

An underwater photograph showing the wreckage of a ship on a sandy seabed. A diver is visible in the background near the structure. The scene is illuminated by blue light from above.

# Underwater Cultural Heritage in Oceania



United Nations  
Educational, Scientific and  
Cultural Organization



The Protection of the  
Underwater Cultural Heritage

Edited by Ulrike Guérin, Barbara Egger and Vidha Penalva

All underwater cultural heritage sites in this book have been chosen for their historic interest. There may however lay more representative and significant sites in the waters of the territory encompassed by this publication. UNESCO's choice was made without any claim to do complete justice to the heritage concerned, even if it aspired to do so.

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United Nations  
Educational, Scientific and  
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Cover page:

*SS Severance*, Australia. The two masted sailing yacht the *Severance* sank off Lady Elliot Island in the Great Barrier Reef, Australia. The *Severance* is relatively undamaged, some remains of its sails persist, which had been rigged in reefed position in a vain attempt to minimize the drag in the heavy storm that sank it. The wreck lies at a depth of 20 m. Schools of pelagics, moray eels and other marine life are present in the area.

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Back Cover:

Wreck of the *Cher* sunk on the Contrariété Reef on 9 January 1885, New Caledonia.

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Map of Oceania.

The Pacific region's historic ties to the seas have left a spectacular legacy of submerged archaeological sites ranging from shipwrecks to sunken villages, preserved in the depths of the ocean. Fortunately for this generation and those to come, these treasures are fully recognised today as being an important part of the region's heritage that it is our duty to safeguard.

The protection of all kinds of cultural heritage is a very important aspect of UNESCO's broader mandate to safeguard cultural diversity. Protecting and promoting such sites around the world reinforces societies' sense of identity, strengthens social cohesion and facilitates mutual understanding, as well as bringing economic benefits. UNESCO works towards these goals by carrying out numerous activities in the field as well by setting international standards in the domain of culture. To date, UNESCO's Member States have adopted seven core international conventions to ensure the safeguarding of the irreplaceable treasures of humanity.

Among these treaties, the 2001 Convention for the Protection of the Underwater Cultural Heritage offers protection for a component of the world's cultural heritage that has never ceased to captivate popular imagination. The Convention is also widely recognized as the foremost reference document in the field. By promoting and guiding the development of sustainable and responsible underwater archaeology, it is hoped that the scourge of illicit looting will be curtailed.

Through this richly illustrated booklet, UNESCO wishes to raise awareness of the region's threatened underwater heritage. In keeping with its mission to stimulate international reflection, UNESCO has enlisted contributions from local archaeologists and experts in the field, as well as the region's national commissions for UNESCO and the Organization's field offices in the preparation of this publication. We also hope that this publication will encourage more countries in the Pacific region to support the UNESCO Convention on the Protection of the Underwater Cultural Heritage.



*Irina Bokova*

Irina Bokova, UNESCO Director-General



An ancient admiral-style anchor from the *SS Kelloe*, which sank in 1902 is now lying at a depth of 50 m in Little Bay off the eastern-suburbs of Sydney, Australia. As the ship was built in 1866, the anchor is probably more than 140 years old.  
© M. Spencer / UNESCO

From the large continent of Australia to the smallest island in Micronesia, life in Oceania has always been closely related to the water. The Pacific Ocean contains therefore an inestimable wealth of submerged traces of human activity.

They have been conserved under the Ocean and range from ancient vestiges of sacred and residential sites, wreckages from the era of early explorers, to the widespread remains of the Second World War battles. Due to the region's cultural richness and complex history, the protection of underwater heritage is extremely important.



Many sites are threatened by dispersal and destruction, natural disasters and the effects of climate change. However this heritage provides opportunities for economic development and helps define our cultural identity.

UNESCO's Convention on the Protection of the Underwater Cultural Heritage is the most effective tool for protecting this important legacy and the Solomon Islands have just recently decided to join it.

The present publication has been prepared in the wake of the significant regional meeting that took place from 18 to 19 December 2009 in Honiara, Solomon Islands. In my capacity as Minister of Education and Human Resources and as Chairman of the Solomon Islands National Commission for UNESCO, I was pleased to welcome representatives of the region to this meeting and our country. This encounter marked a milestone on our common goal to protect underwater cultural heritage. In the course of the workshop the participants attempted to collectively find strategies for the protection of Underwater Cultural Heritage in our beautiful but threatened region.

I strongly encourage all stakeholders to join all efforts in pursuing the protection of precious and irreplaceable components of our shared heritage.

Hon. Matthew C. Waletofea

MP, Minister of Education  
Chair of the Solomon Islands National Commission for UNESCO





Wreck of the *Solsea*, Iron Bottom Sound, Solomon Islands. Once an island trader, the *Solsea* was scuttled on top of a reef in a depth of 18 m. After a cyclone, it was found to have slid down to depths between 18 to 39 m. The radar scanner is still intact and fish life abundant. It provides divers an interesting opportunity.

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Page after: Boeing B-17 Bomber, (*Flying Fortress, Bessie*), Iron Bottom Sound, Solomon Islands.

The wreck of the US American Boeing B-17 Bomber, nicknamed 'Bessie', was shot down on 24 September 1942 while returning from a mission in the Shortland Islands. All the crew survived the crash, but none of them returned to the base. The pilot, Captain E. Norton, was captured but pronounced 'dead on arrival' at Japanese headquarters. The bodies of some of the crew were found, in 1944, by a US Seabees salvage team. Their efforts to recover the plane resulted in the tail section of the plane being torn off. The wreck is located 22 km north of Honiara, lying in 17 m depth. The upper turret machine guns are still in place. The plane is encrusted with soft corals and teems with fish life. This is a favoured touristic dive site that has suffered over the years from the volume of visits. At one stage, the gun turret was pulled out but has since been put back. Being in relatively shallow water the wreck also receives frequent battering from periodic cyclones.

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## Acknowledgements

### Towards the protection of submerged archaeological sites in Oceania

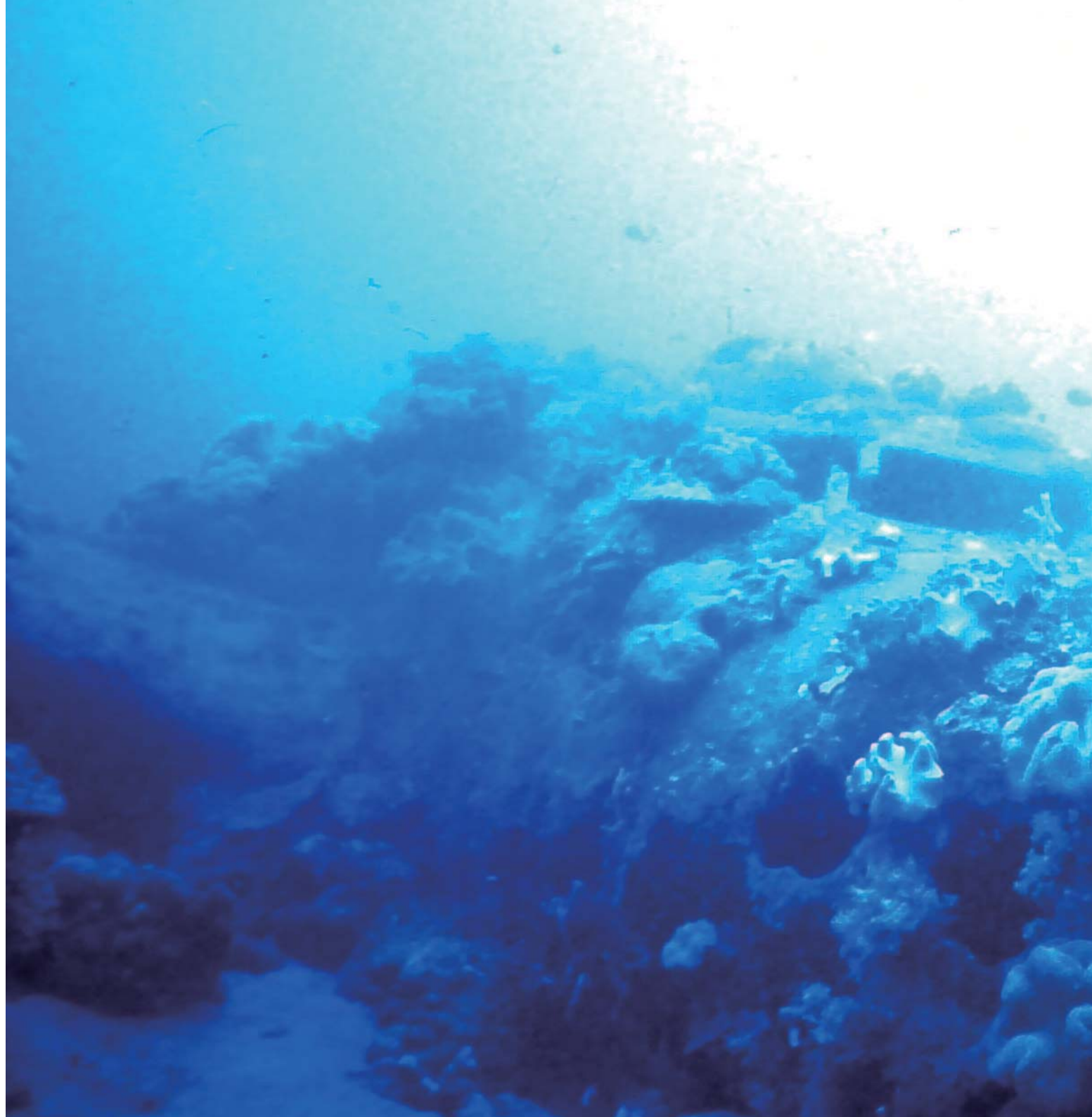
This publication has been prepared in the wake of a significant regional meeting, which took place from 18 to 19 December 2009 in Honiara, Solomon Islands. It was organized by the UNESCO Office for the Pacific States (UNESCO Apia) and hosted by the Solomon Islands National Commission for UNESCO. The goal was to promote the 2001 Convention on the Protection of the Underwater Cultural Heritage and to increase the understanding of the importance of underwater cultural heritage for the region. The conference was a first achievement in the quest towards the protection of submerged archaeological sites and contributed to raising awareness in the Pacific Island States.

This book draws on different perspectives and a rich body of international expertise and research. First and foremost, UNESCO is indebted to the Ministry of Culture of the Solomon Islands for welcoming the UNESCO Meeting on Underwater Cultural Heritage, as well as to the Hon. Matthew C. Waletofea, Chair of the National Commission for UNESCO, for his vision and steadfast support to the UNESCO Underwater Cultural Heritage Programme.

We gratefully acknowledge the faculty and participants of the Honoraria workshop, who inspired our endeavour to prepare this publication as well as Richard Engelhardt and Akatsuki Takahashi from UNESCO's Apia office. Special thanks are due to all those who have generously contributed, providing articles, case studies or views and advice during the stakeholder consultation that preceded the book's design. These were, among others, Andreas Westerwinter, Ross Anderson, Jone Balenaivalu, Ioketan Binataake, Tony L. Carrell, James Delgado, Terry Drew, Nigel Erskine, Craig Forest, Mose Fulu, Bill Jeffery, Chris Hall, Matthew Holly, Kieran Hosty, Chip Lambert, Pierre Larue, Michel L'Hour, Leah McKenzie, Jennifer McKinnon, Elia Nakoro, Sunny Ochob Ngirmang, David Nutley, Robert Parthesius, Paul Peter, Robin Smith, Mark Staniforth, Danish Syed, Tu'ilokamana Tuita, Sarah Ward and Peter Whitelaw. Furthermore we thank Ross Anderson, Bill Jeffrey and Michel L'Hour for the scientific revision.

Visesio Pongi  
Director of the UNESCO Cluster Office in Apia (Samoa)

Ulrike Guérin  
Secretary of the Convention on the Protection of the Underwater Cultural Heritage







Wreck from WWII, Raratonga, Cook Islands.

Off the island of Raratonga, two large wrecks from WWII lay at the bottom of the sea.

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(For the Japanese translation of the introductory texts see pages 104 to 109.)

## **Underwater Cultural Heritage in Oceania**

Underwater Cultural Heritage encompasses all traces of human existence that lie or were lying under water and have a cultural, archaeological or historical character. Over the centuries, thousands of ships, entire cities, and even landscapes have been swallowed by the waves. Their remains now constitute a precious heritage, which attracts increasing attention from the scientific community and the public at large. Scientists are finding more and more unique traces of the history of humanity under water. The oldest human remains in the Americas have been discovered in a flooded cave, the waters of the Mediterranean hide the remains of one of the Wonders of the World, the Pharos of Alexandria. Neanderthalian hunting grounds and painted caves have been found under water, as have been Maya sacrificial sites and ancient pile dwellings, and last but not least, immense and tragic shipwrecks fire the imagination and expectation of scientists and the public.

Often these sites contain, due to the lack of oxygen, material that is lost on comparable sites on dry land. These priceless human footprints are part of humanity's common heritage in the same way as heritage on land and must be handled with the respect that they deserve.

The Pacific Ocean contains a particular wealth of submerged traces of human existence. It spans three continents - Asia, Australia and America. Its archipelagos and islands are stretched over a great distance and many of them were populated by humans very early on, and underwent processes of substantial change by European colonialism. Underwater sites in Oceania span human history from the Stone Age to the Atomic Age. As well as terrestrial traces of early human colonization, underwater cultural heritage sites including ancient sunken villages, wrecks and ancient fish traps offer a deep and colourful insight into the past. Human activity on these islands, from the large continent of Australia to the smallest island of Micronesia, was always closely related to the water. The great variety of submerged archaeological sites is now exceptionally valuable for the understanding and interpretation of the region's and the world's history. Its submerged traces of humans on the seabed range from ancient vestiges of holy sites to remains of ships and aircraft, ports, fish traps and villages. Shipwrecks are abundant and encompass the relics of small fishing boats as well as of large battleships from World War II. They can provide precious historical information and are, like a time capsule, a complete snapshot of the technology and life on board at the time of sinking.

Due to the cultural richness of underwater heritage in the region and its complex history, the protection of these sites is of high importance for the region. It offers a chance for development and defines cultural identity. The sheer multitude of submerged archaeological sites attracts tourists and passionate divers, contributing to the economies of many small archipelagos. Nevertheless, and unfortunately, many sites are exposed to threats of dispersal and destruction, natural disasters and the effects of climate change.

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The first humans inhabited Australia around 40,000 years ago. Many of the islands of Oceania were, however, populated only many thousands of years later by the Lapita people, ancestors of the Polynesians, and traces of their culture remain both above and under water. In the 17th and 18th centuries, the coasts of Australia, Papua New Guinea, the Philippines, New Zealand, Vanuatu, Tahiti and Hawaii were explored and made known to the rest of the world by navigators such as Magellan, Torres, Tasman, D'Urville, Drake, Cook and La Perouse. The Spanish dominated early Pacific colonization and there are many shipwrecks related to the Spanish Panama-Manila galleon trade. Such wrecks are, however, actively treasure hunted and are under constant threat. Shipwrecks relating to the 19th century labour trades, such as the Fijian sugar and Peruvian guano industries, contribute to our knowledge of the movement of cultures and the, sometimes brutal, human experience in the Pacific, while whalers, missionaries and traders have also left behind a legacy of underwater sites. The remains of navigation and fishing infrastructures are testimony to the dependence and connection of the local populations to the sea. They lived on its borders or on its waves and made their living from its exploitation. In particular, ancient fish traps, the remains of which have survived until the present, represent some of the oldest existent working technologies.

Their forms range from artificial rock pools consisting of low stone walls built from beach stones, to complex arrangements of stone walls several hundred meters in length. Sometimes they were also built using timber stakes wrapped with plant material and placed in the middle of a stream, in an estuary or near the coastline, where the fish were herded into the impoundment area and retrieved.

In more recent times, the Pacific was among the major theaters of the Second World War. Between the attacks of the Japanese air squadrons from Pearl Harbour, Hawaii and the US dropping its atomic bombs at Hiroshima and Nagasaki, a succession of fierce attacks and counterattacks was fought across the islands and in the waters surrounding the Pacific islands. This area accordingly holds submerged cemeteries and museums, preserving entire fleets, submarines, and complete samplings of war-planes that played a role during the conflicts. It is estimated that at least 3,855 vessels comprising a total of 13,547,019 tons sank in the Pacific region during the war. This includes ships from many different nations, including both military and civilian merchant vessels.

## Proper respect for human remains

*“Since wars begin in the minds of men,  
it is in the minds of men that the defences of peace must be constructed.”*

Preamble of the Constitution of UNESCO, London, 16 November 1945

UNESCO’s creation is a testimonial to the existence of a culture of peace as early as 1945. Working in the aftermath of the Second World War, UNESCO’s founding members recognized in the preamble to its constitution, that UNESCO’s purpose is to contribute to peace and security in the world. UNESCO does this by promoting collaboration among nations through education, science, culture and communication. These mandates are not ends in themselves but fields in which to cultivate universal respect for justice, for the rule of law, and for the human rights and fundamental freedoms affirmed by the Charter of the United Nations and the Universal Declaration of Human Rights.

It is UNESCO’s duty to guard against collective amnesia of dramatic episodes of the world’s history and to contribute to the construction of a balanced memory of the wars that shaped the world. Respectful memory is an essential component of the culture of peace and must be kept alive for future generations in order to build peace in the minds of humankind.

Many underwater cultural heritage sites are the testimony of tragic events, like the sinking of a ship, the destruction of an airplane or the inundation of a village. This is particularly true in Oceania, where the ocean is the final resting place of many who took part in the fierce battles of World War I and II. This book also pays tribute to their lives and their memory and appeals to anyone undertaking dives to their blue graves, to respect these sites and not touch or take anything, as the passing visitor would do at a cemetery on land.

Being aware of the need for respect and memory, UNESCO’s Convention for the Protection of Underwater Cultural Heritage states that “States Parties shall ensure that proper respect is given to all human remains located in maritime waters”. It also stresses that “Activities directed at underwater cultural heritage shall avoid the unnecessary disturbance of human remains or venerated sites”. Such a culturally sensitive approach, endorsing an ethical stance, is of prominent importance with regards to the relics of World War I and II in the Pacific. As ship and aircraft wrecks often still contain human remains they must be approached with the appropriate respect. Archaeologists are required to preserve and manage the archaeological record with all due diligence. This includes treating any discovered human remains with dignity, attempting to accurately identify them, and permitting the local authorities to manage their safeguarding in an appropriate manner.

## Responsible tourism is needed

Archaeological sites are very fragile and sensitive to intrusion. Even an intervention that opens a site for research purposes “damages” the archaeological information contained therein, as the site no longer remains undisturbed. It is therefore important for information contained therein to be carefully recorded. The surveying, excavation and preservation of sites are important phases of the process of underwater archaeological research.

In the Pacific tourism diving, souvenir collecting, metal recovery and sensation hunting have done great harm to submerged heritage and the awareness of this threat and the consequent loss have only dawned in recent years. The exploitation of submerged sites and the sale of objects found are reminiscent of events that took place a hundred years ago on many archaeological sites on land, and it must be feared that many artefacts still in place will soon disappear. Underwater monuments need to be protected. This must be inspired by the same rationale that led to the protection of monuments on land: the traces of humanity’s past must be handled with the respect that they deserve and be spared the ravages likely to be wrought in present times.

## Hazardous cargo on historic wrecks – the PACPOL programme

Apart from the danger of the destruction of the submerged historic sites in Oceania by external intervention, and apart from their evident historic importance, it should be noted that the sites themselves are often the cause of hazards. The huge shipwrecks and vestiges of aircraft, which remain in the region as a testimony to the events of the Second World War, may represent in the very near future a danger for the fragile balance in the natu-

One example of a historic wreck posing a high-risk for the environment is the wreck of the USS *Mississinewa*, an oil tanker originally supposed to supply aviation fuel and heavy marine fuel oil to the US Pacific Fleet anchored off Ulithi Atoll in the Federated States of Micronesia.

On 20 November, 1944 it had been attacked by a Japanese torpedo and sank, hitting the seabed at a depth of 40 m of water. A tropical storm disturbed the 57-year old wreck in July 2001, causing the oil cargo to spill. It polluted the area and was not contained until more than a month later releasing in the meantime between 68,000 to 91,000 litres of oil. This incident led to the instalment of the PACPOL programme.

The aims of the regional PACPOL are to prevent or minimise damage to marine and coastal environments and resources as a result of marine spills from World War II Wrecks and to ensure that any action taken will retain the sanctity of these sites as war memorials and grave sites.



The Wreck of the USS *Mississinewa*, Ulithi Atoll, Federated States of Micronesia.

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ral environment surrounding them, cause life hazards, pose a severe pollution risk, and endanger the diver who visits the site.

Unexploded ordnance (UXO) and toxic weaponry still remain on many World War II shipwrecks and aircraft in Oceania. Many also still carry large quantities of fuel. These cargos create potential risks for the marine environment and people who conduct activities on or near the shipwrecks. Local people engaged in fishing, mining, and diving industries may accidentally or deliberately encounter hazardous remains in the sunken vessels, tanks, and aircraft. Also, the increase in recreational divers accessing underwater WWII sites augments the risk of serious accidents. These risks can be minimized by including proper risk management measures in the protection and management regimes of the sites, and the education of local people and visiting recreational divers about non-intrusive safe access to the sites. Many of the explosive cargos and fuel contains need however a much broader response.

The South Pacific Regional Environment Programme (SPREP), whose members include 14 Pacific island countries, has in consequence started a Pacific Ocean Pollution Prevention Programme (abbreviated "PACPOL") and elaborated a regional strategy to address the issues related to World War II wrecks in the Pacific. PACPOL has until now compiled a database of 3,855 Second World War wrecks, with a combined tonnage of 13.5 million tons. The wrecks range from relics of submarines to aircraft carriers and include also 333 tankers. Approximately 40 of the wrecks catalogued so far are British, some 400 are American, and about 3,300 (86 %) are Japanese. New wrecks are being discovered constantly and the here cited total number is still increasing.

Before, if ever, allowing public access to this kind of wrecks, which is much desired by divers and historically interested amateurs as well as by local tourism enterprises, a cleaning may be needed, be it through the local authorities or the countries of the origin of the wrecks. After some US American efforts on the USS *Mississinewa* wreck the *New Zealand Navy* is now considering this kind of undertaking and similar efforts will have to follow soon also from other authorities. Extreme care needs to be taken in the preservation of these wrecks and a close monitoring and appropriate action is needed.

## Economic Significance

*“Responsible non-intrusive access to observe or document in situ underwater cultural heritage shall be encouraged to create public awareness, appreciation, and protection of the heritage except where such access is incompatible with its protection and management.”*

Article 2.10, UNESCO Convention  
on the Protection of the Underwater Cultural Heritage

Tourism is nowadays a large industry and heritage tourism is its most rapidly growing international sector. With millions of tourists visiting for instance UNESCO's World Heritage sites each year, sustainable tourism has become an important cross-cutting issue and management concern at culturally significant sites. Especially in Oceania, tourism is the main industry of many islands and the leading element of their economies. Understandably, given the picturesque locations and the clear waters, a large part of this tourism is dive-tourism.

Over the years, many underwater cultural heritage sites in Oceania have become accessible to divers. On certain properly stabilized and protected places, these visits can be encouraged as long as it is made sure that their integrity is respected. Heritage is an asset that should be enjoyed by all and the magnificence and impression of the authentic locations teaches history much better than any classroom stay could do.

Accordingly, the attraction of the historic significance, beauty and authenticity of underwater sites are of considerable economic importance for the region. In Europe, the Roskilde, Mary Rose, Vasa or Hedeby museums are already among the most visited tourist attractions of their countries and the underwater museum project in Alexandria, Egypt, is intended to revive in an integrated approach the whole urban centre of the city. Dive tourism will have a similar economic importance for the Pacific region and already has.

Important factors for the attraction and sustainability of the concerned submerged archaeological sites include the state of preservation, the authenticity and the historic importance of the sites as well as their presentation to the public. In Australia the invention of dive-trails, i.e. well-marked and explained submerged archaeological sites supported by maps and signposts, has impressively fostered their enjoyment by the public as well as the local understanding for protection needs. Accessibility benefits, security awareness and responsible site management ensure the long-term sustainability of these sites.

This kind of efforts needs to include, nevertheless, and of course, the prevention of souvenir hunting or metal recovery, and the prohibition of the export of culturally important artefacts from the concerned country. It is tempting to take 'picturesque' ammunition or outfitting from a World War wreck or a historic artefact from the seabed. Unfortunately, this has been done extensively by divers in past years. The continuation of this state will however have a devastating impact on the concerned sites and as a result, in the long run, on the local economy.

The UNESCO 2001 Convention on the Protection of the Underwater Cultural Heritage encourages responsible public access, as well as opening up promising tourism opportunities. It shows that underwater cultural heritage is a very important tool for economic development and also stresses that it is very important for the reconstruction of memory and the creation of intercultural dialogue. Nevertheless, it additionally calls for the effective protection of sites and establishes strict rules for interventions. Access is encouraged, when protection needs are respected. UNESCO has also put a Model Export Certificate and a Cultural Heritage Law Database at the disposal of government authorities and other stakeholders to make the safeguarding of the integrity of the precious submerged sites effective.



