Colossus 2024

Project Report

CISMAS

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Colossus 2024	
Organisation	**C**ornwall and **I**sles of **S**cilly **M**aritime **A**rchaeology **S**ociety
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I would like to acknowledge the contribution made to the project by the CISMAS volunteers. They worked tirelessly for no pay, giving up their time and money in order to take part – often working long days and always to the highest standards. Without them this project would not have been possible.

I need to thank Izzy Allsop, the skipper of the dive charter boat *Morvoren*, who was always cheerful and very helpful; and ensured that diving went smoothly. Izzy was not available for part of the charter and Tim Allsop, the previous owner returned to the helm of *Morvoren* for part of the week. Between the two skippers we were very well looked after.

Ambient Pressure Diving generously supported the project by suppling Sofnalime for the two rebreather divers on the project. Otter Watersports and Weezle have in the past supplied CISMAS members with a discount on their products.

Last but not least, two of the longest serving members of the CISMAS dive team - Sharon Austin and Nick Sodergren - are hanging up their flippers this year. They have contributed to all the CISMAS projects over the last decade and their 'retirement' leaves a big hole in our dive team which will be very difficult to fill. I would like to thank them for their amazing contribution and hope they will continue to take part in a non-diving capacity. I trust they have enjoyed taking part as much as I have enjoyed working alongside them.

Weezle Undersuits

Ambient Pressure Diving

Otter Watersports

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Cover Photograph: Circular search in progress on geophysics target T14, photograph by Emlyn Morris

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Summary

This report documents the fieldwork undertaken by CISMAS on the protected wreck site of HMS *Colossus* in the Isles of Scilly during the first week of September 2024. It includes the first steps in the investigation of the newly discovered eastern debris field of the wreck, following the geophysical survey of this earlier in the year. A number of small investigations of the site were undertaken, and several exciting new discoveries made. Finally, a rapid audit of the site and dive trail was undertaken which has posed some difficult questions concerning the future management of the site.

Background

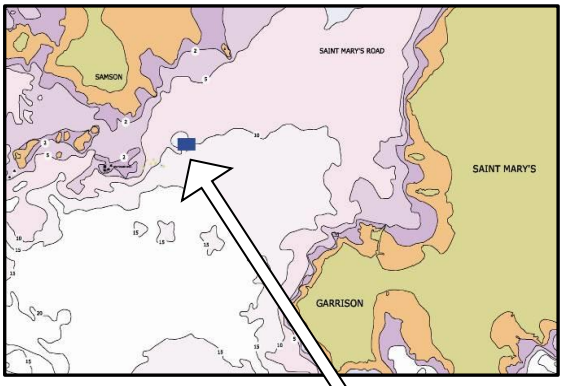


Fig 1
The location of the designated wreck site HMS *Colossus* in St Mary's Road, Isles of Scilly

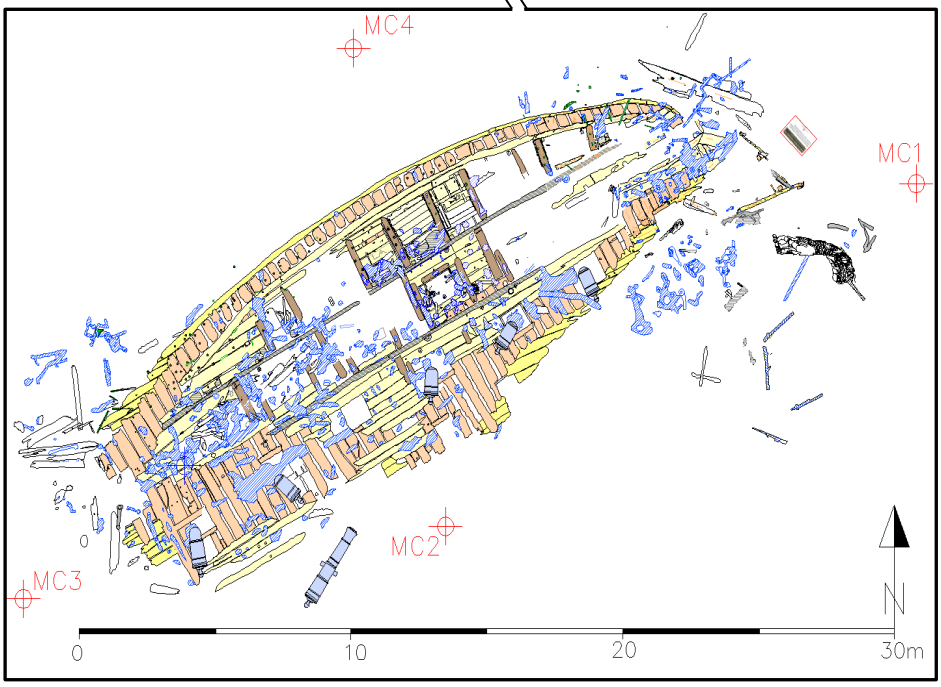


Fig 2
Site plan showing the exposed stern of HMS *Colossus*

The Ship

HMS *Colossus* was a 74-gun warship built in 1787 and wrecked eleven years later on the Isles of Scilly. She was the first warship to bear the name; five others were built over the years culminating in an aircraft carrier launched in 1943.

Colossus was at Naples on 28th September 1798, Nelson's 40th birthday. A lavish celebration was organised for Nelson by Sir William Hamilton's wife Emma, to which the captain and officers of *Colossus* were all invited.[1] When *Colossus* left Naples a week later for refit in England, she was carrying one third of Sir William's valuable second collection of ancient Greek pottery. She left without one of her bower anchors and three of her guns, all given over to Nelson's ship *Vanguard*.[2]

Loss

Colossus reached Scilly in December 1798, in charge of a convoy of merchant vessels. The ship was at anchor in St Mary's Roads sheltering from a storm when the anchor cable parted and she was driven onto shallow ground, losing her rudder and sustaining progressively worsening damage until she foundered with only the poop and quarterdeck above water. All but one of the 595 souls aboard were taken off safely in small boats. The ship soon turned onto its beam ends and began to break up, a process hastened the following month when the crew of HMS *Fearless* were employed *'breaking up the wreck'*.

Salvage

As well as two Navy transports full of stores and fittings recovered from *Colossus* in January 1799, a great deal was salvaged over the next few years. Guns, carriages and shot were raised by the intrepid diver Ralph Tonkin of Penzance in August 1799.[3] Others found more guns in 1800 and 1802. The last salvage we know about was undertaken by John Dean, who in 1833 recovered a number of guns and three quarters of a ton of copper from the wreck.

Rediscovery

By the twentieth century all knowledge of where the wreck of *Colossus* lay was lost. The only clue was the statement in a number of newspaper accounts that she had *'drifted onto a ledge of rocks, called Southern Wells*'. The lure of Sir William Hamilton's lost treasure has prompted many adventurers to seek the wreck of *Colossus*. The archaeologist John Dunbar hunted for it in the 1950s[4] as did several of the teams salvaging the wreck of the *Association* in the 1960s – all were led astray by those newspaper accounts. Then in 1974 a team led by Roland Morris found not only evidence of wreck, but also over 30,000 fragments of Sir William's ancient Greek pots. The site was designated in 1975. The British Museum backed this excavation and the pieces of pot are now in London at the British Museum. Morris also found 12 guns and numerous other artefacts, all of which he recovered. Some were housed in his Museum of Nautical Art in Penzance until the contents were sold at auction in 2001/2.

Morris published his site plan and was convinced he had found the wreck of *Colossus*, scattered over an area extending some 250m with the stern at the west (where he found rudder pintles) and her bow to the east (where he had found evidence of the galley). However, the rudder had been beaten off many hours before the ship foundered and the evidence for the galley area was *'smoke blackened marble slabs'.* The galley stove on *Colossus* would have been made of iron, and would probably have

[1] *Horatio Nelson*, Pocock, 1987 p 176

[2] *Vanguard* received one 32, one 18 and one nine-pound guns from *Colossus* – Captains Log, *Vanguard*: ADM51/1288

[3] *Salisbury & Winchester Journal*. 29 July 1805 p 4

[4] *The Lost Land*, John Dunbar, 1958 pp 32, 63

sat on bricks. What Morris had found were fragments of burnt marble, taken from the ruins of a Roman villa near Naples by Sir William.[5]

Fig 3
Roman Villa San Marco, at Stabiae (1st century BCE) near Naples

Caldarium (the hot room of a Roman baths) with a marble faced bath and now missing bronze water-heater (large circular hole)

The site guide says 'The boiler was one of several items taken by Sir William Hamilton that were lost in 1798 when the ship *Colossus* carrying them foundered'

Morris finished removing the wreckage in 1983 and the site was de-designated in 1984. What Morris had never found were any substantial pieces of the hull itself.

And then there was more… a lot more

In 2001 a large area of hull timber was discovered more than half a kilometre to the east of the Morris site. It became evident that this represented the port side of the ship from the mainmast to the stern – essentially the back half of the ship. The timbers of the hull were in remarkable condition and some of the guns were still in place. A large piece of decorated timber from the quarter gallery was raised, conserved and is now on display on the island of Tresco.

Changing perceptions

What is interesting is how the perception of the wreck site changed after 2001. It was now thought that as the new site was clearly the stern, then the Morris site must have been the bows. It was still assumed that the ship had originally foundered on the Morris site to the west of the stern. The stern section was thought to have drifted east some 500m, shedding material along a debris trail as it went – but did it?

CISMAS undertook a lottery-funded survey of the *Colossus* debris field in 2004/5. The aim was to map the debris from the wreck and determine its extent. A magnetometer survey of the area between the two sites had been produced by the ADU. This was extended by CISMAS and the most promising targets were all dived and recorded. The survey did not extend far to the east of the stern site. It indicated a trail of material between the two sites, but also found debris to the south close to

[5] *Villa San Marco, Stabiae, Bay of Naples an Archaeological Guide*, Keppie 2009 p 149: '*baths whose caldarium was heated by a bronze water-tank spirited away by Sir William Hamilton and lost in the wrecking of HMS Colossus off the Scillies in 1798*'

the stern site. This was the genesis of growing doubts: at which of the two sites had the ship foundered?[6]

Extensive diver searches undertaken to the south of the stern site in 2017 revealed a wealth of ship fittings whose location was puzzling. A theory that *Colossus* had originally foundered some 30 metres to the south-east of the stern site was proposed – but although this theory explained numerous anomalies, it could not be proven.[7]

The testimony of John Dean's weights

Two substantial lead weights were located in 2017. Although their importance was not at first realised, they were eventually recognised as exactly the type of weights John Dean used in his early diving equipment. What caused him to jettison or lose his weights is not recorded, but they remained as testimony to exactly which site he had been diving on when he recovered iron cannon and copper sheathing in 1833. It is recorded that '*John searched for and quickly found the wreck of Colossus'*.[8] This would only have been possible because, as it was then only 35 years since the ship was lost, there were still plenty of islanders who remembered where the wreck was. This demonstrates that the stern, where John Dean lost his weights, was where the *Colossus* originally foundered and that the 'bow site' is in fact only part of the debris trail distributed by the tide when the ship broke up.

Fig 7
Right – the Dean helmet and dress as illustrated in 1842. Note the weight suspended from the helmet by two ropes. Above – one of the lead weights (C10.15) recovered from near the stern of *Colossus*

Why does this matter?

This has changed the centre of gravity for the site. Previously we thought of the old Morris site as where the ship had foundered, and thus the origin of all the wreck material. The debris field which exists to the west of the stern site was thought to have all been 'travelling' east from the Morris site. Now we know that *Colossus* foundered at the 'stern site' and that the material Morris found was small parts of the wreck which had broken off and been carried west by the tide from where the ship

[6] *HMS Colossus Debris Field Survey*, 2005. Download at www.cismas.org.uk
[7] HMS *Colossus* The Wrecking Project 2017. Download at www.cismas.org.uk
[8] *The Infernal Diver*, Bevan, 2010 p 90

was lost. This explains why he found no large structural pieces. But while the tidal flow is westwards on the ebb, on the flood tide it is towards the east. So how much wreckage went east?

