive, Scottish Government and Welsh Assembly Government (DEFRA), 2009, Our Seas – A Shared Resource: High Level Marine Objectives

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/182486/ourseas-2009update.pdf

HM Government, Northern Ireland Executive, Scottish Government and Welsh Assembly Government (DEFRA), 2011, UK Marine Policy Statement

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69322/pb3654-marine-policy-statement-110316.pdf

Joint Nautical Archaeology Policy Committee (JNAPC), 2006, Code of Practice for Seabed Development - defining best practice in terms of co-operation and discussion between archaeologists and seabed developers

http://www.jnapc.org.uk/jnapc_brochure_may_2006.pdf

Marine Aggregates

Marine Aggregate Dredging and the Historic Environment: Guidance Note, 2003 - Provides practical guidelines on assessing, evaluating, mitigating, and monitoring archaeological impacts of marine aggregate dredging. The principles outlined apply throughout the UK Continental Shelf.

<http://www.wessexarch.co.uk/projects/marine/bmapa/dredging-hist-env.html>

British Marine Aggregates Producers Association (BMAPA) Protocol for Reporting Finds of Archaeological Interest, 2005 - The protocol deals with the reporting of finds made by staff on board dredging vessels, and at wharves. In 2008, an annex to the Protocol was produced regarding reporting finds in relation to aircraft crash sites at sea.

<http://www.wessexarch.co.uk/projects/marine/bmapa/arch-interest.html>

<https://www.scribd.com/document/2174360/Annex-to-the-Protocol-Guidance-on-the-use-of-the-Protocol-for-Reporting-Finds-of-Archaeological-Interest-in-Relation-to-Aircraft-Crash-Sites-at-Sea>

Offshore Renewables

COWRIE, 2006, Historic Environment Guidance Note for the Offshore Renewable Energy Sector: Guidance Note

COWRIE, 2007, Guidance for Assessment of Cumulative Impact on the Historic Environment from Offshore Renewable Energy

Crown Estate/Wessex Archaeology, 2010, Model Clauses for Archaeological Written Schemes of Investigation Offshore Renewables Projects

COWRIE, 2011, Offshore Geotechnical Investigations and Historic Environment Analysis: Guidance for the Renewable Energy Sector

Crown Estate/Wessex Archaeology, 2014 Offshore Renewables Protocol for Reporting Archaeological Discoveries

English Heritage, Historic Scotland, Cadw, 2013, Historic Environment Guidance for Wave and Tidal Energy, prepared by Fjordr Ltd

<https://www.historicengland.org.uk/images-books/publications/historic-environment-guidance-wave-tidal-energy/>

Ports Sector

Department of Transport, 2012, National Policy Statement for Ports

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/3931/national-policy-statement-ports.pdf

Historic England/Wessex Archaeology, 2016, The Assessment and Management of Marine Archaeology in Port and Harbour Developments - intended to inform developers on the importance and relevance of the historic environment in relation to ports and how development proposals should take this into account.

<https://historicengland.org.uk/images-books/publications/assessment-management-marine-archaeology-port-and-harbour-development/>

Fishing Industry

Firth, A, McAleese, L, Anderson, E, Smith, R, and Woodcock, T, 2014, Fishing and the Historic Environment, prepared for English Heritage

B6: Material Culture and Preservation by Record

Redknap, M (ed), 1997, Artefacts from Wrecks, Oxbow Monographs

Redknap, M, Rees, S, Aberg, A, (eds), 2019, Wales and the Sea – 10,000 years of Welsh Maritime History, Royal Commission on the Ancient and Historical Monuments of Wales and Y Lolfa

7: Maritime Identities

Butler, Rev P O, 1989, Some Bangor Maritime Inscriptions, *in Cymru a'r Môr* /Maritime Wales (10), 146-152

Davies, T, 2004, Borth: A Seaborn Village, Gwasg Carreg Gwalch

Davies, T, 2009, Borth: A Maritime History, Llygad Gwalch Cyf

Eames, A, 1973. Ships and Seamen of Anglesey 1558-1918, Anglesey Antiquarian Society

Eames, A, 2016, *The Captain's Wife: The Diary of a voyage from the Golden Age of sail in Wales*, Llygad Gwalch Cyf

Jenkins, J G, 1982, *Maritime Heritage: The Ships and Seamen of South Ceredigion*, Gomer Press

