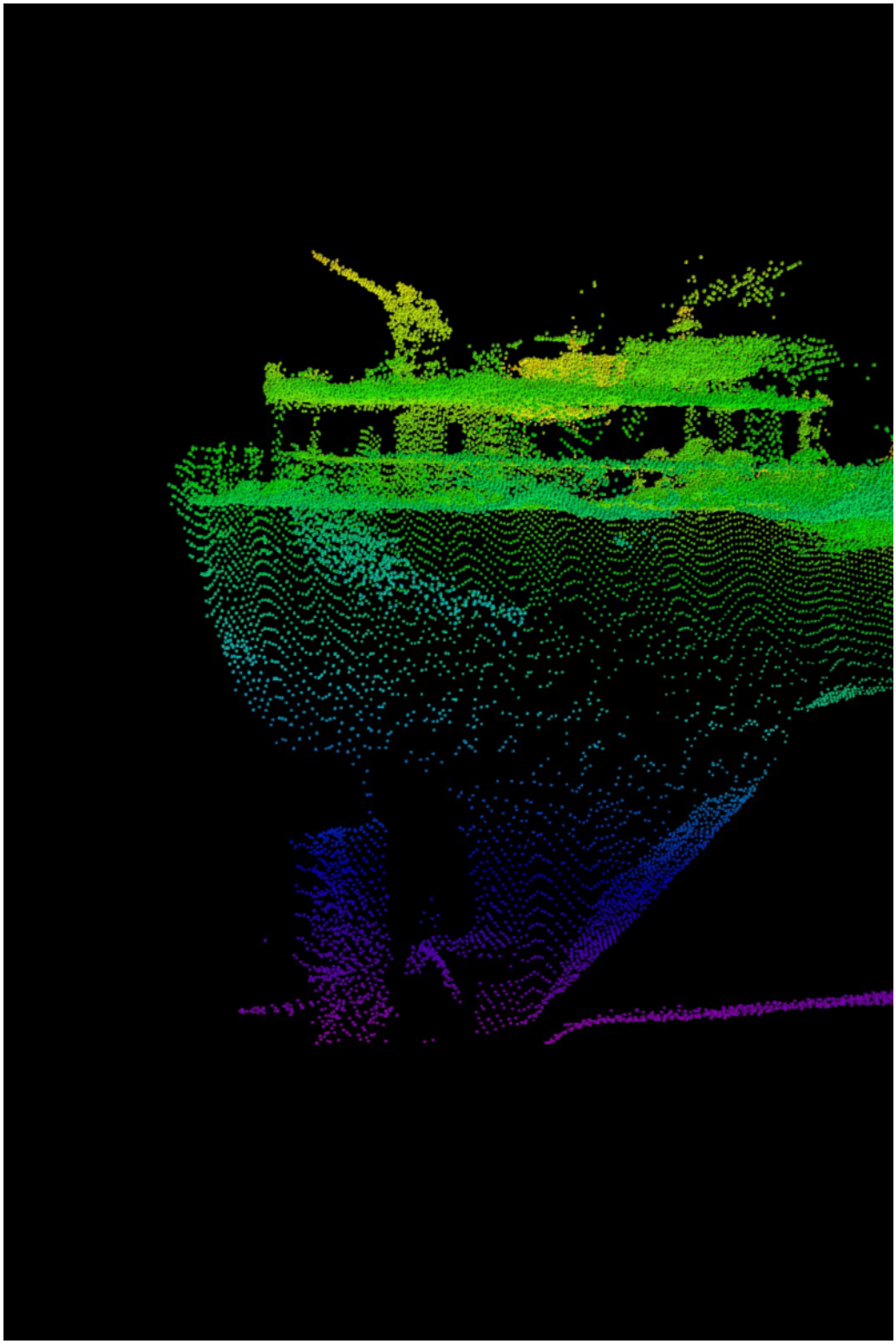
SS Richard Montgomery
2005 Survey Report



Executive Summary

In September 2005, a multi-beam sonar survey was undertaken on behalf of the Maritime & Coastguard Agency in order to gather information about the current state of the wreck of the SS Richard Montgomery. In particular, information was sought on the condition of the hull of the vessel, any changes to the known cracks; and the state of the surrounding seabed with its ongoing pattern of erosion and deposition. The three-dimensional images which were acquired during this survey provide a unique 'snapshot' of the wreck in 2005.