The stern of the wreck of the *Nord*, now sitting in 40 metres depth just north of Cape Pillar in Tasmania. The ship struck submerged rocks between the Hippolyte Islands in 1915 and eventually sank in calmer waters near the cliff face at Cape Pillar.  
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## **Valorising the heritage**

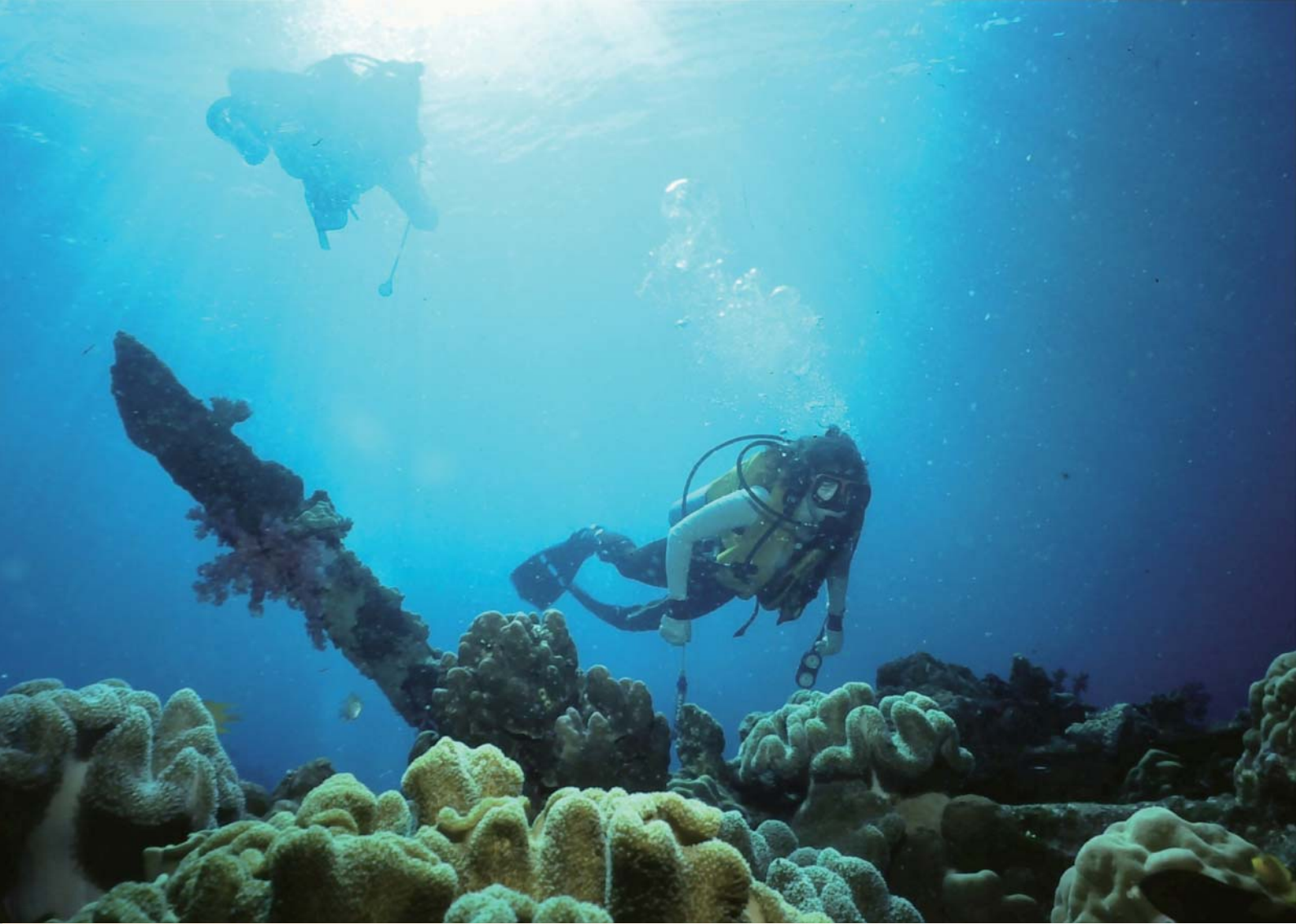
The successful implementation of strategies that foster sustainable tourism can bring important benefits. However, a pre-condition is the putting into place of adequate infrastructure, encompassing for instance the appropriate accessibility of the sites and the surrounding land territory by plane or at least boat. It also needs trained personnel and strong support from the local communities. Only if the local population shares the benefits of protection, it will readily contribute to achieve it and become the most reliable warden of its heritage. Accordingly, it is necessary to build capacity close to the sites for their appropriate management, proceeding from the monitoring of their integrity and the control of possible hazards to learning how to suitably deal with tourism and visitor flows. Local community members are usually the most aware of the context of their region. In making them fully understand the needs and benefits of environment and culture preservation, as well as tourism related activities, they are enabled to receive tourism's benefits. In the Oceanian region, this may also mean teaching to recognize hazards from explosives in the wrecks from the war, and eventually taking into consideration hazard prevention and cleaning.

It is up to local authorities as well as to international cooperation partners, including UNESCO, to aid communities around the sites to valorise their heritage and use the submerged archaeological sites as a lever for local economic, social and cultural development. Raising public awareness of the unique cultural value of the archaeological sites present in the area and building pride and intercultural dialogue between locals and visitors is important. Cultural sites are a chance to explain a history and, especially in the Oceanian region, this can mean illustrating a state-of-being, thinking and living that communicates pride and which the visitor comes expressly for to the region. The appreciation of cultural diversity is what makes travel in times of globalization often the worthwhile reward for the visitor. This is where dialogue becomes most precious.

## **Funding preservation efforts**

Evidently, it is often a problem to make funds available to pay for such safeguarding of submerged sites. Here, tourism-generated funds can effectively serve to supplement site conservation and protection costs. Lessons learned by other protected areas can help. Many European States have, for instance, already had very positive experiences in cooperating with diving enterprises, agreeing on a license system for sites that restricts access in favour of paying enterprises. These take on the responsibility for the site to remain untouched by their clients. Their payment contributes to the funding of heritage management. They themselves profit from the prevention of 'overdiving', and the intact state of the concerned sites. They can, of course, recover their additional costs from their clients in the form of an entry-ticket for the archaeological site.

Last but not least, despite all of the above-mentioned economic benefits that could be achieved: while it is certainly true that shipwrecks provide a source of revenue in terms of diving tourism, the concerned vessels have been the carrier of many human adventures and brought many a traveller, warrior or merchant to his death. In particular, the shipwrecks of the World War II in the Pacific have entailed a great loss of life and in many cases human remains, personal items, weaponry and unexploded ordnance are still evident in the wrecks. Therefore, the management of relics calls for an ethical and sensitive approach in providing historic insights to an interested audience of cultural tourists. Common sense for morals and respect should always prevail over economic interests.



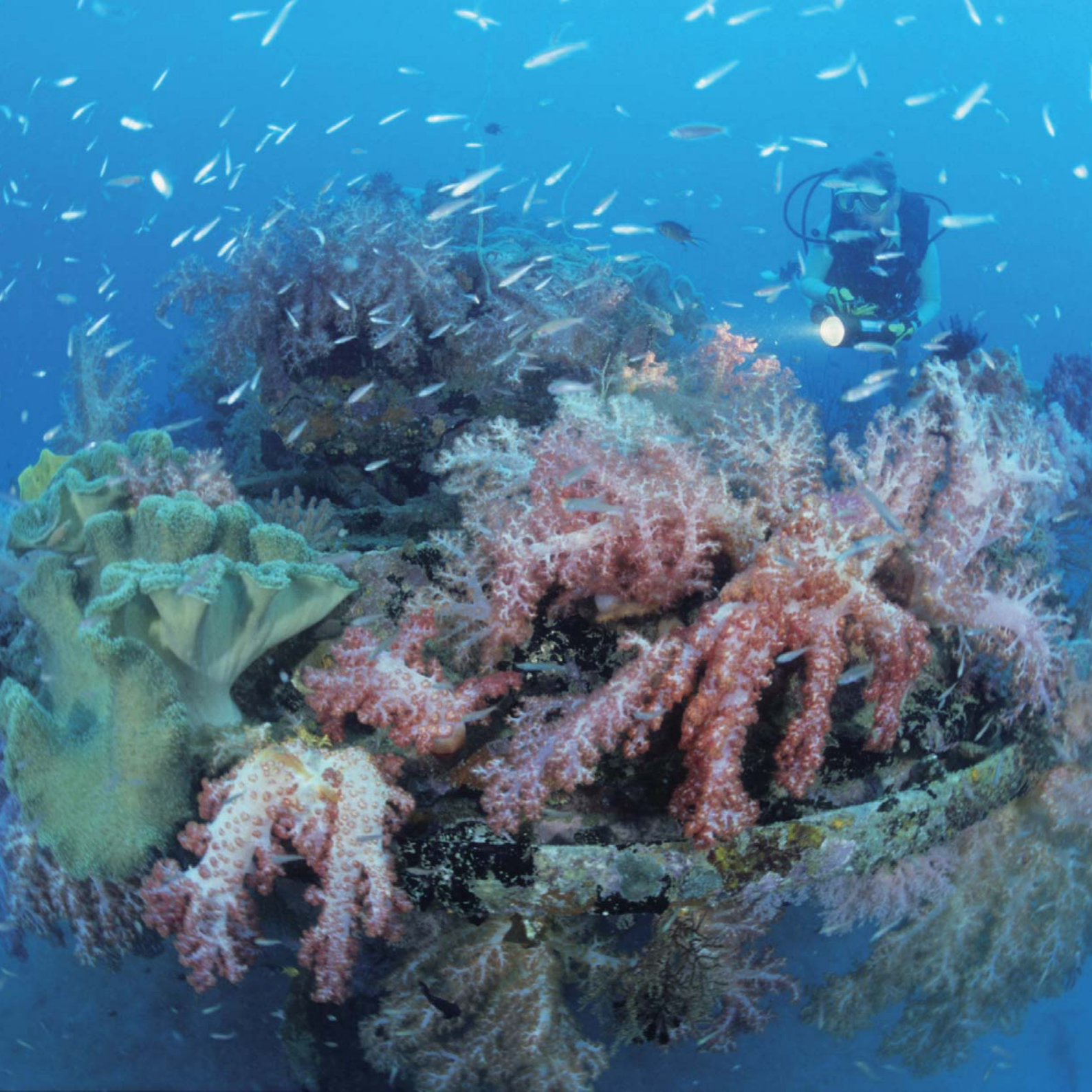
*Bonegi 2 (Kinugawa Maru), Iron Bottom Sound, Solomon Islands.*

The *Kinugawa Maru* was built in 1933 and used by the Japanese Navy at the start of the Pacific war. It formed part of a convoy of eleven ships, when it was spotted by the Americans. Air force attacks hit the convoy on the morning of November 1942, and overwhelmed the escorting Japanese aircraft. They sank six ships and forced one to turn back damaged, which later sank as well.

© T. Drew / UNESCO



The remains of bottles on the *Fujikawa Maru*, a Mitsubishi-built ship. The holds contain a water tank, ammunition for the bow gun, propeller blades, cowling and many other aircraft parts. Chuuk Lagoon, Micronesia  
© G. Adams / UNESCO



## The UNESCO Convention on the Protection of the Underwater Cultural Heritage (2001)

UNESCO works to improve the protection of the world's cultural heritage. In the case of the underwater cultural heritage, it does so by encouraging States to adopt common protection standards, by training underwater archaeologists and by raising public awareness.

UNESCO's Convention on the Protection of the Underwater Cultural Heritage, its most important tool in the efforts to improve legal protection of underwater heritage, is open for adherence by States. It was elaborated by the Member States of UNESCO and adopted by its General Conference on 2 November 2001. It sets basic protection principles to be applied by all its Parties, serves through a State cooperation mechanism to curtail the growing illicit trade by looters, and guides underwater archaeology through the rules for interventions contained in its Annex.

The Convention regulates the preservation of submerged heritage and State cooperation. Its goal is to harmonize the protection of underwater cultural heritage with the protection accorded to land based sites. It however neither regulates the ownership of wrecks nor does it change maritime zones.

The former President of the International Committee for the Underwater Cultural Heritage, Robert Grenier, once said that "the UNESCO 2001 Convention is a gift from heaven for underwater archaeologists." Many associations of archaeologists, congresses and conferences joined him in this judgement and formally endorsed the Convention and/or its Annex.

### **The main principles of the Convention are that:**

Ancient shipwrecks and underwater ruins are cultural heritage, not treasure. They should be preserved. States Parties of the 2001 Convention pledge to preserve underwater cultural heritage for the benefit of humanity. The Convention encourages scientific research and responsible public access to sites.

Underwater cultural heritage should not be moved, except for a good reason and when conservation can be ensured. The in situ preservation of underwater cultural heritage (i.e. on the seabed) should be considered as the preferred option before engaging in activities directed at this heritage. The recovery of objects may be authorized for making a significant contribution to protection or knowledge or enhancement of underwater cultural heritage, when for instance research is undertaken or a museum built to welcome the recovered artefacts in an appropriate manner.

Underwater cultural heritage should not be subject to treasure hunting or destruction. The 2001 Convention stipulates that underwater cultural heritage should neither be commercially exploited for trade or speculation nor irretrievably dispersed. This regulation is in conformity with the moral principles that already apply to heritage on land. It does not oppose archaeological research or tourism. States pledge not to leave their heritage at the mercy of treasure hunters or souvenir tourism.

Opposite : Coral encrusted stern of a shipwreck of the Second World War off Madang, in Papa New Guinea. Time has changed the wreck into a large artificial reef, providing home for an abundance of marine life and many species of scorpion fish, which can be found camouflaged against the hulls.

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*Yap aech*, Lubumow, Yap, Federated States of Micronesia.

The Yap fish weirs, called *aech*, provide an important testimony to Yapese shared heritage that has developed over the centuries in tight conjunction with the sea.

© B. Jeffrey / UNESCO



*Fujikawa Maru*, Chuuk Lagoon, Micronesia. The *Fujikawa Maru* features a bow gun encrusted by sponges and coral. The holds contain military equipment and aircraft parts. There are also partly disassembled fighter planes together with fuselage parts. The superstructure with pilothouse, baths, staterooms, galley and engine room is well preserved. The green turtle floating over this wreck forms a spectacular part of the marine life abundant at the historic wrecks sites in Micronesia.

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## AUSTRALIA

Many ancient scientists, including Aristotle and Ptolemy, believed that the Indian Ocean was enclosed on the south by land, and that the lands of the Northern Hemisphere were balanced by an equal landmass in the south – the Terra Australis. It was only much later that the true Australia was discovered for the Western world. Nevertheless, at least 40,000 years before the first European settlement was established in the late 18th century, Australia was already inhabited by indigenous Australians. After sporadic visits by fishermen from the immediate north and perhaps even Indonesia, it was discovered by Dutch explorers in 1606. The eastern half of Australia was then claimed by the British in 1770 and originally occupied through penal transportation. The population grew steadily and largely self-governing Crown Colonies were established during the 19th century.



Australia's underwater cultural heritage encompasses in addition to wrecks also many Aboriginal sites. The latter have however hardly been explored, until now, but interest and investigation is increasing. Submerged Aboriginal sites have been identified on the floor of Lake Jasper, a freshwater lake located in the D'Entrecasteaux National Park in Western Australia, and the Arefura sea. Also of archaeological interest are the drowned river valleys in the palaeo-landscape of the Backstairs Passage area between Kangaroo Island and the mainland in Southern Australia.

Also ancient fish traps are important to Aboriginal communities. They have strong spiritual, symbolic and cultural associations. The traps at Brewarrina, for instance, are located in the Darling River. When the River was flowing in spring or after rain, immense numbers of fish travelled up the river. The fish traps were open in the direction from which the fish were coming. As soon as those had entered the labyrinth of traps, the openings were closed by large stones and the fish were caught. 5,000 or more people were drawn to the fishery from Aboriginal communities in the surrounding areas.



Brewarrina Aboriginal Fish Traps, Australia surrounding areas. © Vince Scarcella / UNESCO

Opposite: HMCS *Mermaid*, off the coast of Queensland, Australia. Volunteer divers from the Silentworld Foundation and the Maritime Archaeological Association of Queensland record a small kedge anchor. The HMCS *Mermaid*, a very small wood carvel construction, was built in Howrah, India, in 1816. The *Mermaid* became famous as it was used in three of the four voyages made by Parker King, an early explorer, between 1817 and 1822 on his task of 'Exploring and Surveying the Coast of Australia.'

© X. Rivett / UNESCO

by Kieran Hosty, Australian National Maritime Museum

Australia's history is by nature closely connected to seafaring and its traces can be found in the underwater cultural heritage surrounding it. Most discoveries have been made by recreational divers and as a result of snagging by fishing nets. Now, an extensive inventory of Australia's underwater cultural heritage has been developed by maritime archaeologists and dive tourism is soaring.

There are records of about 7,000 shipwrecks lost in Australian waters, mainly in and around ports, with a smaller number located in the inland rivers. Together, government archaeologists, archaeological associations, voluntary divers and researchers have located, surveyed, assessed, and in some special cases excavated, the *Batavia* (1629), the HMS *Sirius* (1790), the HMS *Pandora* (1791), the *Sydney Cove* (1797), the *William Salthouse* (1841), the *Dunbar* (1857) and many others.

Among the approximately 7,000 shipwrecks occurred around Australia, some stand out for their particular historic significance:

The *Batavia* (1629) – Although the Australian coast seems an unlikely resting place for a United Dutch East India Company vessel dating from the 1620s, navigational practices in the 16th century, as well as the proximity of Dutch colonies to northern Australia, resulted in at least four of these vessels, including the *Batavia*, becoming wrecked on the coast of Western Australia. The *Batavia* is arguably Australia's most well-known shipwreck due to the dreadful mutiny that occurred on the isolated islands of the Houtman Abrolhas shortly after the wreck and which resulted in the murder of at least 125 of the survivors.

The *Batavia*'s wrecksite and associated land site was relocated in the early 1960s. Over four seasons of extensive fieldwork thousands of artefacts, including coin, cannon, anchors, trade ceramics and the stern section of the vessel's hull were recovered from the site. After lengthy conservation these artefacts are now on display in Geraldton and Fremantle and at the Australian National Maritime Museum.



A replica of the *Batavia* at sea.

© ADZee / UNESCO

The *Sydney Cove* (1797) – Following the establishment of the penal colony at Port Jackson, New South Wales in 1788, all trade to and from the colony was, in theory, controlled by a monopoly that had been granted to the English East India Company. However, due to the failure of the food crops in the early 1790s, and the desperate need of the growing settlement for additional supplies, the colonial governors were granted permission to obtain supplies from India. The first private trading vessels from India arrived in 1793, bringing much needed essential supplies to the colony, where the goods were sold for a premium. The 250 plus ton, Indian built sailing vessel *Sydney Cove* was the sixth Indian vessel to attempt to trade with the colony and was on its first voyage to New South Wales when it started taking on water off Western Australia. It was run aground on Preservation Island in Bass Strait in February 1797.



HMS *Pandora* (1791) – The famous mutiny on board the British Navy's armed transport *Bounty*, off Tahiti in 1789, had repercussions that were felt all the way back to the British Admiralty in London. Concerned by the effect that such a mutiny would have on general morale, the Admiralty dispatched the 24 gun frigate HMS *Pandora* to the Pacific Ocean to arrest the mutineers and bring them back for trial. In 1791, the HMS *Pandora* and its crew visited many Pacific Islands searching for the *Bounty* and was returning to Britain via the Torres Strait, with fourteen of the *Bounty* mutineers on board, when it was wrecked on the outer fringes of the Great Barrier Reef.

Her wreckage claimed the lives of thirty-one men of her crew and four of the prisoners from the *Bounty*. The rest of the crew, 89 men and ten prisoners, survived and most of them reached finally England after a long and arduous voyage. The ten surviving prisoners were tried and three of them were finally executed.

*Pandora*, Australia: Excavation work on the site of HMS *Pandora* revealed intact cabin partitions along storage compartments.

© Queensland Museum / UNESCO

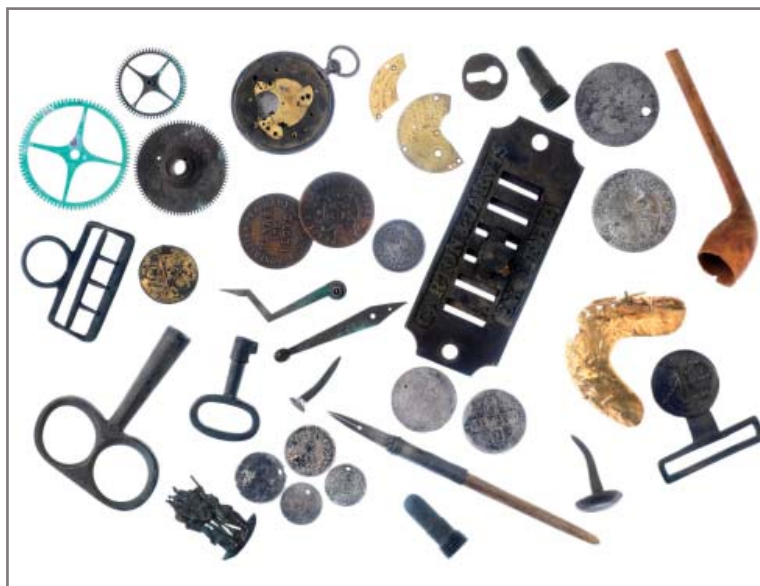
Other important shipwrecks are:

The *Hive* (1835) was driven ashore by her Master Captain Nutting. It represents the only convict transport wrecked on mainland Australia whilst actually delivering convicts. The wreck lies buried under sand in the surf zone of Wreck Bay.

The iron clipper *Loch Ard* (1878) is significant as one of Victoria's and Australia's most tragic and famous shipwrecks. Carrying a range of luxury and household commercial goods from the United Kingdom, and 54 passengers and crew, the *Loch Ard* struck Mutton Bird Island and quickly sank.

The *HMAS Australia* (1924): In March 2007, the deepest ever remote operated shipwreck survey was undertaken some fifty kilometres off Sydney. The target was the wreck of Australia's first flagship, the heavy battle cruiser *HMAS Australia*. The *Australia* served throughout World War One and was ceremoniously scuttled off Sydney in 1924.

The *HMAS Sydney II* and the German raider *HSK Kormoran* sank after a battle on 19 November 1941. It was Australia's worst naval disaster with the loss of the *Sydney* and all 645 crew. Around 80 German sailors died.



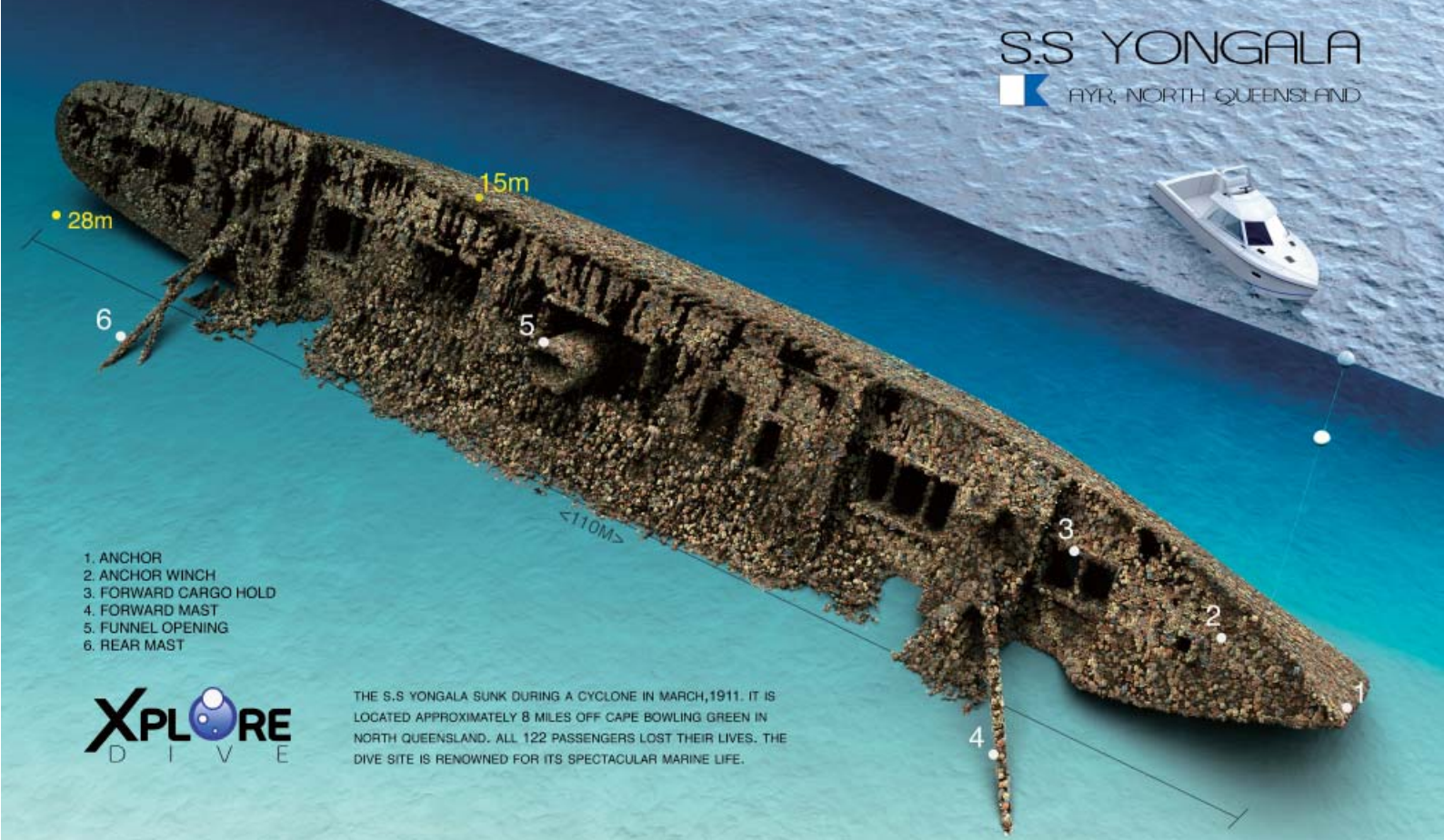
by Kieran Hosty, Australian National Maritime Museum

The *Dunbar* (1857) – The 1850s were years of great social and economic growth in Australia. Spurred on by the gold rush, thousands of people flocked to the colonies from overseas, creating a huge demand for goods and services. As the demand for cargo and passenger space increased, a number of ship-owners and builders, including Duncan Dunbar, commissioned a series of fast clipper ships to accommodate the trade. The *Dunbar* was a perfect example of a luxurious mid-19th century international passenger and cargo clipper when it was wrecked outside Sydney Heads, New South Wales, in August 1857 with the loss of more than 120 lives.