Jenkins, J G, 2006, *Welsh Ships and Sailing Men*, Gwasg Carreg Gwalch

Kilminster, G and Mytum, H, 1987, *Mariners at Newport, Pembrokeshire: The Evidence from the Gravestones*, *in Cymru a'r Môr /Maritime Wales* (11), 7-27

Lloyd, L, 1993, *Wherever Freights May Offer: The Maritime Communities of Abermawr and Barmouth 1565-1920*, Lewis Lloyd

6: Useful Sources and Contacts

Journals and Newsletters:

Cymru a'r Mor/Maritime Wales

<https://www.gwynedd.llyw.cymru/en/Residents/Documents-Residents/Libraries-and-archives-documents/Archives/List-of-articles.pdf>

International Journal of Nautical Archaeology

<https://www.nauticalarchaeologysociety.org/ijna>

Mariners Mirror, Society of Nautical Research

<http://snr.org.uk/the-mariners-mirror-archive/>

Nautical Archaeology Society Newsletter

<https://www.nauticalarchaeologysociety.org/free-newsletter>

Severn Estuary Levels Research Committee: Archaeology in the Severn Estuary

<http://www.selrc.org.uk/publications.html>

National and Regional Research Frameworks neighbouring Wales and Welsh waters:

Maritime and Marine Historic Environment Research Framework for England 2013

http://archaeologydataservice.ac.uk/archives/view/mheresearch_eh_2011/

Scottish Archaeological Research Framework (SCARF) 2016

<https://scaarf.scot>

Northwest England Archaeological Research Framework 2006

<https://researchframeworks.org/nwrf/introduction>

Southwest England Archaeological Research Framework 2012

<https://researchframeworks.org/swarf/>

Palaeolithic Research Framework for the Bristol and Avon Basin 2005

<https://www.bristol.gov.uk/documents/20182/33848/Palaeolithic+Research+Framework+for+the+Bristol+Avon+basin.pdf/a3d95de1-a749-481d-a8ae-7266c67fc05d>

North Sea Prehistory Research and Management Framework 2009

<https://www.historicengland.org.uk/images-books/publications/ns-prehistory-research-manage-framework/>

WWW resources:

Archwilio provides online public access to the historic environment records for each local authority area in Wales.

<https://www.archwilio.org.uk>

Borth: A Maritime History

<https://borthmaritimehistory.com/>

Britannia's Dragon – Welsh naval History

<https://britanniasdragon.com/>

British Commission for Maritime History

<http://www.maritimehistory.org.uk/>

Crew List Index Project

<http://www.crewlist.org.uk/>

Crest Lists of the British Merchant Navy 1915

<http://1915crewlists.rmg.co.uk/>

Cof Cymru – National Historic Assets of Wales portal to access information about designated, scheduled, and listed sites in Wales

<https://cadw.goc.wales/advice-support/cof-cymu>

Coflein is the online catalogue for the National Monuments Record of Wales, the national collection of information about the historic environment of Wales.

<https://www.coflein.gov.uk>

Friends of the Newport Ship

<https://www.newportship.org/>

Lloyd's Register Foundation – Lloyd's Register of Ships and Lloyds Casualty Returns

<https://hec.lrfoundation.org.uk/archive-library/digital-resources>

HMS NHS: The Nautical Health Service

<https://www.zooniverse.org/projects/msalmon/hms-nhs-the-nautical-health-service>

Mariners on Swansea Registered Ships

<http://www.swanseamariners.org.uk/>

The Maritime Heritage Trust

<https://www.maritimeheritage.org.uk/>

Morol - Institute of Welsh Maritime Historical Studies

<https://www.facebook.com/MOROL.eu/>

People's Collection Wales

<https://www.peoplescollection.wales>

National Historic Ships

<https://www.nationalhistoricships.org.uk/>

Welsh Mariner 1800-1945

<http://www.welshmariners.org.uk>

Welsh Government Marine Planning Portal – interactive mapping tool for data relating to marine planning in Wales

<http://lle.gov.wales/apps/marineportal>

First World War Projects

Cartooning the First World War, Cardiff University

<https://www.cartoonww1.org>

Flintshire War Memorials

<https://www.flintshirewarmemorials.com/memorials>

Project Zero, History Matters

<https://projectzerohistorymatters.blogspot.com/about-project-zero.html>

U-Boat Project Wales 1914-18

<https://uboatproject.wales>

Welsh Memorials to the Great War, University of Swansea

<https://war-memorials.swansea.ac.uk>

West Wales War Memorial Project

<https://ww1.wales>

Organisations with Maritime Interests and Responsibilities:

