TITLE: Recognition and value of submerged prehistoric landscape resources in Australia.

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Abstract

Maritime cultural heritage is not just restricted to shipwrecks, historic waterfronts and contemporary Indigenous associations with marine and coastal areas, but also includes Indigenous coastal and submerged prehistoric archaeological sites and landscapes. For most of the 65,000 years or so of human occupation in Australia, sea level has been lower than present, yet we know almost nothing about submerged landscapes and their associated cultural heritage. Improved mapping of the physical continental shelf is providing an insight into these landscapes from a geomorphological perspective but the prehistoric cultural potential is as yet unrealised. The unknown nature of this record means that it is overlooked in any pre-development assessment along the intertidal and offshore zones. The result is the potential damage or loss of maritime prehistoric cultural resources, and unrealized socioeconomic benefit. Focused on Western Australia, this article aims to raise awareness of this unrecognised cultural resource, with a view towards developing a more inclusive policy and one that specifically involves Traditional Owners in the protection of maritime cultural heritage in Australia. This is particularly apposite given seascapes are increasingly included in Native Title determinations, Indigenous Protected Areas and co-managed marine parks across Australia.

Highlights

- The 65 ka record of cultural landscapes on Australia's continental shelf is largely unrecognised.
- Theoretical studies and high-resolution imagery of the seabed highlight this potential.
- Seascapes are part of a common humanity for both Indigenous and non-Indigenous people.
- Collaboration between stakeholder and interest groups will improve discovery of these seascapes.
- Clearer involvement of Indigenous people in marine heritage is needed.

Introduction

In recent decades, ethnographic research has begun to reveal the complex cultural values and connections Australia's Indigenous peoples have with the maritime environments ('sea country') surrounding this island continent. Increasingly, Indigenous peoples' connection to sea country is being formally recognised through native title determinations (Morphy and Morphy 2006), collaborative governance of Indigenous Protected Areas (IPAs) and Indigenous engagement in marine parks and fisheries management (Smyth and Isherwood 2016). In the Northern Territory, 80 per cent of the intertidal zone is legally owned by coastal Aboriginal groups under land rights legislation (**Figure 1**). Complementing this process of recognition, research has documented traditional knowledge of marine ecosystems and resources, and cultural mapping has revealed the presence of sacred sites and Dreaming tracks (i.e. mythological sites) in the sea, some of which correspond with geographical features such as valleys, rivers and estuaries that are part of ancient landscapes now submerged by rising sea levels over the last 20,000 cal. BP (Bradley, 2010; Nunn and Reid, 2015). Less effort and recognition, however, has been directed towards searching for material or archaeological evidence of Indigenous peoples' occupation, use and management of these landscapes during the millennia before their inundation by the sea.

Across the world there is an increasing awareness of submerged prehistoric landscapes, with over 3000 known sites in the Northern Hemisphere alone (Bailey and Flemming, 2008). By contrast, the prehistoric cultural archaeological record of Australia's continental shelf is largely unknown, and represents an under-researched gap in our understanding of Indigenous peoples' interactions with Australia's palaeoenvironments and resources. This represents a major gap in global narratives not only in coastal archaeology but also in World Prehistory (see also Ulm, 2016; Benjamin and Bailey, 2017). With the rapid expansion of marine commercial developments across many areas of the globe, a key challenge is to minimise the threats to the marine archaeological resource whilst maximising the opportunities for its collaborative monitoring and management (Flemming, 2004; Evans et al., 2009; Ward et al., 2014). To this end Australia is in a privileged situation of being able to build on the collaborative research in the Northern Hemisphere to begin to develop a much needed Australasian insight to the international field of submerged landscape studies and global prehistory. Moreover, we have the opportunity to collaborate with contemporary Indigenous cultures to assist in the quest for, and understanding of, any archaeological evidence that may have survived marine inundation of the continental shelf.

