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The team excavated a starboard section of Clarence that extended from the stern some 11m along datums towards the bow, ending just aft of a large mast-stern some 11m along datums towards the bow. Excavation plans were created to support the frames and structure on site. The excavation trenches are contoured concrete weights during the early stages of trench opening. Shade cloth was installed over the field trench to create an anaerobic environment. Sediment was removed from the site using a water dredge operated from JPUB with controlled by divers below. Sediment traps were created at both bow and stern to contain as much of the spoil as possible in the current. Mid-Autumn was selected for the fieldwork for its stable weather patterns in this region. Unfortunately, the team suffered unreasonable bouts of poor weather despite this predictive approach. Even with the challenge of difficult transfers from the vessel to JUB, the team only lost a total of 10 non-diving days out of the 27 field days allocated. Excavation for geo-archaeological and chemical analysis were taken both on and off site, and volunteers attended for periods of 1-3 weeks, allowing them to carry out a pre-disturbance survey and make a preliminary reburial to ensure that all the exposed artefacts were recorded in the project artefact database, with 109 pieces in total. The majority of the artefacts were parts of four timber barrels that were laying end to end longways on the hull. These tierce-sized casks had multiple components (staves, hoop fragments, lids and bases), as well as damage (packing material), accounting for the large number of individual artefacts recorded. Other artefacts included leather wrappings, cordage and glass. All of these artefacts were returned to the seabed, with small samples of leather and rope retained for conservation analysis.

During excavation, a surprising element to the site was encountered: a substantial layer of fine clay, most likely kaolin pipe clay, overlaying the bottom of the excavation trench. This clay was soon identified as an artefact, and research has indicated that pipe clay out of Newcastle (NSW) was used as ballast on some ships. This also was common practice in the UK at the time, and Clarence is the first wreck in Australian waters to yield a substantial and well-preserved clay ballast. Detailed analyses are now being carried out by Tony Bartham and students at the ANU to geochemically fingerprint point of origin and to fully understand conservation processes on the buried timbers.

In Situ Preservation
Artefact Reburial
An off-site artefact repository was installed in the seabed circa 10m southwest of the stern to contain the artefact assemblage recovered was ideal for the recording and reburial trial. Only the interior of the wreck was excavated and all exposed timbers and artefacts were measured in situ using hand held tapes attached to a network of datum points. Excavated trenches were drawn to scale using the existing grid square. The measurement data and sketches were later transferred into the Site Recorder GIS program by SA state maritime archaeologist Amer Khan. Artefacts, primarily timber barrel staves and lids and fragments of leather, were exposed from the first day of excavation. All artefacts were measured and photographed in situ prior to removal and transfer to the surface. On deck, conservation scientists and artefact specialists undertook rapid significance and conservation assessments, detailed imaging by photography and x-ray, morphometric measurements and cataloguing. Artefacts were then prepared for reburial with their individual identifiers, wrapped in geotextile and eventually returned to the seabed. One hundred and two artefacts were recorded in the project artefact database, with 109 pieces in total. The majority of the artefacts were parts of four timber barrels that were laying end to end longways on the hull. These tierce-sized casks had multiple components (staves, hoop fragments, lids and bases), as well as damage (packing material), accounting for the large number of individual artefacts recorded. Other artefacts included leather wrappings, cordage and glass. All of these artefacts were returned to the seabed, with small samples of leather and rope retained for conservation analysis.

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Archaeological Science students from the ANU. These cores will also be used to compare with the results of cores they have taken at nearby terrestrial locations. Replicate cores were taken for all sample in situ analysis of the cores is in process.

Future work

The conservation science component of the reburial project, while always imagined to be significant, looms as a critical longitudinal task. While all aspects of the overall archaeological research design were sequentially addressed, it became clear that some tasks including artefact documentation, imaging (including X-ray), preparation for reburial and the reburial itself could not be characterised as especially ‘rapid’. Equally the discovery of a significant stratigraphic unit/artefact—the pipe clay ballast—served as a caution that contingencies must be allowed for when intervening on an at-risk wrecksite. Re-scoping of tasks and the research design itself is part of any excavation, but an especially critical one in a reburial exercise.

A final period of intensive fieldwork is planned for November 2012 when a discrete team will return to the site for 10 days to complete the final installation of the in situ reburial stabilisation, protection and monitoring materials. Additional sandbags will be delivered to the site to support upstanding hull timbers before shadecloth is deployed to cover the entire wreck. Once these are in place large PVC tarpaulins will be placed over the entire site to completely cover the wreck as a mound. The tarpaulins will be anchored in place with contoured concrete blocks (set in situ), with the intention of preventing boat anchors from snagging on the shadecloth and dragging it from the site.