It is important to understand that the following changes have not necessarily occurred recently, but have been observed in this survey due to the improved quality of the data compared with previous surveys.

The key findings of the survey are as follows:

- Hull still largely intact
- Collapsed section of deck on port side of Hatch 3 (noted in 2002 data, but now more clearly visible)
- Bulge on starboard side of Hatch 2
- Apparent partial collapse of part of the cover over the hatch to lower hold 2.
- Discernible difference in pitch of deck in both sections, indicating hogging
- Deterioration of bulwarks around deck

The hull of the vessel is still acting as a container for the cargo of munitions. However, these observations indicate that the ageing structure is beginning to show signs of deterioration (which is consistent with other wrecks of a similar age).

Introduction

The *SS Richard Montgomery* was a Liberty Ship built by the St. John's River Shipbuilding Company, Jacksonville, USA in 1943. The ship sailed from the USA to the UK as part of a convoy in summer 1944 with a cargo of munitions, of which approximately 1,400 tons (Net Explosive Quantity (NEQ)) is still in the forward section. On arrival in the Thames Estuary the vessel was directed to anchor in the Great Nore Anchorage, off Sheerness. On the next tide, however, the ship's anchor dragged and it drifted on to a bank running east from the Isle of Grain, north of the Medway Approach Channel. The ship grounded amidships on the crest of the bank and shortly afterwards broke in two. The aft section of the ship was salvaged at the time.

Survey

In September 2005, a high-definition multi-beam sonar survey was undertaken on behalf of the Maritime & Coastguard Agency by ADUS University of St Andrews, in order to gather information about the current state of the wreck of the SS Richard Montgomery. In particular, information was sought on the state of the hull of the vessel, any changes to the known cracks and the shape of the surrounding seabed with its ongoing pattern of erosion and deposition.

The three-dimensional images which were acquired during this survey provide a unique ‘snapshot’ of the wreck in 2005.

The Reson 8125 sonar covers a 120º swath on the seafloor consisting of 240 dynamically focused beams. The 8125 uses focused true time delay beam forming to provide an excellent level of detail. Up to 240 soundings are collected with every pulse of the multibeam across the swath and this can happen up to 40 times per second depending on the depth of water.

The 2005 survey encompassed not only the hull but also the masts, overhanging rigging and debris around the wreck and between the two sections of the wreck. It visualised all evident splits, cracks, buckling and apertures of any significant size. A detailed topographical survey of the surrounding seabed out to 400m was also undertaken.

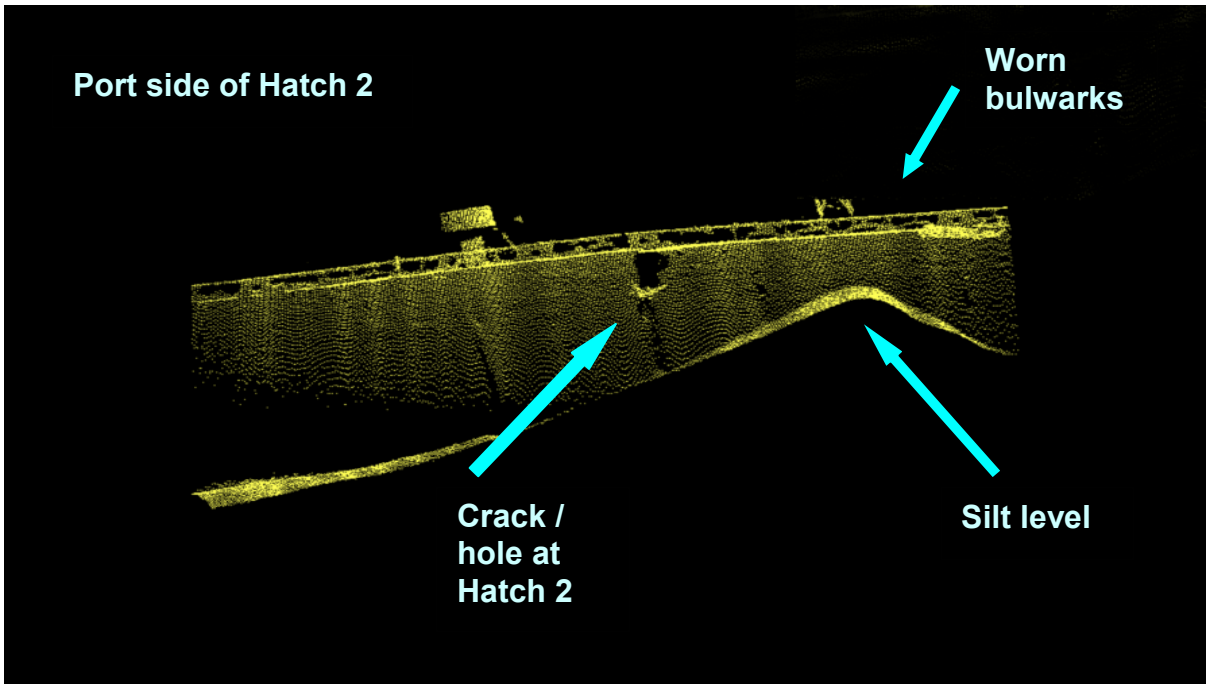
Because of the detail provided by the survey and the fact that it is fully geo-referenced, the 2005 survey can be used as a datum against which any future surveys can be measured and will therefore allow comparisons and a greater understanding of the rate of deterioration.