In this paper we wish to raise awareness of the significant potential for submerged maritime cultural resources on the Australian continental shelf as part of acknowledging Indigenous people's interests across the current land and sea boundaries. We focus mainly on coastal Western Australia (WA) where some of the earliest records of human occupation exist (O'Connor, 1999; Przywolnik, 2002, 2005; Veth et al., 2017) amongst areas of intense active commercial development (e.g. Mulvaney, 2011, 2015; Ward et al., 2016). Here large areas of

the continental margin are currently being developed for natural reserves of oil and gas, and billions of dollars committed to further development at the coastline (Oceans Policy Science Advisory Group, 2013; The Blueprint for Marine Science 2050 Report, 2015). Given this forward commitment, the need to understand those areas subject to potential development from both environmental and cultural perspectives is paramount. At the same time, research tied to such development offers considerable potential for the discovery and greater understanding of submerged landscapes along WA's vast coastline (20 871 km), which might otherwise be too costly to investigate as pure research. This submerged resource effectively represents *aqua incognita* and the cost of ignoring this unrecognised (and untapped) resource is arguably high and not aligned to international Environmental Impact Statement (EIS) standards.

Sea Country

"Indigenous people still relate to land that was inundated by sea during the last ice age and regard it as their own" (Anon. in Smyth, 2002: 11).

When considering Australia's marine cultural heritage, it is vital to incorporate the ongoing connection Aboriginal and Torres Strait Islander peoples have to a living heritage.¹ To maritime Indigenous groups, 'Sea Country' or 'Saltwater Country' includes coastal, island and marine environments (McNiven 2008; Smyth, 2002; 2007). This connection is not only contemporary but also relates to many millennia of sea-level changes, which at their lowest ~22,000 years ago saw relative sea levels ~130 m below present and coastlines up to 300 km or more farther offshore than today. Recently collected Indigenous histories around Australia recount the rise of the ocean and indicate that this connection may extend to the late Pleistocene (Bradley, 2010; Nunn and Reid, 2015). Green (1988), for example, reported that Bardi and Jawa people of the Dampier Peninsula and Buccaneer Archipelago (Figure 1) believe that ancestral beings travelled the seas and created the islands, reefs, sandbanks and marine species found within the sea (see also Smyth, 2007). These ancestral beings name all the features in the environment *including particular places on the seabed* where certain ritual activities occurred which, in some cases, resulted in ritual paraphernalia being left behind metamorphosing into particular marine features (Green, 1988). These rituals passed through the islands and the Dampierland Peninsula and travelled south along the coast, and south-east into the interior. In other words, Indigenous Australians view both onshore (present) and offshore (past) components of Sea Country as a continuum.

In NW Australia many traditional marine activities revolve around the huge tidal range and gently sloping seabed that result in vast areas of intertidal land and reef flats available for exploitation (Smyth, 2007), and retrodictive modelling indicates such intertidal areas were as great or greater in the past (Ward et al., 2013). Such resource-rich contexts were as important

¹ See also <https://australianmuseum.net.au/event/garrigarrang-sea-country>

to Aboriginal people both past (McNiven, 2003; Manne and Veth, 2015; Veth et al., 2016) and present (Jackson et al., 2012) and are critical in linking land and sea (see also Khakzad et al., 2015). In the Shark Bay **area (Figure 1)**, **deeply** held knowledge about the land and the sea country informs where people continue to hunt fish and gather today. Cultural knowledge about the connections between, for example Point Peron and Dirk Hartog Island, informs the traditional knowledge of contemporary reef features which are rich maritime resources and favoured fishing grounds. Knowledge about freshwater sources and soaks (i.e. freshwater found by digging in sand) in the intertidal zone has always been an important part of Indigenous cultural mapping. As sea levels rose through the Holocene, Indigenous knowledge about natural features - at the interface between limestone reefs and beach dunes, with the growth of certain vegetation, and observing animal behaviours - would have been vital to ensure survival as the sea country encroached on the land. We believe there are clear and timely opportunities to engage with Traditional Owner groups with respect to their knowledge, rights and interests of coastal and marine prehistoric cultural heritage. Indeed, in the contemporary context of legal and moral obligation of Indigenous marine heritage (see below) we argue that such engagement is essential.

In addition to being a domain for Indigenous Australians, the inundated continental shelf also relates to a global narrative of human migration, maritime adaptation and sea level change (Ward et al., 2016). It speaks to a common humanity and history of seafaring. Indeed, implicit in the advocacy for an improved international regime for the protection of underwater cultural heritage is the concept that historical and archaeological artefacts are a part of the shared or common heritage of humanity (Frost, 2004; see also Little, 2016).² Consider, as an example, the 7000 year old gravesite found at Tybrind Vig in Denmark of a young woman and her baby, found associated with a submerged midden site. We empathise in the pathos of this shared death, with an added awareness that skeletal remains have also been found in early Holocene midden sites on the outer islands of the Dampier Archipelago (JMcD, pers. observation) and adjacent mainland (Vinnicombe 1987). The submerged Danish middens provide an insight into a complex coastal- sea country economy that is likely echoed in any submerged middens along the Western Australian coast (as documented by Veth and O'Brien, 1986; Clune and Harrison, 2009; Harrison, 2009) and in other parts of the country (see Bailey, 1975, 1999; Bourke and Crassweller, 2006). Despite differences between the past cultures and physical environments of Europe and Australia, in both regions Holocene coastal hunter-gatherer groups developed