Artefacts recovered from the wreck of the *Dunbar* in the early 1960s are now being analyzed to add to our knowledge on international trade to New South Wales in the 1850s. © Australian National Maritime Museum / UNESCO.

## Research and protection of underwater cultural heritage in Australia

In Australia, maritime archaeology began with the discovery of four 17th century Dutch shipwrecks off the coast of Western Australia in the late 1950s and early 1960s. Concerned by the growing number of divers visiting these wrecks and removing material from them, the Western Australian Government introduced legislation in 1964 to protect these archaeological sites. This lead was followed in 1976 by the Australian Commonwealth Government who enacted the Historic Shipwrecks Act. Along with similar State legislation, it prohibited damage to, or disturbance of, declared shipwreck sites, and required finders of shipwrecks to report them to the relevant state authority. Australia protects its underwater cultural heritage also under the Environmental Protection and Biodiversity Conservation Act of 1999, as far as items of particular significance are concerned.



1. ANCHOR
2. ANCHOR WINCH
3. FORWARD CARGO HOLD
4. FORWARD MAST
5. FUNNEL OPENING
6. REAR MAST

**XPLORE**  
D I V E

THE S.S. YONGALA SUNK DURING A CYCLONE IN MARCH, 1911. IT IS LOCATED APPROXIMATELY 8 MILES OFF CAPE BOWLING GREEN IN NORTH QUEENSLAND. ALL 122 PASSENGERS LOST THEIR LIVES. THE DIVE SITE IS RENOWNED FOR ITS SPECTACULAR MARINE LIFE.

### Shipwreck trail card of the SS *Yongala*.

The SS *Yongala* (1911) lies in the central section of the Great Barrier Reef Marine Park. It was an early 20th century interstate coastal steamer that sunk during cyclonic weather. It provides a snapshot of Edwardian life in Australia and is now one of Australia's most highly regarded and popular wreck dives. The wreck is also the final resting place of the 122 passengers and crew who were aboard the *Yongala* on her 99th and final journey. © Xplorediver / UNESCO

### Public enjoyment and shipwreck trails

Shipwreck trails exist all over Australia. While certain maritime sites are too fragile and archaeologically sensitive to support public access, there are other more robust sites that have become stable in their environment. Effectively interpreted and actively managed, they can sustain large numbers of visitors. The shipwrecks that are highlighted in such a trail can be selected for the strange and tragic circumstances surrounding their loss, their historical significance, and because they provide a fascinating underwater experience for divers. Usually water-proof booklets and land-based interpretive signs are located along the coastline to assist in the interpretation of the wrecks.

Other successful examples of public interaction are maritime heritage websites maintained by museums and government agencies that provide opportunities for the non-scuba diving public to learn about their heritage.





*SS Maitai*, Cook Islands. Illustrative of the intense commercial exchange between Tahiti and the Cook Islands is the wreck of the *SS Maitai*, a 3,393 ton Union Steam ship vessel that used to embark on this maritime trade route. Run onto a reef in 1916, the ship with its cargo of historic Ford cars is located directly off-shore from the centre of Avarua.

© The Dive Centre / UNESCO

## COOK ISLANDS

The Cook Islands are located in the South Pacific Ocean, north-east of New Zealand, between French Polynesia and American Samoa. They encompass fifteen major islands spread over an area of 2.2 million km<sup>2</sup>. They are divided into two distinct groups of coral atolls - the Southern and the Northern Cook Islands. They were formed when sunken volcanoes were topped by coral growth. The main population centres are on the island of Rarotonga, with its international airport. With over 100.000 visitors travelling to the islands per year, tourism is the country's number one industry and the leading element of the economy. A large part of this tourism is dive-tourism.



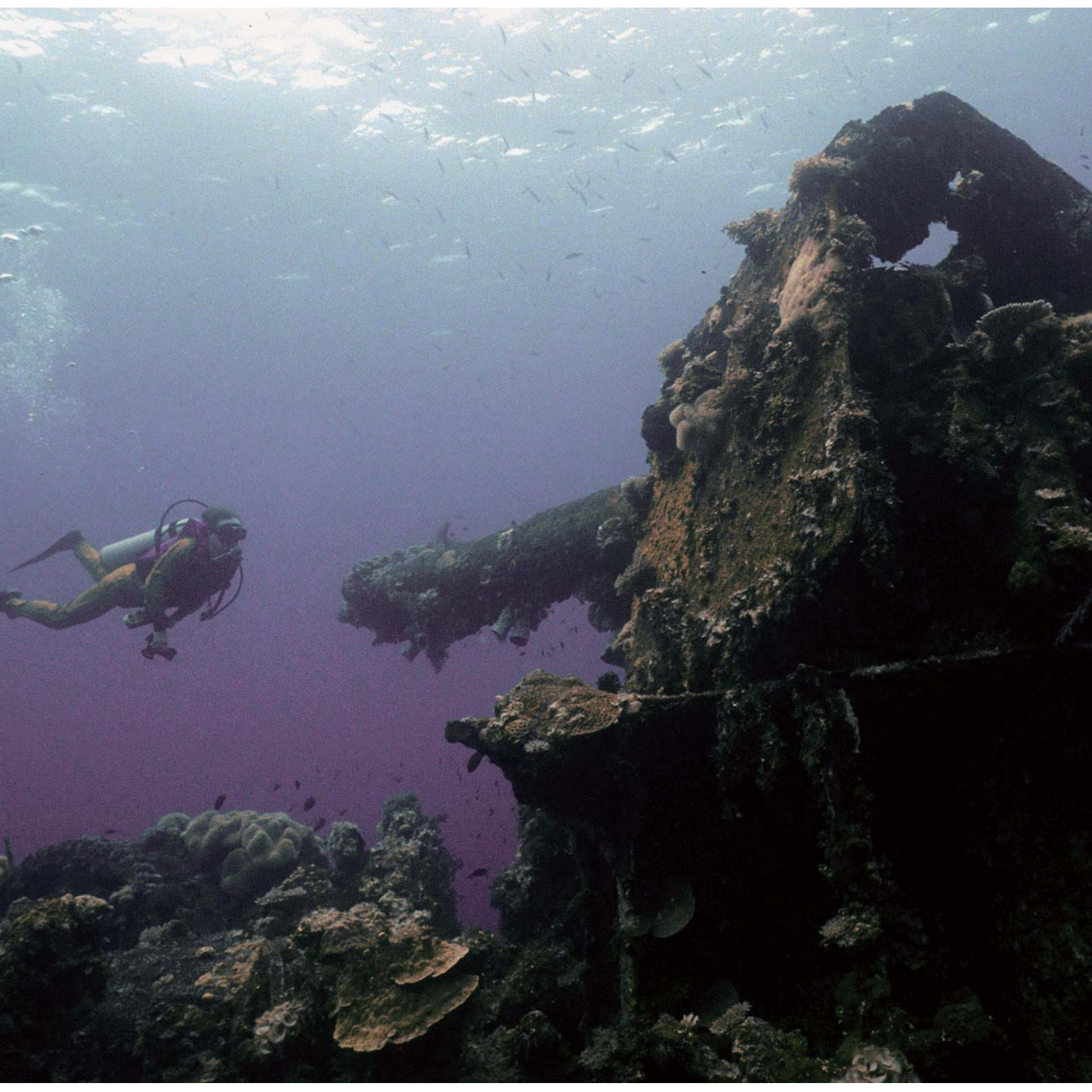
It is believed that the Cook Islands were settled in the 6th century by Polynesians, who migrated from nearby Tahiti. Nevertheless, local legend has it that submerged megalithic stone ruins or Bronze Age ruins are located on the shallow seafloor.

In the 16<sup>th</sup> century Spanish ships visited the island. Their first written record of contact came with the sighting of Pukapuka by the Spanish sailor Álvaro de Mendaña in 1595 who called it San Bernardo. British navigator Captain James Cook arrived in 1773 and again in 1777 and named the islands the Hervey Islands. Curiously the name Cook Islands, in honour of Cook, appeared on a Russian naval chart published in the 1820s. The Cook Islands became a British protectorate at their own request in 1888, but they were transferred to New Zealand in 1901. In 1965 they became a self-governing territory in free association with New Zealand.

Off the main island of Rarotonga, two ship wrecks are located at the bottom of the sea. Both the *M. V. Mataora*, once a Tongan registered 395 hp cargo vessel, and *Maritime Reefer*, once a large fishing vessel, serve as a diving attraction, despite the fact that the wrecks have been largely damaged and broken by a number of cyclones.



Wreck, Rarotonga, Cook Islands  
© R. Smith / UNESCO



## FEDERATED STATES OF MICRONESIA

by Jennifer McKinnon, Flinders University, Australia

The Federated States of Micronesia are a grouping of 607 small islands in the Western Pacific just north of the equator. They are spread over an area of 2,700 km<sup>2</sup>. They consist of four States: Yap, Chuuk, Pohnpei and Kosrae (from west to east). Their land area is quite small, amounting to approximately 700 km<sup>2</sup>. The capital is Palikir, and the largest city is Kolonia; both are located on the island of Pohnpei. All land area is the result of volcanic activity millions of years ago resulting in islands and atolls of incredible variety. Each of the four States constitutes one or more main high islands, and all but Kosrae include numerous outlying atolls. Each of them has its own culture and traditions, nevertheless, common cultural and economic bonds are centuries old.



Together with the Republic of Palau, the Federated States of Micronesia forms the group known as the Caroline Islands and in association with the Mariana Islands, the Marshall Islands and Kiribati they form the group today known as Micronesia - a Greek term meaning 'tiny islands'.

The maritime history of Micronesia spans nearly 4,000 years and is inextricably linked with the wider cultural region. Initial settlement of the area is approximated at 3,500 years based on linguistic, archaeological, and anthropological evidence. It suggests that the area was first inhabited by groups from Austronesia who arrived in ocean-going canoes. The inhabitants of each island group developed their own variations of watercraft based on their needs for procuring food and inter-island travel. The people of Micronesia are known to have been some of the most knowledgeable and skilled navigators of the Pacific, a tradition which continues to today.

In the 16<sup>th</sup> century European explorers discovered the region. The Portuguese and Spanish visited the islands, initially in 1521 with Magellan and then in 1565 with Legazpi. Due to their position on the trading routes of the *Manila Galleon* trade, the Spanish focused their colonial and missionary efforts on northern Micronesia's Mariana Islands. Spanish administrative centres were also set up in Yap and Pohnpei. As time passed whalers, merchant ships, supply ships and scientific expeditions sailed through the region, leaving their mark on the islands. In 1898 Spain sold the Caroline and Marshall islands to Germany, which set up administrative centres in Yap and Pohnpei. In 1914 and as a result of the First World War, the Japanese were awarded the islands under the League of Nations. This was followed by a period of shipping and commerce which included mail boats, frigates, merchant ships, inter-island schooners and military cruisers owned by various nations carrying sugar, fish, copra, tobacco, fruit, cattle, cotton and rice. Trade and economic expansion also brought Japanese immigrants to the islands.

*Opposite : Fujikawa Maru, Chuuk Lagoon.*

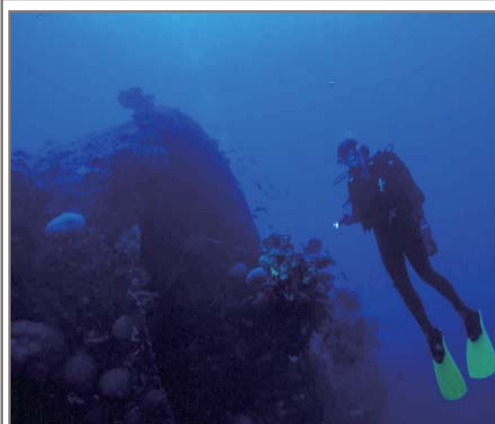
On 17 and 18 February 1944 and again on 30 April and 1 May 1944 US forces sank in Operation Hailstone many of the Japanese cruisers, destroyers, transports and aircraft at anchor in Chuuk Lagoon.

© G. Adams / UNESCO

The Second World War had then a huge impact on the islands and its people. By 1939 Japan established regional military headquarters on Palau and Chuuk which included a few thousand men as a military force, as well as Japanese convicts sent to build airfields. Chuuk in particular played a major role in Japan's naval strategy during the war. Because of its natural fortification and deep lagoon, Chuuk was used to harbour Japan's mobile fleet for air and surface offensive operations. A legacy of that decision lies submerged in the lagoon as a result of U.S. Operation Hailstone. On 17 and 18 February 1944 and again on 30 April and 1 May 1944 U.S. forces sank many of the Japanese cruisers, destroyers, transports and aircraft at anchor there. The Japanese build-up to WWII and the U.S.-led battle to capture Micronesia from Japanese control significantly altered the lives of Indigenous peoples living on the islands. Memories of these periods are fading as generations are passing; however the remains of these efforts are still visible along the coasts and in the waters of Micronesia.

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The people of the Federated States of Micronesia have a strong bond with their land, sea and reefs. This is evident through the wealth of heritage sites that entail a spiritual association with the sea, which encompasses stories and the determined ownership of the land and water. Many sea- and landscape features provide deep-seated connections to history, mythology and settlement of the islands, submerged heritage sites being powerful and tangible part of society. The variety of submerged cultural heritage also reflects the broad range of activity which occurred in these island states. Shipwrecks from many time periods are known to lie in its waters, as do the remains of maritime infrastructure efforts such as piers, wharves and landings.



The Wreck of the USS *Mississinewa*, Ulithi Atoll, Federated States of Micronesia.

© C. Lambert / UNESCO

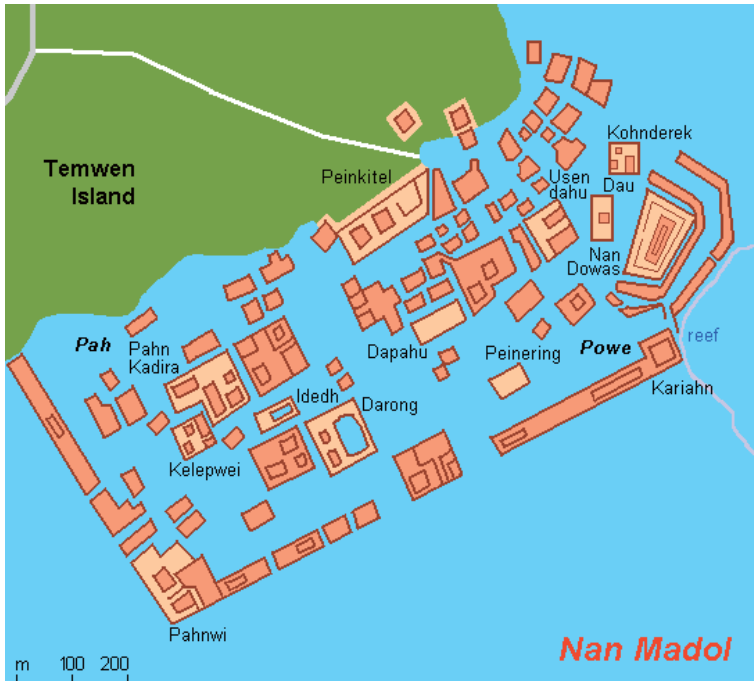
that it was not setting a precedent concerning its responsibility. The incident led to the establishment of the regional PACPOL programme, dealing now with this kind of issues.

In 1944 the USS *Mississinewa*, an American navy tanker containing a large cargo of heavy marine fuel oil was sunk in the Ulithi lagoon in the Caroline Islands by a Japanese Kaiten suicide submarine. In early July, 2001 a tropical storm damaged the fuel container of the wreck causing a heavy oil spill resulting in an ecological catastrophe with wide reaching consequences for the fragile ecosystem, especially the turtle hatcheries, and fisheries. The USA has removed oil from the *Mississinewa* and tapped its containers, declaring however,

These customs and sites provide the people with a sense of belonging and contribute to the cultural identity in addition to providing an economic benefit through eco and heritage tourism. To date only a few submerged sites have been investigated historically and archaeologically. Among the most exciting and culturally significant partially submerged sites are the Indigenous ruins of *Nan Madol* on Pohnpei, the Yap fish weirs (aech) and the World War II relics of Chuuk Lagoon.

Yap is equally known for its circular stone money which was quarried in Palau and transported to Yap to be used for a range of social and political transactions. Many such 'coins' can still be discovered under water off the shores of Yap and they give testimony to the historic development of the island. The Yapese Disk Money has been nominated for consideration of designation as a regional World Heritage Site involving two countries, Republic of Palau and Federated States of Micronesia. The Mangyol Stone Money Bank or Dancing Ground also known as Baleyrach is unique in design and shape as it is the only stone money bank or dancing ground in the entire Yap State which is crossed-shaped. The Bleyrach stone money bank is one of the seven original banks designated by spirits in the pre-historic era. Historically, both stone money banks and dancing grounds are commonly referred to as Mangyol as this was the last one constructed prior to the Spanish occupation. The Bleyrach bank or ground has 50 pieces of stone money of various sizes, shapes and designs while the Mangyol bank or ground has 21 pieces of similar nature. Historically, all of the pieces of stone money in both banks and grounds were quarried in Palau and transported by sea to Yap.

## The Indigenous ruins of *Nan Madol* on Pohnpei, Micronesia



A map of *Nan Madol*  
© WikiCommons / UNESCO

Archaeological research has shown that *Nan Madol* is comprised of more than 100 artificial islets bordered by canals and that the initial construction on the site dates to approximately 500 CE. These structures are part of an elaborate ceremonial and political complex. *Nan Madol* translates as the place of spaces and references the canals that separate the structures. What lies submerged in the waters at *Nan Madol* is still a mystery and is likely to comprise the refuse of residents, as well as clues to the construction of these massive complex structures, but may be even more.

*Nan Madol* is a complex collection of ruins that lies at the eastern part of Pohnpei. This ancient city used to be the capital of a dynasty called Saudeleur, the chiefs of the area. This family reigned from the 5th until the 15th century. *Nan Madol* had already been abandoned by the time the first Europeans arrived in the 19th century.



*Nan Madol*  
© B. Jeffrey / UNESCO

## The Yap fish weirs



Yap *aech*, Yap, Federated States of Micronesia.  
© B. Jeffrey / UNESCO

<- The Yap fish weirs, called *aech*, provide an important testimony to Yapese shared heritage that has developed over the centuries in tight conjunction with the sea. There are many different types of fishing practices used in Yap and there are many associated cultural and social practices associated with fishing. The types of fishing practices include the use of various types of nets, line fishing, spear fishing, fish traps, bamboo and stone/rock weirs on the reef flat in association with a canoe or a bamboo raft, and outside the reef in a canoe.

The *aech* is a unique example of how a society can exploit as well as live in harmony with its natural resources. It was designed and built to suit the local environment, to take advantage of the way certain fish move along the shoreline as well as further offshore, in addition to the strength and direction of currents, wind and the location of channels. The *aech* also provides an insight into Yap's complex social ranking. It is unknown when the first *aech* was built or when many of the remaining ones were built in Yap, possibly more than a thousand years or more ago. They comprise of a shaft of various lengths up to 200 metres lying perpendicular to the shoreline and a fish catchment area—the 'arrow head'.

As fish are moving with the current when the tide is ebbing, they are redirected by the shaft through entrances into the arrow head that could contain up to four smaller compartments that trap the fish, generally at the end of one arm of the arrow head. The different size compartments are for the segregation of different size fish. Small nets (*k'ef*) and weir baskets (*yanup*) may be used to collect the fish from the *aech*. Two, three or more *aech* can form a continuous line from the shoreline out to deeper water that will trap fish feeding in this area. The different shape and construction methods used are a reflection of their different locations on the reef flat and at least 15 different styles have been documented from the estimated 700-800 *aech*.



Yap *aech*, Yap, Federated States of Micronesia. © B. Jeffrey / UNESCO

## Shipwrecks in Micronesia

The wreck of the *Leonora* is one of the more interesting and significant historic period submerged sites off the island of Kosrae. Bully Hayes, a notorious blackbirder and rogue was in command of the *Leonora* when it was anchored in Utwa Harbor in 1874. A storm sank the ship before it could be moved.

Even better known for shipwrecks is however Chuuk Lagoon. It features a prominent shipwreck cemetery dating from World War II. Chuuk is also known as Truk and is an atoll consisting of a protective reef enclosing a natural harbour, 11 major islands and 46 smaller ones within the lagoon.

During World War II, the Lagoon served as the forward anchorage for the Japanese Imperial Fleet. It was the base for Japanese operations against allied forces in New Guinea and the Solomon Islands. With superb natural fortifications and supposedly well constructed man-made fortifications, it was known to allied forces as the Gibraltar of the Pacific. However, in 1944 during Operation Hailstone, an American bombardment sent more than 60 Japanese ships and 275 aircraft to the seabed. The seabed of Chuuk Lagoon offers therefore a step-back in history: a major ship's graveyard from World War II, on which many shipwrecks have been transformed into colourful reefs. They are known amongst divers as a fascinating wreck diving location and provide an important economic resource for Chuuk's inhabitants. Nevertheless, many of these wrecks are also grave sites and – in addition to this- still hold explosives. Respect is therefore required in approaching them and in the manner of diving.



*Emily Flying Boat*, Chuuk Lagoon, Micronesia. © G. Adams / UNESCO



Tanks on *Nippo Maru*, Chuuk Lagoon, Micronesia.  
© B. Jeffrey / UNESCO



Among Chuuk's well-known wrecks count the *Shinkoku Maru*, a large oil tanker which rests upright on an even keel. The bow gun and most exposed structures are overgrown with corals, hydroids and sponges, swirling with fish. The bridge still holds the encrusted engine telegraph and helm, the galley holds dishes, utensils and a large stove.

Another one, the wreck of the *Heian Maru*, a submarine tender and cargo ship and the largest vessel in the lagoon, still contains ammunition and near the galley and an assortment of teacups and plates is preserved. The *Nippo Maru*, a cargo ship, is a particularly well-preserved wreck containing a tank on its port deck.

The *Susuki destroyer*, known as Patrol Boat 34 at the time of sinking, is known for its well-preserved engine room.

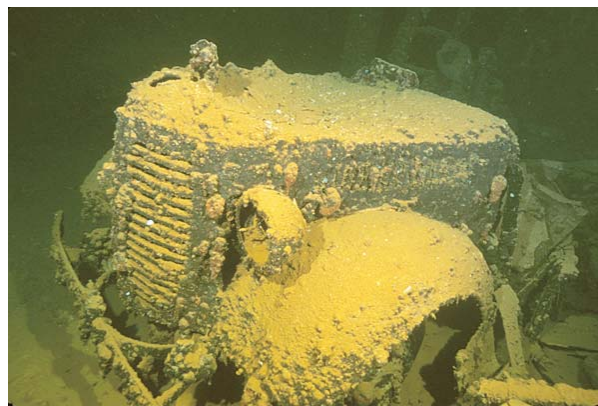
The wreck of the *San Francisco Maru* lies at a considerable depth and contains many large, well-preserved war relics. Tanks rest on the main deck, while the forward hold contains mines.

The *Yamagiri Maru* was a Japanese freighter, which came to rest on her port side after she was hit repeatedly during air strikes. Almost completely intact, it is encrusted with coral and sponges and holds a variety of artefacts, including huge 18-inch artillery shells.

The *Sankisan Maru* sunk after suffering a hit to an aft hold full of ordinance, causing a devastating explosion. The consequences can still be seen on the wreck, whose shallow masts are now the homes of dense coral growth, while its cargo areas still hold truck chassis and ammunition.