Site monitoring, involving the recovery and testing of timber and metal sacrificial samples, and further sediment cores will be undertaken periodically until 2014 to measure the impact of the excavation and the rate at which the site returns to an anoxic condition. This site monitoring will occur at sample points on the wreck itself and also at the reburial repository located to the stern of the wreck (containing the organic material from the site). This monitoring will ultimately form the quantitative evaluation of the success of the in situ reburial strategy for historic shipwrecks that are at risk in southern waters.

For more information about the project, or to see the daily blogs and images from the excavation, visit the project website at www.ahspp.org.au.

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The project acknowledges the time, expertise and equipment provided by AIMA members and practitioners, and our tremendous volunteers. We would especially like to thank the following volunteers: Ian McCann, Des Williams, Sven Bartels, Russell Stewart, Eric Bruning, Michael Gregg, Jane Mitchell, Lyall Mills and John Osman; and researchers Jennifer Rodrigues, Andy Viduka, Peter Harvey, Mike Nash, Deb Shefl, and Cos Coroneos.

Cassandra Philippou & Peter Veth
School of Social Sciences
University of Western Australia

J5 Submarine Anode Protection Project

The aim of this project was to carry out investigative and conservation work on the J5 submarine site off Port Phillip Heads, Victoria. It is hoped that the site can be preserved as part of Victoria’s maritime history by reducing the corrosion of the submarine’s pressure hull and frames. The project involved carrying out a general site survey, mapping and corrosion potential survey work to provide information on the site and its current state of deterioration. The data obtained was then used to establish a plan for anode placements within the hull structure, which was carried out through November 2011.

Introduction

The J Class submarines actually had a rather short active life in the RAN, as mechanical problems following their years of active service, together with funding cutbacks, led the Navy to retire the vessels in 1921. By 1922, the decision was finally made to scrap the vessels; all but one (J7) was sold.

The Navy stripped four of the submarines before scuttling them in an area outside Port Phillip Bay known as the Ships’ Graveyard. J1, J2 and J3 were scuttled in 1926, while J4 was scuttled a year later. J7 had been beached in shallow water at Swan Island, Queenscliff, in 1923 to supply electric power, while the last vessel, J5, was eventually scrapped as well in 1930 and sunk at Sandringham to serve as a breakwater for the yacht club.

The submarines scuttled in the Ships’ Graveyard laid undisturbed until scuba divers rediscovered them in relatively recent times. J2 was the first discovered, in 1974, followed by J5 and then J4 in 1982, and J1 in 1984. Of these four subs, the hulls of J4 and J2 are broken, and J1 is in an advanced state of decay.

At the time of planning this project, J5 was regarded as being the most intact, largely because she was scuttled with most of her bulkheads still in place, which have added to her current structural integrity. As such, it became the focus of this preservation study. Unfortunately, the resting wrecks of J5, in 36m of water, is one of the deeper of the four sites, making the underwater tasks reasonably challenging.

The project was conceived by members of the Getunder Dive Club following a 2008 presentation on anodic protection of underwater wreck sites by Dr Ian McLear of the Western Australian Museum. Project methodology was coordinated in consultation with Heritage Victoria, who also were responsible for granting relevant permits for the project work. All of the underwater work was carried out by members of Getunder Dive Club using members’ boats and equipment. An underwater multimeter was supplied by Mal Venturoni from Professional Diving Services.

The wreck site is approximately 2 nautical miles seaward from the entrance to Port Phillip Bay. Access to the site requires traversing through Port Phillip Heads and the narrow stretch of water known as ‘The Rip’, due to the strong and turbulent tidal currents that run through the entrance. The entrance can be dangerous in poor weather conditions, especially for small craft, and the wreck site is subject to ocean swells, necessitating careful planning.

Project Implementation

Site map

The first phase of the project was to prepare a pre-disturbance survey of the J5 wreck site. Teams of divers made a number of dives, which resulted in a sketch map showing relative positions, dimensions and layout of the site. A baseline was established along the hull and fixed datum points placed at strategic locations, such as at the bow. Position and orientation of all datum points and lines, as well as key features, were determined with GPS coordinates, depth measurements and compass bearings. Plastic labelling discs...