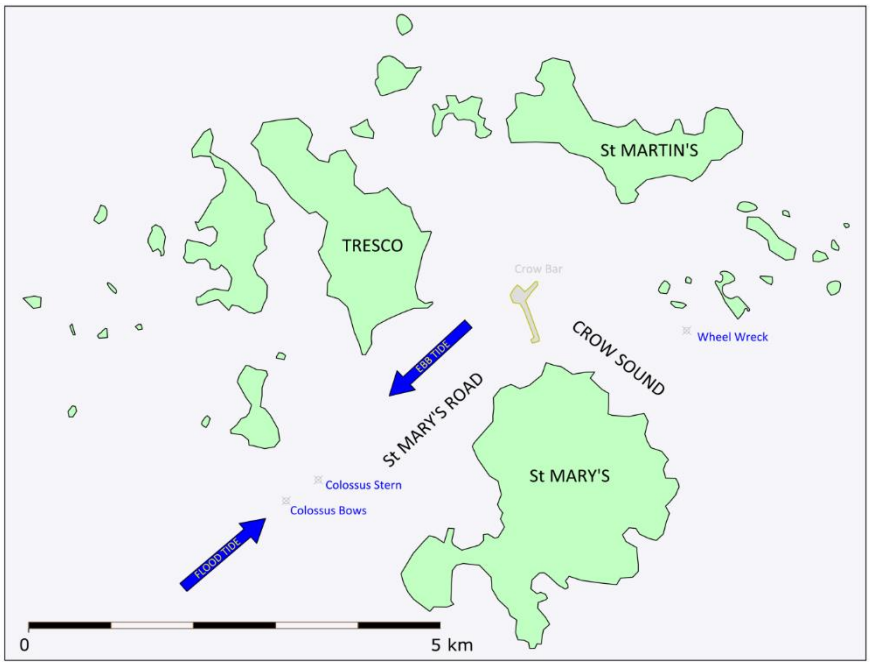


Fig 8
Map showing the main tidal flows over the site

The Historic Evidence

Shortly after the wreck of *Colossus*, an anxious Sir William made enquiries as to whether any of his ancient Greek pottery could be salvaged. The following extract is from a letter written in November 1799, from Major Bowen (commander of the Star Castle on St Mary's) to Sir William's nephew:

> *The Colossus being, as is generally thought here, in a very weak state, broke up uncommonly soon after striking on the rocks. The people of St Martin's island met several packages drifting out at Crow Sound, among the rest those described to them as Sir W. Hamilton's. They assert that, anxious to fulfil Captain Murray's and my earnest injunctions, they used the utmost efforts for recovery of the latter; but the sea running very high and the wind blowing a storm, they found it impossible to lift the packages which were very large into their boats. They then tried to disengage the contents. Unfortunately, in this also they failed. Their solemn declaration to me is, in their own words, that 'they saw on opening the canvass cases, several large pieces of most beautifully painted clome' (the name for earthen ware here); 'but that, on their trying to lift them, whether from the effect of seawater on them, or a cement used in joining them, a single piece could not be taken into the boat, each giving way in their hands like wet dough'*

Major Bowen goes on to say that another crate had washed up on the island of St Martin's, where at least ten of the pots had been recovered whole and purchased from the islanders on behalf of Sir William. There were eight crates of pottery aboard *Colossus*. From the vessel count made by the BM of the pottery recovered by Morris, it seems that at least three of the crates went west and lodged in a gulley where Morris found and recovered them. Several more crates, apart from the one washed up at St Martin's, went east and were seen at Crow Sound. This all demonstrates that as *Colossus* broke up, wreckage went west on the ebb tide, where Morris later recovered much of it. But some went east on the flood tide: how much waits to be found?

The 2024 Fieldwork

Old Pots and the Morris Men

We have continued our search for the exact spot where Roland Morris recovered 30,000 sherds of ancient Greek pottery. This year we dived again in the area where his site plan shows he excavated. The topography accords very well with the depths shown on Morris' plan and the descriptions of the surrounding features in 'Slim' Macdonnell's dive logs. Despite this we have as yet found no artefacts on the seabed – but there is still more ground to be searched. We will be back.

Safeguarding the Reburial Trials

In 2012 CISMAS undertook a small excavation at the stern of the wreck. The majority of the artefacts recovered are now in the Isles of Scilly Museum; a small representative sample was used in a long-term reburial trial on the site. These objects were placed into two separate repositories buried in the seabed close to the wreck. The contents of one repository were retrieved after 10 years reburial in 2022. The other repository is due to be retrieved after 25 years of burial, in 2037. [9]

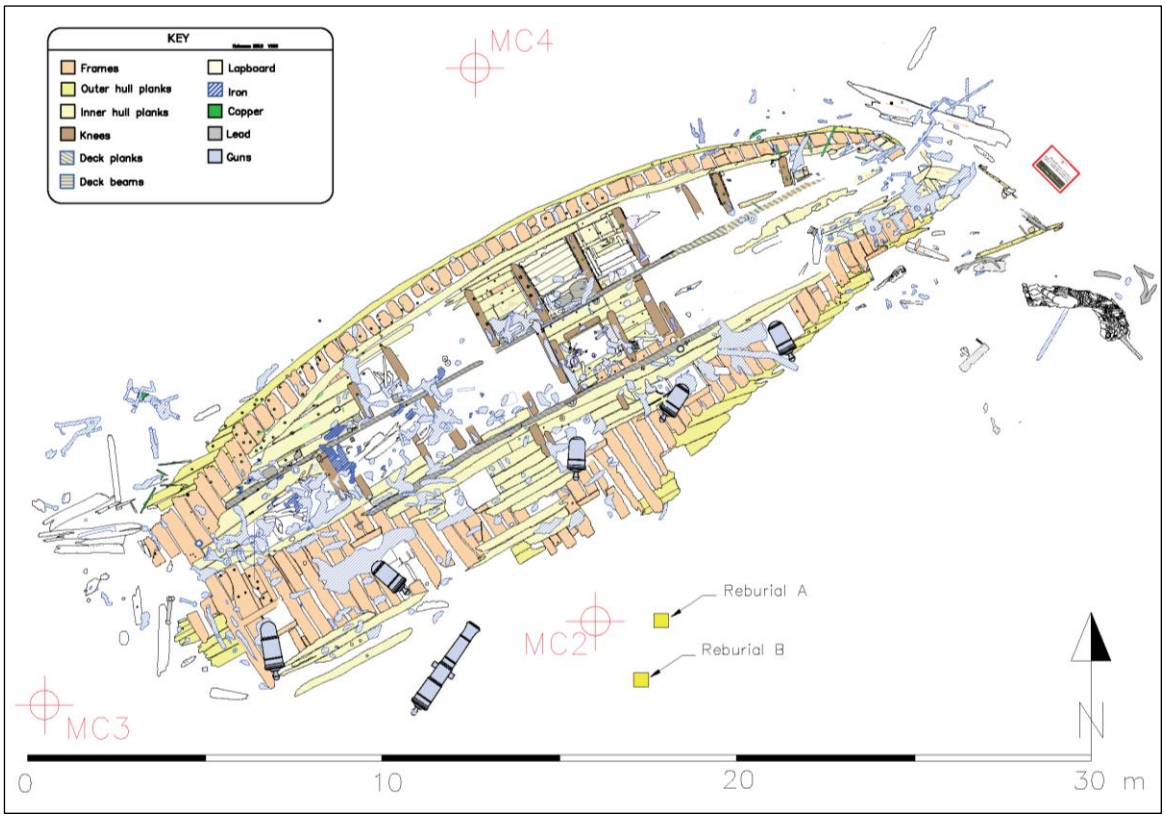


Fig 9
Plan showing the location of the two reburial repositories A and B, to the south of the exposed wreckage

[9] See *Colossus Reburial Trial Retrieval 2022* (HE8401)

When the 10-year finds were retrieved in 2022 it was noticeable that the tops of the plastic reburial crates were visible on the seabed – due to falling sediment levels on the site. As a temporary measure, extra sandbags were placed over the 25-year repository to help protect it.

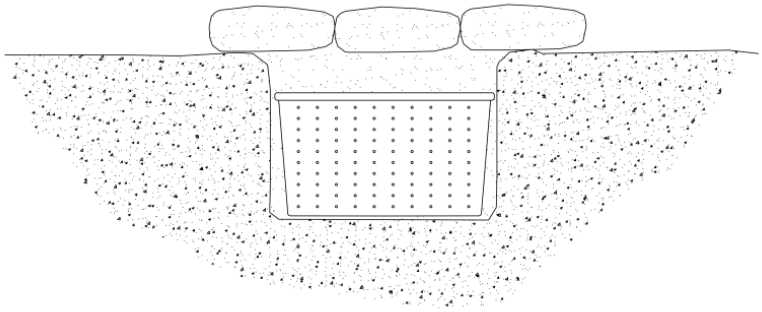


Fig 10
Schematic section showing one of the reburial crates buried beneath the seabed and covered with sandbags

The first task CISMAS undertook in 2024 was to place a two-metre square of geotextile (Terram 4000) over the 25-year repository to protect it from falling sediment levels. The Terram was held in place by sandbags, placed in a continuous line around the edges of the Terram.[10] This method has been used elsewhere on the site and has proved very effective at protecting elements of the wreck from falling sediment levels. Previously, the Terram and sandbags have been quickly colonised by seaweed and a layer of sand quickly accumulates over the geotextile.

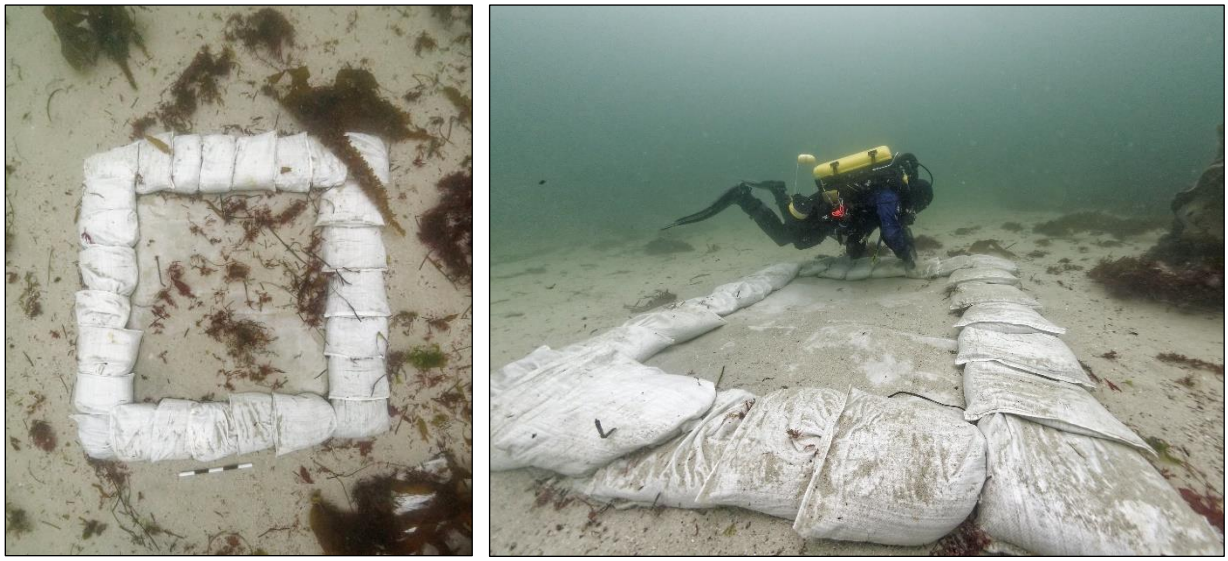


Fig 11
The Terram covering over the 25-year repository shortly after installation in September 2024. The Terram is 2 metres square (scale = 0.5m)

[10] Thanks to Dave Parham for suppling the Terram 4000. All other materials were financed by CISMAS

A Little Something for 2037

A small ‘time capsule’ was deposited on the seabed under the Terram mat, each member of the team contributing an item. These were sealed into a self-sealing polythene bag which was placed under the Terram.