² Note archaeological and historical objects are excluded from the 'common heritage of mankind' in the United Nations Convention on the Law of the Sea (UNCLOS) because it applies in respect to exploration and exploitation of the mineral resources of the deep seabed. In contrast, the principle of 'common heritage of mankind' in cultural heritage law (e.g. Convention on the Protection of the Underwater Cultural Heritage) is concerned with non-appropriation, preservation, protection and education (see Frost, 2004).

intensive maritime economies and created extensive shell middens - similarities that provide a basis for intercontinental and cross-cultural comparison (see also Benjamin and Bailey, 2017).

Archaeological and palaeoenvironmental evidence on Australia's NW coast and emergent shelf environments provide a critical insight into the nature and timing of early occupation (O'Connor and Chappell, 2003; Pryzwolnik, 2002, 2005; Veth et al., 2007, 2017) and littoral and marine resource use (Balme, 2013; McDonald, 2015). But until there is systematic study of submerged cultural landscapes, these coastal and islands contexts provide only limited and relatively recent geological, chronological or archaeological evidence for what was once an extensive occupied environment – but is now submerged (McDonald and Berry, 2017; Ward and Veth, 2017).

There is potential for both a geoheritage and a cultural heritage to be preserved across much of the WA continental shelf (Brocx, 2008). The Dampier Archipelago (Ward et al., 2013b) and James Price Point (Ward et al., 2016) not only offer insights into past archaeological and cultural landscapes but also are a physical manifestation of earlier Holocene sea levels (see also Bruno et al., 2014). High-resolution Light Detection and Ranging (LIDAR) and 3D geophysical survey imagery are continuing to reveal submerged fossil dune ridges and palaeoshoreline sequences along much of the WA continental shelf (Ward et al., 2016; Brooke et al., 2017).

Potential for submerged cultural resources in areas of commercial development.

Based on intensive survey of islands and proximal shorelines of the continental shelf and using a predictive model approach, investigations of submerged sites might focus on linear and mounded middens and stonewall fish traps, particularly those which are of appropriate scale to be observable using remote sensing technology (e.g. Momber, 1991). In northern Dampierland and around the Bentinck Islands in the Gulf of Carpentaria, many stone walled fish traps extend for hundreds of metres in length, some at previous sea-stand levels (Smith, 1997; see also Rowland and Ulm, 2011) representing the largest and the longest-use anthropogenic intertidal structures in Australasia. In addition to issues of scale there is the critical influence of physical processes on preservation of submerged Indigenous sites in northern Australia (Dortch, 2002; Nutley, 2014). Theoretical studies (yet to be ground-truthed) have suggested the physical sedimentary context of the NW Shelf will affect the preservation potential of many submerged prehistoric archaeological contexts, particularly in the lee of islands (Ward et al., 2013) and within indurated erosion-resistant strata (Ward et al., 2015; 2016). The cost of obtaining the necessary information to establish this potential beyond a theoretical level is often beyond the scope of academic research. Hence there is a strong need for collaboration between academic research departments, government laboratories, archaeological practices, museums, amateurs and offshore industries (Flemming, 2004). There is a wealth of existing information, including very high quality marine survey data, derived from the suite of commercially funded, scientific and collaborative programs associated with offshore developments in the past few decades. This is generally not undertaken with cultural heritage in mind and may be limited in terms of

coverage or resolution. Maximum value may be gained when such accumulated work is refined with more targeted geoarchaeological research that identifies geomorphological context, likely site occurrence, preservation and/or visibility and vulnerability of cultural site assets. Mechanisms should be sought for mobilising this accumulated data for research and management purposes - as has successfully been done in other parts of the world (Gaffney, 2007; 2009; Tizzard et al., 2011).

