

Conservation in Archaeology – an awareness training programme

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Abstract

Since the inception of tertiary maritime archaeological courses in Australia in the early 1980s, the Materials Conservation Department (MCD) of the Western Australian Museum (WAM) has presented a conservation awareness and training component to archaeology students. Creating awareness and an appropriate understanding of principals was the aim, because the intention was not to teach archaeologists how to apply conservation techniques or to conserve artefacts, but for them to appreciate the need for conservation, to encourage consultation with conservators and to stress the importance for conservator participation in archaeological projects. As integral participants in expeditions on-site conservators provide the archaeologist with a degree of assurance that recently exposed and subsequently recovered artefacts will be effectively managed i.e. have optimal prospects for their stabilization and be afforded the best post-excavation care. Appropriately trained conservators may also be engaged to determine the environmental conditions prevailing at, and within, an archaeological site in order to ascertain the condition of anticipated artefact materials and identify any potential problems prior to excavation. This information, including any risk factors determined, can guide the archaeologist when the investigation of sites is being prioritized and importantly indicate if urgent action is required. Conservators qualified to use Self-Contained Breathing Apparatus (SCUBA) diving equipment are an additional asset to the investigation of underwater sites as they are able to directly apply the above procedures to this aspect of archaeology. Considering their knowledge of waterlogged and corroded materials the archaeologist may also prefer the diving conservator to recover badly deteriorated artefacts.

The Conservation in Archaeology training programme can be tailored to suit particular aspects of the subject and target different levels of education. It provides straightforward explanation and demonstration to school children, provides a chemistry emphasis for exceptional science students, presents Nautical Archaeology Society (NAS) courses for the public and avocational practitioners and most recently a Conservation Field School incorporating higher level tutorials and practicals for post-graduate maritime and terrestrial archaeology university students.

The WAM Conservation in Archaeology courses are presented intra-state, nationally and internationally. Awareness of the conservation considerations and requirements during archaeological investigations of cultural heritage sites is now more widely accepted by archaeologists and through school education programmes appreciated by young students who are the potential conservators and archaeologists of the future.

Introduction

Over the past 30 years the MCD has developed a well-established international reputation in archaeological conservation education and more recently, in the area of *in situ* monitoring and on-site preservation of shipwreck sites in particular. The Department is regarded as Australia's primary source of expertise in this field. The

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greater interest in and promotion of in situ management rather than more intensive excavation has meant this aspect of the training programme is timely.

Early Learning and the Wider Community

Educating people about maritime archaeology and materials conservation begins at an early age at the WAM. At the Shipwreck Galleries, in Fremantle, more than 10,500 students ranging in age from primary to tertiary level visited the museum in the 2010/11 financial year. Education programs are focussed on the historical aspects, the story of the exploration and charting of the WA coast, the story of shipwrecks and what archaeology tells us about them. The legislation concerning protection of underwater cultural heritage (UCH) sites is also introduced as the students become older. Primary and secondary students are also introduced to the simpler concepts of materials conservation.

In these Maritime Archaeology and Shipwreck Scientists programmes the teachers and education staff explain that the objects and artefacts require conservation intervention to ensure their survival and future stability and they are not simply recovered from the sea and put into display cases. In consultation with conservators, and referring to specific artefacts as examples, they also explain what happens to the artefact materials during long-term immersion in the sea and the steps that need to be taken to treat metals or impregnate organic materials with consolidants. Older students, year 12 (aged 17-18) studying Maritime Heritage and Archaeology units as part of their school curriculum, have the opportunity to engage with conservators who can explain more complex processes and demonstrate procedures utilising artefacts at various stages of treatment. Schools can also enrol Marine and Maritime Technology Studies students in the Australasian Institute for Maritime Archaeology/Nautical Archaeological Society (AIMA/NAS) Level 1 course which includes an introduction to maritime archaeological conservation practices.

Conservation research scientists, as well as conservators, annually engage with groups of exceptionally bright science students (at a level equivalent to 2nd year university) as part of the National Youth Science Forum (NYSF). These students come from all parts of Australia to visit our conservation laboratories for a more extensive introduction to conservation and the associated chemistry (Figure 1).

On request our conservation staff will also visit schools, often during specific weeks, such as National Science Week and National Archaeology Week to present illustrated talks and in some instances, facilitate teachers to establish conservation treatments (using expendable objects) that make the demonstration of chemical principles and processes to young science students more interesting and show that they are actually applicable outside the classroom.