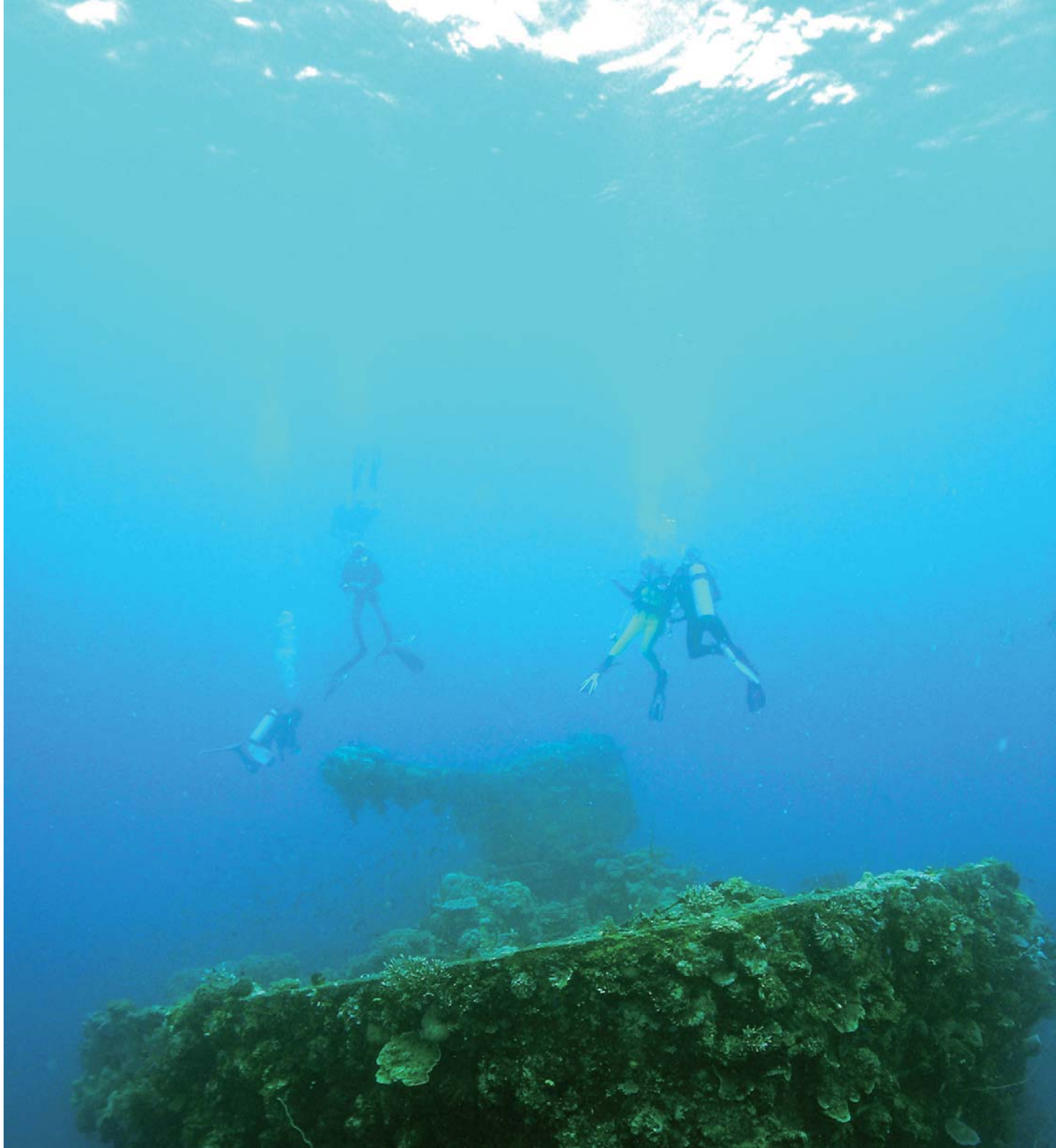
*Fujikawa Maru*, Chuuk Lagoon, Micronesia  
© B. Jeffrey / UNESCO



The *Hoki Maru* wreck is only partially intact. Nevertheless, the aft hold contains trucks and road building equipment. Other holds contain an assortment of bombs and sake bottles. Above: the remains of a 1930s truck in its hold. Truk Lagoon, Micronesia.

© Aquaimages / UNESCO

Opposite: *Fujikawa Maru*, Chuuk Lagoon, Micronesia.  
© B. Jeffrey / UNESCO





Underwater landscape off the Fiji Islands.  
© R. Smith / UNESCO

## FIJI ISLANDS

The Republic of the Fiji Islands is an archipelago, in the South West Pacific, midway between the Equator and the South Pole. Fiji's territory covers about 1.3 million km<sup>2</sup> of South Pacific Ocean and contains approximately 330 islands, of which about one third are inhabited. Fiji's total land area is 18,333 km<sup>2</sup> consisting of two major islands, Viti Levu and Vanua Levu, and more than three hundred smaller islands that make up the land mass. The remainder of Fiji's "land" lies under water and so does a substantial part of its cultural heritage. The Fiji archipelago is encircled by a huge reef, and within its protected waters are shallow lagoons, steep drop offs, and numerous unexplored submerged sites ranging from sunken villages to three shipwrecks from WWII.

Fiji has many myths of villages disappearing overnight in certain places. Indeed, there are many relics of sunken villages, which include, in addition to more recent ones, pre-historical dwellings that were long ago reclaimed by the sea, either through natural processes of islands sinking or by earthquakes.



### The sacred Druas

Intriguing are the legendary Fijian Druas, sacred war canoes. They were double-hull sailing canoes of a length of up to 30 metres, often built over a time of several years, and capable of carrying more than 200 people. Their origin is largely discussed, but they used to be widely acclaimed as the largest and finest sea-going vessel ever designed, and built by natives of Oceania before contact with Europeans. Druas were sacred in the sense that only aristocrats could own one. They served mainly as war ships or as representative vessels. Following Fijian custom, it was an insult to cross the canoes' bows, to sail winward of a Drua, or to sail one sight of another chief's territory. According to legend, launching a Drua required a blood-thirsty ritual, including human sacrifices. Entire battles were fought by Druas. The disappearance of this famous double canoe from Fiji coincided with the close of the 19th century. Few were constructed after 1883, the year of the death of King Thakombau. Legend has it that these large ocean-going canoes were buried in swampy mud to preserve them as tribute to the king, warrior or chief who had died. This tradition of burying canoes was practised in and around the Bau Island, whose coastal earthwork denotes landing places for canoes or for their mooring. An archaeological dig in these parts of Fiji revealed Vesi (Intsia Bijuga) wood from one such old ocean-going vessel.



An ancient image of a Drua

Fiji shipwrecks, ranging from sailing ships to steam ships, are mainly located around the Lomaiviti Island Group, where Levuka, the former Capital of Fiji was located. Also the island of Ovalau has a number of shipwreckages around its shores.

The Yasawa Islands group, which is located west of Viti Levu, has a large number of aircraft wrecks dating from World War II, which were lost in training runs around the islands.



## FRENCH POLYNESIA

With the contribution of Michel L'Hour, DRASSM, France

French Polynesia is a French overseas territory in the southern Pacific Ocean. Its islands are a series of volcanic islands and atolls strewn between South America and Australia. The most famous island is certainly Tahiti in the Society Islands group, which is also the most populous island and the seat of the capital of the territory, Papeete. French Polynesia includes five archipelagos, of which four are volcanic and one coral: The Marquesas Islands, near the equator, the Tuamotu Islands, the high tropical Society Islands, the far off southern Austral Islands, which are among the least inhabited islands of the South Pacific, and the also rarely visited Gambier Islands, eroded remains of a former gigantic crater.

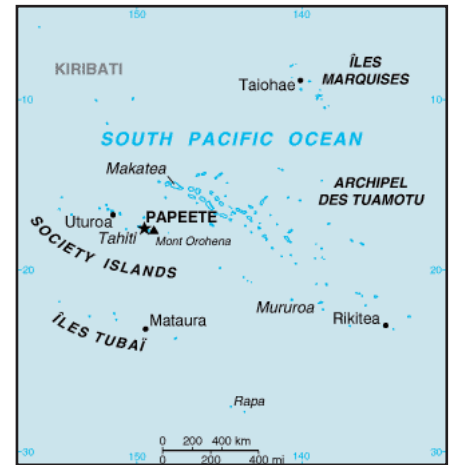
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Polynesians have always been sailors and navigators who traversed vast distances of open ocean to settle as far and wide as present-day French Polynesia, Hawaii, New Zealand, parts of the New Guinea Island, Tonga and the Cook Islands. The exact history of the population of the islands is still subject to debate. It is, however, speculated that the ancestor of today's Polynesians left South-East Asia around 4,000 years ago and arrived in present-day French Polynesia around 300 CE. The islands of French

Polynesia have enticed, inspired and captivated visitors since they were first discovered. Some of the first European visitors, including Samuel Wallis (1767), Louis Antoine de Bougainville (1768) and James Cook (1769), inspired writers and artists, such as Herman Melville, Robert Louis Stevenson and Paul Gauguin, to pursue the tropical myth of Polynesia. France annexed various Polynesian island groups during the 19th century.

A number of shipwrecks bear testimony to Polynesia's tormented history. One of the ships of the discovery expedition led by Roggeveen through the Pacific, the *Dutch Africaense Galley*, sunk in 1722, on the coral reef of Takapoto atoll (Tuamotou). Other historic ship wrecks include the American bark *Julia Ann* sunk in 1854 on Manuae atoll, also named the *Scilly*; the full rigged Chilean ship *Francisco Alvarez*, sunk in 1868 on Mangareva Island at Gambier Archipelago; the Danish bark *Norby* sunk in 1900 on Tepua Ref, Raiatea Island, Society archipelago; and the four masted *County of Roxburg* sunk in 1906 during a hurricane on Takaroa Atoll (Tuamotou).

There are also two famous recovered anchors that relate stories of maritime adventures. An anchor found in 1976 has been attributed to Captain Cook and it is believed that it originally belonged to the *HMS Adventure*, one of Captain James Cook's boats, and was lost whilst he was attempting to land in Tahiti during tricky weather conditions in 1773. Today, it is on display at the Museum of Tahiti and Her Islands. The second is Commander Bougainville's anchor.



Opposite : Aerial view of Bora Bora with surrounding Motus, French Polynesia.  
© Wikicommons / UNESCO

In addition to recovered artefacts, a number of submerged archaeological sites are known. A major site is located in Mo'orea near Tupaparau Pass in the Afareaitu lagoon, where numerous stone objects have been discovered. These include hewn and worked stone objects, but also volcanic rocks apparently in their natural state. The objects found relate to fishing: anchors and fishing weights for lines or nets. Some stones may have come from ceremonial sites such as Marae, while others include un-worked basalt prisms, finished basalt tools (adzes) and a very small number of domestic objects, such as a pestle and other less readily identifiable objects. The significance of the excavation area is due to its dimensions (250 by 50 meters) and to the number of the objects it holds, which has been estimated to be several hundred.

Traces of ancient pre-European settlements have been discovered on the island of Huahine, where the sites of Vaito'otia and Fa'ahia were discovered during hotel constructions. The swampy ground had preserved many wooden objects and even house foundations that indicate an approximately 1,000 year old village. Some of the most interesting items found were canoes and patu, ancient weapons made of wood and bone used by the New Zealand Maoris. These weapons had never been found outside of New Zealand and support theories of migration from Tahiti to New Zealand.

Ancient fish traps that have been used for centuries were found in Lake Fauna Nui, an inlet from the sea. As fish were pulled towards the sea by an ebb tide, they became trapped in the V-shaped fish traps and could be easily caught by net or harpoon.

A significant Polynesian cult site that was destroyed and submerged by a Tsunami was discovered on the seabed of the great Marae of Taputapuatea in Raiatea Island, Society Islands.



In the month of April 1768, two French ships, *La Boudeuse* and *L'Etoile*, directed by Louis Antoine de Bougainville, passed by Hiti'a. Bougainville was a French sailor, soldier, statesman and mathematician, and one of the most interesting characters of the 18th century. On his voyage around the world, he came into a heavy storm near Tahiti and thus anchored between the two small islands of Oputotara and Variararu and the coast, hoping to be sheltered from prevailing winds. Though preventing his ships from going aground, he lost six anchors during that stay. The Tahitians have found one and gave it to the chief of Bora Bora, who in turn gave it to Captain Cook in 1777. Another anchor was found in 1974. It has a total height of 3.65 m and a wingspan of 2.35 m and has been attributed to Bougainville.

Portrait of French explorer and navigator Louis Antoine de Bougainville (1729-1811) by Jean-Pierre Franque (1774-1860).

## GUAM

By Jennifer McKinnon, Flinders University, Australia

Guam is an unincorporated territory of the United States and one of fifteen islands within the Mariana Island chain in Micronesia. It is the largest and southernmost island within the archipelago and enjoys a tropical oceanic climate. Although the island is volcanic in origin it is covered with uplifted limestone from ancient reefs in the north and volcanic features in the south. The ocean surrounding the island quickly drops to depths and off the southern tip of Guam it is recorded at 10,914 metre. Guam has a number of bays and anchorages which made it appealing to colonial powers. In fact Umatac Bay on the southwest coast may have been the location where Magellan made the first landing in the Pacific.

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Human occupation of Guam is similar to that of the Northern Marianas and likely started around 3,500 years ago by ocean-going Austronesians. Magellan made his first landing on Guam in 1521 but it was not until 1688 that the Spanish would begin colonizing the island. Guam's location made it an excellent candidate for Spanish settlement to support the Manila Galleon trade. Thus administrative headquarters were constructed on Guam. The Spanish relocated many Indigenous Chamorros from other islands to aid with this construction, control the resistant populations, and begin converting them to Christianity.

Today Guam is the largest and most populated island between Hawaii and the Philippines. It has an excellent port and is a major communication centre and crossroads for air routes between the U.S. and Asia. The Micronesian Area Research Centre (MARC), a high quality historical research centre and archives facility is located on Guam and provides much of the known history for the region. In recent years the Department of Agriculture, Division of Aquatic and Wildlife Resources of Guam has established several new marine preserves where fish and turtle populations are monitored by biologists.

Unlike the northern islands, Guam was never held by the Germans but was directly passed to the US in 1898 after the Spanish American War, and has been administratively separated from the remainder of the Northern Marianas chain since that time. The US colonial administration, referred to as the American Naval Period, resulted in an increase in military transports, station ships, Japanese and US trading vessels, German cruisers, colliers, passenger steamers and mail ships to, from and by the island. By the late 1930s all foreign owned ships were prohibited from entering the harbour at Guam and in the period just prior to WWII only military ships of the U.S. were allowed in the harbour. The American Naval Period was ended when the Japanese invaded and overtook the island on 10 December 1941, three days after the attack on Pearl Harbour.

Guam was also the location of extensive fighting during WWII while it was under Japanese occupation. The original plan for Operation Forager, the name given the US invasion of the Marianas, was a simultaneous invasion of Guam, Saipan, and Tinian. However Guam was taken last on 10 August 1944 after Saipan and Tinian.

Submerged cultural heritage from every period of colonial occupation is known to be present in the waters of Guam including shipwrecks from the Spanish colonial period, from whaling, from the American Naval Period, from both World Wars and up to the modern era.



## Guam's submerged caves - a unique archaeological potential

The volcanic origin of the Mariana Islands and their numerous caves, both dry and submerged, make for an interesting proposition for early Indigenous habitation. Since some of the best evidence supporting early human occupation in the islands has come from excavations in or near caves, submerged caves offer a unique potential for finding early sites. Although to date no prehistoric sites have been found in submerged caves, few or no systematic archaeological investigations have been conducted either. A number of caves located in 5 to 10 m of water exist along the coast of Guam. The investigation of these caves could provide concrete evidence of habitation or a lack thereof.

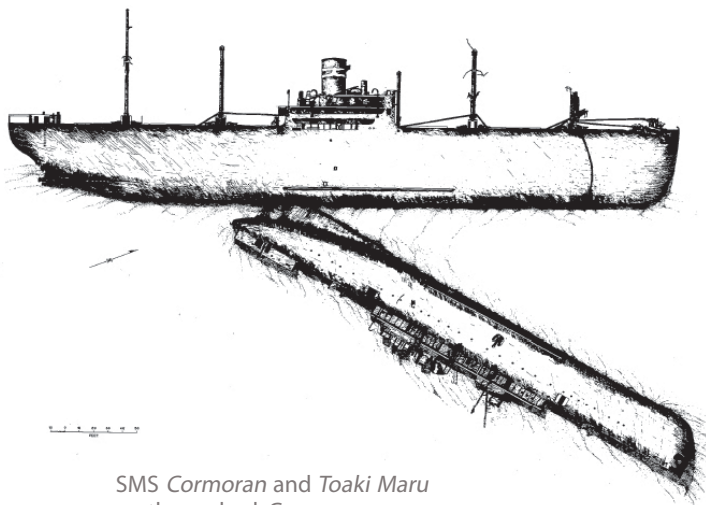
## Spanish shipwrecks from the 17th century

Not surprisingly, its wealth of Spanish galleonwrecks has stirred the desire of commercial treasure hunting groups in Guamanian waters. One in particular, the wreck of the *Nuestra Senora de Pilar de Saragoza y Santiago* which sank in 1690 at Cocos Island off Guam, has been salvaged by the company Pilar Project Limited (PPL). Thus far several coins, fasteners, cannon balls, musket balls, ballast stones, ceramics and hull sheathing have been recovered. It is uncertain if the site is still being worked as there are no available reports on the activities of this endeavour. It is hoped that the governments of the Pacific will take note that those engaged in recovering artefacts for profit are being pushed out of other areas of the world such as the US, Europe and the Caribbean, and that their submerged heritage is at risk as these groups target the Pacific. It is easy for governments to be lured into the treasure hunt with a promise of gain in exchange for little investment; however selling off bits of history does not preserve it for future generations and may destroy opportunities for public enjoyment, national identification and tourism.

## The first American shot in WWI

*SMS Cormoran* was originally the SS *Rjasan* built in 1909 by the Germans for the Russian Volunteer Fleet Association. It was captured in 1914 by the German cruiser *SMS Emden* at which point it was renamed *Cormoran*, outfitted with guns and a new crew, and sent to raid merchant ships in the Pacific. On 14 December 1914 it entered Apra Harbor and requested provisions which were denied. Instead it was interred until the US entered WWI on 7 April 1917, and only two hours after President Wilson signed the declaration of war it was asked to surrender. The captain offered to surrender the crew but not the ship, giving his crew the order to scuttle it. The reply was a demolition charge often cited as the first shot fired by the US in World War I. The crew abandoned the vessel, but several crewmen were lost. Today the wreck of the *Cormoran* lies in 34 m depth of water on its starboard side nearly intact. Mooring buoys were placed on the site in order to facilitate diver access to the shipwreck.

The particular importance of the *Cormoran* wreck for the history of World War I was taken into account when it was placed on the US National Register of Historic Places in 1975.



*SMS Cormoran* and *Toaki Maru*  
on the seabed, Guam  
© J.L. Livingston / UNESCO

## Important World War wrecks in Guam

Archaeological investigation of both WWI and WWII shipwrecks has been conducted in the waters of Guam. One shipwreck that has been the subject of both archaeology and dive enthusiasts is SMS *Cormoran*, a German auxiliary cruiser lying on the bottom of Apra Harbour on the west side of Guam.

Nearly touching the wreck of *Cormoran* is the wreck of *Tokai Maru*, a passenger and cargo ship built in Nagasaki in 1929-1930. *Tokai Maru* was used during WWII by the Imperial Japanese Navy as a transport vessel and was anchored in Apra Harbour on 24 January 1943 when it was hit by a torpedo fired by the U.S. submarine Flying Fish. Although damaged it did not sink, but on 20 August 1943 it was not so lucky when it received a torpedo from the submarine Snapper which sank the vessel immediately. Today it lies adjacent to the *Cormoran* and in conjunction the two vessels make for a spectacular recreational dive.

Post-war military dumps are well-known in the waters of Guam which provide both cause for concern (unexploded ordnance and chemical contamination) and curiosity. One site, Camel Rock Ammunition Dump, is said to contain at least 64 tons of unexploded WWII Japanese and American ordnance. This dump is the result of a post-war cleanup during which the Navy gathered bullets and bombs and encased them in tar before dumping them off Camel Rock. The scatter ranges from 10 to 35 m depth and is not a suggested recreational dive due to its potential danger. Although subject of human utilization of water for discard, these types of sites prove fascinating. Another dump site locally known as the Shark Hole is located just south of Orote Peninsula. The site contains the remains of historic tracked vehicles, mess hall trays, cables, small wheeled carts, tires, telephone equipment, radio boxes, and ammunition boxes. The site is scattered along a slope from 5 to 35 m depth and is well-known and highly visited by divers.



*Bombardment of Guam* - the traces of this battle are still to be found on the seabed off Guam.



Millennium Island, Kiribati.  
© NASA / UNESCO

## KIRIBATI

The islands of Kiribati are scattered and geographically remote. They are only accessible by ship or plane. These are scheduled about twice a week for islands that are situated close to the Capital Tarawa, including the central and northern districts, and about once every month for islands located further away from Tarawa, like the southern islands and the Line and Phoenix group.

The people of Kiribati as with other Micronesians have a very close connection to the sea and the underwater cultural heritage in this region of the world is accordingly very rich. These submerged sites are culturally linked to the past, relating unique stories that were passed orally from generation to generation through story telling, songs, navigation, legends, skills, material cultures, healings and dances. Sites include the remains of traditional settlements, meeting places, burial sites and ancient fish weirs. Some sites are well-known and documented, others are only locally known and their story is merely confirmed through legend. The underwater cultural heritage of Kiribati also encompasses vestiges from battles, in particular the Second World War. A total of six shipwrecks are known to be located in the waters of Kiribati, including a US escort carrier, *Liscome Bay* and two Japanese submarines.

A major example of the remains of ancient traditional settlements is Utiroa, located on Makin Island. According to stories from Makin, there used to be settlements located on both sides adjacent to an island passage. Because of heavy silt and the accumulation of sediment at the mouth of this passage, along with the opposite force of the wave from the western side of the island, it filled up to form land. Japanese researchers found that ancient settlements were buried, and new settlements established elsewhere.

Another site consists of the remains of an ancient meeting place, a Maneaba, now submerged. Maneabas are traditional meeting places, which are common in the region. Submerged pillars seem to indicate a Maneaba once existed at Temotu, one of the villages located at the end of Nonouti island. According to the old persons in the village, this Maneaba was once on land. Local divers at Nonouti have seen its erect pillars on the sea floor and confirmed that they are laid out like the plan of a traditional Maneaba.

Ancient submerged burial sites exist at Bike in Abemama and Nei Teinaiaeta in Butaritari. Bike islet has been inundated and according to legend used to serve as a cemetery. Bike is located off Abemama islet, about 4 hours away by sailing canoe. The burial site of a woman known as Neil Teinaiaeta is located at sea close to Kuma on the island of Butaritari. The small site consists of a raised mound of sand, similar to a sand dune, enclosed by mangroves.

The sites at Betio and Butaritari contain the remains of a battle fought in Tarawa by the Japanese and US marines during WWII. This is why now all manner of military machinery can be found scattered on the reef flat and on the seabed. Today, Chinese enterprises export metal from Tarawa and unfortunately, many locals find these remains useful as a source of income. The retrieval of metal seriously damages the sites.



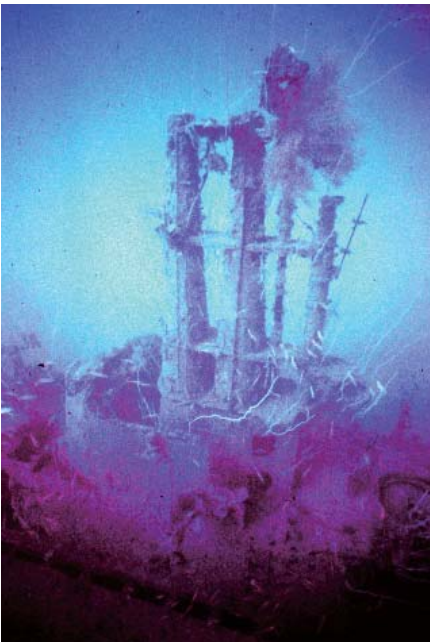






The blast from Test Baker erupts from Bikini's lagoon on 25 July 1946, Bikini, Marshall Islands. Remarkable are the ships raised by the blast, which have now come to rest in the lagoon.

© US National Archives / UNESCO



The conning tower of the submarine USS *Pilotfish*, sunk by the Baker blast on 25 July 1946, Bikini, Marshall Islands.

© US National Park Service / UNESCO



The bow of the destroyer USS *Anderson* lies on the lagoon bed where it sank during Test Able on 1 July 1946, Bikini, Marshall Islands.

© J.P. Delgado / UNESCO

## MARSHALL ISLANDS

The Marshall Islands comprise twenty-nine atolls and five islands, which are scattered across the central Pacific, just west of the International Date Line and north of the equator. They have roughly 62,000 inhabitants and total a mere 181 km<sup>2</sup> in land area. Nevertheless, they cover almost 1,200 km<sup>2</sup> of ocean. Majuro, capital of the Marshall Islands, is the main gateway into the country. The setting of the islands is picturesque and intricate reef systems are found off the atolls, while coral breaks the surface of the lagoons. Nevertheless, as the Marshall Islands rise no more than 7 metres from the sea level, they are particularly threatened by its predicted rise.

Whilst the Marshall Islands had been already inhabited for almost 2,000 years, the first European, the Spanish navigator Alonso de Salazar landed there only in 1525. This visit left few traces and they were not visited again until 1788, this time by the English naval captain John Marshall, after whom the islands were subsequently named. Changing missionaries, German influence and Japanese occupation marked the next centuries.

The Islands gained worldwide historic importance when in February of 1944, toward the end of the Second World War, in a gruesome and terrifying battle, the American forces captured Kwajalein Atoll and destroyed the Japanese hold on the Marshall Islands. Majuro Atoll and Arno Atoll are today well known sites for WWII relics preserved at the lagoon floor.

### The shipwrecks of Bikini Atoll/Marshall Islands

by James Delgado, Institute of Nautical Archaeology, USA

A unique collection of shipwrecks of a very particular historic significance lies at a depth of 60 meters in the lagoon of Bikini Atoll. These vessels, all sunk in July 1946 by two separate nuclear detonations, are a group of warships from the United States Navy and the Rengo Kentai, the Imperial Japanese Navy, that were assembled for Operation Crossroads, a series of atomic tests conducted by the United States in the immediate aftermath of the Second World War. The tests had been designed to analyse the effects of newly developed atomic bombs on naval ships, military hardware and equipment, as well as on test animals. They also had a distinct political component and were widely seen by U.S. and international observers as a statement of newly developed American military strength at the advent of the Cold War between the US and the Soviet Bloc.