Whilst not discounting the importance of collating and reviewing previously acquired data, new data generated for future developments have the potential to provide the greatest insights into marine prehistoric cultural resources, especially if they are formulated in accordance with both good cultural heritage research and management practice (www.splashcos.org). The development of offshore renewable energy infrastructure - for example, Offshore Wind Farms³ - has a pre-development stage which includes an assessment of the physical nature of the seabed in which the foundations are to be placed and the potential impacts of such installations on the seabed. The assessment and management of submerged prehistoric resources similarly require information on the broader depositional, stratigraphic and chronostratigraphic context in which they occur (see also Ward and Larcombe, 2008; Ward, 2014; Ward et al., 2014).

In Western Australia, traditional energy from the oceans has been from oil and gas exploration in offshore areas where there is less perceived likelihood of interference with heritage seascapes in deeper parts. However, infrastructure (e.g. pipelines, ports, etc.) associated with these industries can impact shallower seascapes (Ward et al., 2016). With attention increasingly turning to inshore/coastal marine renewable energy in the first kilometre offshore and in shallower water there will be greater risks of interfering with unknown sites of cultural heritage. Offshore wind energy is one example, but Western Australia has already seen permission granted for pilot wave energy projects which will be located in shallow depths. Tidal energy potential in the north west of Western Australia also points to the need for urgency in undertaking investigation of what submerged heritage might be in those locations. Whether from a geological, engineering, Indigenous or heritage perspective there remains a common need to develop a comprehensive understanding of the subsurface sediments environment; and hence clear potential for a collaborative, multi-disciplinary and holistic approach to such assessments from associated stakeholder groups and individuals (see also Ward et al., 2015; 2016).

Current approach to marine heritage assessment and management

Maritime archaeological heritage is a finite and non-renewable resource, whether considered in terms of intrinsic (e.g. scientific, historical, spiritual, cultural) and extrinsic (e.g. economic) value (Claesson, 2011). However, in the absence of any known submerged prehistoric archaeological sites, our ability to assess the 'value' of and potential 'risks' to these unknown resources is obviously limited. Further, the general lack of awareness of the submerged archaeological

³ <http://www.abc.net.au/news/2017-06-02/victoria-plans-to-build-australias-first-offshore-wind-farm/8582652>

potential of the Australian inner continental shelf means that, at present, there is no formal consideration of this heritage asset in the early stages of any marine development in Australia. Overlooking cultural resources potentially results in a loss in cultural identity associated with certain habitats or features, decline in local ecological knowledge and loss of opportunity for social and cultural capital (Khakzad et al., 2015).

Environmental Impact Assessments (EIAs) for new development proposals provide an important decision-making and management tool in risk management for both the project and the natural environment (Larcombe and Morrison-Saunders, 2017). The 'scoping phase' is intended to identify the key issues and the kind of expertise and data that are needed to make an informed decision about impacts. Archaeological and cultural heritage information is just one set of data collected to form part of an EIA. However, the regimes set up to protect Australia's archaeological past primarily reflect an understanding of archaeology based on terrestrial records, with the assumption that past and present coastlines, and coastal processes, are analogous (c.f. Ward et al., 2013); with marine cultural heritage management is principally confined to the realms of shipwreck sites and associated port-related structures (Staniforth, 2007).⁴

Federal, State and Territory legislation protects sites of Indigenous cultural heritage. The Western Australian Aboriginal Heritage Act 1972 (AHA) operates within a Federal legal context of the Aboriginal and Torres Strait Islander Heritage Protection Act 1984 and the Native Title Act 1993 (NTA), and is the main Act that protects the State's Aboriginal heritage sites (see Herriman, 2013). This Act provides no specific provision for underwater cultural heritage of Indigenous peoples and any native title that has been granted to tidal and sea areas has been determined to be non-exclusive (i.e. these areas remain available to be exploited or developed). Whilst there is nothing to preclude underwater heritage on state-owned seabed to form part of a protected area (or 'place'), specific provisions would be beneficial given the different access and preservation issues. For coastal and offshore heritage sites, both the Commonwealth Historic Shipwrecks Act 1976 and the State Maritime Archaeology Act 1973 are predominantly focused on historic wrecks and associated relics, and early maritime infrastructure (e.g. camps, stations, jetties, etc.). What needs to be acknowledged is that submerged prehistoric sites are as much a part of common cultural heritage and have as much if not more societal value than any shipwreck (Pinder and Vallega, 2003).