Lectures are also presented at Summer Vacation Schools and are aimed at interested persons in the general community. Specific NAS courses are also run for the wider community usually attracting scuba divers, persons interested in maritime heritage and those working for maritime service organisations, etc. Education in materials conservation is presented on many levels and is

considered one of the MCD's primary roles. This is also reflected in the number of national and international conservation interns the department attracts every year.



Figure 1. Conservator Jon Carpenter with school students in the MCD, WAM. Image M. Brevenholt.

Teaching and Training Conducted by the MCD, WAM

Another main teaching and training role for the MCD is its contribution to the Post Graduate Maritime Archaeology courses. The programme was originally conceived in conjunction with Curtin University, then in collaboration with Flinders University and James Cook University and more recently undertaken with the University of Western Australia. Many of these post-graduates have subsequently guided the establishment of, and head the maritime archaeological units established in the other states and territories of Australia.

The most intensive and long-term programme of teaching and training was undertaken in Sri Lanka when the WAM was approached to provide its expertise to guide the formal establishment of maritime archaeology and conservation in the island republic. Importantly the MCD was involved from the outset, not only to support initial archaeological investigations of sites and shipwrecks in Galle Harbour (Carpenter and Richards 1993; Richards and Carpenter 1998) but to train new and practicing Sri Lankan maritime archaeologists and conservators (Figure 2). Sri Lanka has a long history of terrestrial archaeology and conservators dealing with land finds had to become more versatile by extending their work practices to waterlogged and corroded artefacts recovered principally from marine sites (Carpenter and Godfrey 2005). Conservation lectures, tutorials

and practicals were presented and importantly, guidelines provided to establish a conservation laboratory (Carpenter 1997). In 2006 the United Nations Educational, Scientific and Cultural Organization (UNESCO) sponsored a "Train the Trainers" Maritime Archaeological Field School in Galle incorporating a conservation awareness component provided by the WAM. The workshop involved local conservators and archaeologists as well as inviting archaeological students from countries in the extended region to participate.



Figure 2. Training Sri Lankan conservators (early 1990s). Image P.E. Baker.

The MCD, WAM has also supported the capacity building programmes, in Maritime and Underwater Cultural Heritage (MUCH) established by Robert Parthesius and Bill Jeffery in developing countries. Jeffery strongly endorsed the involvement of conservators and conservation scientists in a project he initiated in Micronesia and this led to the WAM working in Chuuk. Including a group of Earthwatch volunteers, the aim was to compile an archaeological record of the World War Two (WWII) wreck sites and assess their condition and corrosion status which has a direct bearing on the tourism livelihood of the Chuukese people (Richards et al 2007). NAS based courses in maritime archaeology and conservation have been the subsequent focus, conducted both at the University of Guam (University of Guam 2010) and most recently in South Africa (Richards and Carpenter 2011a; 2011b). The latter course was run with the support of the Centre for International Heritage Activities (CIE - Centrum Internationale Erfgoed) and the organization's Director Parthesius.

In 2008 Jennifer McKinnon, Lecturer in Maritime Archaeology at Flinders University, in South Australia, instigated a conservation awareness training programme for maritime and terrestrial archaeology post-graduate students. The

Conservation Field School is a one week intensive course including lectures, tutorials and practical sessions presented by WAM conservation staff (Figure 3). As is stated in the Flinders University Conservation Field School handbook (McKinnon 2011: 2) the topic aims, "to expose students to the range and variety of field projects, methodologies and practical skills necessary for implementing conservation strategies and give further meaning and relevance to their classroom learning experiences".



Figure 3. Conservation Scientist Vicki Richards at Flinders University demonstrating the use of meters etc for recording environmental data and corrosion activity. Image J. Carpenter.

The first three days of the programme introduce the archaeology students to the basic principles of deterioration, identification, recovery, initial storage, stabilization and transportation of the major artefact material types (typically found on archaeological sites), conservation surveys (principles, techniques and data interpretation) and in situ preservation and monitoring techniques for archaeological sites. The lectures and tutorials presented are listed below.