Crossroads was planned as a series of three separate tests, each detonating a nominal yield 20 kiloton weapon known as the *Mark III Fat Man* bomb, the same type of weapon the United States had deployed in combat against the Japanese city of Nagasaki in August 1945. This bomb, although existing in small numbers, represented the most powerful weapon not only in the United States' arsenal, but in the world, as at that time the US was the world's sole nuclear power, even though other nations, in particular Great Britain and Canada, had participated in the Manhattan Project to develop atomic weapons during the recent war.

Double-page before: The *Baker* explosion, part of Operation Crossroads, Bikini Atoll, Marshall Islands.





After initial discussions and political demands to determine if the atomic bomb posed a threat and following disagreements among the various branches of the American military establishment the President of the United States, Harry S Truman, created in January 1946 Joint Task Force One, a combined military force primarily drawn from the ranks of the United States Navy and commanded by Admiral Purnell Blandy to conduct the tests.

Operation Crossroads took place in the face of internal opposition in the United States, including that of the atomic scientists from the Manhattan Project, who expressed their belief that the tests were unnecessary for science and were nothing more than provocative political demonstrations. They were joined by expressions of public concern in the United States and abroad that the tests posed significant risks. Despite these and other concerns and protests, Joint Task Force One quickly proceeded with the tests, selecting Bikini Atoll as the site and relocating its population of 167 people, who were convinced that they were leaving their ancestral home for the good of mankind.

The atoll and islands were prepared for the tests as engineers blasted channels into the lagoon, removed coral heads, and built facilities to observe and film the detonations. Ninety-five ships were assembled and moored in the lagoon off Bikini Island as targets, part of an overall fleet of 242 ships comprising JTF-1's support and target fleet. The Task Force also included some 42,000 military personnel and scientists, reporters, and 5,666 test animals placed on the target ships to be exposed to the atomic blasts.

After hurried preparations in the early months of 1946, the tests took place in July 1946. The first test, "Able," dropped a Mark III weapon from a B-29 aircraft over the moored fleet on the morning of July 1. Detonating over the surface of the lagoon at approximately 158 meters, the 23 kiloton explosion sank five vessels and started fires on several other ships that were later extinguished. In addition to the test animals, the target ships were loaded with fuel, ammunition, ship's stores and equipment, and scientific test instruments. Some of the vessels were loaded with equipment from other branches of the military, including aircraft, armoured vehicles, and other weapons to see what a nuclear blast would do to them.

Following the "Able" test, the Navy repositioned the ships, reloaded test equipment, animals and instruments, and placed a second Mark III weapon in a water-tight caisson suspended 27 meters below from a test ship in the middle of the target array for test "Baker" on July 25. The "Baker" detonation created an impressive "mushroom" cloud of superheated steam, seawater and ejected two million tons of sand and coral from the seabed 1,829 meters into the air. The blast sank ten ships. The greater, although then not fully appreciated result was the radioactive contamination of nearly all of the surviving target ships. In the immediate aftermath of the test, the Navy's efforts to decontaminate the surviving target ships failed because of intense, short-lived radiation in the sodium of the seawater and unfissioned plutonium contamination from the bomb. On August 10, JTF-1 cancelled plans for a third, deeper-water test detonation, sank ships too badly damaged to be towed away, and then departed Bikini leaving 23 vessels on the bottom. The other surviving target ships were towed to Kwajalein, Hawaii and the continental United States, where most were eventually deliberately sunk because of lasting concerns over their radioactive contamination.

A scientific resurvey of Bikini by the U.S. Government in 1947 was followed by a decision to not return the Bikinians to their home, and in 1954, a decision to continue to use the atoll as a nuclear test site. As of 2010, the nuclear exile of the people of Bikini continues, with many living on the distant island of Kili while others, as a result of their atomic Diaspora, live abroad. Between 1954 and 1948, 21 additional tests detonated weapons of increasing power at Bikini, releasing 75 megatons of force and generating intense radioactive contamination of portions of the atoll. The "Castle-Bravo" hydrogen bomb test of March 1, 1954, a 15-megaton burst, eradicated one small island in the atoll chain, and spread fallout over a vast area of the Pacific, including the island of Rongelap, where the Bikinians were living at the time.

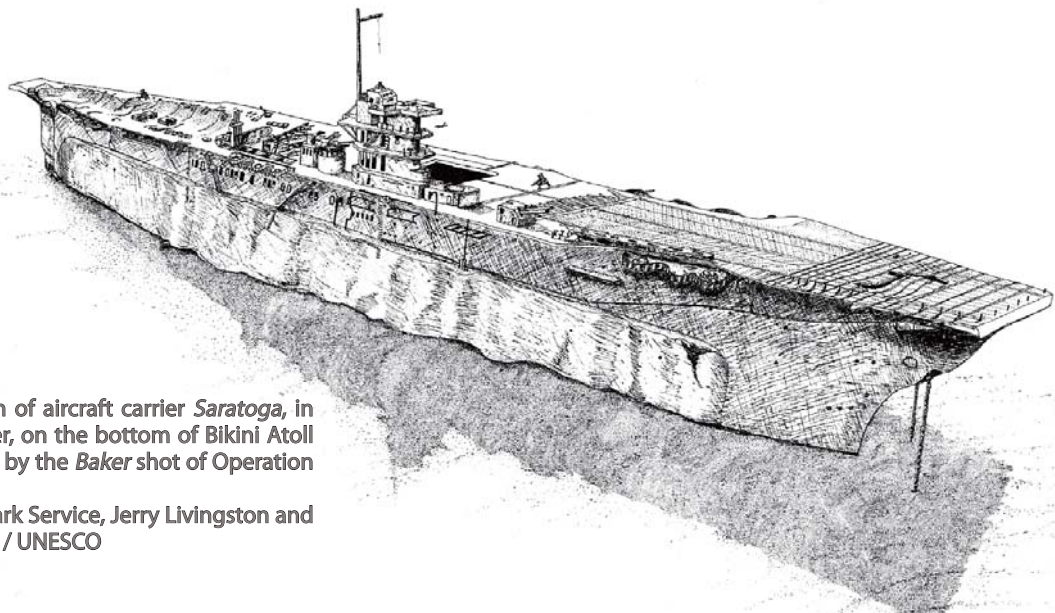
Scientific monitoring of Bikini by the US Department of Energy and the University of California's Lawrence Livermore Laboratory has been continuous for decades. In 1989-1990, a detailed archaeological assessment and scientific resurvey of the sunken test ships was conducted by the US National Park Service's Submerged Cultural Resources Unit, the United States Navy, and the Department of Energy. A comprehensive publication and a subsequent book, and a documentary film resulted from the survey, as well as a decision by the Bikini Council to develop a dive tourism operation and open the ships in the lagoon to regulated diving by qualified tourists. The Bikini dive operation successfully operated until recent years and is currently mothballed as a result of the global economic slowdown and access issues.

Bikini Atoll and the "ghost fleet" of Operation Crossroads are a unique cultural landscape reflecting the beginnings of the nuclear age and a unique set of cultural resources that depict not only military technology, and the effects of nuclear weapons. Bikini Atoll has conserved direct tangible evidence that is highly significant in conveying the power of the nuclear tests, i.e. the Equivalent to 7,000 times the force of the Hiroshima bomb, the tests had major consequences on the geology and natural environment of Bikini Atoll and on the health of those who were exposed to radiation. They also reflect in a material way the social and political mindset of the early Cold War period, and the ongoing cultural impact of the decisions made by the United States during 1946-1958 which had a direct impact on the people of Bikini.



Through its history, the Bikini atoll symbolizes the dawn of the nuclear age, despite its paradoxical image of peace and of earthly paradise.

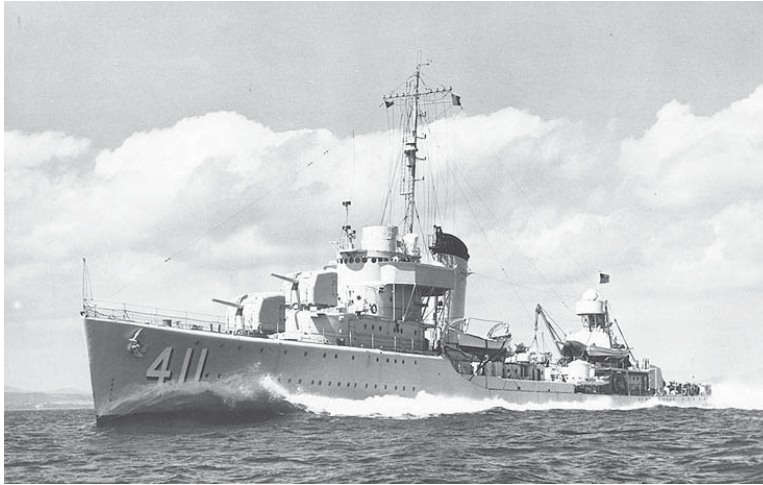
The sunken test ships, as well as associated aircraft, test vehicles, and test equipment, cables, test bunkers, and the atomic craters (the gigantic Bravo crater) on the sea floor inside the lagoon are a museum of the beginnings of the atomic age, and as such, have been inscribed on the UNESCO World Heritage List in 2010.



Diver's sketch of aircraft carrier *Saratoga*, in 60 m of water, on the bottom of Bikini Atoll lagoon. Sunk by the *Baker* shot of Operation Crossroads.

© National Park Service, Jerry Livingston and Larry Nordby / UNESCO

During the Able Test the following ships sunk: USS Gilliam (attack transport), USS Carlisle (attack transport), USS Anderson (destroyer), USS Lamson (destroyer), HIJMS Sakawa (cruiser), while during the Baker Test the USS Arkansas (battleship), HIJMS Nagato (battleship), USS Saratoga (aircraft carrier), USS Pilotfish (submarine), USS Apogon (submarine), LSM-60 (amphibious landing craft), YO-160 (oiler), ARDC-13 (floating drydock) and several smaller amphibious landing craft were sunk.



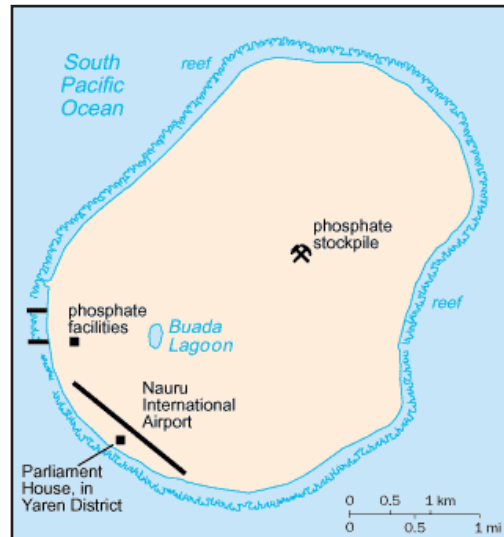
**USS Anderson (DD-411) steaming at high speed during her trials, 1939, Marshall Island.**  
© Bellhalla / UNESCO



**The U.S. Navy aircraft carrier USS Saratoga (CV-3) was the second aircraft carrier of the United States Navy. In recent years, the submerged wreck, the top of which is only 12 m below the surface, has become a scuba diving destination, one of only two carrier wrecks accessible to recreational divers. Marshall Island.**  
© USN / UNESCO

## NAURU

Nauru is a small rock island nation located in the South Pacific Ocean, south of the Marshall Islands. It lies 53 kilometres south of the Equator. Nauru is one of three rock islands in the Pacific Ocean containing an abundant source of phosphate — the others being Banaba (Kiribati) and Makatea (French Polynesia). Nauru's land area amounts to only 21 km<sup>2</sup>, and its coastline stretches over 30 km. The raised phosphate plateau takes up the central portion of the island, with sandy beach rising to a surrounding fertile ring around raised coral reefs. Due to being surrounded by corals and beaches, the island contains no natural harbours, nor any rivers or substantial lakes. Nauru's only economically significant natural resource is the phosphate, formed from guano deposits by seabirds over many thousands of years. The indigenous people of Nauru are thought to descend from Polynesian, Melanesian and Micronesian ancestry. Despite its small size and isolation, Nauru's story is one of monumental dimensions. Colonial annexation, world war, the discovery of phosphate and a century's worth of mining have moulded a nation with a distinct history facing a unique future.



The Italian merchant vessel *Romolo* being scuttled after interception by HMAS *Manoora*.  
© Nick-D / UNESCO

Four WWII shipwrecks are located in Nauru's waters, the Japanese ships *Minatu Maru* and *Hokushu Maru*, the Italian ship *Romolo* and the British ship *Triadic*. The latter two are very large ships of over 10,000 tons.

The *Triadic* was a British merchant ship that was hit in 1940 by a German raider off Nauru. It got some sad international publicity recently as it was recognized that the wreck of the *Triadic* was carrying about 500 tons of diesel, when it was sunk. Diesel disperses very easily and in fact even easier than fuel oil. Nevertheless, it can be very damaging to the environment and cause profound injury to fish and coral reefs. The cleaning of the wreck from the Diesel is needed, but the efforts of cleaning would be too costly for the State of Nauru. Solutions are now discussed.



Boiler of the *Haudaudine* sunk on the Contrariété Reef on 1905, New Caledonia.  
© P. Larue / FMC / UNESCO



Reversed bow of the *Ville de Saint-Nazaire*, sunk in the passé de Kouakoué on 1904, New Caledonia.  
© P. Larue / FMC / UNESCO



Exploration of *La Seine*, sunken in the Passe de Pouebo, New Caledonia.  
© L. Faucompré / FMC / UNESCO Pierre Larue



Archaeological research carried out on the wreck of the *Tacite* sunk in the Passe de Mato on 1873 by Fortunes de Mer Calédoniennes, New Caledonia.  
© P. Larue / FMC / UNESCO



Discovery of a cosmetics pot on the wreck of the *Tacite*, New Caledonia.  
© P. Larue / FMC / UNESCO

## NEW CALEDONIA

With the contribution of Michel L'Hour, DRASSM, France

New Caledonia, located in southern Melanesia, is the third largest island in the Pacific Region after Papua New Guinea and New Zealand and is a French territory. It consists of the mountainous mainland Grande Terre, the Isle of Pines to the south, the Loyalty Islands to the east (Maré, Lifou, Tiga and Ouvéa), the Belep Archipelago in the north west and numerous islands and islets including Huon & Surprise, Chesterfield, Walpole, Beautemps-Beaupré, Astrolabe, and the Bellona reef, amounting altogether to a total surface of 19,000 km<sup>2</sup>. Unlike its volcanic neighbour island states, 93% of New Caledonia is the northernmost part of a submerged continent called Zealandia. It sank after rifting away from Antarctica and Australia some 60–130 million years ago.



Surrounded by a 1,600 km long coral reef, New Caledonia is gifted with the largest lagoon in the world. The reef can be as close as a few kilometres from the coast in some places and as far as 65 km in others - with an average depth of 40 m. Marine reserves have been created by the New Caledonian Authorities on several islets to protect marine fauna and flora.

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While New-Guinea has been populated about 30,000 years ago, human settlement in New Caledonia happened much more recently. The oldest archaeological sites date from 4,000 years ago. Initial migrations came from Asia via Borneo and New-Guinea. This migration went further from New Caledonia to the Fiji Islands. Around 1,500 BC the people of the Lapita started to settle in New Caledonia. From about the 11th century onwards Polynesians arrived and mixed with the populations of the archipelago. Europeans first arrived in the late 18th century. The British explorer James Cook en route to New Zealand on board his ship Resolution sighted Grande Terre in 1774 and named it New Caledonia in homage to Scotland. Later-on whalers operated off New Caledonia during the 19th century, as well as Sandalwood traders. Both were eventually replaced by the slave trade abducting inhabitants from New Caledonia to work in sugar cane plantations in Fiji and Queensland until the beginning of the 20th century. New Caledonia was made a French possession in late 1853. At about the same time, the discovery of large mineral resources and subsequent mining of copper, cobalt and nickel were at the origin of the New Caledonian economy. It also served as a penal colony for four decades after 1864. During World War II, the French South Pacific colonies of New Caledonia, French Polynesia and the New Hebrides joined the Free French Forces. American Allied forces built a major naval base in New Caledonia to combat the advance of Imperial Japan toward Australia, New Zealand, and the Solomon Islands.

Unfortunately no submerged traces of ancient settlements have yet been found on the New Caledonian Islands. Nevertheless, and in addition to its natural beauty, the islands boast many submerged ships. In total more than 300 large vessels are known to have been lost in New Caledonian waters. From the 19th century remain the wrecks of whalers and sandal merchants. From later years persist the relics of sailing ships carrying nickel and chromate ores from the New Caledonian mines.

As the lagoons are full of shallow waters, reefs and violent currents they are even for steamships and engine driven vessels navigating close to the barrier reef or inside the lagoon risky. Often also terrible tropical cyclones sealed the fate of ships.

Opposite : New Caledonia © Audeper / UNESCO

In December 1831, the 108 ton schooner *Madeira Packet*, whose crew had just hunted for whale, ran aground on the Bampton reef in the Chesterfield archipelago, beginning the long list of shipwrecks which have made New Caledonia the "Cemetery of the large sailing ships". By an extraordinary co-incidence, the two largest commercial sailing ships ever constructed in the world rest in New Caledonia's lagoon. One made of wood, the four-masted ship called the *Roanoke*, launched on 22 August 1892 by the State of Maine, United States, sunk on 9 August 1905 in Néhoué bay (commune of Poum) as a result of a fire. The *Roanoke's* 12 metre rudder blade is today shown at the Maritime Museum of New Caledonia in Nouméa.

The mythical luxury and transport ship *France II*, made of iron and launched in Bordeaux on 9 November 1911, run on the Térémba reef (Moindou) in 1922. She is said to have been the largest sailing ship ever built, title that has been competed for since then by other sailing ships. She was bound for Europe with a cargo of chrome ore from Pouembout when she ran on the reef. As the market price of the chrome ore had in the meantime fallen her owner refused to pay for her being towed free from reef which would have been possible. In 1944, American bombers bombed the wreckage for target practice. The remains of the wreck of the *France II* is still visible on the reef.

Other major shipwrecks include the *Seine* (1846), the *Tacite* (1873), the *Isabella* (1875) *La Pactole* (1876), the *John Higginson* (1882), the *Cher* (1885), the *Emilie Renouf* (1900), the *Ville de St. Nazaire* (1904), the *Joliette* (1909) and many more, such as the *Monique* that mysteriously disappeared in 1953 and has yet not been found.

New-Caledonia is home to the mystery of the disappearance of Jean-François de Galaup, count de *La Pérouse*. He left France on mission for the King Louis XVI in August 1785 with two ships the *Boussole* and the *Astrolabe*, for a much acclaimed voyage of discovery in the Pacific Ocean. He left Botany Bay in Australia after having dispatched a full report of his prior voyage to France on 10th march 1788 heading towards New Caledonia. Then his ships and 220 men of crew vanished. It was a pure chance that changed the way of history that the young Napoleon Bonaparte, who had applied to be part of the expedition, had not been accepted and was therefore not on the ships.



Louis XVI gives instructions to *La Pérouse*. Painting by Nicolas Monsiau, Musée du château de Versailles.

The disappearance of de *La Pérouse* was a mystery for a long time. Only in 1826 an Irish sailor, Peter Dillon, bought a hilt of sword he had reason to believe had belonged to *La Pérouse*. He learned that they came from Vanikoro, where two large ships had stranded. His following research discovered cannon balls, anchors and other evidence of the ships in the waters in the coral reef. The people of Vanikoro told him, referring to the *Boussole* and the *Astrolabe*, however not knowing their names, that two large canoes had wrecked on the reefs. Many of the survivors were then massacred by the local population. Surviving sailors constructed a craft from the wreckage of the ships and left about 5 months later, but were never seen again. Two men were said to have been left behind, but one was dead and the other had left before Dillon arrived. The search and find of the shipwreck of the *Boussole* in 1964 allowed verifying this story and only recently, in 2005, the *Boussole* was formally identified.

## NEW ZEALAND

New Zealand is an island country and in comparison with other Pacific Island nations, its two main islands are of a very substantial size. It is located in the south-western Pacific Ocean and was only relatively recently settled. It comprises a north and a south island as well as numerous smaller islands. New Zealand is notable for its geographic isolation: it is situated about 2,000 km southeast of Australia, and its closest neighbours are New Caledonia, Fiji and Tonga.

New Zealand was first settled by Eastern Polynesians, later named the Maori, who are believed to have arrived by canoe in the 13th century or earlier. The first Europeans to reach the islands came with the Dutch explorer, Abel Tasman, in 1642. However, conflict between the Maoris and the Dutch saw an absence of further foreign presence until British explorer James Cook's voyage of 1771. From that time on, New Zealand was visited by numerous European and North American whaling, sealing and trading ships.

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The history of New Zealand includes many sea related catastrophes and shipwrecks given its hazardous and storm swept coastline. In particular the 19th century saw many frequent and lethal maritime disasters. Not surprisingly, there are more than 2,000 shipwrecks off New Zealand's coast with only about 150 having been accurately located. However, New Zealand's underwater cultural heritage includes a whole range of sites associated with its history, including Maori fish weirs, small canoes (waka), a submerged Maori fort (pā), jetties, wharves, a submerged town (the old city of Cromwell submerged by the artificial Lake Dunstan, created in 1992) and aircraft wrecks from the Royal New Zealand Air Force.

Notable shipwrecks include the HMS *Orpheus*, a corvette that served as the flagship of the Australian squadron, and sank off the west coast on 7 February 1863. It was owned by the Royal Navy, and was 69 m long. Of the 259 naval officers and men aboard, 189 died, including the captain.







The SS *Wairarapa*, a 19th century New Zealand ship plying the route between Auckland, New Zealand and Australia, came to a tragic end and sank after hitting a reef at the northern edge of Great Barrier Island, about 100 km out from Auckland. The death toll of around 140 remains one of the largest such losses in the country's history.

The wreck of the SS *Wairarapa*, (1864)  
Miners Head, Great Barrier Island, New Zealand .

The HMS *Buffalo*, a well-known wreck, served as a transport vessel for immigrants, troops, convicts and government officials before being wrecked in 1840. The ship was originally built in India in 1813 as a merchant vessel, but it was purchased by the Royal Navy to carry out these voyages taking the ship to Australia and Canada.

The *General Grant* was a 1,005-ton, three-masted vessel built in Maine, USA, in 1864. It departed Melbourne on May 1866 bound for London via the Cape Horn under the command of Captain William H. Loughlin. It was carrying 58 passengers and 25 crew, along with a cargo of wool, skins, 2,576 ounces of gold and 9 tons of zinc spelter ballast. Included in the passenger list were a number of successful miners from the Australian gold fields. It sank with its captain, who did not abandon his ship. There were only fifteen survivors. The wreck obtained a certain notoriety due to a treasure hunt instigated over the years to recover its cargo.

Similarly, the SS *Elingamite* was a single screw passenger steamer of 2585 tons, built in 1887. The ship was wrecked in 1902 off the north coast of New Zealand, while carrying a large consignment of gold, which fuelled the imagination of treasure hunters and adventurers.

The steamship *SS Victory* departed Port Chalmers bound for Melbourne on July 1861, carrying passengers, mail and cargo. It ran aground at the southern end of the beach.



Flywheel from wreck of the *SS Victory*, in the surf at low tide at the southern end of Victory Beach, Otago Peninsula, New Zealand.  
© USN / UNESCO

Nowadays, some of New Zealand's famous sunken shipwrecks have become attractions for divers. Although the wrecks have legal protection, it is limited and regarded as ineffective and divers continue to search for artefacts. The wreck of the Wellington is perhaps the most accessible shipwreck to dive. Just a few kilometres from the Wellington international airport, this old navy warship sank on 13 November 2005 in 23 to 26 metres of water off Island Bay on Wellington's south coast. The bow section of the wreck, containing the ship's twin 4.5-inch main gun, is still intact and lies on its starboard side. It is held in place by a large anchor and can be reached by qualified wreck divers. The stern section has collapsed and is inaccessible. The wreck has attracted the interest of many tourist divers, including many former navy servicemen who had once served on the ship. Its remains also are an attraction and home for thousands of fish, including juvenile kahawai, cod and tarakihi.

Given the attraction of this and other underwater cultural heritage sites, the New Zealand Maritime Archaeological Association has a long-term plan to develop a "wreck trail" of the main shipwrecks off the Wellington shore. Designed for divers and non-divers alike, the trail might be a rich source of information on the location, the history and the range of shipwrecks around the city.



Avaiki Cave is situated on West Coast of Niue, 7km north of Alofi. The undersea tunnel connects Avaki Cave and sea. There are hundreds of caves and grottoes in Niue, and many of them have been used to store canoes or bury ancestors. Avaiki Cave is supposed to be the place where the first settler's canoe landed. Another cave, Anatoloa, 2 km north of Lakepa, is believed by Niuean mythology to be the home of a dangerous god and human bones have been found in it.  
©Vuorikari / UNESCO

## NIUE

Niue is an island nation in the South Pacific, lying 2,400 kilometres northeast of New Zealand in a triangle between Tonga to the southwest, Samoa to the northwest, and the Cook Islands to the southeast. Niue is governed in free association with New Zealand.