Visibility on site is notoriously bad and for this reason the use of remote sensing such as multibeam sonar provides more reliable information than could be achieved by diving on the wreck.

State of the Hull – Survey Findings

The wreck is in two pieces, the break being at the bulkhead between the aft end of Hold 3 and the Engine Room at frame 88. The forward section of the wreck is aligned 1º east of UTM grid north, lists 17º to starboard and lays bow down by approximately 9º. The aft section is aligned 12º east of UTM grid north, lists 14º to starboard and lays with the stern down by approximately 3º. The data indicates that both sections of hull are hogging.

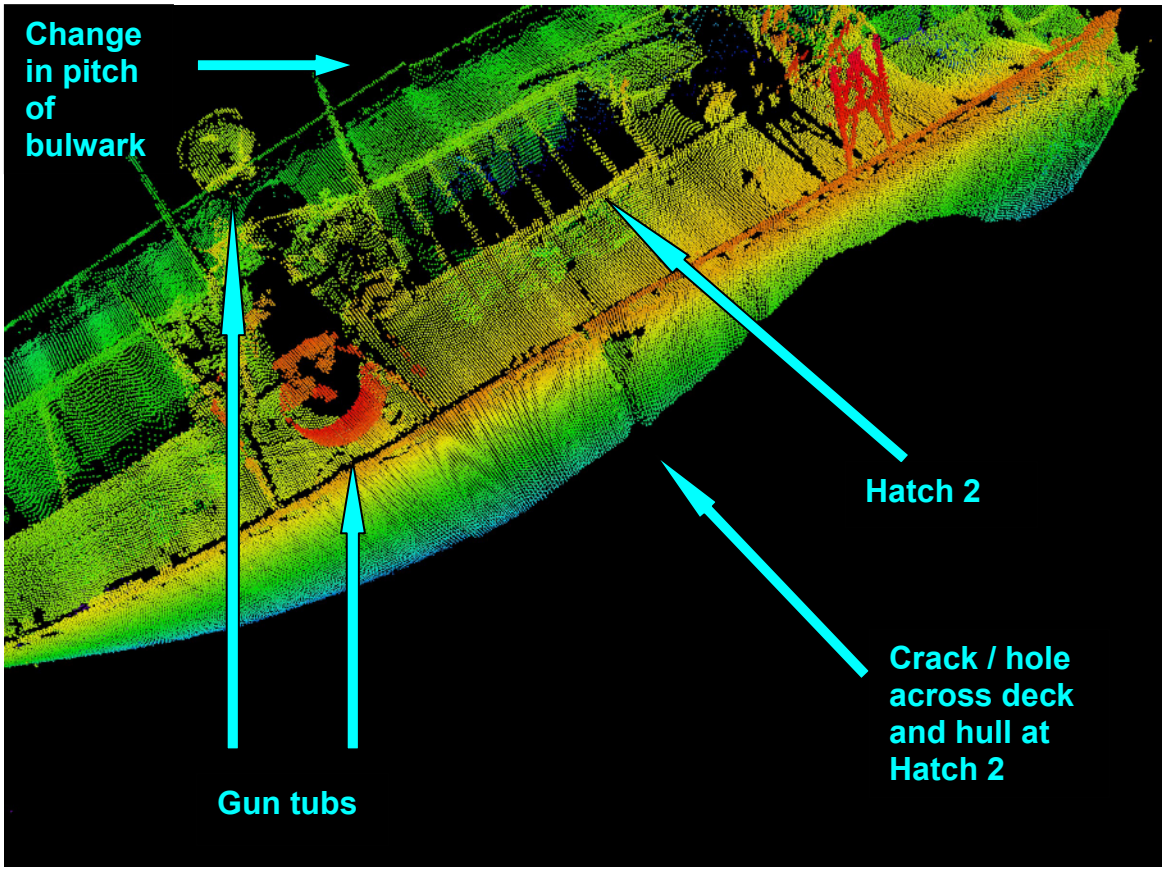
The hull separation, which happened when the vessel sank in 1944, has caused extensive collateral damage in the area and most visible elements of the structure have irregular edges, splits and apertures in the immediate vicinity.