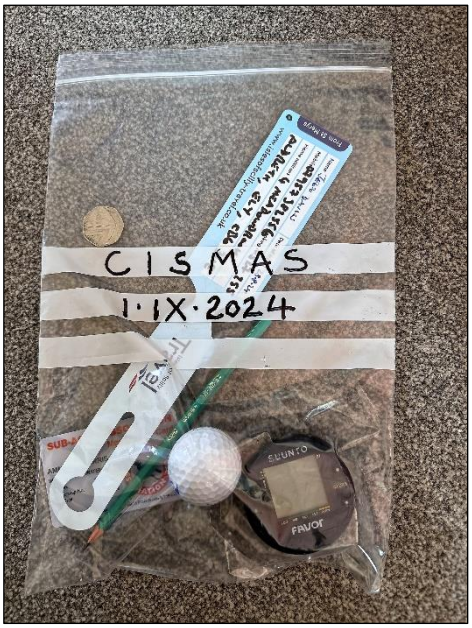


Fig 12

The CISMAS time capsule contains two coins (50p, one each of Charles III & Elizebeth II), a waterproof pencil, golf ball, Isles of Scilly Steamship luggage tag, diver qualification card and dive computer

Any Old Iron?

One of the least understood elements of the wreck of *Colossus* is the numerous pieces of heavily concreted iron lying over the surviving timber. Some of the iron is easy to identify, such as ring bolts, clench bolts and similar fastenings. But most has defied identification, one notable example being a large, solid piece of iron lying on the seabed close to Gun 1. It appears on the site plan but has not been examined in detail as it has never been properly de-weeded (a time-consuming process). One of our tasks this year was to identify this particular piece of iron and its function, by clearing the marine growth. We little imagined just how informative this would be.

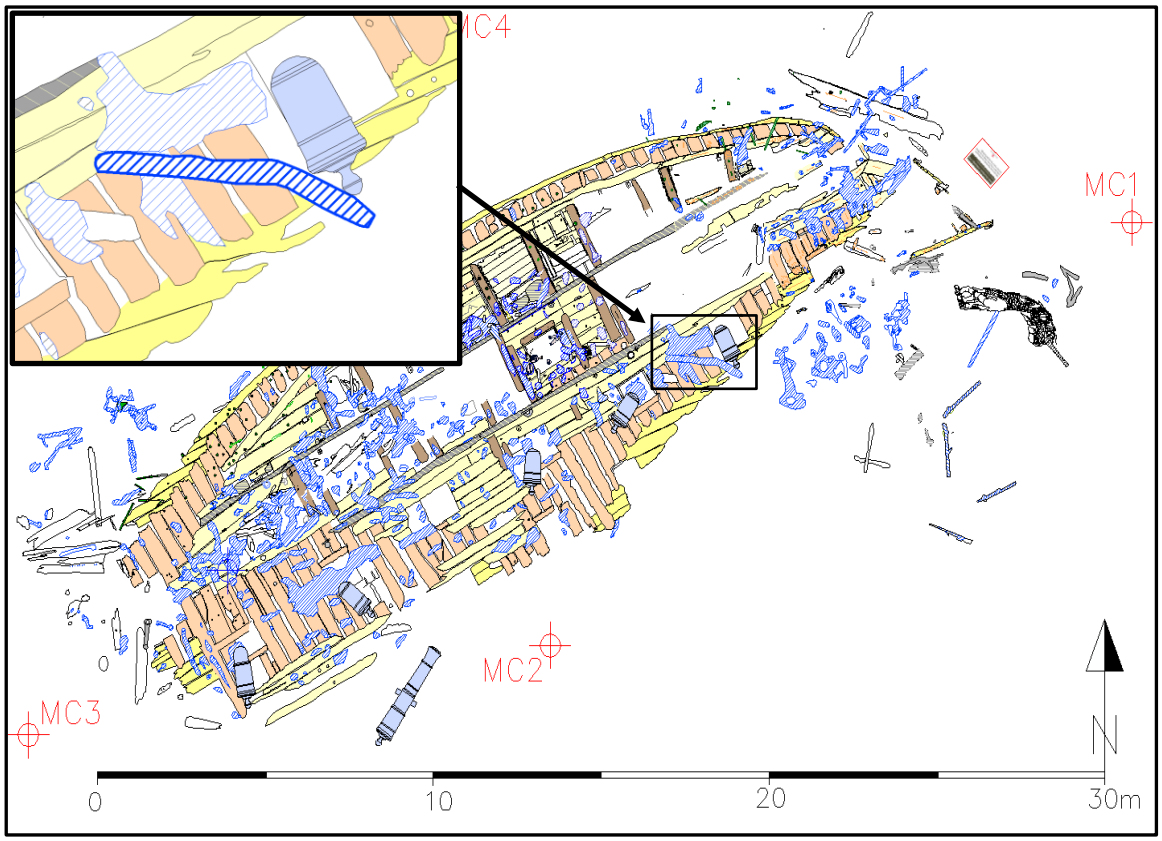


Fig 13
The position of the mystery iron object (shown hatched in bold on the inset) close to G1, the most easterly of the five upstanding 18-pound guns

The mobile kelp was first removed from around Gun 1 and then the fine 'seaweed' was carefully detached from the surface of the iron. It became immediately apparent that this object closely resembled the broken and twisted shank of an angle-crown anchor with the arms and crown broken off. Close examination revealed 'fibrous' strands of iron under the concretion indicating that it is made of wrought iron.

The iron consists of a bar 2.35 metres long, square sectioned at its southern end (0.17 x 0.17m) and roughly circular in section for the rest of the bar (0.14m ∅ average). It is slightly bent and appears to be twisted as well. This is a substantial piece of iron and considerable force would have been needed to bend it. We initially speculated that the anchor had become fast on the seabed and the shank was bent and broken when attempting recovery of the anchor.

Fig 14

The iron anchor shank found adjacent to Gun 1 after removal of marine growth. The position of the anchor ring hole can just be made out in the lower photograph - where it shows as a slight indentation in the iron concretion, indicated by the yellow arrow. The black arrow indicates a different textured area on the 'square' which may be where the nut was originally attached (the nut located the stock on the square). Scale = 0.5m

Fig 15
Divers removing 'scaffs' and fine weed from the concreted iron around gun 1. The iron bars visible in the foreground are the remains of the iron bolts which fastened the wooden gun carriage, still attached to gun 1

The anchor shank appears to conform to the typical Admiralty angle-crown type of the late 18th century, so is of the right period and type to be part of the ground tackle on board *Colossus*. But the dimensions are far too small for it to be one of the ship's bower anchors. 74-gun ships at this time usually carried six anchors, four main bower anchors (71 cwt, 18ft 6" long),[11] a stream anchor (17cwt, 12ft 6") and a kedge anchor (8cwt, 9ft 6"). The diameter of the 'small' [12] accords well with the published dimensions of a stream anchor for a 74-gun ship such as *Colossus*.[13] The bower anchors were kept at the bow ready to be dropped and were used for mooring the ship; the stream and kedge anchors were used for manoeuvring in confined waters and were often deployed remotely from one of the ship's boats. But why is there a broken stream anchor onboard at all?

On site, we speculated that the anchor had broken on recovery from the seabed after becoming stuck. However, a search of the documentary evidence revealed an entry from the logbook of the Master, David Wallace, from 12th February 1797 which records a collision with HMS *Culloden* on the eve of the battle of Cape St Vincent:

> *'At the signal to tack, past the Culloden, wore, the Orion hove in stays. Put our helm up to pass to leeward of the Orion. Hail-d the Culloden to keep her wind she came aboard of us which* ***broke the Shank of the Stream anchor*** *– carried away fore top gallant mast and stove in some of the upper works abreast the 5 gun on the main deck'.*[14]

The stream anchor was usually stowed lashed to the outside of the sheet or spare bower anchors, which were carried just to the rear of the two 'ready to go' bower anchors. Thus, the stream anchor would probably have been the first thing *Culloden* made contact with during the collision. The '*5 gun on the main deck*' was on the port side, third port back from the bow – the guns were numbered starting at the bow: even numbers on the starboard, odd numbers on the port.

[11] *Colossus* only had 3 bower anchors when she sank as one had been given to Nelson's ship, *Vanguard* in Naples
[12] The small is the section of the shank next to the square of the anchor at the ring / stock end of the shank
[13] *Arming & Fitting of English Ships of War*, Brian Lavery, 1987 p 32
[14] Master's Log HMS Colossus – ADM 52 2808

Colossus had not been back in home waters since this collision. It seems probable, therefore, that this mystery piece of iron, now thought to be the broken shank from the stream anchor, was the same one broken in that collision with *Culloden* at the battle of Cape St Vincent. The other half of this anchor may lie somewhere amongst the corroding iron scattered around the site, or on the seabed off Cape St Vincent. The broken anchor part (or parts) was probably stored in the aft hold for transport back to England, and fell from there to its current location while *Colossus* was on her beam ends and breaking up.

Much ado has been made by various authors of the fact that *Colossus* had given one of her anchors away to Nelson's ship *Vanguard* in Naples and was therefore short an anchor when she was wrecked. It now seems likely that *Colossus* may have been short not one but two of her six anchors when she foundered in 1798.

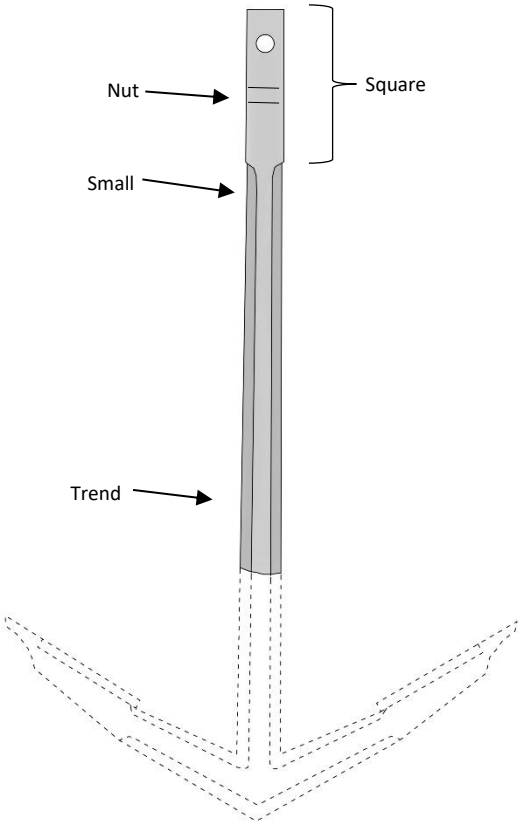


Fig 16

Sketch of a typical 18th century angle-crown anchor. The part corresponding to the iron adjacent to Gun 1 is shown shaded; the missing parts are shown with dashed lines and unshaded

The Empty Gun Port

The row of upper gun-deck ports was one of the first things recorded on the wreck in late 2001 and early 2002. At that time, we were faced with over 350 square metres of seabed to draw and next to no resources to achieve this (not even a planning frame). The early planning was undertaken at a scale of 1:20 – which limits the amount of detail that can be shown, but enables 4-5 square metres to be drawn per hour. In later years we drew the site plan at a scale of 1:10, which allows much more detail to be recorded – but it takes about four times longer to cover the same area.