Niue is one of the world's largest emerged coral atolls. It is saucer shaped and lies on a basement of an isolated volcanic cone, surrounded by three protective limestone reefs of living corals that do not have any land area: the Beveridge, the Antiope and the Haran Reefs. The main island of Niue rises only 69 m above sea level, with sea levels slowly rising. The land area of Niue comprises 260 km<sup>2</sup> with about 1,400 inhabitants, who are predominantly Polynesians and are living in 14 widely dispersed villages. Niue is only accessible with difficulty, Air New Zealand being the sole airline serving it and flying to Niue once a week.

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Niue was first settled by Polynesians from Samoa in the 10th century. Further settlers arrived from Tonga in the 16th century. Thus Niue evolved a unique culture and language, similar to, but quite separate from its neighbours.

The first European to sight Niue was Captain James Cook in 1774. Cook made three attempts to land on the island, but was refused permission to do so by the inhabitants.

So far, almost no submerged archaeological sites have been discovered in the waters of Niue that could provide evidence of the Polynesian settlement period, a supposed passing of the Chinese Zheng He's Fleet, Captain Cook's passage or any subsequent commercial exchange.

While Niue has until recently been dependent upon foreign aid, especially from New Zealand and Australia, it has now recognized the importance of tourism and in particular dive tourism. In 2006, the estimated visitor expenditure reached USD 1.6 million making this the major export industry. Nevertheless, in January 2004, Niue was hit by Cyclone Heta, causing the destruction of the capital Alofi, as well as extensive damage to the coral reefs. This created such a threat for the island's economic well-being that the local dive industry launched an appeal for a ship to be sunk off Niue to serve for wreck diving.



### **Chinese traces at Niue**

There is linguistic evidence, the Niuean dialect containing particular Chinese words traceable to a village in China, that the voyages of Zheng He's Fleets passed Niue. Zheng He was a Hui Chinese mariner, eunuch, explorer, diplomat and fleet admiral, who commanded voyages to Southeast Asia, South Asia, and East Africa, from 1405 to 1433. His travels are collectively referred to as the travels of "Eunuch Sanbao to the Western Ocean" or "Zheng He to the Western Ocean". The voyages of Zeng He were one of the role model for the stories of Sinbad the Sailor and underwater archaeologists from China are currently retracing his steps by the discovery of shipwrecks and descendants of his crew. One of these wrecks is currently being excavated in Kenya.



Statue from a modern monument to Zheng He at the Stadthuys Museum in Malacca, Malaysia.

© Hassan Saeed / UNESCO

## NORFOLK ISLAND

By Nigel Erskine, Australian National Maritime Museum

Norfolk Island is a volcanic South Pacific Island that lies 1,600 km east of the Australian mainland. It has an area of 34.6 km<sup>2</sup> and 32 km of coastline. Norfolk is the highest point on the Norfolk Ridge, which extends from New Zealand to New Caledonia. There are three islands in the group: Norfolk, and the uninhabited Phillip and Nepean Islands.

Archaeological evidence of Polynesian habitation at Norfolk Island has been found at Emily Bay on the southern side of the island. It is believed that Polynesian seafarers either from the Kermadec Islands north of New Zealand or from the North Island of New Zealand settled or visited Norfolk in the 14th or 15th century for some generations before mysteriously disappearing. European discovery occurred in October 1774 when Captain James Cook landed on the island during his second Pacific voyage of exploration.

He named the island after the Norfolk family. It was proclaimed British territory in March 1788, operating as a satellite to the British colony of New South Wales established a month earlier in Sydney Cove on the east coast of Australia.

The island was soon thereafter settled as a British prison colony in 1788, supplying Britain with hemp and flax indispensable for sails by the so-called First Fleet. Abandoned as a penal colony in 1855, Norfolk Island became the intermediary home of the Pitcairn Islanders, descendants of the Mutineers of the *Bounty*. Norfolk Island today is a Territory under the authority of the Commonwealth of Australia.



Following establishment of the colony, the settlements at Port Jackson and Norfolk Island were entirely dependent on two vessels for all transport - HMS *Sirius* and the smaller tender HMS *Supply*. In March 1790, with the failure of crops at Sydney Cove placing increasing pressure on rations, the *Sirius* sailed for Norfolk Island carrying a large number of convicts and marines to relieve the situation at Sydney. Unfortunately this strategy proved disastrous when the *Sirius* was wrecked at Norfolk Island, placing the survival of the fledgling colony at great risk. The remains of the *Sirius* lie in the surf zone on the south coast of Norfolk Island. The site is nationally significant to Australia and important in the history of European settlement in the south-west Pacific. Hundreds of artefacts, including navigational military equipment and ships stores have been archaeologically recovered.

Amongst the material are copper-alloy fittings, including keel bolts, hull fastenings, sheathing, pump parts and rudder fittings. Artefacts from the wreck are displayed at the Norfolk Island Museum and online.

Other vessels wrecked at Norfolk Island include the *Friendship* (88-ton schooner, 1835), *Mary Hamilton* (218-ton barque, 1873), *Warrigal* (90-ton ketch, 1918), and the *Renaki* (255-ton schooner, 1943).

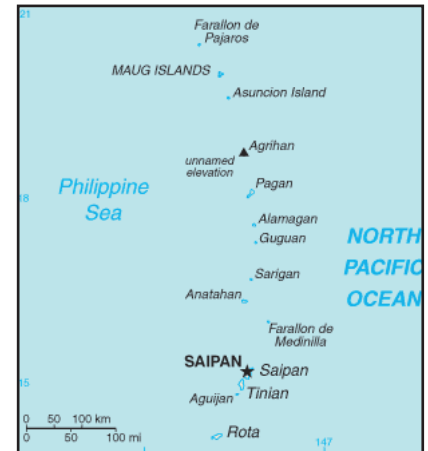


The well preserved remains of a LVT(A)4 landing craft, Saipan, Northern Mariana Islands.  
© T. L. Carrell / UNESCO

## NORTHERN MARIANA ISLANDS

by Jennifer McKinnon, Flinders University, Australia

The Mariana Islands are a small island group within the area traditionally known as Micronesia. Consisting of 15 single islands and one group of 3 islands (Maug), the Marianas are politically divided into the Commonwealth of the Northern Mariana Islands (CNMI) and Guam, which is an unincorporated territory of the United States. The Northern Mariana Islands are a commonwealth of the US and include the islands of Farallon de Pajaros, Maug (with Supply Reef), Asuncion, Agrihan, Pagan, Alamagan, Guguan, Sarigan (with Zelandia), Anatahan, Farallon de Medinilla, Saipan (and Marpi Bank), Tinian, Aguijan, and Rota. The three largest islands, Saipan, Tinian, and Rota are the only islands with significant human populations. The Northern Mariana Islands have a total land area of 463.63 km<sup>2</sup> and have a population of 80,362 persons. Most of them live on the island of Saipan. The southern islands are limestone with level terraces and fringing coral reefs; the northern islands are volcanic, with active volcanoes on Anatahan, Pagan and Agrihan.



Today two predominate Indigenous groups reside in the Northern Mariana Islands – Chamorro, the original Indigenous population, and Carolinians, who moved into the region from the Caroline Islands during Spanish colonial occupation. Chamorro and Carolinians are descendants of Austronesia peoples who voyaged to Micronesia in ocean-going canoes approximately 3500 years ago. Watercraft in the Mariana Islands played a central role in the traditional life of the inhabitants through inter-island transportation and trade and a subsistence economy based on deep sea fishing. Little is known about traditional Chamorro watercraft due to the fact that no example remains exist and the tradition of building and using these watercraft was suppressed by colonial efforts in the eighteenth century. Based on historical documents there appear to have existed two types of canoes: a simple paddled canoe and a more elaborate sailing canoe of varying lengths. One of the more notable characteristics of the sailing canoes is the speed by which the watercraft moved through the water. They were said to have reached speeds in excess of 20 miles per hour. Another fascinating fact about Chamorro seafaring includes their ability to deep sea fish by means of trolling for different species of large pelagic fish. Chamorro people may be the only Pacific islanders who successfully hunted these large fish prior to the advent of modern fishing equipment.

The historic period began in 1521 with Magellan's landing at Guam. During the Spanish period (1521-1898), the Marianas were used as a destination for trade and re-provisioning for the Manila Galleon trade. In 1688, Spanish colonization of the islands began with the arrival of Jesuit priests intending to convert Chamorros to Christianity. Many Chamorros were relocated to Guam in an effort to control the Indigenous populations and to facilitate the mission effort. Government buildings and residences supported Spain's possession of the islands and were constructed primarily on Guam, though some were built on Saipan, Rota, and Tinian.

In April 1898 war was declared between Spain and the US and in June the Marianas were partitioned. Guam became a possession of the US while the islands within the Northern Mariana Islands were transferred to German colonial administration. The German colonial period lasted from 1899 until 1914 and was an active period of trade and transport within the region. Saipan was the sole port of entry for foreign vessels in the Mariana Islands which meant that administration buildings and maritime infrastructure installations in the form of an improved harbour and landing dock were located there. The Marianas colony was not a huge



success for the German government despite the small copra trade which had developed. Eventually it was ceded to the Japanese as a result of WWI, when the League of Nations awarded the string of islands to Japan. Japanese efforts were more fruitful and sugar cane became a major product exported from the Marianas. This and other industries brought economic expansion, Japanese and Okinawan immigrants and more administrative buildings primarily to Saipan and Rota.

WWII had a profound impact on the Mariana Islands and its people. Japanese military build-up had already altered the landscape and seascape of the islands in significant ways. Operation Forager was the US's plan to capture the Mariana Islands from Japan. The US invasion began on 12 June 1944 with an air attack on Japanese airbases and strategic installations on Saipan, Tinian, and Rota. On 14 June battleships, cruisers, and destroyers arrived at Saipan shelling the coastline in preparation for the landing forces launched on 15 June. On 9 June the Battle of Saipan ended when the U.S. finally raised the flag and declared the islands secure. The Marianas, with the exception of Guam, became a Trust Territory in July 1947; in June 1975 the "Covenant to Establish a Commonwealth of the Northern Marianas in Political Union with the United States" was voted on and passed by the islanders. The Northern Mariana Islands has a range of submerged cultural heritage which is only now being archaeologically investigated. Much of the work has focussed on the Spanish colonial period and the WWII era archaeological sites.



View of US landing craft, Saipan, Commonwealth of the Northern Mariana Islands  
© T. L. Carrell / UNESCO



The bow of the unidentified Submarine Chaser 1 in Tanapag Lagoon, Commonwealth of the Northern Mariana Islands.  
© T. L. Carrell / UNESCO

## Relics from WWII

In terms of WWII heritage submerged sites, the island of Saipan has an incredible graveyard of planes, tanks, landing craft, and ships inside and outside of its fringing reef. These sites have been the subject of much recreational diving and are now being evaluated for the development of a WWII maritime heritage trail. Already, ten vehicles have been archaeologically recorded; these include a US TBM *Avenger* and a PBM *Mariner*, a Japanese *Aichi E-13A "Jake"* seaplane and a Kawanishi H8K "Emily" flying boat, three US Sherman tanks, two Japanese Daihatsu landing craft, and a US landing vehicle tracked (LVT).

## Spanish shipwrecks

The Spanish period of occupation in the Marianas provides significant submerged cultural heritage. From 1565 to 1668 over 100 ships passed constantly through the Marianas en route between Manila, Philippines, and Acapulco, Mexico.

About 40 galleons are supposed to have sunk on their long journey from Manila to Mexico and backwards and many of them around the Mariana's reefs. In particular three important shipwrecks are known to have occurred in this area - the *San Pablo* in 1568, Legazpi's flagship, the *Santa Margarita* in 1600 and the *Nuestra Señora de la Concepción* in 1638.

According to preserved correspondence from the Philippines (including letters from Legazpi), the *San Pablo*, carrying mostly cinnamon and some "small wares" to New Spain, was wrecked in a storm while at anchor in the Ladrones (Marianas Islands). All 132 on board survived and managed to return to the Philippines on board a "bark which they made from a small boat."

The *Santa Margarita* on Rota and the *Nuestra Señora de la Concepción* on Saipan have been located and have unfortunately been subjected to commercial exploitation by private companies. The *Concepción* was excavated by the salvage company, Pacific Sea Resources in 1987-1988 and a report on the salvage of the site was published in 1990. The *Margarita* is the subject of the for-profit commercial salvage company IOTA Partners, who have held a salvage contract on the site since 1993 and have not yet produced any formal published reports.

The potential for submerged cultural heritage sites in the Commonwealth of the Northern Mariana Islands spans many centuries; however very little of this heritage has been investigated historically and archaeologically. Given the rich nature of the Marianas' history the location of any new sites in its waters would add immeasurably to what is known about the maritime activities in this region. Nearly every human endeavour in this region was linked to the water from the arrival of the first Indigenous groups to the battles of WWII. This heritage is incredibly significant for the people of the islands both culturally and economically. The local Historic Preservation Office (HPO) has taken important steps in recent years to document, research, and interpret these sites for the benefit of cultural knowledge, public outreach and heritage tourism.



Spanish Galleon by A Dürer.

## The Manila-Acapulco galleons

For 250 years the Spanish Manila-Acapulco galleons linked Asia with America, Europe and Africa. They served not only as carriers of trade but also as transmitters of culture. In order to commemorate this beginning of world trade and cross-cultural contacts UNESCO proclaimed the 8 October of each years as "**Día del Galeón**" (Day of the Galleon).

The Manila galleon trade owes its successful run to the discovery of the "tornaviaje", the return route from Manila, Philippines, to Acapulco, Mexico, which was made by the Augustinian monk Andrés de Urdaneta. He was member of

the expedition led by the Spanish explorer Miguel López de Legazpi who was sent by the viceroy of New Spain to claim the Philippine archipelago, serving as its first governor and establishing the city of Manila.

Legazpi's fleet left Acapulco, with five ships and reached Cebu, one the Philippines, in April 1565, founding the first Spanish settlement. To report their arrival, Legazpi instructed Urdaneta to return to Mexico, which was a very difficult task due to the environmental conditions. Nevertheless, Urdaneta guided the ship *San Pedro* successfully to Acapulco, reaching it on 8 October 1565, thus establishing the route that the Manila-Acapulco galleons would take in the next 250 years to transport merchandise from Asia to Latin-America. Traded were porcelain, spices, silk, medical ingredients and many other goods. After leaving the port of Cavite in Manila during summer a Manila Galleon would usually pass by the Northern Mariana Islands. Due to the difficult conditions this could take weeks and many of them wrecked on their way.



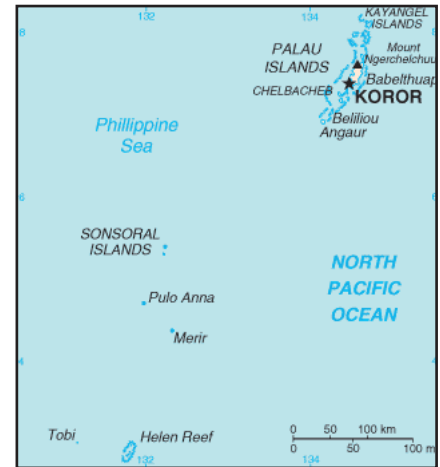
Remains from WWII off the Northern Mariana Islands  
© Flinders University / UNESCO

## PALAU

With a contribution from Sunny Ngirmang, Palau Historic Preservation Office

The Republic of Palau is the westernmost archipelago in the Caroline Islands chain, consisting of six island groups with more than 300 islands, of which only 16 are inhabited. They include the legendary World War II battleground of Peleliu and the world-famous rock islands. The largest of the islands, Babeldaob, features an international airport and the new capital Melekeok. Palau became independent from the US only in 1994. Tourism is currently a major source of income.

Palau has been inhabited from about 4,500 to 3,500 years ago through migration from the Philippines before Spanish explorer Ruy López de Villalobos sighted it in 1543. A shipwreck bears testimony to the next contact with Europeans, as the English captain Henry Wilson shipwrecked his British Indiaman Antelope in a storm on its return passage from Macao, off the Coast of Ulong Island, in 1783. Captain Wilson's venture was the first extensive contact with Europeans that Palauans had. The islands then frequently changed hands from England, to Spain, to Germany, to Japan and then the USA.



Many submerged archaeological sites in Palau are only locally known in the form of myths and folklore. This is true, for instance, for the sunken village of Ngibtal, which is associated with a colourful story. According to this ancient tale, half-gods used to travel from village to village. They performed amazing feats to teach people valuable lessons. The female half-god, Dirachedesbsungel, spent her working life teaching the women of Palau how to grow taro. After many years of selfless service she settled as an old woman in Ngibtal. Despite her many years of service to the community, no local fisherman ever offered her a fish. After a particularly long absence, her son came to visit, feeling remorse and sadness when he observed his mother's pitiful state. So the son manipulated a breadfruit tree near the water's edge in his mother's yard, so that with every surge of the ocean, fresh fish were driven out of the hollow trunk to the waiting arms of his mother. The villagers, seeing the old woman's good fortune, grew jealous. So one day a boisterous group of young men entered the old woman's yard and cut down the magic tree. Immediately the ocean rose through the remaining hollow stump and flooded the entire village of Ngibtal.

Another submerged village can be found on the northeast coast of Palau's largest island of Babeldaob. Its stone pathways and dwelling platforms can be seen just beneath the clear ocean waters. Further important underwater sites, which are found in different parts of Palau, include ancient fish weirs, stone docks and piers and underwater burial sites.

As a result of World War II events in the Caroline Islands, a prominent type of underwater cultural heritage site within Palau are the WWII wrecks located mostly around Koror, the southern and western lagoons, the states of Peleliu and Angaur, and around the coast of Babeldaob.

Palau's domestic legislation regulates the recovery of material from World War II sites. In 2006, two divers were imprisoned and fined for taking a number of artefacts including portholes and lanterns from three Japanese shipwrecks. This is indicative of how serious Palau looks after its heritage, from traditional, to colonial and war-time sites.

## Giant's stone money on the seabed of Palau

Known, but not fully documented and located, are the numerous Yapese stone money disks, which are very large and heavy and apparently fell onto the seabed during their transport from Palau to Yap. Yapese people travelled across the 400 km of open water to Palau limestone Rock Islands where they quarried their megalithic disk money prior to and during European occupation. The Yapese earned the right to quarry their disks money by bartering or exchanging exotic materials and forming alliances with villages in Palau with rights to particular Rock Islands. Uet el Daob ma Uet el Beluu and Chelechol ra Orrak are two of the best examples of this type of site in existence. These are located on a Rock Island located south of the largest landmass in Palau between two marine lakes. Chelechol ra Orrak contains series of caves behind a beach along the west coast of the Rock Island. Both sites contain the best examples of activities associated with the quarrying of the largest money in the world including rock shelters, caves, complete and unfinished disk money, human remains, burial sites, rock alignments, retaining walls, shell middens, docks, flake debitage and artifacts.

An archaeological excavation in one of the caves at Chelechol ra Orrak in the summer of 2000, unearthed human burials dating to more than 3000 years ago. These are the earliest human burials found in the Pacific Islands outside of Melanesia. During their several hundred kilometres of oceanic voyage back to Yap, some vessels transporting the money disks seem to have capsized, leaving a trail of stone disks on the ocean floor. It is worthy to note that the value of the Yap stone money is not based on size (which can be man-size), but rather on the number of lives lost in the journey to quarry it. The Yapese Disk Money has been nominated for consideration of designation as a regional World Heritage Site involving two countries, the Republic of Palau and the Federated States of Micronesia.



A example of Yapese stone money in the village of Gachpar.

© Eric Guinther / UNESCO

One of the many Rock Islands, Palau Islands, Micronesia. © Aquaimages / UNESCO



## The Jake Sea Plane

At the time of war, Palau was one of the regional headquarters of the Japanese military in Micronesia, Malakal Harbour being a major forward supply base for Japanese shipping. On 30 and 31 March 1944 US dive-bomber strikes destroyed over 50 warships, merchant ship and aircraft of the Japanese Imperial Forces and further ships were sunk during the Battle of Peleliu in September 1944. Palau has in consequence a total of 77 World War II wrecks located in its waters with 90% of them being Japanese. The *Jake Sea Plane* wreck bears prominent testimony to this. It is a Japanese Aichi E13A1-1 Navy Floatplane, built in 1941, that was destroyed in 1944 and sits upright on the bed of the Lagoon. There are numerous artefacts still on board, such as radios and ammunition, even a small bomb inside its cockpit to the right of the aft seat. Today many of the shipwrecks offer divers with spectacular dives given the range of nautical and military artefacts remaining and the rich and varied flora and fauna that inhabit these sites. They are also painful reminders of the death and devastation caused by war and a valuable part of Palau's history. It is evident that these remains should not be damaged by the touristic visitor and caution should be taken in approaching the remains.



The *Jake Sea Plane* wreck, Palau.  
© S. Ngirmang / UNESCO



## PAPUA NEW GUINEA

Papua New Guinea occupies the eastern half of the rugged tropical island of New Guinea, which it shares with the Indonesian territory of Irian Jaya, as well as numerous smaller islands and atolls in the Pacific. Situated directly north of Australia, it consists of a mainland and about 600 islands, of which New Britain, New Ireland and Bougainville are the largest. The central part of New Guinea rises into a wide ridge of mountains known as the Highlands. Papua New Guinea is one of the most diverse countries worldwide, with over 850 indigenous languages spoken by its approximately 7 million inhabitants.

Papua's coastline is liberally endowed with spectacular coral reefs. The smaller island groups of Papua New Guinea include the Bismarck Archipelago, New Britain, New Ireland and the North Solomons. With 17,000 km of coastline and 45,000 km<sup>2</sup> of reef systems, the underwater heritage is particularly rich. The immense diversity of sites include barrier reefs, coral walls, coral gardens, patch reefs, fringing reefs, sea grass beds, coral atolls and wrecks.

Human remains, found on Papua New Guinea, date its population back to at least 50,000 years. These ancient inhabitants probably had their origins in people having travelled from Africa via Asia. Its territory was later subject to European and Asian influence.

Papua New Guinea was a major arena of WWII. In Port Moresby, the capital of Papua New Guinea, and other provinces, many traces of the war have been removed or disappeared, but airfields and wreck sites still remain. Port Moresby is also home to the National Museum, which has a collection of war relics and artefacts. Over 270 shipwrecks from WWII can be found in Papua New Guinea's waters, the majority being Japanese. They range from the Japanese aircraft carrier *Shōhō* of 14,000 tons, to military craft such as destroyers and submarines, to many cargo vessels. Rabaul features one of the world's largest concentrations of WWII shipwrecks. 64 ships alone are located within Simpson Harbour, with more lying outside. Well-known examples are the *Hakkai Maru*, lying upright on the seabed with a coral encrusted cannon, the so-called *George's Wreck* whose identity is yet unknown, a Mitsubishi BI plane resting perfectly upright on a sandy bottom, a Zero fighter plane, the *Manko Maru*, *Italy Maru*, *Kanshin Maru*, *Yamamoto Maru* and a Japanese submarine base.

The Tufi wharf in the Oro Province is also particularly rich with submerged WWII sites. Originally occupied by the Japanese and subsequently the site of a USN Advance PT Boat base during WWII, there is a large amount of wreckage and debris off the wharf, including PT Boats, a large concrete boat, empty 200 litre drums, anti-tank barriers, a US B-17F bomber nicknamed the '*Black Jack*' and the Dutch Merchant Navy Ship *S Jacob*.





More shipwrecks from WWII lie in shallow water in Kimbe Bay, Madang Lagoon, near the island of Kairuru and Muschu. Here the Japanese were the victims of a surprise US attack and a number of their armed merchant fleet and military aircraft were sunk. This includes a well preserved *Catalina* flying boat wreck, and from the US side, the USS *Boston*. Time has changed these military machines into large artificial reefs, providing homes for an abundance of marine life and many species of scorpion fish can be found camouflaged and lying against the hull of a shipwreck.

In Port Moresby harbour, on the inside of the reef that protects the coast, lies the HMPNGS Aitape (Her Majesty's Papua New Guinea Ship), the first of PNG's patrol boats.

The above-mentioned underwater sites serve as study sites for researchers, students, marine specialists and for the enjoyment of tourists. Commercial exploitation for trade is regulated by the War Surplus Material Act, concerning the war remains in the waters of Papua New Guinea.



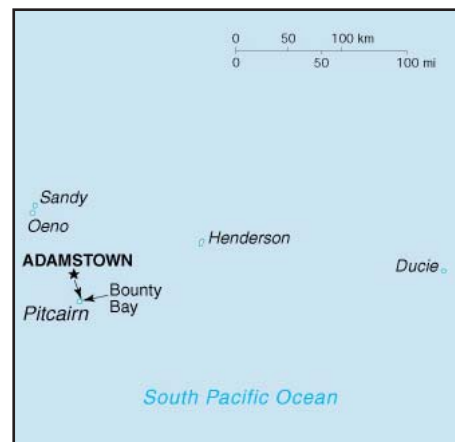
Satellite Image of Oeno  
Island in the Pitcairn group  
© NASA

## PITCAIRN ISLAND

by Nigel Erskine, Australian National Maritime Museum

The Pitcairn islands area group of four volcanic islands rising abruptly out of the deep waters of the eastern South Pacific, halfway between New Zealand and the Americas. The four islands – Pitcairn, Henderson, Ducie, and Oeno – are spread over several hundred miles of ocean and have a total area of about 43 km<sup>2</sup>. Of the four islands, Pitcairn is the only inhabited one, and is among the most remote inhabited islands on earth. It is believed that Pitcairn was visited by Polynesians as early as in the 15th century. . The island was first reported by Carteret in 1767 and settled by mutineers of HMAV Bounty and their Tahitian companions in 1790. Pitcairn became a British protectorate in 1838, and today remains the oldest surviving British territory in the South Pacific.