Welsh Government:

Cadw, Welsh Government

Ty'r Afon

Bedwas Road

Caerphilly CF83 8WT

Tel. 0300 025600

historicenvironmentleg@gov.wales

<https://cadw.gov.wales>

Welsh Government Sponsored Bodies:

National Library of Wales

Ffordd Penglais, Aberystwyth, SN23 3BU

Tel: 01970 632800

enquiry@llgc.org.uk

<https://www.llgc.org.uk/>

National Museum of Wales

National Museum Cardiff, Cathays Park, Cardiff, CF10 3NP

Tel: (029) 2039 7951

<http://www.museumwales.ac.uk/enquiries/>

<http://www.museumwales.ac.uk/cardiff/>

Natural Resources Wales

c/o Customer Care Centre, Ty Cambria, 29 Newport Road, Cardiff CF24 0TP

Tel: 0300 065 3000

enquiries@naturalresourceswales.gov.uk

<http://naturalresources.wales/>

Royal Commission on the Ancient and Historical Monuments of Wales

RCAHMW, Ffordd Penglais, Aberystwyth, SY23 3BU

Tel. 01970 621200

nmr.wales@rcahmw.gov.uk

www.rcahmw.gov.uk

National Monuments Record of Wales

nmr.wales@rcahmw.gov.uk

www.coflein.gov.uk

Welsh Archaeological Trusts:

Clwyd-Powys Archaeological Trust

41 Broad Street, Welshpool SY21 7RR

Tel. 01938 553670

trust@cpat.org.uk

www.cpat.org.uk

Dyfed Archaeological Trust

The Shire Hall, 8 Carmarthen Street, Llandeilo SA19 6AF

Tel. 01558 823121

info@dyfedarchaeology.org.uk

www.dyfedarchaeology.org.uk

Glamorgan-Gwent Archaeological Trust

Heathfield House, Heathfield, Swansea SA1 6EL

Tel. 01792 655208

enquiries@ggat.org.uk

www.ggat.org.uk

Gwynedd Archaeological Trust

Craig Beuno, Garth Road, Bangor LL57 2RT

Tel. 01248 352535

gat@heneb.co.uk

www.heneb.co.uk

Welsh Museums and Archives:

Welsh Archives Network

<http://www.archiveswales.org.uk/>

Ceredigion Museum

<http://www.ceredigion.gov.uk/index.cfm?articleid=197>

Chepstow Museum

<http://www.monmouthshire.gov.uk/places-to-visit/chepstow-museum>

Holyhead Maritime Museum

<http://www.holyheadmaritimemuseum.co.uk/>

Amgueddfa Forwrol Llŷn Maritime Museum

<http://www.llyn-maritime-museum.co.uk/>

Menai Heritage (Thomas Telford Centre)

<http://menaibridges.co.uk/>

National Waterfront Museum, Swansea

<https://museum.wales/swansea/>

Newport Ship

<http://www.newport.gov.uk/heritage/Newport-Ship/Newport-Ship.aspx>

Porthcawl Museum

<http://www.porthcawlmuseum.com/>

Porthmadog Maritime Museum

<http://www.porthmadogmaritimemuseum.org.uk/page12.html>

Ships Timbers Maritime Museum

<https://facebook.com/Shipstimbers/>

Swansea Museum

<http://www.swanseamuseum.co.uk/>

West Wales Maritime Heritage Society

<http://www.westwalesmaritimeheritage.org.uk/>

UK-wide Organisations:

Maritime and Coastguard Agency

Receiver of Wreck

row@mcga.gov.uk

Tel. 02380 329 474

<https://www.gov.uk/guidance/wreck-and-salvage-law>

Ministry of Defence (Downed Aircraft)

Defence Business Services JCCC, Room G35, Innsworth House, Imjin Barracks, Gloucester GL3 1HW

dbs-jcccgrouppmailbox@mod.uk

Tel. 01452 712612 extension 7330/6303

Ministry of Defence Wrecks Section (Naval Vessels and Merchant Ships on Admiralty Service)

FLEET-DCS 3rd SECTOR- HERITAGE, Navy Command HQ (MP1.3), Leach Building, Whale Island, Portsmouth, Hants, PO2 8BY

Tel: 023 9262 5620.

UK Hydrographic Office

UK Hydrographic Office, Admiralty Way, Taunton TA1 2DN

Tel. 01823 337900

<https://www.gov.uk/the-ukho-archive>