We had been aware for some time that the empty upper gun-deck port no longer looked as it had when drawn back in 2001. Therefore, one of our tasks for this year was to produce a measured sketch and profile of it, to determine what had changed in the intervening 20 years. It was also a good opportunity for team members to brush up on their recording skills – which had been sadly underemployed of late.

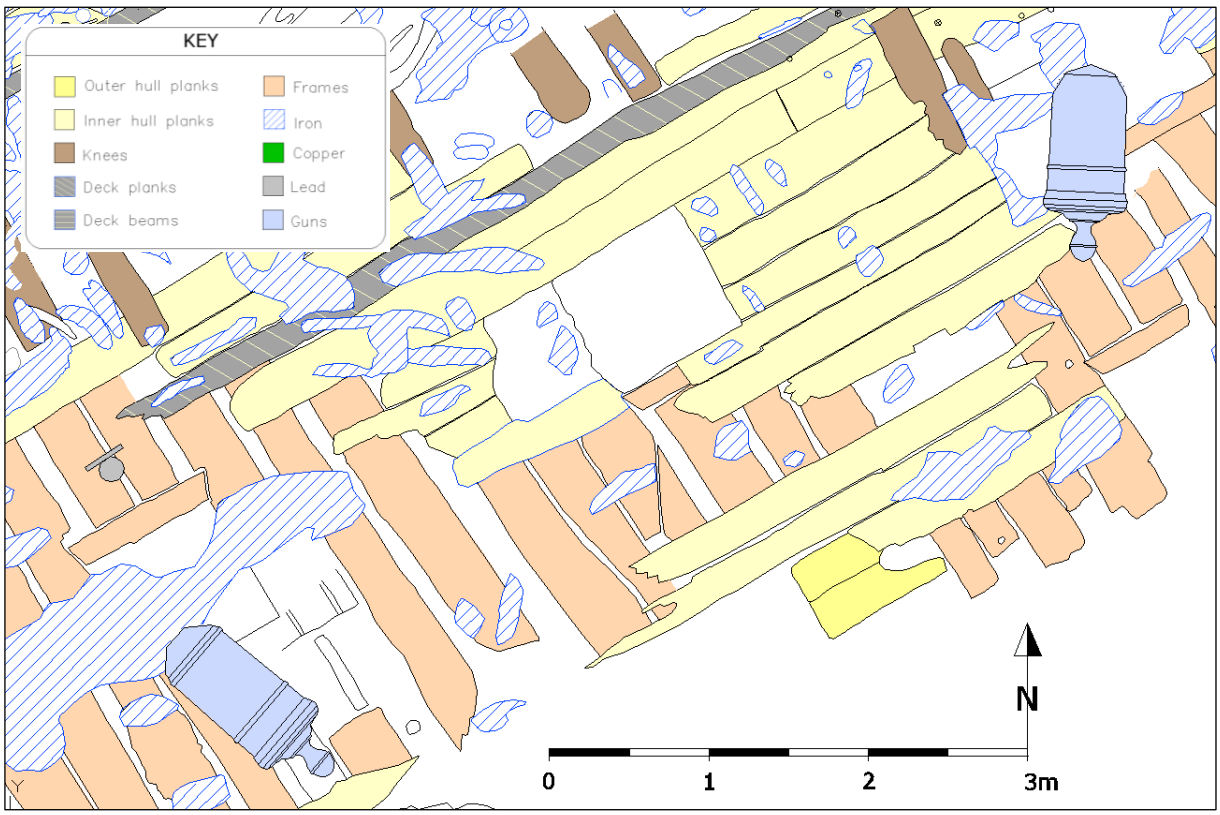


Fig 17
Detail from the *Colossus* site plan showing the empty gunport (centre). The blank space to the left of the gun port is where the timber was covered by sediment in 2001/2

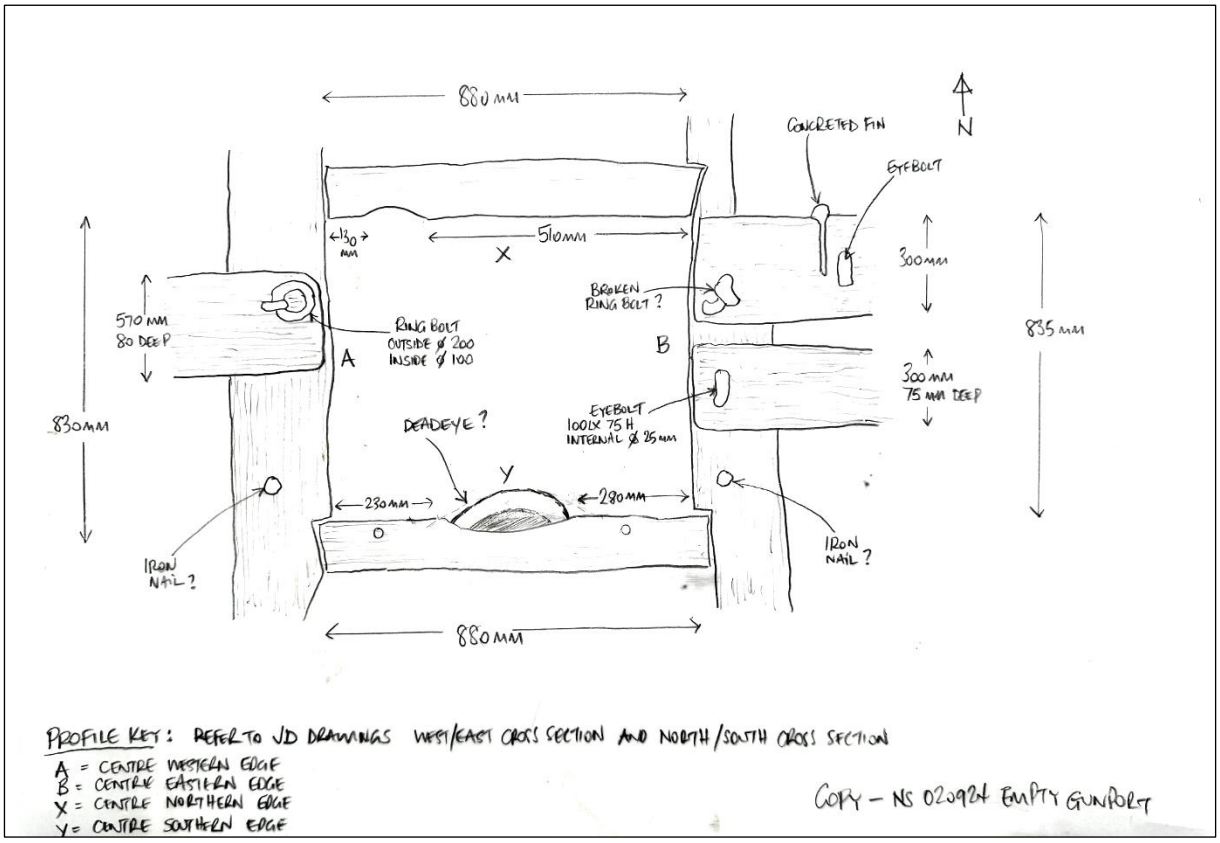


Fig 18
Sketch plan of the empty upper-deck gunport made in September 2024 – drawn by Nick Sodergren.

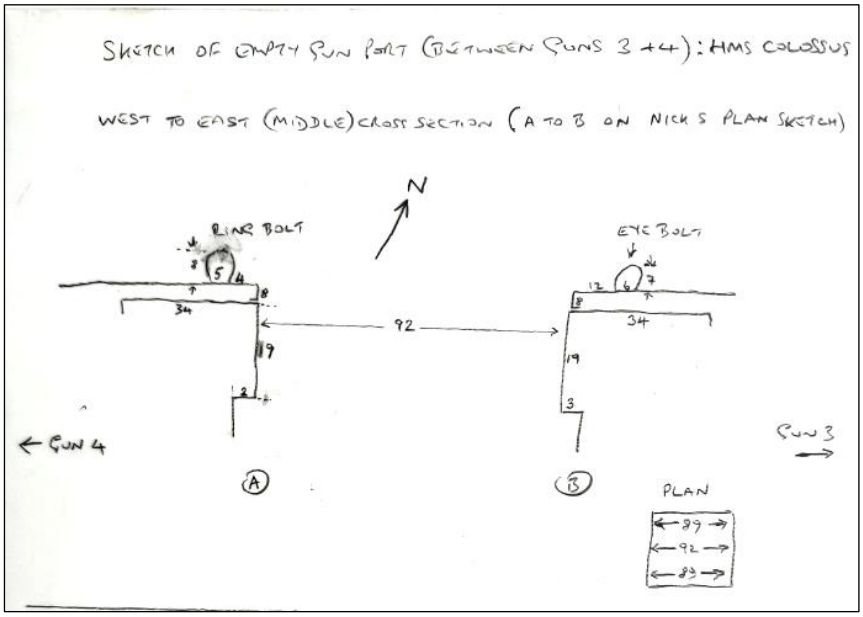


Fig 19
An east-west profile sketch of the gunport drawn in September 2024 by Jezz Davies

Referring to figs 17, 18 and 20 it is clear that a great deal of timber shown on the 2001 plan no longer exists. Much of the inner hull planking has now gone - exposing the gun port lintel, sill beams and many more of the hull frame timbers. The inner hull planking was constructed of substantial strakes of around 12 inches wide by 3 inches thick, which were in near-perfect condition when first seen in 2001. it has only taken a little over twenty years for these to largely disappear from around the gunport. Similarly, the deck planking of the upper gun deck shown in fig 17 is, sadly, no longer with us.

It is now also possible to see damage to the gun-port lintel (the timber along the south side of the port), in the form of a missing central curved section. This was probably caused by the upper part of the gun muzzle striking the lintel on recoil (which could be particularly violent when the gun was hot). To reduce this type of damage, naval guns have flared muzzles while garrison guns often have a ring at the muzzle. There is a similar piece missing from one end of the gun port sill.[15]

The sediment level record indicates that the seabed levels around the wreck have continued to fall – inevitably exposing more timber. But it is now clear that significant parts of the hull timbers have decayed and no longer exist. Unfortunately, our site plan is now a record of what existed when it was drawn, not what is there today.