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Pitcairn Island is best known for the Bounty, which is famously associated with one of the most notorious mutinies in British history. In December 1787, the Bounty sailed from England on a mission to collect breadfruit in Tahiti and transport the plants to the West Indies, where they would be grown to feed slaves on plantations. The expedition was compromised by delays departing England, severe weather during the voyage and a prolonged stay at Tahiti. Over a period of five months that the vessel remained at Tahiti, the crew formed close ties with the Polynesian inhabitants and discipline suffered in the sensuous atmosphere of the island. The mutiny occurred on 28 April 1789, just 24 days after the ship left Tahiti. In a matter of a few hours, the ship's captain William Bligh and 18 other crew members were cast adrift in the ship's launch and the officer of the watch Fletcher Christian took charge.

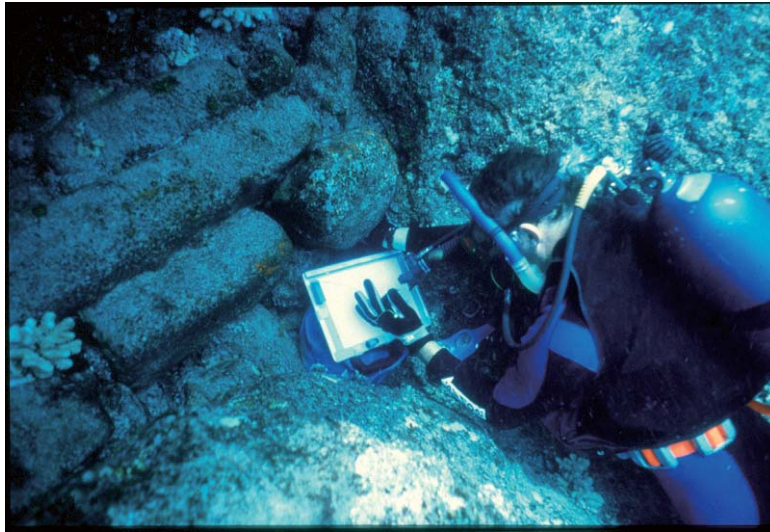
In an extraordinary display of seamanship, Captain Bligh sailed the 23-foot launch 5,800 km to the island of Timor, in the Dutch East Indies, from where he alerted the British Admiralty of the events. After the mutiny, the mutineers attempted to start a settlement on the island of Tubuai, 480 km south of Tahiti, but following sustained opposition from the Polynesian inhabitants, a decision was made to briefly return to Tahiti where most of the mutineers chose to remain. Fletcher Christian preferred to look for a new place to settle, and accompanied by eight other mutineers and their Polynesian wives and six Polynesian men, the Bounty sailed away, finally arriving at Pitcairn in 1790. The mutineers deliberately burned and sank the Bounty in the waters off Pitcairn, hoping to avoid detection by the British Navy. In the following years jealousies led to massacres and suicide which threatened the existence of the Pitcairn settlement. However, the tiny community survived, and in later years, sailors wrecked on other islands in the Pitcairn group brought new blood to the burgeoning settlement. The current island population traces its roots to these people.

The Bounty and mutineer village sites on land are significant for a number of reasons. The wreck, although often exposed to extreme ocean swell and scavenged by later generations, has yielded valuable information about what the mutineers took from the ship, providing a baseline of what was available at the inception of the settlement. For Pitcairn's population the Bounty was for many years an irreplaceable resource of European materials such as fastenings, copper sheathing, rope, canvas, and planks. Structurally, the vessel is an example of an 18th century ship modified for the transport of botanical specimens.

Although the vessel was largely destroyed by fire shortly after arriving at Pitcairn, remains of the vessel (mainly in the form of iron ballast) survive in Bounty Bay on the north-eastern side of the island. In 1999 an Australian archaeological expedition surveyed and excavated parts of the site – raising the last of the Bounty's cannons. Following conservation, it is now on display in the Pitcairn museum along with other material from the site.

In a continuing annual ritual, Pitcairn islanders build a replica of the Bounty from scrap wood and cardboard. Set adrift, it is burned to commemorate the destruction of the Bounty by the mutineers on 23 January 1790.

There are a number of further shipwrecks in the waters surrounding the Pitcairn Islands that include the Wild Wave (Wooden clipper ship, Oeno 1858), Cornwallis (1,214-ton iron ship, Pitcairn 1875), Khandeish (1,009-ton iron ship, Oeno 1875), Arcadia (697-ton schooner, Ducie 1881), Oregon (American bark, Oeno 1883), Bowden (Oeno 1893), and the St. James (1536-ton wooden 3-masted schooner, Oeno 1918).



Diver mapping the HMAV *Bounty* (1790), Pitcairn Islands  
© J. Carpenter / UNESCO

## SAMOA

Samoa governs the western part of the Samoan Islands in the South Pacific. It lies half way between Hawaii and New Zealand. The two main islands of Samoa are Upolu, with the capital Apia, and Savai'i, one of the biggest islands in Polynesia. In addition, there are several smaller islands and uninhabited islets, all sharing a topography of a narrow coastal plain with volcanic, rocky, rugged mountains covered by rainforests in their interior. A protecting reef surrounds the islands, creating beautiful areas of turquoise blue lagoons. Towards the open sea, external reefs break the water, forming a white foam belt. Inside and outside of this seam, lie a number of outstanding wreck sites attracting and fostering the tourism industry of the islands.



The Samoan population is believed to have originated from Austronesian predecessors, who arrived from Southeast Asia and Melanesia in approximately 1,500 BCE. The first Europeans, the Dutch, sighted the islands in 1722, followed by French explorer Louis-Antoine de Bougainville. Samoa then became subject to times of colonial rule and unrest, before declaring independence in 1962.

Archaeological research in Samoa interprets the origins of its inhabitants. It has also discovered important underwater sites, encompassing the remains of settlements, stone and earth mounds as well as Lapita pottery. Lapita is the name of an ancient culture in the Pacific Ocean, which is believed by many archaeologists to be the common ancestor of several cultures in Polynesia and Micronesia.

At the submerged site at *Mulifanua* on Upolu island, 4,288 pottery sherds and two Lapita type adzes have been recovered. This site dates to approximately 3,000 years ago based on C14 dating and was found in 1973 during the expansion of a ferry berth. The archaeologists that surveyed the site believe that it used to be a sandy beach by a lagoon. *Mulifanua* is the only site in Samoa where decorated Lapita sherds have been found, even when undecorated ceramics have been found on other sites.

Off Savai'i Island, the wreck of the *Juno* is one of Samoa's best-known submerged vessels. It was a 3-masted missionary sailing ship that sunk in Lelepa Bay in 1881. This iron hull wreck is full of corals, where divers can easily see trumpet fish, turtles and a wide variety of colourful reef fish, parrot fish, yellow snappers, big-eyes and more.

Samoa's most recent wreck, the *Nongoonmanda*, is a 16m fishing schooner now resting in 30m of tropical waters. The warm waters are quickly transforming the surface from the hard steel of the hull, into a bed of soft corals. With its masts extending up to around 18m this is a quite spectacular spot for the local dive tourism industry.



The *John Penn* was an American troop–cargo ship, which is now lying on its side in 36–55 m of water, off Henderson field, Solomon Islands. Sunk on 13 August 1943, it still features a theatre and intact galleys. Until 1975, the bridge was intact but it has now collapsed.  
© T. Drew / UNESCO

## SOLOMON ISLANDS

The Solomon Islands are located in the South Pacific region east of Papua New Guinea. They comprise a large variety of almost 1,000 islands. The overall land area amounts to 28,400 km<sup>2</sup> and their capital is Honiara on the Guadalcanal Island. The Solomon Islands declared independence in 1978. They are now part of the Commonwealth.

The first inhabitants of the Solomon Islands are believed to have been from Melanesia and to have arrived thousands of years ago. Nevertheless, after the arrival of Europeans, the Solomon Islands were under British rule from 1893 onwards. Events of historic importance occurred in the area during World War II, when US forces fought Japanese forces in the Solomon Islands campaign from 1942 to 1945. The battle of Guadalcanal was of particular significance.

The resulting underwater cultural heritage is very rich and consists mainly of remains of the fierce battles of that time. Nearly fifty Japanese, American, Australian and New Zealand shipwrecks lie in the area now known as 'Iron Bottom Sound' making it one of the world's major maritime 'battlefields'. Elsewhere in the Solomon Islands lie other shipwrecks that resulted when the conflict spread.

The so-called Iron Bottom Sound is located between Guadalcanal Island and Tulagi in the Florida group. During 1942-3 the Japanese attempted to resupply and then rescue their forces. It was during these operations that they lost the ships on the shores of Guadalcanal. They are now accessible to researchers and divers.

The Solomon Islands Government requested the South Pacific Applied Geoscience Commission (SOPAC) in 1999 to conduct a contamination risk assessment study of these World War II wrecks in Iron Bottom Sound, scattered over an area of about 3500 km<sup>2</sup>. In the course of the study, a complete inventory of the number of vessels, their location, type/s and probable cargo content was compiled. The results have shown that in the Iron Bottom Sound area, 65 Japanese, 44 American, 1 Australian and 1 New Zealand vessel(s) were destroyed and sunk. The wrecks of 1,120 Japanese and 330 American fighter planes also lie there. The debris of the wrecks on the seabed of the area amounts to a cumulative mass of 446,517 tons of metal. Investigations have shown that the shallow water wrecks are extremely corroded and are heavily colonised by benthic species, including corals, green, red and brown algae and other macro-benthic dwellers. The specific cargo contents of the various military vehicles, which were part of the Guadalcanal Offence, are unknown.

In the years immediately after World War II, Japan cleared to the water-line much of the ship wreckage left from its ill-fated attempts to win back Guadalcanal from the American forces. Then, in the 1960s and 1970s, Australian and New Zealand divers bought salvage rights and worked on recovering non-ferrous metals from the accessible sites throughout the region. Underwater salvage activities have such affected most shallow wrecks by use of explosives. One legendary anecdote tells of a well-known Australian diver who blew the bow section of the Japanese *I-1* submarine about 400 m through the air, landing it on the edge of a village at Tambea.

By Terry Drew, AIMA, Australia





The *Kinugawa Maru* was a Japanese 6,937 ton transport ship with an overall length of 134 m. It rests partly above water with the stern in 24 m. The wreck is broken at the bow section with a lot of wreckage scattered around the stern. The latter is intact but twisted onto the port side. Its engines stand upright and break the water surface.

© T. Drew / UNESCO

Examples of wrecks from WWII are abundant on the Solomon Islands, specifically in the (now so-called) Iron Bottom Sound:

The *Hirokawa Maru* is for instance a wreck located north-west of Honiara. It was a Japanese transport ship of 6,872 tons with an overall length of 156m. It was beached on 14 November 1942 after being attacked by U.S. dive bombers. The ship lies bow to the shore on its port side. Until the year 1981 its bridge was still attached, but it has now separated and fallen to the port side.

Another one, the *Kyushu Maru*, is a Japanese 7,623-ton transport ship, with an overall length of 140 m lying in a depth of 6 m to 45 m. The bow is broken while the stern is intact. The goal post masts, which were once an impressive feature, have collapsed at right angles to the deck.

Apart from the remains of the fierce battles of World War II, also historic residential sites have been preserved under water. These are Islands and villages that were submerged due to climate change some 50 to 100 years ago, as for instance the artificial Islands of Langa langa Lagoon and Lau Lagoon on Malaita Province and Roviana Lagoon in the Western Province.

Religious sites also constitute a major component of the Solomon Islands underwater cultural heritage. These sites are usually reserved for traditional and cultural rituals such as shark calling, whale calling and crocodile calling. It is particularly important to preserve them in order to enhance their spiritual connection to the community.



The wreck of a *I-1* Japanese submarine is located at the western end of Guadalcanal, at Kamimbo Bay. It lies in 5–30 m of water at the base of a coral wall. This 98 m, 2,300-ton submarine blew up on 29 January 1943, after being heavily damaged by two New Zealand corvettes, the *Kiwi* and the *Moa*. In spite of the war damage and salvage, it retains the hull shape.

© T. Drew / UNESCO



Wreckages from the era of early explorers are also present for instance remains from La Perouse expedition in Vanikoro, Temotu Province.

**Fault which had penetrated Compass, the ship *La Perouse*. One of the anchors, materializes the middle of the wreckage. Divers of the national marine remove a 8-pound canon from the wreck of the *Astrolabe*, that sunk during La Pérouse expedition in 1788 off the Island of Vanikoro, Solomon Islands.**

© P. Larue / FMC / UNESCO



## **Solomon Island's shipwrecks as tourist attractions**

The Solomon Islands Visitors' Bureau estimates that 5,000 tourist divers pass through Guadalcanal each year. Diving activities have had a visible impact on many of these sites with the disappearance of small artefacts. This sort of disturbance is now actively discouraged by the dive operators who recognise the wrecks as a valuable resource for tourism. Some of the wreck sites have visibly deteriorated over the years with large sections that have collapsed. Local divers have observed damage from cyclones and frequent earth tremors that have shaken coral concretions from the wrecks.

### **Conservation and protection**

The Solomon Island Government has made it illegal for war artefacts to be taken from the country, and tourist operators are supportive of the need for conservation and protection of these wrecks that are described as 'national treasures' because of their historical and economic importance. However, until now there has been no effective shipwreck management program, other than that applied by local residents as de facto custodians of the wreck sites.

*I - 1 Submarine, Solomon Islands, now a tourist attraction.*

© T. Drew / UNESCO



## TOKELAU

Tokelau is a group of three low-lying coral atolls, Fakaofu, Nukunonu, and Atafu each of which encloses a large lagoon. Tokelau is one of the smallest and most remote tropical-island nations in the world and is located approximately 500 to 600 km north of Samoa in the equatorial Pacific. Tokelau became a British protectorate in 1877. In 1926, Britain passed administration of Tokelau to New Zealand. Tokelau is now a non-self-governing territory. Nevertheless, in recent years it has taken on increasing levels of responsibility for its own administration. There is no airport and access is by a two-day boat trip. Visitors are allowed to Tokelau by invitation only. Global climate change and rising sea levels are feared to cause a disproportionate effect on its atolls because of their tiny landmass of 10 km<sup>2</sup>, most of which is less than 2 m above sea level. The current population is 1,400 and this is considered to probably be near the prehistoric maximum. The very thin coral atolls of Tokelau are remarkable ecosystems that are quite distinct from volcanic islands. Due to the extremely limited terrestrial resources available in the atoll environment, the people of Tokelau had to develop long ago very sophisticated cultural mechanisms for sustainable resource use, management and resiliency.



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Archaeologists believe that Tokelau was settled approximately 1,000 years ago and the number of inhabitants remained quite stable. Nevertheless, in 1863 a tragic fate struck the islands, when almost all able-bodied men (253) as well as women and children were captured from Tokelau and taken as slaves to Peru. This slave trade, known under the infamous title of 'blackbirding', employed 33 ships making 38 voyages to the South Seas and calling at every inhabited group in southern Polynesia. Nearly all people taken to Peru were from low coral atolls or small isolated islands like Atafu (Tokelau) or Niuafo'ou (Tonga) whereas the ships kept away from large high islands, where the islanders were under European influence and able to defend themselves. The abducted islanders from Tokelau died by the dozens from poor treatment, dysentery and smallpox, and very few ever returned to their homes. The impact of the slave trade was devastating, and led to major changes in governance.

Underwater cultural heritage sites provide testimony to the contacts made by Tokelau with surrounding countries. The wreck of the *Ophelia* is supposed to lay off Atafu. The vessel sunk in 1865. Its crew survived and remained on the island for a while before setting sail with a boat made from the timber of the wreck. Another wreck is that of the *Novelty*, located off Nataulaga which sunk in 1851.



## TONGA

Tonga is an archipelago comprising 176 tropical islands immediately to the east of the International Dateline. The high volcanic to low coral terrain creates remarkable scenic variety. Tonga's islands are divided into four groups with Nuku'alofa, the capital, located on the main island of Tongatapu. Only 36 islands are inhabited and the total population amounts to 112,400.

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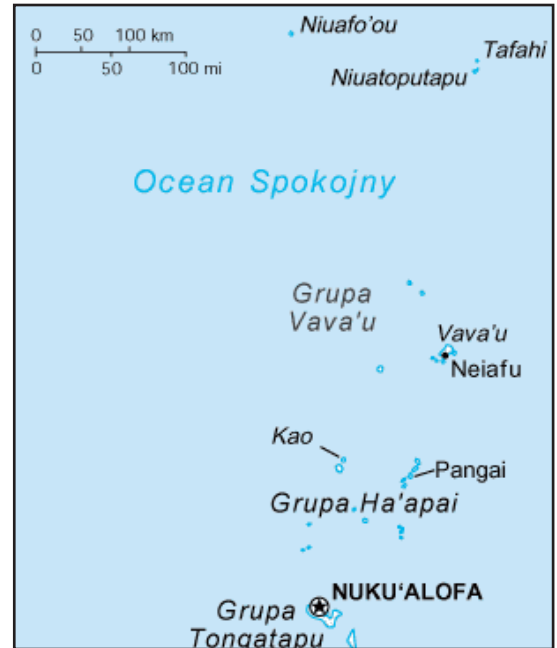
A result of the dependence on boats in Tonga's daily life is the abundance of shipwrecks spread around the coasts of its islands. Many of them are easily visible in the clear water, while others lay deeper and provide beside research also touristic diving opportunities.

A particularly interesting shipwreck is that of the British privateer ship, *Port au Prince*, which was ransacked and burned after an attack of the local population in the Ha'apai Island Group. The ship's clerk, William Mariner, was at that time a teenage boy. In the book, "The Tongan Islands, William Mariner's account", he recounts that the ship had arrived loaded with a cargo robbed from other ships, and with the *Port au Prince* itself being damaged and forced to anchor off the Tongan island Lifuka. There it was seized by

the Ha'apai chief Finau on 1 December 1806. The locals killed most of the crew in the takeover, but Finau spared Mariner and three of his colleagues. Finau assumed responsibility for Mariner, taking him under his protection. The young Mariner then lived in Tonga for four years and his book on this experience is historically important as it illustrates the local customs of the time and contains the islanders' grammar and vocabulary. According to Mariner and local myths, the *Port Au Prince* was carrying gold and many valuable objects, which were however stripped from the wreck when it was burned. A gun is still preserved from the wreck.

Another interesting wreck is that of the *Glen McWilliam*, which measures 122 m in length and sank over 50 years ago. It now sits upright and intact on the bottom of the harbour, not far from the main wharf.

The wreck of the *Takuo* has been found off Nomuka Iki, which is a small uninhabited island just off Nomuka. The *Takuo* was a fishing vessel that foundered on the Hakaufisi reef during a storm, and some of the men on board were lost. The hull later washed ashore on Nomuka Iki where it remains as a reminder of how treacherous its reefs can be.





Funafuti atoll, Tuvalu. © WikiCommons

## TUVALU

Tuvalu is an island group of atolls and islands in the South Pacific Ocean. It is located midway between Australia and Hawaii. The capital of the archipelago is Funafuti. Tuvalu has a population of about 12,000 persons of mainly Polynesian origin.

Tuvalu is believed to have first been settled by Polynesians some 2,000 years ago. It was then first sighted by Europeans in 1568, when the Spaniard Alvaro de Mendaña de Neyra sailed its route. The islands were later named Ellice Islands after Edward Ellice, a British politician and merchant, when Captain Arent de Peyster sighted the islands in 1819 sailing on the ship Rebecca. Ellice owned the cargo of the ship. Tuvalu became then British protectorate and later colony as part of the Gilbert and Ellice Islands until it became independent in 1978.



Tuvalu was greatly impacted by the slave trade to Peru in the 1860s when about 400 islanders were taken. Later on the Second World War shaped its calm islands. It reached Tuvalu in December 1941, when it became an important air and Navy base. In 1943 over 6,000 American military personnel stayed at its islands. This dramatic episode in Tuvalu's history left war relics in abundance.

A partially submerged earth excavator was for instance left by the US American forces near the ruins of a seaplane ramp, also built by them during the war. In Nanumea Lagoon a surplus of wartime equipment was dumped into the water and the wreckage of several US landing craft can be observed. Near the main settlement of Nanumea the American cargo ship John Williams wrecked. WWII wrecks are also quite spectacularly present at Funafuti and Motulalo features a wartime airfield. 22 aircraft were lost off Tuvalu in January 1944.

In recent times Tuvalu drew some unfortunate headlines as its highest point is less than 5 m above sea level, this being of concern to the people of Tuvalu. It is indeed feared that rising sea levels could submerge the islands and relocation would be needed. It would indeed become the first sovereign nation of our time to be faced with total destruction due to the effects of global warming, even when it is estimated that this will not happen before at least another 30 years. Similar submersions of whole landscapes are known from other parts of the earth, as for instance in the Baltic, where underwater archeologists are researching the so-called Doggerland area on the seabed. However, this submersion happened some thousand years ago and where not of man-made origin.



Stern of the SS *President Coolidge*, Vanuatu  
© Aquamarine Santo / UNESCO.



Cargo in the galley and the dining saloon of the SS *President Coolidge*, Vanuatu.  
© Aquamarine Santo / UNESCO.

Vanuatu's best known submerged historic site is the wreck of the SS *President Coolidge*. The wreck, which is on UNESCO's tentative list of consideration as World Heritage, was a luxury passenger liner converted to a troop carrier during WWII. Launched on 21 February 1931 the SS *President Coolidge* was the largest passenger ship to be constructed in America (with its sister ship, the SS *President Hoover*) at that time. On 6 October 1942, it sailed out from San Francisco, headed for New Caledonia and then for Espiritu Santo in Vanuatu. This was the ship's last voyage. While entering the harbour of Espiritu Santo, she hit two American mines on 26 October 1942. The *President Coolidge* is currently known as the largest most accessible wreck dive in the world and contains a unique combination of features belonging to its dual function as a luxury passenger liner and a military vessel. Almost completely intact, numerous holds and decks allow for the viewing of the reminders of her glorious days as a cruise liner and the remnants of her days as a troop ship. There are guns, cannons, jeeps, helmets, trucks and personal supplies left by some of the soldiers, as well as the beautiful porcelain statue of "The Lady"; an Elizabethan statue, chandeliers and a mosaic tile fountain. The wreck is covered in coral and is the home to a plethora of sea life, including turtles, barracuda, lion fish, and a host of reef fish.



The well-preserved ceramic figure of the lady and her unicorn and the cargo of the SS *President Coolidge*, Vanuatu.  
© Aquamarine Santo / UNESCO.

## VANUATU

Vanuatu is an archipelago located in the South Pacific Ocean. Its more than 80 islands are of volcanic origin and encompass a total area of 14,760 km<sup>2</sup>. Melanesian people first inhabited Vanuatu about 4,000 years ago and Europeans settled in the islands in the early 19th century. While France and the United Kingdom had competing interests in the islands they settled into joint administration in the early 20th century until the country achieved independence in 1980. Vanuatu offers a great potential wealth of underwater cultural heritage sites due to its long coastline of 2,500 km.

The best-known wreck is the famous SS *President Coolidge*, a huge luxury liner. Other wreck sites of WWII around Espiritu Santo Island include the USS *Tucker* and at the so-called Million Dollar point, where thousands of tons of US Military equipment were dumped into the sea at the end of WWII. Three Japanese submarines are also located in Vanuatu's waters. In contrast, the MV *Henry Bonneaud*, also lying off the coast of Espiritu Santo, is a 45 m coastal trading tramp sunk intentionally in 1989 for the purpose of diving.

In the sea surrounding Efate, there are also numerous shipwrecks to be found giving testimony of the dramatic history and technological changes of ship transport over the centuries. Among them figures the *Star of Russia* that enjoyed a long career making its first voyage in 1874. The *Star of Russia* was a three-masted ship, one of 12 'Star' ships built by the famous Belfast shipping company *Harland and Wolff*, the builders of the *Titanic*. It was a fast and efficient ship and proved a worthy rival to the developing steam ships. The last few years of its career was as a store ship in *Port Vila Harbour* where it sank in 1953. It now provides divers with a view of one of the last ships from the windjammer era. Other wrecks in Vanuatu include the *Tasman*, a Qantas S26 Sandringham Flying-boat, the first such boat to cross the Tasman Sea from Auckland to Sydney in under eight hours, and the *Semle Federson*, a cargo-carrying trading vessel which sank in 1985.







Large sections of hull plating are scattered along the axis of this unidentified Submarine Chaser 1 in Tanapag Lagoon, Commonwealth of the Northern Mariana Islands.  
© T. L. Carrell / UNESCO



Anchor, Raratonga, Cook Islands.  
© R. Smith / UNESCO

## Professional Organizations and Institutes working in the Oceanian Region.

Professional organizations are major stakeholders in the protection of the underwater cultural heritage. They link professionals working in the field of underwater archaeology, raise public awareness, assist in training, and provide expertise. Professional organizations in the Asia-Pacific region that perform remarkable activities for the protection of submerged archaeological sites, and work in accordance with internationally accepted ethical standards, include:

### ACUA - Advisory Council on Underwater Archaeology



ACUA joins underwater archaeologists and serves as an international advisory body on issues relating to underwater archaeology. It educates scholars, governments, sport divers, and the public about underwater archaeology and the preservation of underwater resources. ACUA also provides scholarships, supports research, and participates in a number of research projects.