- Marine Environment
- Shipwreck Artefacts, Conservation In situ to Display
- Deterioration and Conservation of Ceramics, Glass and Stone
- Organic Materials – Deterioration and First Aid for Finds
- Corrosion and Conservation of Ferrous Metals
- Corrosion and First Aid for Non-Ferrous Metals
- On-Site Conservation Surveys – Principles and Techniques

- On-site Conservation for Terrestrial Archaeological Sites
- Techniques for *In situ* Preservation – Reburial
- Techniques for *In situ* Preservation – Cathodic Protection
- Tutorial - Preparation and Calibration of On-Site Conservation Survey Equipment

Fieldwork is conducted on the fourth day. The lectures and tutorials provide students with the necessary background information and skills to perform a basic conservation survey (Richards and Carpenter 2008) on an easily accessible, historic jetty located on a local beach. For training purposes actual field practicals are best conducted above water depending on availability and access to suitable sites. The land-based situation allows the trainers to easily demonstrate procedures, it facilitates normal communication and the general ability to perform the tasks involved. It also reduces the preparation required with respect to equipment, minimizes risk and some potential safety concerns. If however, data and information from an actual wreck site(s) is to be a specific outcome from the training programme then appropriately qualified diving students can be supervised underwater.

On day five, the students are assisted in the interpretation of the data collected during the practical fieldwork session with the primary aim to produce an individual preliminary conservation survey report including brief recommendations for a conservation management programme for the jetty site. The students are assessed based on their level of participation both in the classroom and in the field (50%) and the final conservation survey report (50%).

Depending on the specific requirements of a conservation awareness and training programme, existing lectures may be deleted if they are not considered applicable and additional lectures can be incorporated into the course. The programme is specifically designed to be flexible and can thereby be custom-made for any prerequisite requirement or situation.

NAS Courses

NAS courses usually form the basis of the conservation awareness training programme. As stated the level and extent of materials and in situ conservation taught is dependant on the specific requirement for a particular course. Generally, in the NAS I Course, a one hour lecture is presented and provides an overview of the marine environment and the factors that have implications for UCH sites, the emphasis generally being on shipwreck sites and the artefact materials commonly encountered. The NAS II (2-3 days) and NAS III courses (5 days) expand on this theme and also include lectures on conservation surveys and in-situ preservation and monitoring techniques. These courses also include a practical component. The level at which the information is presented is tailored to suit the level of maturity and considers prior knowledge of the student audience.

One of the introductory lectures presented in both the NAS II and NAS III courses concerns shipwreck artefacts and the conservation procedures involved from the time of their in situ discovery through to their storage or display. This

presentation illustrates what maritime archaeological conservators do, why, and how the procedures are carried out. The presentation includes a reasonable amount of text so that foreign students with perhaps a better understanding of written English will also be appropriately informed. An interpreter can also be employed as was the case in Taiwan (Carpenter 2007). It provides general information about subject matter that is dealt with in more detail in the presentations and practical sessions that follow.

Lectures concerning actual treatment of the different types of artefact materials, both organic and inorganic, are usually not presented in great detail but only briefly introduced in order to inform archaeologists of the general conservation processes involved and what is the usual outcome for the artefacts they recover. However, the lectures do emphasise that at the first available opportunity, after artefacts arrive at the conservation laboratory, the conservator and archaeologist responsible for artefacts need to determine treatment priorities and these are usually based on a compromise between the conservator's advice on the urgency of treatment for specific artefact materials and the archaeologist's research requirements. Importantly the main emphasis and focus of the practical aspects of these NAS II and III courses is the pre-disturbance conservation assessment of sites, usually shipwrecks, and their in situ management (Figure 4).