One example relevant to this discussion of a submerged landscape that has been discounted is Department of Indigenous Affairs (DIA) Site 3776 (Indian Ocean, site no. S02169) (Figure 2). This mythological site lies within the area of Cockburn Sound between the mainland and Rottnest, Carnac and Garden Islands (Figure 2). It relates to Indigenous narratives (recorded by Armstrong in 1836 and Moore in 1884) that describe the separation of the islands from the

⁴ Underwater and coastal heritage, as a part of common cultural heritage, has social dimensions and societal values whether it is a shipwreck or submerged site and ruin (Pinder and Vallega, 2003). Unfortunately these values carry no legislative weighting.

mainland as a result of preternatural influence by the Rainbow Serpent (Waugal). Alarming the advisory committee to the WA Heritage Minister (the Aboriginal Cultural Material Committee) recently resolved (Resolution 2004/082) to reassess and evaluate this mythological site as 'Not a Site' under the Aboriginal Heritage Act (1972). Hence both known mythology and any potential submerged archaeology has lost protection.

Another example is the Dampier Archipelago ⁵ (Figure 1). National Heritage listing identifies the scientific and cultural values of this place, but the boundaries of this Place extend only to the high tide mark. Engravings are identified (under criterion (a) of the Environmental Protection and Biodiversity Conservation Act 1999) as highly significant at the national level because they document (in part) the rising of the sea (Commonwealth of Australia Gazette, 2007: 7):

"The engravings on the Dampier Archipelago include finely executed images of a wide range of terrestrial, avian and marine fauna many of which can be identified to genus or species level (Vinnicombe 2002; McDonald and Veth 2009). Most of the engravings, particularly the images of marine fauna, are slightly or moderately weathered and were produced following the rise of sea levels about 8,000 years ago. There are a number of deeply weathered images of terrestrial fauna, particularly kangaroo, which date to the time when the sea was much lower (Lorblanchet 1992). The different degrees of weathering of particular types of faunal engravings on the Dampier Archipelago provide an outstanding visual record of the course of Australia's cultural history through the Aboriginal responses to the rise of sea levels at the end of the last Ice Age."

While this documentation of values implicitly acknowledges that the art documents the changing landscape throughout the period of occupation, it excludes those parts of the underwater landscape which might be considered to be a continuation of the terrestrial canvas – pre 8,000 years ago (Figure 3). These are but two examples of the treatment or lack thereof of waterways that are tangible cultural land and seascapes in Western Australia.

The recognition of Indigenous rights and interests in marine environmental and resource management legislation for internal, territorial or archipelagic waters varies considerably between jurisdictions (State, Territory, and Commonwealth), and between the types of activities being regulated (Smyth, 2002; Marshall, 2016). In some jurisdictions, for example, Indigenous people have a statutory advisory role in fisheries and marine protected area management, while in others they do not. Murujuga National Park is a unique example in Western Australia, being Aboriginal-owned land, leased back to the State Government on a 99 year lease, and co-managed by Murujuga Aboriginal Corporation (MAC) and the Department of Parks and Wildlife.⁶ This Park is terrestrial, however, and while MAC has aspirations to manage the seascape around this Park, and their Ranger Unit is titled the Murujuga Land and Sea Unit,

⁵ <http://www.environment.gov.au/heritage/places/national/dampier-archipelago>

⁶ The Flying Foam Massacre in 1863 resulted in the slaughter of the Yaburrara language group, and MAC is the coalition of language groups from the coastal Pilbara who now take responsibility for the ongoing cultural and natural management of Murujuga National Park.

MAC's authority is currently largely land focused. MAC's role in managing the Burrup Peninsula involves regular sea-patrols, which provide Murujuga Rangers with the opportunity to reconnect with Sea Country around the Archipelago. These trips are usually accompanied by senior traditional owners, to ensure the cultural safety of the young Rangers: an important part of reasserting rights and knowledge of these places which may have fallen out of use because of inaccessibility (McDonald, 2016). The rock art of the Murujuga is seen as tangible evidence for Indigenous knowledge about the biodiversity of the Sea Country. The range of maritime subjects and the locations they have been placed in is a record of how Aboriginal people know and curate information about their resources (Sean McNeair, pers. obs.). This rock art is engraved with sufficient detail to identify the six species of turtle which are found across the Archipelago (De Koning, 2014), and that through time the species of macropods that inhabit this landscape have changed from large plains-dwelling species, to the small rock wallabies which are found here today (Stewart, 2016).