### AIMA – Australian Institute for Maritime Archaeology



AIMA is a non-profit organization dedicated to the preservation of underwater cultural heritage. Based in Australia, it has sponsored work and provided training throughout Australia and the Asia-Pacific region. Joint projects have been undertaken in Africa and Asia, to assist existing or develop new maritime archaeological programmes. AIMA works closely with the Australian Government on policy pertaining to underwater cultural heritage.

### ICUCH – International Committee for the Underwater Cultural Heritage



## ICUCH

ICUCH was established as an ICOMOS committee in 1991 to promote international cooperation concerning underwater cultural heritage. It assisted in the drafting of the UNESCO 2001 Convention.

ICUCH provides a forum for debate and information exchange for underwater archaeologists, other professionals, and decision-makers involved in the management of underwater cultural heritage. ICUCH members are primarily experienced underwater archaeologists.

### INA – The Institute of Nautical Archaeology



INA is a research institute affiliated with Texas A&M University in the USA. It is a global leader in the field of underwater research, exploration and discovery. Since 1973, INA has sponsored more than 160 excavations and surveys around the world, from the Atlantic Ocean and Mediterranean Sea to the Yukon River. Its archaeological research of high scientific standards is conducted to increase knowledge of the evolution of civilization.

## NAS – Nautical Archaeology Society



NAS is located in the UK. It is a charitable organization providing education in nautical archaeology at various levels. It works to improve and standardize techniques in excavation, conservation and reporting.

The internationally recognized NAS four-step training curriculum is being used by heritage and archaeology organizations in fifteen countries to raise awareness of threats to archaeology and to provide skills for participation in projects. NAS has assisted UNESCO in the elaboration of its regional training programme in Thailand.

## SHA – Society for Historical Archaeology



SHA is a scholarly group concerned with the archaeology of the modern world. It promotes research and dissemination of knowledge concerning historical archaeology and is specifically concerned with the identification, excavation, and conservation of sites and materials on land and underwater. The society emphasizes the Americas, but also includes European exploration in Africa, Asia, and Oceania. SHA also facilitates training opportunities and raises public awareness. The SHA-UNESCO Committee encourages support and endorsements for the 2001 Convention.

## Worldwide Diver Organizations

Divers are major stakeholders in the protection and the enjoyment of underwater cultural heritage. They should be involved and heard. Their contribution and involvement can also make the protection of sites feasible in small island States. Prominent diver organizations include:

### PADI – Professional association of diving instructors



PADI is among the world's leading scuba diving training organizations, with more than forty years experience, 135,000 PADI Professionals and 5,700 dive shops and resorts worldwide. Padi's "Project Aware" raises awareness for the protection of underwater cultural heritage.

### CMAS – World Underwater Federation



CMAS is an international umbrella organization for dive-training organizations. Founded in 1958, it is one of the world's oldest scuba diving organizations. CMAS offers an international framework for diver and instructor qualifications. Its Scientific Committee works to raise awareness of the need to protect underwater cultural heritage.

## Universities and Training in the Asia-Pacific Region

Underwater archaeology studies submerged historic sites, artefacts, human remains and landscapes. It is to be seen in the larger context of maritime archaeology, which studies human relations with oceans, lakes and rivers and is complemented by nautical archaeology, which studies vessel construction and use. Underwater archaeology is in the Asian Pacific region a relatively recent scientific discipline that requires nevertheless a high level of knowledge and technical experience. It has yet to receive its full recognition and appreciation within the Pacific region's community. The interest in exploring this new discipline is however fast increasing amongst the youth which enables the development of local training programs, workshops, and courses at college level. This is needed to promote effective and sustainable resource management, public education and awareness, and advocacy that will instigate community based efforts and goals in preserving archaeological heritage sites.

Universities train young people to become underwater archaeologist, teaching them in the conscious application of archaeological methodology for the study and preservation of the precious underwater sites. Until now, only a limited number of universities offer academic formation in underwater and maritime archaeology in the Asia and Pacific region. Those are among others:

- Flinders University, Adelaide, Australia
- James Cook University Queensland, Australia
- Slipakorn University, Bangkok, Thailand
- University of Guam, Guam
- University of the Philippines, Philippines
- University of Western Australia, Australia

UNESCO organizes practical and theoretical training courses in underwater archaeology in Chanthaburi, Thailand, in order to foster the exchange and cooperation between the various experts.

Opposite: *US PBM Mariner* aircraft located in the waters off Saipan. Flinders university archaeology students are surveying the wing section.  
© Ships of Discovery / UNESCO



## オセアニアの水中文化遺産 (日本語訳)

「水中文化遺産」とは水中に残る、あるいは残っていた文化的、考古学的、又は歴史的な性質を有する人類の存在の全ての痕跡を含んでいます。何世紀にもわたって、何千もの船や、都市全体、そして陸地形さえも、波にのまれてきました。現在、それらの痕跡は貴重な遺産となり、科学者や一般の人々の関心を集めています。科学者達は、水中にある人間の歴史の特徴ある痕跡に関して、発見を重ねています。アメリカ大陸の最も古い人間の痕跡が、水中の洞窟の中に発見され、地中海には、世界の不思議の一つであるアレクサンドリアの灯台跡が秘められてきました。ネアンデルタール人の狩猟跡や洞窟壁画が水中で発見されており、マヤの祭祀遺跡や古代の住居跡と同様に、巨大で悲劇的な沈没船遺跡が、科学者と一般の人々の想像力や期待をかきたてていることはいうまでもありません。

空気に触れていないこれらの遺跡では、陸上の同様の遺跡では失われてしまう遺物が残ることもあります。このような大変貴重な人類の足跡は、陸上の遺産と同様に、人類共通の遺産の一部であり、それらにふさわしい尊重の念を持って取り扱われなくてはなりません。

太平洋には、特に豊かな人類の痕跡が、水没し残っています。それは、アジア、オーストラリア、アメリカという三つの大陸を結ぶものです。大陸の島嶼や島は、遠く離れて広がっており、そこには、古代から人間が居住していましたが、西欧人による植民地化によって、大きな変化を経ました。オセアニアの水中遺跡は、石器時代から核の時代に至る人間の歴史を示しています。陸上に残る初期入植民化の痕跡と同様に、古代の水没した村々、沈没船、古代の漁労跡等の水中文化遺産は、過去に関する深遠で豊かな知見を提供しています。広大なオーストラリア大陸から、ミクロネシアの小さな島々にわたる地域での人間の活動は、常に、水に密接に関連してきました。水没した遺跡の多様性は、この地域や世界の歴史の理解や解明のために、特に貴重なものといえます。海底の水没した人間の痕跡は、古代神事場の跡から、船や航空機、港、漁労跡や村の跡にわたっています。数多く存在する沈没船は、小型の漁船から第二次世界大戦の大型戦艦の跡にわたるものです。それらは、貴重な歴史的情報を提供し、タイム・カプセルのように、船が沈んだ当時の技術や船上生活を示す完璧なスナップ・ショットといえます。

この地域における水中文化遺産の文化上の豊かさとその複雑な歴史のゆえに、これらの遺跡の保護は、この地域にとって大変重要な問題となっています。太平洋の水中文化遺産は、開発の機会を提供し、その文化的同一性を定義するものです。水没した考古遺跡は、その規模によって、観光客や熱心なダイバーを惹きつけ、多くの小さな島嶼国の経済に貢献しています。しかし、不幸なことに、多くの遺跡が、散在、破壊、自然災害や気候変動の影響による脅威に晒されています。

最初の人類は、4万年ほど前に、オーストラリアに住み始めました。しかし、オセアニアの島の多くは、ポリネシア人の祖先であるラピュタ人によって、その何千年もあとになって初めて植民がなされました。彼らの文化の痕跡は、水上、そして水中に残っています。17・18世紀になると、オーストラリアの海岸、パプア・ニューギニア、フィリピン、ニュージーランド、ヴァヌアツ、タヒチやハワイが発見され、マゼラン、トーレス、タスマン、ド・ヴィル、ドレイク、クック、ラ・ペルーズなどの航海者によって、世界の他の地域にも知られるようになりました。スペイン人が主となって初期の植民地化を行ったため、スペイン植民地であったパナマ・マニラ間の貿易に関連する多くの沈没船が存在します。しかし、そのような沈没船は、活発な宝探しの対象となり、継続的な脅威の下に置かれています。砂糖に関するフィジー人や、グアノ産業に関するペルー人のような19世紀の労働力の移転に関する沈没船は、太平洋における文化の移動や、時に残酷な人間の歴史に関する知見を明らかにしています。また、捕鯨や布教、交易に携わる人々も、水中文化遺産として、その歴史を残しています。航海と漁労施設の遺構は、地元の人々の海との依存や繋がりの証拠といえます。彼らは、波打ち際や波の上に住みながら生計をたてていました。特に、古代の漁労の跡等の今日まで残る遺構は、現存する技術の中で最古の例を示しています。

これらの遺構は、浜石を低く積み上げた石囲いから、何百メートルにもなる石垣を複雑に配置したものまで、多様な形態を示しています。それらは、植物繊維で束ねた木杭で造った木垣を、河口や海岸付近の流れの中心に置いて魚を捕獲する人工の湖でもあったのです。

より最近になると、太平洋は、第二次世界大戦の主要な戦線となりました。日本によるハワイのパール・ハーバー攻撃と、アメリカによる広島、長崎への原子爆弾の投下の際に、島々と太平洋を取り巻く海域において、激しい攻撃と反撃が繰り返されました。従って、これらの地域は、水中の墓地、そして紛争に関連した戦艦や、潜水艦、戦闘機を保存する水中博物館となっています。太平洋には、総計1,354,701トンにのぼる、少なくとも3,855隻の船が沈んでいるとみられています。この数には、多くの異なる国の軍艦、及び民間の商業船が含まれています。

## 遺骸への適切な配慮

「戦争は人の心の中に生まれるものであるから、人の心の中に平和の砦を作らなくてはならない。」

ユネスコ憲章前文 1945年11月16日

1945年に遡るユネスコの創設は、平和の文化の存在の証明といえます。ユネスコの創設メンバーは、ユネスコ憲章の前文で、ユネスコの目的は、世界の平和と安全に寄与することとし、第二次世界大戦後の復興のために共同して取り組んできました。ユネスコは、教育、科学、文化、コミュニケーションの分野における各国の協力を促進することによって、この目的を推進しています。このようなユネスコの権限は、それ自体が目的ではなく、国連憲章や、人権宣言によって確認されている正義、法による統治、人権や基本的な自由に対する普遍的な尊重の念を育成するための分野でもあります。



世界の歴史の中の激動の物語に関する集団的な記憶喪失に抗し、世界が経てきた戦争に関する均衡有る記憶の構築に貢献することは、ユネスコの責任でもあります。敬意に満ちた記憶は、平和の文化の必須の要素であり、人々の心の中に平和を築くために、将来の世代に対して伝えられなければなりません。

多くの水中文化遺産・遺跡は、船の沈没、航空機の破壊、村の洪水等の悲劇的な事件の証言です。これは、第一次、及び第二次世界大戦に参加した多くの人々が眠る海である太平洋に、特にあてはまることでもあります。この出版物は、彼らの命や、記憶に対する尊敬の印であり、陸上の墓地と同様に、青い墓に潜る全てのダイバーに対し、これらの場所を尊重し、触れたり、取ったりしないようにとの呼びかけでもあります。

ユネスコの水中文化遺産条約は、尊重と記憶に対する必要の認識の上に立って、「締約国は、海洋に存在するあらゆる人間の遺骸に対して適切な考慮が払われることを確保する」と述べています。また、条約は、「水中文化遺産を対象とする活動は、人間の遺骸又は崇拜・敬意の対象となる遺跡への不必要な侵害を避けるものでなければならない」と強調しています。このような文化的配慮を備えたアプローチは、倫理的な立場に立つものであり、太平洋における第一次・第二次世界大戦に関して、特に重要なことといえます。考古学者は、不断の努力をもって、考古学上の記録を保存し管理する必要があります。これは、発見された全ての遺骸を、尊厳をもって取り扱い、正確に同定し、地元の当局が、適切な方法によって、その保全を管理することを許可することを示しています。

## 責任ある観光の必要

考古学上の遺跡は、大変脆弱で、立ち入られることで影響を受けやすいものです。研究のために遺跡を開放する機会でも、その遺跡が攪乱されてしまうことを意味するため、含まれている考古学的な情報に影響をもたらします。ゆえに、含まれている情報を、注意深く記録することが重要となってきます。遺跡の調査、発掘、保存は、水中考古学研究の重要な各過程です。

太平洋の観光ダイビングでは、土産収集、金属物の引き上げ、刺激を求めた行為が水没した遺産に大きな被害を与えています。これらの脅威や、結果として失うものに対する意識は、ごく最近になって認識されるに至ったものです。水中遺産の搾取や発見物の売買は、何百年も以前に陸上の遺跡で起こった同様のことを思い出させ、現在、水中に残る多くの遺物が、瞬間に消失してしまうのではないかと危惧されています。水中の遺跡は、保護される必要があります。これは、陸上の遺跡を保護するに至った同様の道理によるものです。人類の過去の痕跡は、それにふさわしい尊重の念を持って取り扱われなければならず、現在の破壊行為から保護されなければなりません。

環境への大きなリスクのある史跡沈没船の例として、USSミシシネワがあります。この船は、もともと、航空機燃料と船用重質燃料油をミクロネシア連邦にあるウリティ環礁沖に停泊するアメリカ太平洋艦隊に供給するためのものでした。

1944年11月20日、日本の魚雷艇によって攻撃され沈没し、40メートルの深さの海底に沈みました。2001年7月、熱帯の嵐が、この57年の歴史を持つ沈没船に影響を与え、貨物の油が流出しました。地域は汚染され、一か月以上にわたって、6万8千から9万1千リットルの油の流失の後によろやく封印されました。この事件を契機にPACPOL事業が開始されました。

地域事業であるPACPOLの目的は、第二次世界大戦の沈没船からの海洋汚染による、海・沿岸環境や資源に対する被害を防止、又は最小限に食い止めることを目的としています。

## 史跡沈没船の有害積載物—PACPOL

オセアニアにおける水没した歴史的遺跡の、外的要因による破壊の危険、そして明らかな歴史上の重要性とは別に、これらの遺跡そのものが害の原因であることに留意しなくてはなりません。第二次世界大戦の事件の証言として、この地域に残る巨大な沈没船や、航空機の跡は、近い将来、それらをとりまく自然環境の脆弱なバランスへの脅威そのものとなるかもしれず、人命にかかわる危険を引き起こし、深刻な公害の発生や、その場所に潜るダイバーを危機にさらすかもしれません。

オセアニアの第二次世界大戦関連の多くの沈没船と航空機には、不発弾と化学兵器が残存しています。それらの多くが、大量の燃料を含んでいます。これらの積載物は、海洋環境、及び沈没船上やその近辺で活動する人々への、潜在的な危険となっています。漁業に従事する地元の人々、資源採掘とダイビング産業は、水没した船舶、戦車や、航空機の有害残留物に、偶然、又は意図的に、遭遇することとなるでしょう。また、レジャーダイバーの第二次世界大戦関連遺跡へのアクセスが高まるにつれて、深刻な事故の危険が増しています。これらのリスクは、適切な遺跡の保護と管理施策のなかで危機管理手段を講じ、地域の人々やレジャーダイバーに、このような場所への非介入的で安全なアクセスを教育することによって、最小限に抑えることができます。しかし、爆発物を含んだ貨物や燃料については、より広範な対応が必要とされています。

14ヶ国の太平洋島嶼国からなる南太平洋地域環境計画 (South Pacific Regional Environment Programme) は、太平洋公害防止事業 (Pacific Ocean Pollution Prevention Programme) を発足し、その中で、第二次世界大戦の難破船に関する問題に対する地域戦略を作成しました。PACPOLは、現在までに、第二次世界大戦関連の3,855隻、総計1,300万5千トンに上る、沈没船のデータベースを作成しました。沈没船は、潜水艦から航空母艦に至る残骸、333隻のタンカー等を含むものです。記録されたもののうち、約40隻の沈没船がイギリスのもので、400隻がアメリカ、そして86%に上る3,300隻が、日本関連となっています。新しい沈没船が、継続して発見されており、合計数は増加の傾向にあります。

このような沈没船へのアクセスを、ダイバー、歴史に興味を持つ愛好家や、地元の観光業者が望むように、いつかは容認すると仮定するならば、地域の当局、さらには沈没船が由来する国による除去が必要となってきます。USSミシシネワに対するアメリカの努力の後、ニュージーランドは同種の手段を考慮しており、これは他の国による同様の努力に引き継がれなくてはなりません。これらの沈没船の保存のためには、特別の注意が必要であり、モニタリングと適切な行動が必要とされています。

## 経済的意義

「現地にある水中文化遺産を観察し又は記録するための、侵害を伴わない責任あるアクセスは、このようなアクセスが当該水中文化遺産の保護及び管理と両立しない場合を除くほか、当該水中文化遺産の周知、評価及び保護のために推奨される。」

ユネスコ水中文化遺産保護条約第2条10項

観光は、今日では、巨大な産業であり、遺跡観光は、国際的に最も急速に成長している分野です。例えば、ユネスコの世界遺産を毎年訪問する何百万人もの観光客によって、文化的に重要な場所における持続的観光は、重要な横断的問題、そして管理上の配慮点となっています。オセアニアにおいては、観光は多くの島嶼国の主要産業であり、経済を主導する要因となっています。風光明媚な場所と澄んだ水によって、観光の大部分は、ダイビング観光となっています。

長年にわたって、オセアニアにおける多くの水中文化遺産は、ダイバーにとって、アクセス可能なものとなってきました。適切に安定化され、保護された遺跡においては、それらの完全性が尊重される限りにおいて、ダイバーの活動は尊重され得るものです。遺産は、全ての人々によって享受されなくてはならず、本物の遺産で受けた印象によって、教室で学ぶよりも、身をもって歴史を学ぶことができます。

従って、水中遺跡の歴史的意義、美しさや本物の価値としての魅力は、この地域にとって、大切な経済的重要性を備えています。ヨーロッパにおいては、ロスキレのヴァイキング博物館、メリーローズ号博物館、ヴァーサ号博物館やヘーゼビューのヴァイキング博物館は、既に、それぞれの国で、多くの観光客が訪れるところとなっており、エジプトのアレクサンドリアにおける水中博物館の事業は、町の中心を統合的に再生することを意図するものです。ダイビング観光は、太平洋地域において、同様の経済的重要性を持つと考えられ、既に、そのような効果がみられはじめています。

水中の遺跡の魅力と持続性の重要な要因としては、その場所の保存状態、本質的価値や歴史上の重要性、一般の人々に対する表現等があげられます。オーストラリアでは、地図や標識板によって十分に説明された水中遺跡の案内であるダイブ・トレイルという工夫が、一般の人々や、現地の人々の娯楽や保護の必要性に対する理解の促進に寄与しています。アクセスによる利益、安全に対する認識、責任ある管理が、これらの遺跡の長期的な持続性を確保しています。

しかし、このような努力は、土産物収集行為、金属物の引き上げや文化的に重要な物を輸出することの禁止などを含んでいます。第二次世界大戦の沈没船から、美しく見える外装や銃弾類、あるいは海底からの歴史的な遺物を持ち去ることは、大変心そそわれることです。残念ながら、このようなことは、過去、多くのダイバーによってなされてきました。しかし、このような状態が継続することは、その遺跡に壊滅的な影響をもたらし、長期的には、現地の経済にも、大きな影響をもたらすでしょう。

ユネスコの2001年水中文化遺産保護条約は、遺跡への責任ある一般の人のアクセスと同時に、遺跡観光の機会の促進を奨励しています。条約は、水中文化遺産が、経済発展にとって極めて重要なものであることを示し、記憶の再構築や、文化間の対話にとって大変重要であることを強調しています。しかし、条約は、遺跡の効果的な保護、そして介入の厳しい規則を定めています。保護の必要性が尊重されている時に限って、アクセスが奨励されます。ユネスコは、輸出証書の見本、及び文化遺産法のデータベースを作成し、政府当局や他の関連する人々の使用に供し、貴重な水中の遺跡の全体性を効果的に保存する目的に貢献しています。

## 遺産の価値の維持

持続的な観光を促進する戦略の効果的な実施は、大きな利益をもたらします。しかし、その条件として、例えば、飛行機や、少なくとも船で周辺の領域に適切にアクセスするための基盤施設が必要とされています。訓練された人材や、当該地域の人々の強い支持も必要です。その地域の人々が、保護による利益を共有する時のみに、持続的観光が可能となり、遺産の、最も信頼のおける監視人となります。全体性のモニタリング、起こり得る災害のコントロール、そして、観光と観光客の流れを適切に扱うこと等の管理能力は、その遺産の近くに形成される必要があります。現地の人々は、通常、その地域の背景を最もよく知っている人々といえます。環境と文化遺産保護、及び観光関連の活動の必要性と利益を、彼らに良く理解してもらうことは、彼らが、観光の利益を享受することを可能にするものです。オセアニア地域においては、戦争の沈没船の爆発物による災害の可能性を認識し、災害防止、及び危険物除去を考慮することを意味しています。

場所の近くの共同体が、その遺産の価値を利用し、地域経済のために水没した史跡を利用するかどうかは、地元当局、及びユネスコを含む国際協力のパートナーに依っています。その場所にある史跡の唯一の文化的価値に対する認識を高め、誇りを形成し、地元の人々と訪問者との間の文化間対話を深めることが重要といえます。文化遺産は、歴史を伝える可能性を持っています。特にオセアニアにおいては、現在の状況を示し、誇りを認識し伝えることを意味しています。文化の多様性に対する認識は、グローバリゼーションの時代において、その地を訪問する人々に対して、その旅をより価値の高いものにするでしょう。この点において、対話が最も貴重なこととなります。

## 保存努力に対する資金的支援

水中遺跡の保存のための資金を確保することが、しばしば、問題となることも明らかです。観光によってもたらされる資金は、遺跡の保存や保護にかかる費用を補完するために用いられることができます。他の保護地区から得られた教訓が参考になるでしょう。

多くのヨーロッパの国では、例えば、ダイビング企業と協力し、遺跡へのアクセスをライセンス制にすることで成果をあげた経験があります。企業はダイバーに、その遺跡に直接触れないことに責任をもちます。ライセンス支払いは遺産管理の費用にあてられます。過剰なダイビングを防止し、遺跡を無傷で保存することが、企業の利益となります。もちろん、企業は、遺跡への入場料という形で、ダイビング客から、負担費用を回収することができます。

最後に、上記のような経済的効果を期待できる、即ち、沈没船はダイビング観光にとって利益の源泉となる一方で、その沈没船には、多くの冒険家、旅行者、兵士、商人を運び、死に至らしめた事実があります。特に、太平洋の第二次世界大戦の沈没船は多くの命が失われた事実を伴っており、多くの場合に遺骸や、個人の持ち物、武器類や不発弾が、依然として残っています。従って、これらの遺骸・遺物の管理は、倫理的で、配慮をもったアプローチをもって、文化に興味を持つ観光客に、歴史的な洞察をもたらすものでなくてはなりません。道徳、及び尊重に対する常識が、経済的利益よりも、大切にされなくてはなりません。

## ユネスコ水中文化遺産保護条約 (2001年)

ユネスコは、世界の文化遺産の保護の改良のために、まい進してきました。水中文化遺産に関しては、締約国が、共通の保護基準を採択し、水中考古学者の訓練を行い、一般の人々の認識を高めることを奨励しています。

ユネスコの水中文化遺産保護条約は、水中文化遺産の法的な保護を改良するための努力における最も重要な手段として、各国の批准に開放されています。条約はユネスコの加盟国によって作成され、2001年11月2日に総会によって採択されました。条約は、締約国によって適用される基本的な保護原則を定め、各国の協力の仕組みによって、盗掘者による不法な売買が増加することを抑制し、その附属書に含まれている介入の規則を通して、水中考古学の指針を定めています。

条約は、水中遺産の保護と締約国の協力を規定しています。その目的は、水中文化遺産の保護を、陸上の遺産に適用される保護と同等にすることにあります。しかし、条約は、沈没船の所有権や、海域の変更については規定していません。

水中文化遺産国際委員会の前会長であるロバート・グルニエーは、2001年ユネスコ水中文化遺産保護条約は、水中考古学者にとって天からの恵みであると述べています。多くの考古学者、学会や会議は、彼のこの評価に同意を示し、条約と付属書を正式に承認しています。

### **条約の主要な目的は；**

古代の沈没船や、水中の遺跡は文化遺産であり、財宝ではありません。それらは保存されなくてはなりません。2001年条約の締約国は、水中文化遺産を人類の利益のために保存することを謳っています。条約は、科学的研究と、その場所に対する責任あるアクセスを奨励しています。

水中文化遺産は、もっともな理由があり、保存が確保される時を除いて、動かしてはいけません。水中文化遺産の（海底などでの）その場における保存は、その遺産へのあらゆる行動に先立ち、優先される選択肢です。物を引き揚げることは、保護や知識に対する重要な貢献のためや、例えば、研究や水中から引き揚げられた物を適切な方法で保存するための博物館を建設する等、水中文化遺産保護を強化するためならば許されるものです。

水中文化遺産は、宝探しの対象や破壊の対象とすることはできません。この2001年条約は、水中文化遺産を、商業上の売買や投機のために利用し、回復が不可能なほど分散してはならないことを規定しています。この規定は、陸上の遺産に全て適用されている道徳的な原則に準じるものです。この規定は、考古学上の研究や観光を否定するものではありません。締約国は、その遺産を、トレジャーハンターや遺物収集観光者の手に委ねないことを誓っています。

（翻訳：高橋暁、木村淳）



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The Protection of the  
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