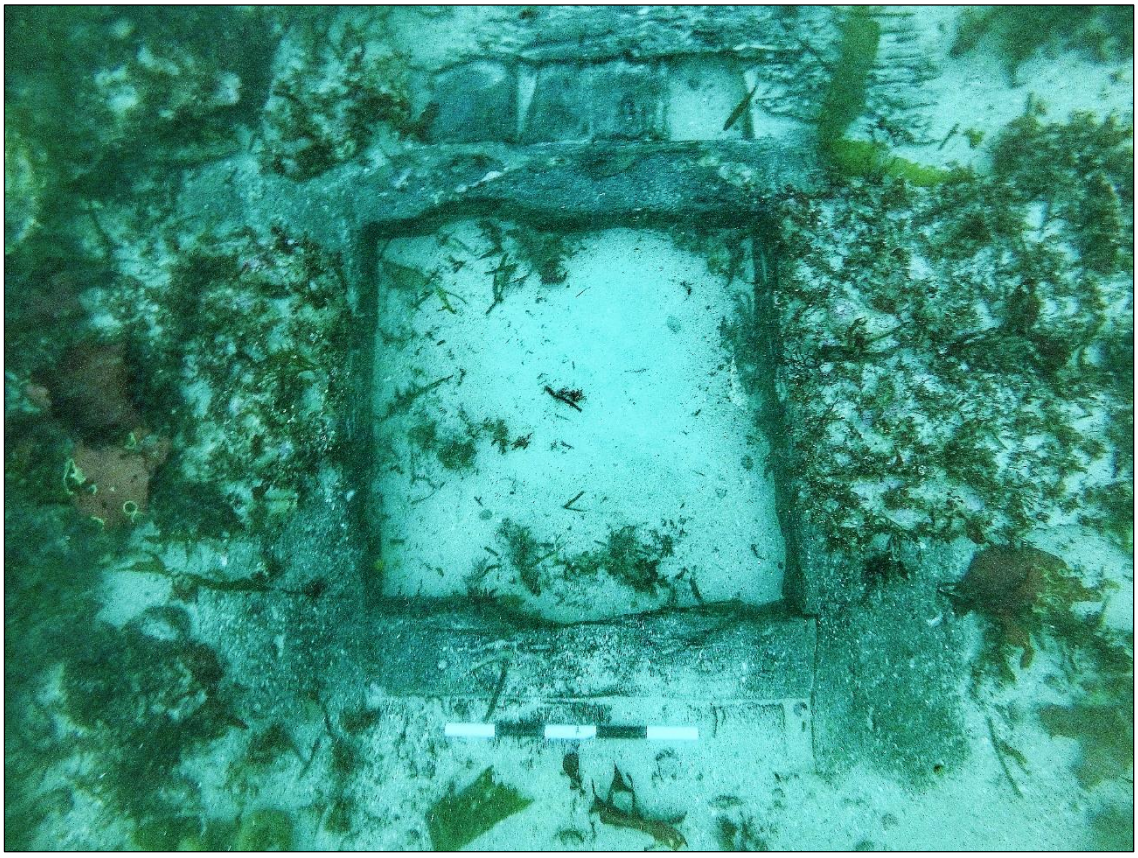


Fig 20
The gunport, partially de-weeded in September 2024. It is clear how decayed the remaining inner hull planking is now (not long for this world), and the frame timbers are showing evidence of gribble and teredo attack. This is a good underwater photograph – but note how much more information is contained on the drawings above (figs 17 and 18); the ideal situation is to have both. North is up and the scale = 0.5m long

[15] The horizontal 'frame' timber above the gun-port was called the lintel, while that at the bottom was called the sill

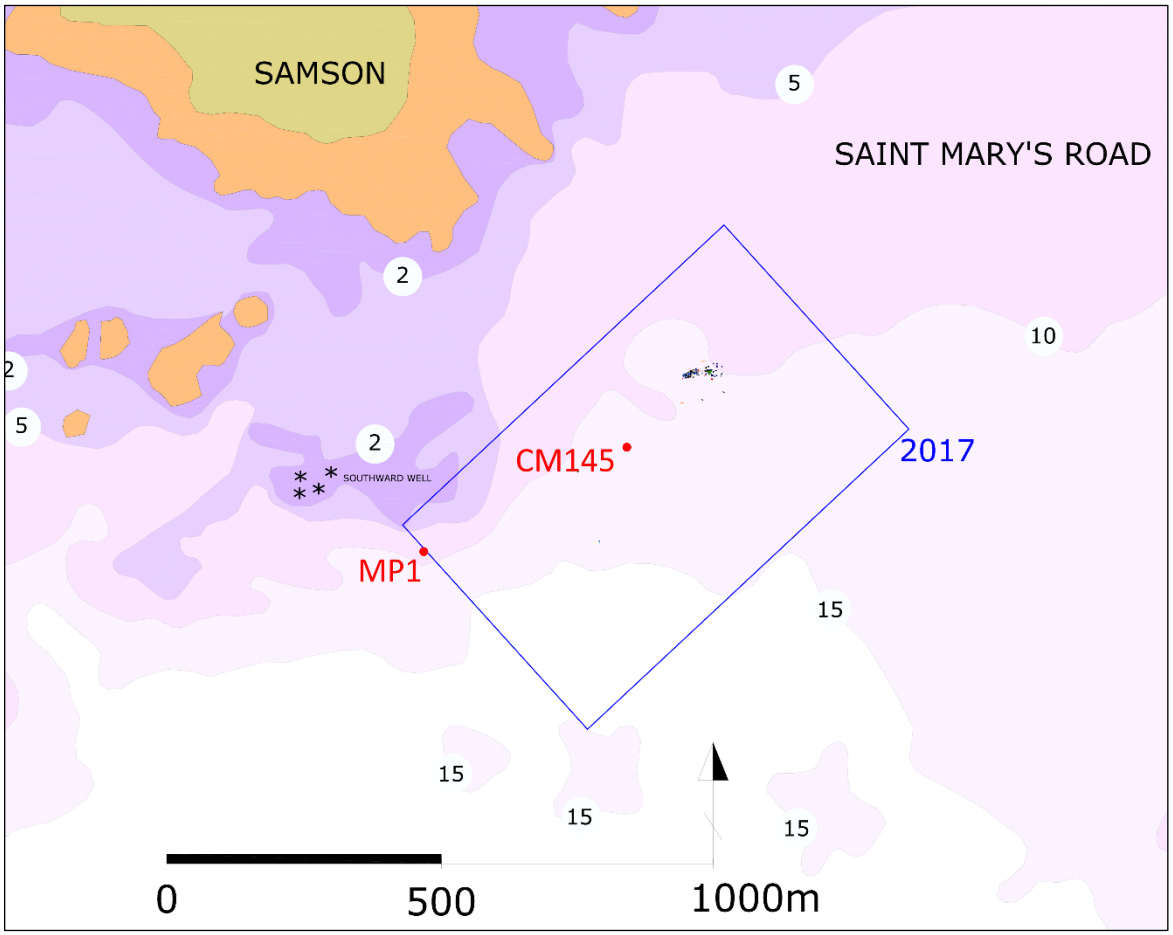


Fig 21
Plan showing the location of the debris field wreckage found in 2005, revisited in 2024(CM145), and the possible site where Roland Morris recovered the ancient Greek pottery (MP1). The blue rectangle shows the current designated area around the wreck

For many years we have been intending to revisit an area of wreckage discovered in the western debris field during the CISMAS Debris Field Survey in 2005.[16] In 2005, a number of pieces of timber and iron concretions were seen and their position recorded. We had speculated that this might be the area discovered by Tod Stevens in 1999 and described by Richard Larn at the 2002 International Shipwreck conference in Plymouth.[17] He said it was a vast area of timber decking in pristine condition. We have been told that this no longer exists, and that some of it was used to make garden furniture on St Mary's. There was also an enigmatic annotation on a very early sketch plan made in 2001 by Terry Hiron of the newly discovered stern site showing a westward pointing arrow and the text '*Approx 110m to end of visible timber*'.[18] Whatever 'visible timber' was, it forms an intriguing prospect.

[16] See *HMS Colossus Debris Field Survey,* 2006
[17] A dive apparently where TS showed an area of Timber to Richard Larn, David McBride and other sometime in 1999
[18] When asked about this in 2023 Terry Hiron replied 'I have no idea'

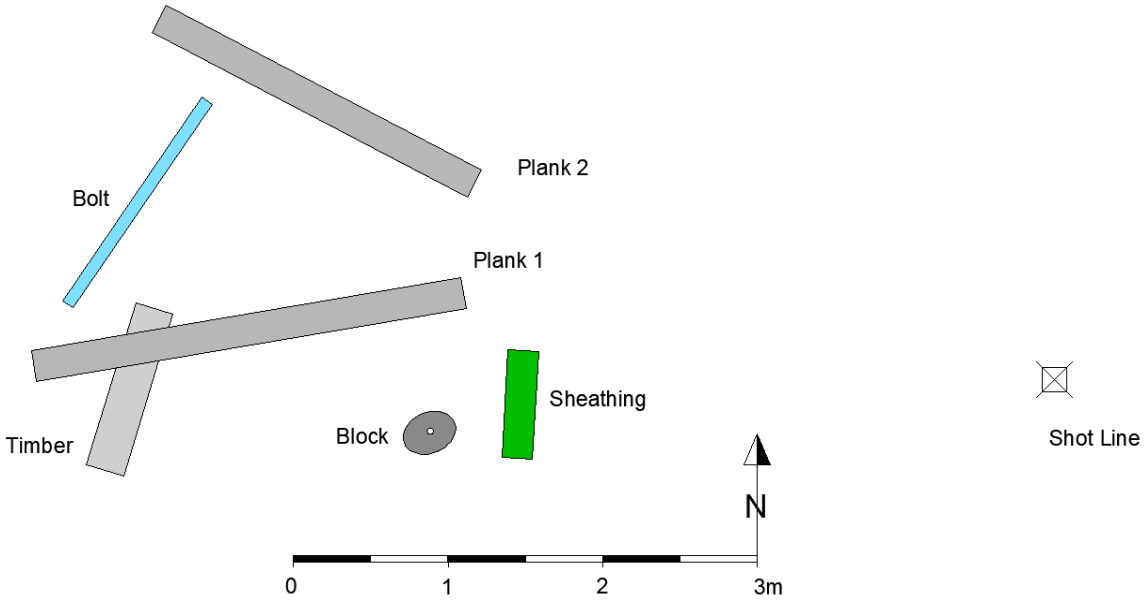


Fig 22
Schematic sketch of the items located in the search of the wreckage in 2024. Positions were recorded as a distance and bearing back to the shot line. Grey = timber, green = copper and blue = iron

This year we made the decision to revisit the remains we had found in 2005. The search did not get far – almost as soon as we reached the seabed, we started finding wreckage: a substantial timber single-pulley block (0.35 x 0.25 x 0.15m) which lay close to a folded sheet of copper sheathing, only partly exposed but confirmed by metal detector to be over 1.2m long. The sheathing had a row of regularly spaced nail-holes along the uppermost (exposed) edge.

Fig 23
The pulley block
Scale = 0.2m

Fig 24
The folded copper sheathing
Scale = 0.2m

Fig 25
The iron bolt
Scale = 0.2m

Fig 26
Plank 2
Scale = 0.2m

Fig 27
Plank 1 and timber
Scale = 0.2m

Not far from these there was a piece of planking (2.85 x 0.20 x 0.075m) which showed signs of attack by wood boring organisms. This lay over another piece of timber, thicker than the planking so possibly structural (frame or deck beam timber 1.10 x 0.25 x 0.11m). Close to this was a second section of planking (2.30 x 0.20m), and finally, a substantial iron bolt (1.60 x 0.08∅ m). Only a very small area was searched and it seemed that everywhere we looked there was wreckage. This area should be recorded properly and its true extent determined. As all the timber observed was showing evidence of attack by wood boring organisms, this needs to happen fairly soon.

It now seems possible that this was not the area found by Mr Stevens, as the position he recorded on his sketch plan of 2003 is over 80m from the location of this wreckage.[19] That position should also be investigated to determine whether any wreckage remains on that site. There is certainly more work to be done in this part of the debris field.

The Eastern Debris Field

As outlined in the background section above, once we knew that *Colossus* was wrecked where the 'stern' wreckage lies we realised that an eastern debris field was also likely to exist. The first stage in investigating this was a geophysical survey of the area to the north-east of *Colossus.*

Geophysical Survey

A geophysical survey was undertaken between 20-27th of April 2024 by a team of six people including charter boat skipper. The aim was to locate the hypothetical eastern debris field from the wrecking of *Colossus*. The survey was funded by Historic England (for further details see *Catching the Drift*, available at cismas.org.uk).

[19] He gave a slightly different position to Wessex Archaeology – which is 130m away from our timber. The difference is a single digit in the northing, so possibly a transcription error.

Analysis of the geophysical data has produced a list of potential targets / anomalies to be investigated. So far 230 magnetic anomalies have been identified as well as 102 sidescan sonar targets. We allocated half our available project time this year to investigating these anomalies. This amounted to three days of diving geophysics targets (which would have allowed 12 targets to be searched and recorded), but this was reduced to two days when a day of diving was lost due to bad weather.[20] We managed to dive seven of the targets in the two days.