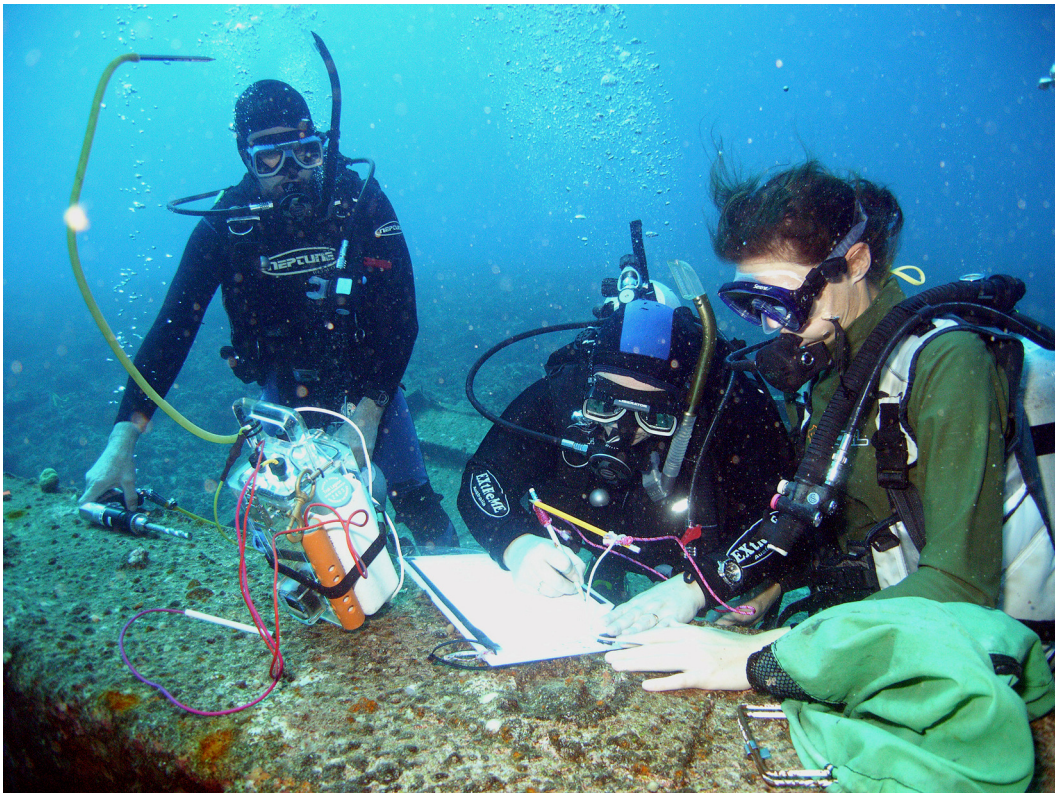


Figure 4. Recording data after demonstrating the use of corrosion meters. Image R. Chan.

The courses are usually conducted over a period of two to five days and permits the tutorials and practicals to be incorporated as well as illustrated

lectures. If diving is involved, with the intention of acquiring specific information from a number of underwater sites then depending on the primary focus of the course a longer time frame may be required.

As an example, a recent 5 day NAS III course, conducted in South Africa for university students and maritime services personnel in conjunction with staff from the MUCH unit of the South African Heritage Resources Agency (SAHRA), provided an introduction to the deterioration processes of the main types of materials found on shipwreck sites in the marine environment, on-site conservation survey methodology including corrosion data acquisition and the information that can be gained through the scientific process. The in situ methods used for site stabilisation in order to ameliorate further degradation of terrestrial and UCH sites was also explained. For the practical component, the diving participants performed an on-site conservation survey on a local shipwreck and the non-diving participants assessed the condition of a number of vessel remains wrecked on the shoreline of Robben Island. One collaborative report for each team (diving and non-diving) had to be produced including an assessment on the stability of the sites using the acquired survey data and based on these conclusions, suggest recommendations for their future management.

The NAS III course emphasises the need for accurate interpretation of conservation survey results and the information this can provide regarding the stability or otherwise of a site with respect to different physico-chemical, geological, biological and archaeological variables. It also demonstrates how to evaluate the potential effectiveness of various in situ preservation techniques based on the interpretation of the conservation survey results and the necessity for continued on-site monitoring of sites, especially those to be preserved in situ.

Importantly it also instils awareness that conservators and conservation scientists, with their specific training, knowledge, skills and experience need to be consulted and engaged for the effective management of cultural heritage sites. The course is suitable for individuals undertaking the NAS Training syllabus and professional archaeologists and conservators wanting to increase their knowledge and skills in on-site conservation survey and in situ preservation management techniques. Most importantly, SCUBA diving qualifications are not necessary for participation.

It has been found that a number of marine services organisations, such as the Water Police and Fisheries are keen for their personnel to have an awareness of maritime archaeology and conservation practices, especially since they may encounter these activities during the course of their duties. In countries with legislation protecting UCH sites Water Police can enforce the laws and Fisheries personnel report inappropriate activities.

Conclusion

The presentation of conservation awareness workshops and courses to national and international participants will ensure the dissemination of this knowledge to a wide range of people, especially post graduate archaeologists, the future practitioners, and other cultural resource managers who may be involved in or be

confronted with heritage conservation issues. By consulting and involving conservators, the archaeologists and heritage managers will have a degree of assurance that recently exposed, and subsequently recovered artefacts will be effectively managed i.e. have optimal prospects for stabilization and be afforded the best post-excavation care. Appropriately trained conservators may also be engaged to determine the environmental conditions prevailing at, and within, an archaeological site in order to ascertain the condition of anticipated artefact materials and identify any potential problems prior to excavation. This information, including any risk factors determined, can guide the archaeologist when the investigation of sites is being prioritized and importantly indicate if urgent action is required. In the past this action may have meant urgent recovery but with the establishment of in situ stabilization methods and the development of improved environmental monitoring techniques, the in situ management of UCH is a viable option.

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