From the global perspective, there is increasing interest and involvement of Indigenous people in environmental and marine resource management, through fora such as the 1992 Convention on Biological Diversity (CBD), the 2007 United Nations (UN) Declaration on the Rights of Indigenous Peoples (UNDRIP) and the 2012 World Indigenous Network of Land and Sea Managers (WIN) (see Butterly and Techera, 2016). Indeed Frost (2004) suggests underwater cultural heritage is the latest frontier issue of international legal debate. Further developments including the adoption of the UN Convention on the Safeguarding of Intangible Cultural Heritage and the UN Convention on Cultural Expression also evidence a shift in global thinking to respect different types of cultural heritage and the involvement of the custodians. Even though Australia has not ratified these treaties they are still globally influential and provide further impetus for participatory and representative approaches to heritage governance.

Australia's growing network of Sea Country Indigenous Protected Areas provides additional opportunities for Indigenous driven collaborative governance of seascapes and their associated cultural heritage (Smyth et al. 2016). Within the next two years, Australia is expected to ratify the UNESCO 2001 Convention for the Protection of Underwater Cultural Heritage (UNCPUCH) and will need to develop and implement national guidelines for marine cultural heritage management. This will require an effective exploration of the key regional issues for assessments of marine sustainability and marine cultural heritage management at the State, Territory and National scales, recognising the differences in the cultural (McNiven, 2003), physical (see Ward et al., 2015) and legislative (Schnierer et al., 2011; Butterley, 2013) contexts of different parts of the Australian coastline.

Separate to legal and statutory requirements, there is a social and moral obligation to ensure Aboriginal heritage is not detrimentally affected by any proposed works. Often an agreement is reached whereby the developer agrees through consultation with Native Title Claimants or Native Title Holders to undertake more extensive heritage surveys employing suitably qualified heritage practitioners (though each developer is not obligated to do so). For the proposed

Liquid National Gas facility at James Price Point, these heritage surveys included a desktop assessment of offshore prehistoric cultural resources, which focused around a series of well-preserved linear shoreline features (Ward et al., 2016). We argue there needs to be clearer involvement of Traditional Owner groups in any assessment and management of prehistoric marine heritage (see also Taylor and Lennon, 2011; Butterly, 2012; Lepofsky and Caldwell, 2013; Kamoot, 2014). Associated with this can be a greater appreciation of the more Indigenous metaphysical view of geographical landscapes rather than the purely Western physical view (Kwaymullina and Kwaymullina, 2010).

Lessons from abroad

Whilst we might also argue for better funding of submerged landscape research generally, it has to be acknowledged that the vast majority of submerged prehistoric sites in the Northern Hemisphere have been found through development (Flemming, 2004). Hence the aim here is not to stymie such activity but rather to open up a dialogue that allows better sharing of information and data, particularly marine spatial data (see Ward et al., 2013 and references therein). The benefits of such collaboration relate to scientific and environmental contributions by reducing duplication; assessment and mitigation by promoting sustainable management, and social by raising awareness both nationally and internationally (Dellino-Musgrave et al., 2009; Tarmidi et al., 2016; Satchell, nd). In the same vein, there needs to be more cross-disciplinary links and ideally sharing of critical ship-time with those already tasked to carry out marine ecological or geological research, e.g. Kimberley Marine research projects (Western Australian Marine Science Institution, WAMSI). Essentially whilst data obtained for prospecting or academic purposes can be reinterpreted, it would be more useful if archaeological objectives could be incorporated into surveys from the start (Firth, 2006; Faught and Flemming 2008; Faught 2014).

We believe there is great value in raising awareness of submerged prehistoric archaeology in commercial, regulatory, academic and general public sectors. Consider that in the mid-1970s in Denmark a competition for scuba divers organised by a local magazine led to the discovery of one of the most important and well-researched submerged Mesolithic sites in Europe, Tybrind Vig (Anderson, 2013). More formal examples of building such a knowledge-base include voluntary reporting of exposed or shallowly buried sites (e.g. Wessex Archaeology, 2006; Crown Estate, 2014). Such protocols need to acknowledge the sensitivities of Indigenous people, particularly Traditional Owners of Sea Country, including the confidentiality of culturally sensitive information (Morphy and Morphy 2006). It should be recognised that a lack of information does not indicate an absence of cultural heritage significance. Local representative groups should be consulted to identify the intangible heritage values of the site or region, as is the norm in terrestrial surveys. Better still, developers, regulators and underwater archaeologists should support saltwater Traditional Owners' own initiatives to plan, research and manage their seascapes, e.g. through Sea Country IPAs.