Hunting for Treasure

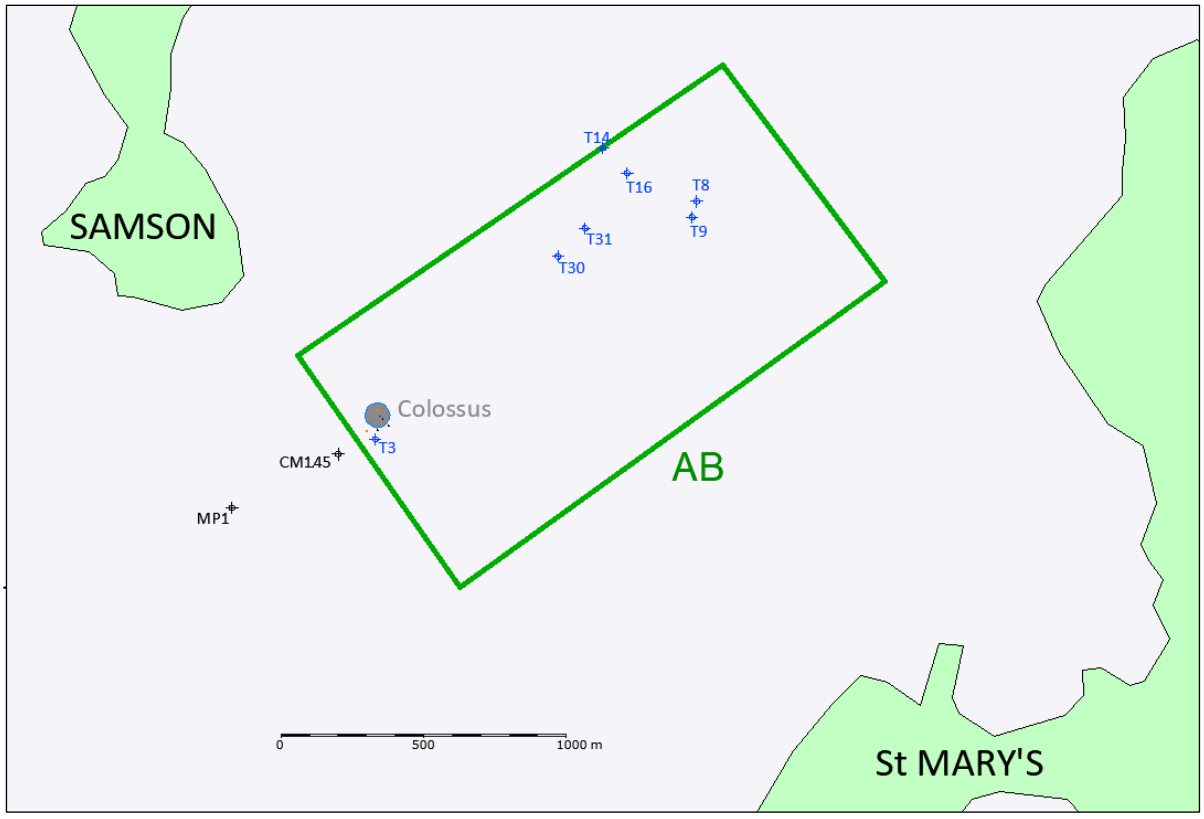


Fig 28
Plan showing the location of the seven targets searched in September 2024 (shown with 'T' prefix in blue). The green rectangle is the geophysics area AB – see *Catching the Drift* at www.cismas.org.uk

The difficulty was choosing which targets to dive from literally hundreds of chosen anomalies. One consideration was that targets were selected in pairs preferably less than 200m apart. This allowed them to be dived simultaneously by two dive teams while both remained in sight of the dive boat, allowing more targets per day to be investigated. Investigating these targets will be a long-term project.

[20] A week of diving in Scilly on the available charter boats consists of six days diving, two dives per day per diver – we almost always lose at least one day per week to bad weather; as accommodation and transport to and from the islands has to be pre-booked, this lost time cannot easily be regained

T3
Sidescan target = MJ_38
Magnetic Target = none
Not an outstanding target but its proximity to the Colossus stern site (33m south of Gun 9) allowed investigation while we were moored at the stern site (just south of Colossus on fig 28).

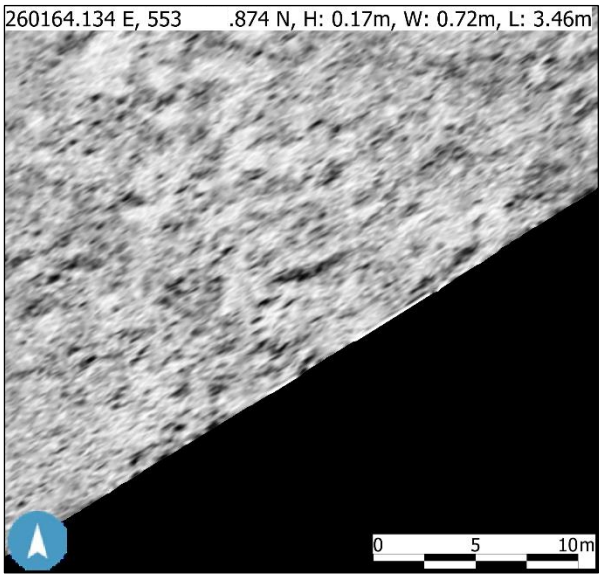
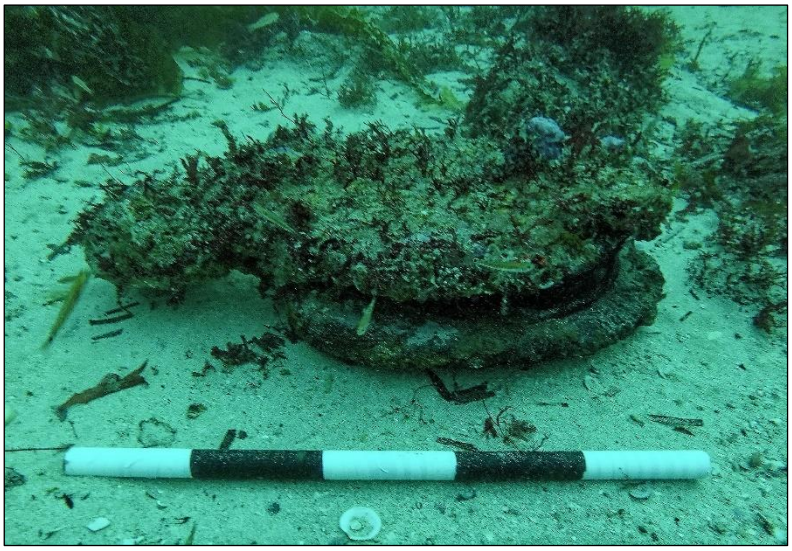


Fig 29

Left: sidescan target MJ_38, described as linear features. There were no detected magnetic anomalies near this target

Below: what was found on the seabed at that location – a timber pulley block with iron concretions



What was found at the location specified was a large pulley block with attached iron concretion 0.60 x 0.35 x 0.13m. It seems unlikely that this block would have caused the linear features observed on the sidescan imagery, but nothing else was visible at that location.

T8
Sidescan target = MJ_35, MJ_36 & MJ_37
Magnetic target = AB24_3, 6nT, (estimated as 50-250kg of iron)

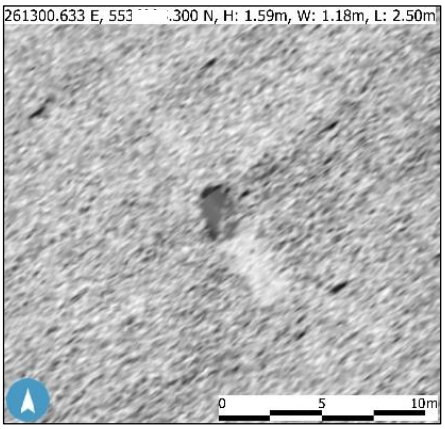


Fig 30
MJ_35 'hard target with shadow'

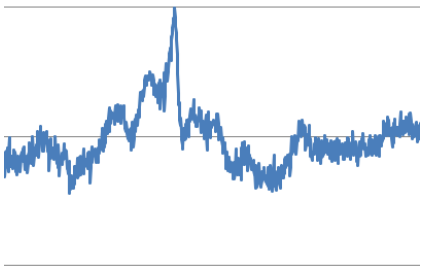


Fig 31
AB224_3 time series graph of magnetic target (estimated as 50-250kg of iron)

This target was searched for a radius of 20m around the sidescan target position. Two anomalies were located, a fragment from a large iron anchor and a small raised mound of eelgrass 0.15m high and 3m in diameter. The mound of eelgrass is the only possible cause of the object shown on the sidescan image (fig XX) – the rest of the area searched was flat, featureless sand. The small mound was found 16m to the west of the shot line. We also found part of a large broken iron anchor partly buried in the sand some 8m to the west of the shot line (fig 32). This consisted of the broken off end of one arm, with the palm partly buried in the sand. The arm of the anchor is 0.22m square in section at the point it has broken, and the palm is 0.6m at its widest point. Not enough of the anchor was exposed to determine its age – but it is possibly 18-20th century. This area has been used as an anchorage for centuries, and anchors are a fairly common find.

Fig 32
Left: the shallow mound covered in eelgrass. Right: the broken arm of an iron anchor with part of the palm visible; the bill of the anchor was not exposed. Scale = 0.2m

T9

Sidescan target = MJ_34, Scatter of small objects plus linear feature
Magnetic target = AB23_1, AB22/1_4 & AB22/2_1 (estimated as 200-900kg of iron)

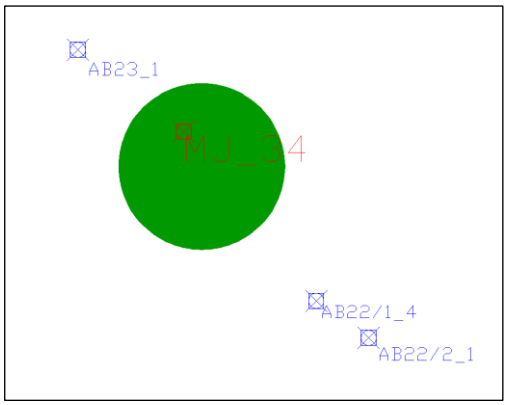


Fig 33

Plan showing the three magnetic anomalies clustered around the sidescan target MJ_34 (AB23_1 is 10m from MJ_34, AB22/1_4 is 16m and AB22/2_1 is 21m (15m run line spacing)

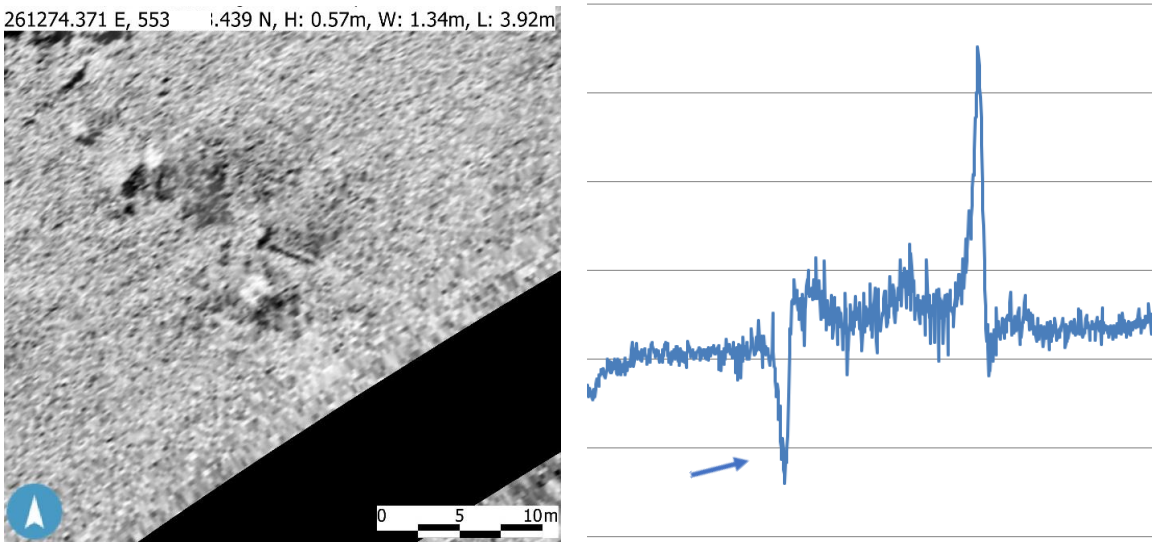


Fig 34

Left: sidescan target MJ_34 scatter of small hard objects plus linear feature. Right: time series graph of magnetic animally AB23_1 an 8 nT negative spike

The area around this target was searched to a diameter of 40m. A number of areas of exposed rock were found, all with tabular fissures so that the rock had a superficial resemblance to a laid pavement. No doubt natural formations like this are what gives rise to the persistent rumours of a paved road underwater between the islands of St Mary's and St Martin's. As no iron objects were observed, the origin of the three magnetic anomalies remains a mystery.