The relatively thin plating of the bulwarks is corroded all around the wreck, and numerous apertures in the main deck and on the boat deck are evident. These are likely to be constructed of thinner steel than the 5/8" (15.5mm) of the hull plating, but even here, where the hull form provides strength to the whole structure, there is evidence of corrosion in the irregular shape of most apertures and edges to splits.

There is distortion of the hull and buckling of the plates for the length of Hold 2, probably caused by the weight of cargo and structure pressing down in this area, as well as buckling and splitting of deck plates. This distortion is mirrored on the port side, indicating that the weight of the contents of Hold 2 is pressing outwards.

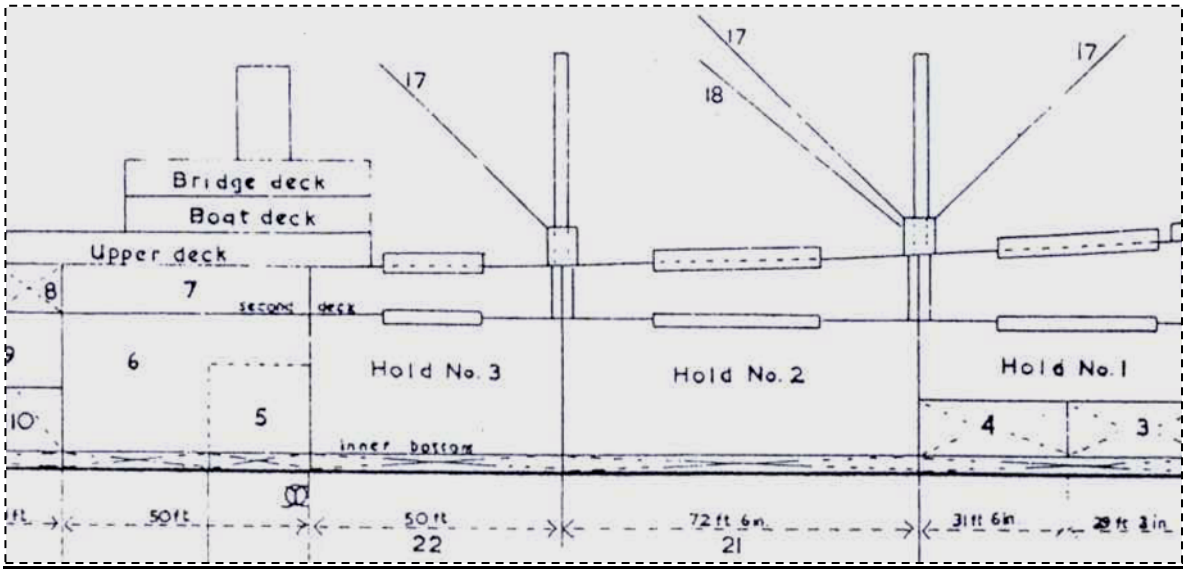
The survey indicates localised corrosion in the area of the main crack by hold 2 (detailed in previous reports), a split in the starboard side of the forward section with overlapping plates as well as buckling and splitting of deck plates on both the port and starboard sides. The data indicates that the structural integrity of the wreck is inevitably being compromised by a number of cracks in the hull and decks.