A good example of this kind of engagement is in New England, where there was concern from Native American Tribes over the potential impact of offshore wind farm development on ancestral ceremonial sites and burial grounds (Purdy, 2016). According to Narragansett oral history, these sites had been inundated by water off the coast of Rhode Island more than 15,000 years ago (*ibid*). Beginning in 2012, an interdisciplinary team of geologists, archaeologists, and members from the Narragansett Indian Tribe conducted remote sensing surveys and diver visual assessments – including Native divers - of near-shore submerged paleo-landscapes (Figure 3). The study is developing best practices for identifying submerged ancient landscapes and determining the potential for preservation of ancient Native American sites in areas subject to development (Coastal Mapping Laboratory, 2017). It follows an earlier Special Area Management Plan (or Ocean SAMP) that engaged stakeholders, *including* Narragansett people, and the public to develop comprehensive regulations to ensure the management and protection of Rhode Islands' ocean resources (see <http://seagrant.gso.uri.edu/oceansamp/>).

Other countries are beginning to address the research, regulation and management of marine prehistoric archaeology on regional and local scales, through dedicated research and management frameworks and by greater inclusion of archaeological interests in regional marine surveys and in pre-development assessments (see Ward et al., 2014 and references therein). We need to follow these examples by establishing best practice guidelines for assessing heritage in intertidal and shelf contexts, and where appropriate for specific commercial activities or development (e.g. COWRIE, 2007; Firth, 2013; Gribble et al., 2014). We also need to follow countries such as United States of America in their endeavours to not only study inundated sites with Indigenous archaeological records (Goggin, 1960; Faught, 2002, 2004; Halligan et al., 2016) but also to actively engage the appropriate Indigenous people in all aspects of research and management (Nicholas, 2016; Coastal Mapping Laboratory, 2017). Finally we need to build links with global partners in these research endeavours so we can learn from previous strategies and ensure data is collected in a comparable way for future analyses.

Conclusion - Australia as a Maritime Nation

Knowledge underpins management but in Australia the submerged shelf remains essentially *aqua incognita* with respect to the 'Deep History' of humans. This period below current sea level (c. 8 - 6 ky BP), in Australia represents some 55,000 years of coastal occupation. Hence without a systematic investigation of these submerged landscapes our understanding of human migrations and maritime adaptations will remain incomplete. As summarised by Khakzad et al. (2015:110), "maritime and coastal cultural heritage, encompassing land and sea, *and underwater* [our emphasis], is an important part of our cultural resources and requires a proper valorization in order to play its role in sustainable development... and helps to promote people's sense of identity and place attachment".

The key to unlocking this unknown potential is through collaborative efforts between Indigenous, commercial, regulatory, academic and public sectors to identify, inventory and protect cultural heritage resources that are not currently known and/or protected by Federal,

Territorial or State law. This kind of engagement helps alleviate some of the issues and concerns that act as barriers to maximizing benefits from any offshore development activity and allows for better documentation, management, regulation and discovery of prehistoric cultural and other seabed resources for all stakeholder and interest groups.

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List of Figures

Figure 1 Overview of ethnographic links with offshore landscapes in Western Australia (content sourced from Green 1985; Mulvaney 2015; Nunn and Reid 2015). Map also shows declared Indigenous Protected Areas (IPAs) and Aboriginal lands along the coast (inland areas not depicted).

Figure 2 The mythological site of Cockburn Sound (DIA Site 3776; Indian Ocean, site no. S02169) lies between the mainland and Rottnest, Carnac and Garden Islands (image courtesy of Mick O'Leary). The site is no longer considered a site under the Western Australian Australian Heritage Act 1972 and as such the underwater cultural seascape has no protection.

Figure 3 Superimposed engraving of turtles (right) over a kangaroo (left) (photo taken by Jo McDonald). The rock art of the Dampier Archipelago documents the changing landscape throughout the period of occupation, with terrestrial fauna dominating the early art repertoire and marine fauna dominating the later art (see also Mulvaney 2015). The implication is that the offshore element of this prehistoric cultural landscape should not be overlooked in any offshore development activity.