Fig 35
Two examples of the exposed tabular rock encountered in this search. These are thought to be natural formations. The scale is 0.2m long

T14
Sidescan target = MJ_51 'Cluster of small features and boulders'
Magnetic target = AB 38_1, 105nT dipole (estimated 1-6 tonne of iron)

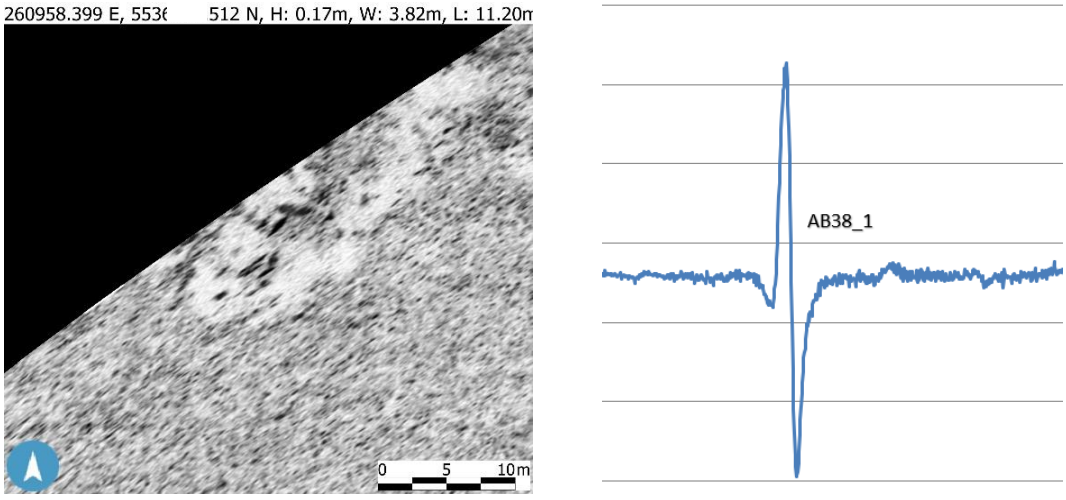


Fig 36
Left: sidescan image of selected target 'cluster of features and boulders. Right: time series graph of magnetic anomaly AB_38_1, a 105nT dipole

One of the reasons for selecting this target was the magnitude of the magnetic anomaly, but sadly in this case it was probably caused by a disused, broken, steel armoured electricity cable partly buried on the seabed (fig 37). Several fragments of 19-20th century pottery were also seen (normal for this area as it has long been used as an anchorage).

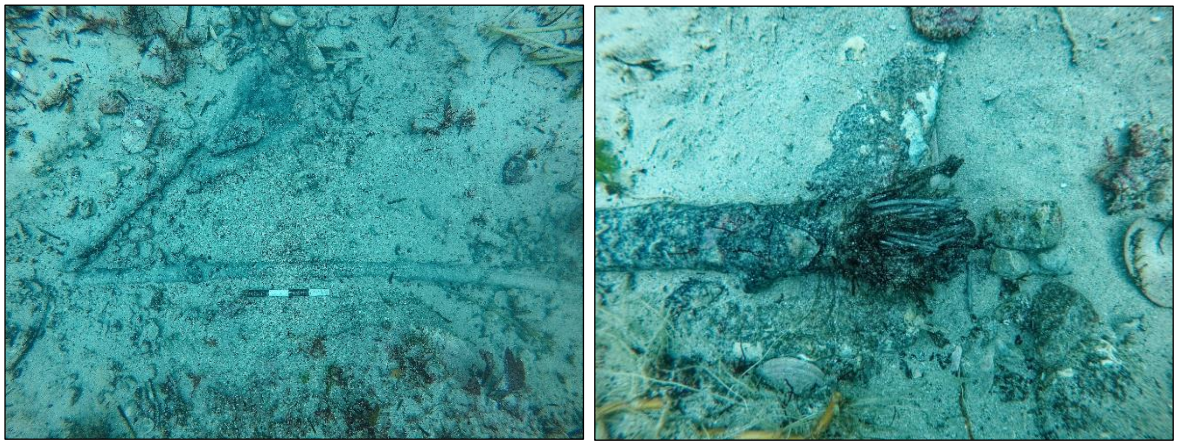


Fig 37
Left: the broken armoured cable found partially buried on the seabed. Right: detail of the end of the cable

T16

Sidescan target = MJ_47 ‘looks unusual but probably geology’
Magnetic target = AB 33_2 5nT spike (estimated 100-500kg of iron) 3m from SSS pos

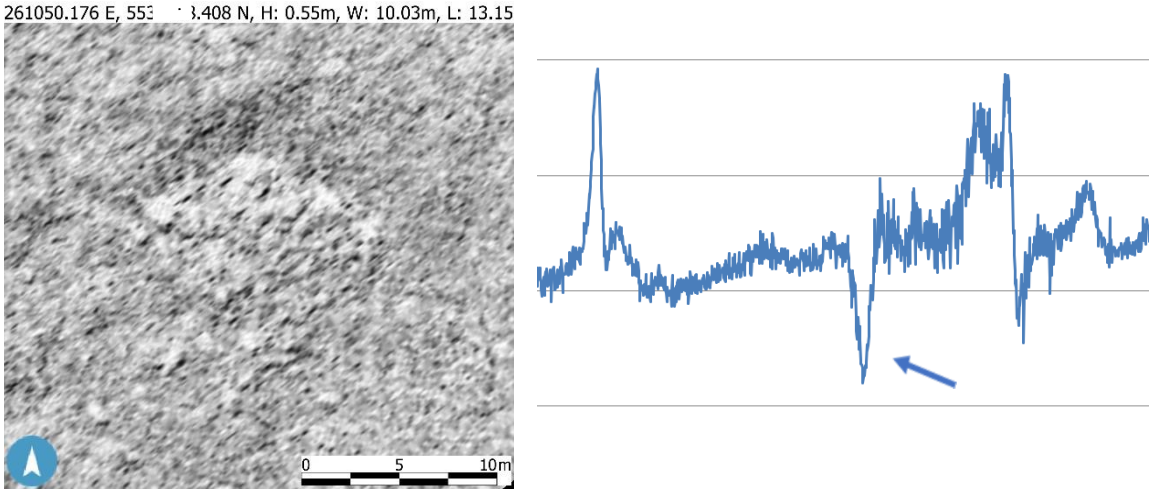


Fig 38
Left: sidescan image showing ‘unusual feature’. Right: time series graph showing 5nT negative spike

The shot line was within a small pile of boulders, which was about 10m in diameter. This was surrounded by a sandy, gently undulating seabed covered with eelgrass. The stone pile was probably what was picked up by the sidescan but nothing was seen to account for the magnetic target. The cover photograph shows this search in progress over the eelgrass beds.

T30
Sidescan target = NS_AB28_3 'Small hard targets with shadow'
Magnetic target = AB 9_3, 10nT spike (estimated 200-1000kg of iron)

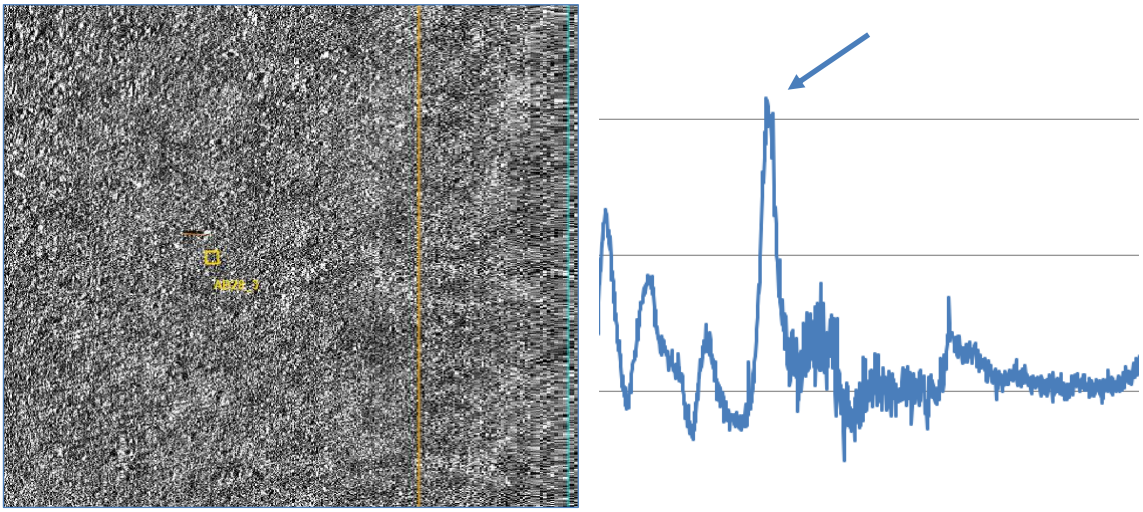


Fig 39
Left: NS_AB28_3 small hard targets with shadow. Right: time series graph of magnetic anomaly AB9_3

In a search over sandy seabed for a diameter of 60m, the only thing seen was an isolated rock about 0.5m square standing 0.35m above the seabed (sadly not photographed). No iron objects were seen.

T31
Sidescan target = NS_AB29_1 <2m> MJ_43
Magnetic target = No magnetic anomaly

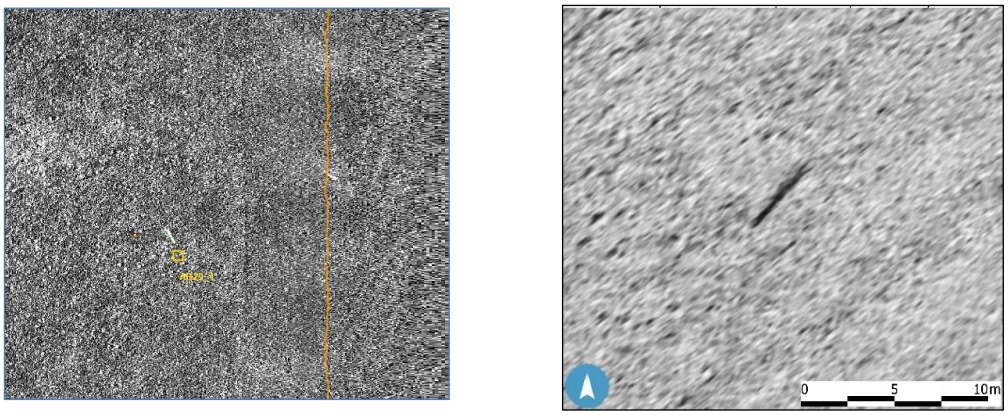


Fig 40
Left: sidescan target chosen by Nick Sodergren, linear hard target with shadow
Right: the same object chosen by Mark James (position differs by only 2m)

This sidescan target looked just like a gun lying on the seabed, but there was no magnetic anomaly in the vicinity. Diving the position revealed nothing at all noteworthy on the seabed despite searching a

diameter of over 50m. Various pieces of 19th-20th century pottery and glass were noted and photographed.