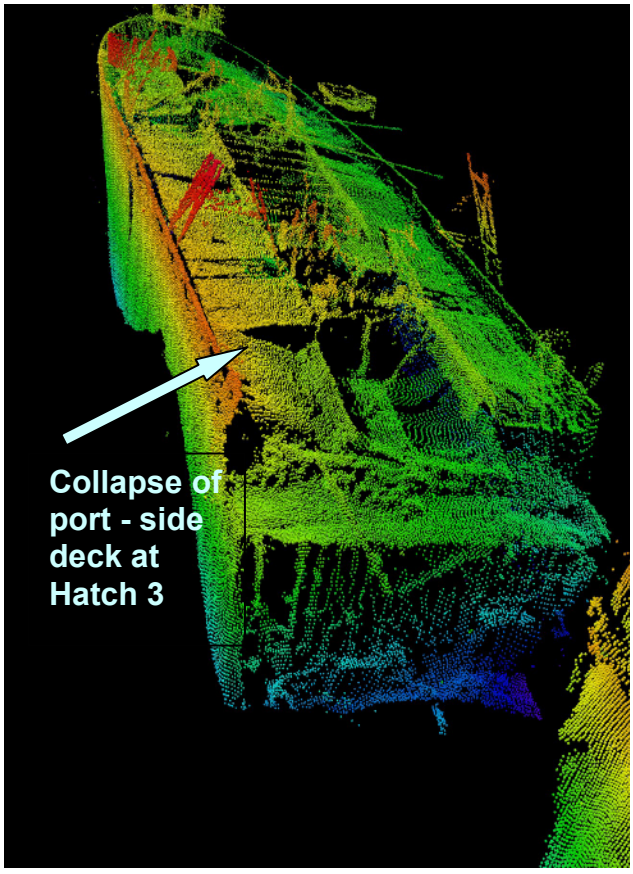
Distortion is apparent in the bow section, probably owing to the weight of cargo, and this is especially noticeable in Hold 2. On the starboard side this has resulted in a longitudinal crease in the hull plating at 'tween deck level running for 11m from a major split to the aft end of Hold 2. Below this the side of the ship just above the turn of the bilge has been pushed outboard by up to 2m. Forward of the split there appears to be a 4m long aperture just detectable at the turn of the bilge.

A significant internal change in the wreck, the apparent collapse of part of the cover over the hatch to lower Hold 2, took place sometime between 2002 and 2005.

At either end of Hold 2 are the fore and main masts, both extending up into the area of maximum wave dynamics. These masts may be subjecting the Hold 2 area of the forward section to additional stress.



Debris from upper Hold 3 is piled on the seabed between the two sections against the bulkhead of Hold 3. Two larger pieces of debris, one port side of the forward section, the other starboard side of the after section, are also apparent.



A section of the deck along the port side of Hatch 3, has collapsed. This is also evident from the 2002 survey, but appears to be more pronounced in the 2005 survey.

The 2005 survey shows that the wreck is in a state of inevitable decline, and appears to be in a worse state than previous surveys have indicated. **However, the hull is still intact (in two sections) and the munitions are contained.**

It should be remembered that the detailed information on the number of cracks, buckling etc. provided by the 2005 survey does not indicate recent deterioration, but highlights deterioration that has been taking place over a long period of time, which we are now able to visualise and assess due to improvements in available technology.

General Observations

Four of the original eight 20mm anti-aircraft gun tubs survive without their guns, but the larger bow and stern tubs still have their guns *in situ.* Two lifeboat davits and four cargo handling booms hang over the starboard side, and three davits and part of a collapsed anti-torpedo net cage hang over the port side. The maximum extent of any projection from the side of the hull is 3m.

Other significant features are the 4-bladed propeller and rudder, the remains of an anti-torpedo net cage, and four substantial structures on the weather deck for life-rafts. These structures are removable and are only held in place with a few bolts. At least one was exposed at low water during the survey indicating that they would be in the area of highest energy during storms, and therefore vulnerable to damage.

An area around the wreck is marked with twelve red danger buoys and four yellow navigational buoys at the cardinal points. Seabed anomalies to the east of each indicate the approximate location of the sinkers.

Conclusions

There have been no major changes to the seabed around the wreck.

There have been no major external changes to the wreck.

A significant internal change in the wreck (the collapse of part of the cover over the hatch to lower Hold 2) took place sometime between 2002 and 2005.