There are still a large number of targets from the geophysical survey which need to be investigated. We now know what the seabed looks like in this area, and can reappraise the target list in the light of the above findings. I am still confident that debris from *Colossus* will be found to the ENE of the stern wreckage.

Site Condition Audit

One of the tasks we set for ourselves this year was a rapid audit of the current condition of the site and dive trail. This was largely prompted by recent comments from the dive charter boat skippers that because of its condition, dive groups are not keen to dive the site. A particular problem is the weed which accumulates over the site and obscures the wreckage and dive trail.

The Scaffs

There are two distinct types of 'sea weed' on the site, mobile kelp (locally known as scaffs)[21] and much finer growths which adhere to the iron and timber of the wreck. Of the two, the mobile kelp forms the majority of the flora which covers and obscures the site. It consists of large kelp fronds, up to two metres in length, growing on a small rock or boulder. These probably originate from the shallow rocky ground to the south-west of the site, and are carried to the site on the flood tide. They become entangled in the wreckage which stands above the seabed and build up into very large mounds, sometimes as much as three metres tall.

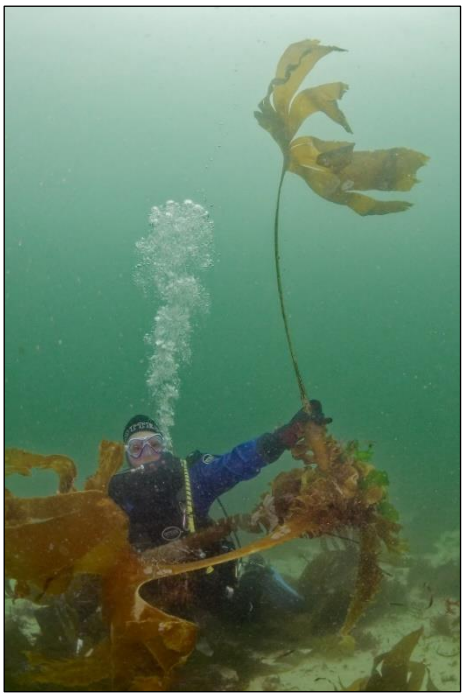


Fig 41

One of the mobile kelp fronds being held aloft by Kevin Camidge (not a small person) which demonstrates how large these can be

[21] See HMS *Colossus* Survey Report 2002, p 7

When this kelp dies it can also be the source of a ‘blizzard’ of decaying kelp pieces, reducing underwater visibility to less than two metres at times. The mobile kelp can be removed from the site, but it takes a team of six divers a couple of hours of hard work to clear the site.

Visitor Engagement

When the dive trail was created in 2009, it was designed to make the site accessible to divers and to engage with them, so that some might become involved with protected wrecks. It has become clear that reduced maintenance of the site has reduced its appeal to visiting divers. *Colossus* is a spectacular site when properly cared for, but when neglected it is somewhat underwhelming.

Fig 42

One of the row of upper gun-deck 18-pound guns as they were in September 2024

Fig 43
The same guns when the weed had been cleared in 2021. Note the inner hull planking in the foreground

These examples demonstrate how much survives under the cover of the mobile kelp. Clearing the weed usually keeps the site 'presentable' for several weeks or until the next storm. One possibility would be to occasionally clear the weed in advance of an advertised site open day/week, possibly timed to coincide with a field school in practical archaeology.

Fig 44
Above: the rudder gudgeon strap in September 2024 – the scale is inside the gudgeon pivot hole
Below: the gudgeon after de-weeding in 2021. The gudgeon is 3.3m from end to end

Sediment Levels

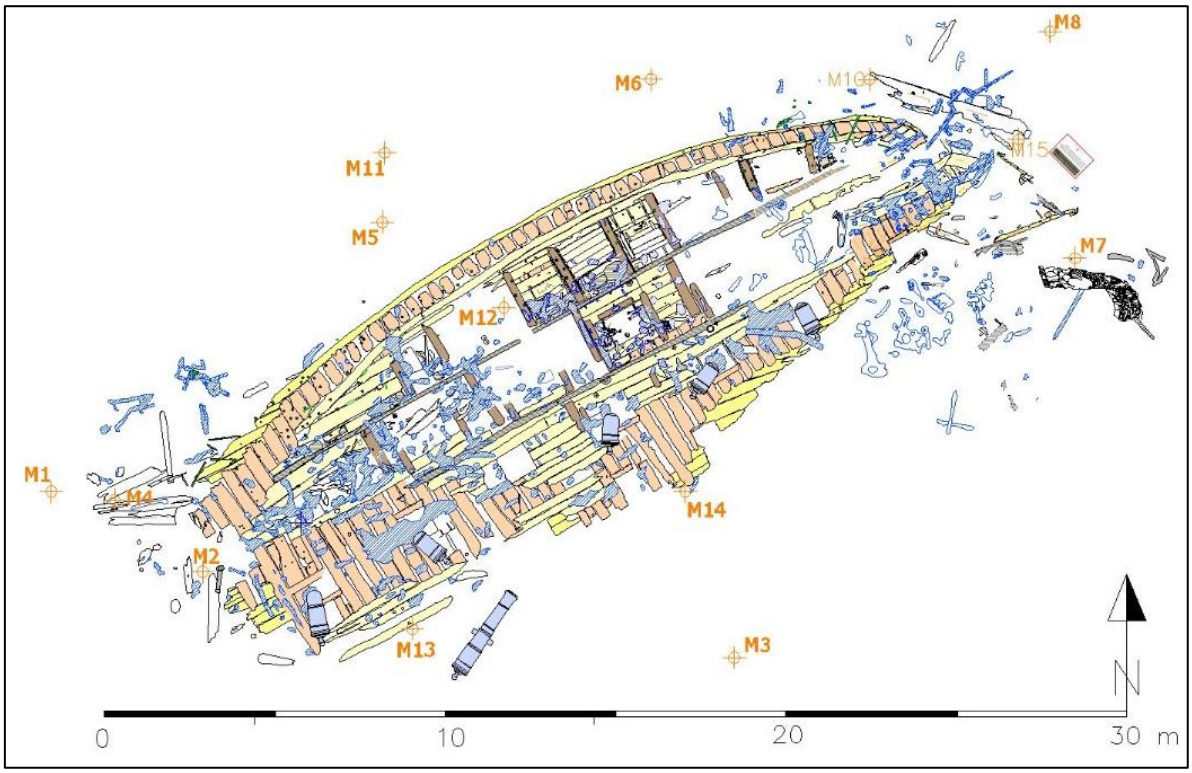


Fig 45
The distribution of the sediment monitoring points – M1 to M14 (There is no M10)

When the stern site was rediscovered in 2001 it was apparent that the sediment levels on the site were decreasing.[22] Since then, we have undertaken systematic ongoing measurements by means of 14 sediment monitoring points on and around the site. The results are not as we expected; they show that the levels can rise on some parts of the site while they fall on others. The overall trend has been for a fluctuating, but steady diminution of the sediment in the area of the *Colossus* wreckage over most of the last 23 years. This year the sediment had risen at three of the monitoring points and fallen at the remaining eight. Three of the points M3, M4 and M7 are now missing.

The overall mean sediment change for the 11 remaining monitoring points is a fall of 19mm since September 2023 (fig 46). This clearly demonstrates that the sediment levels on site continue to fall, putting the buried wreckage at risk.

[22] Many features standing above the seabed exhibited bands free from flora at their base – these had been colonised by flora by the following year. This indicated that these parts had been newly exposed

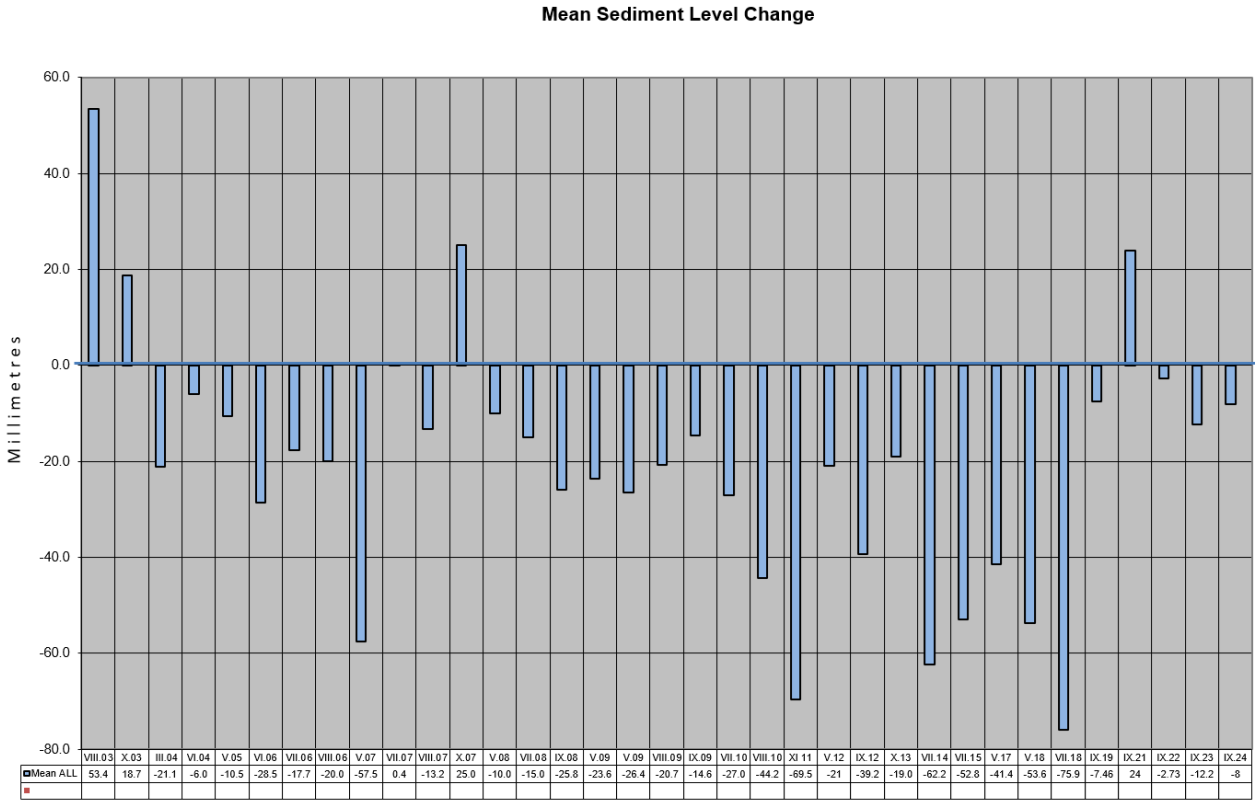


Fig 46

Bar chart showing the mean sediment change over all sediment monitoring points since September 2023.

The monitoring points consist of half-metre long stainless-steel bar with 25mm rings welded to their ends. The rings are stamped with the ID number for that point. They each have a yellow plastic tag identifying the monitor point. The tags are now illegible due to dense black marine growth obscuring the numbers. The tags are in need of replacement and the three missing monitoring points need to be reinstated to enable sediment monitoring to continue on this site. The sediment level is recorded by measuring the length of steel bar exposed above the seabed.

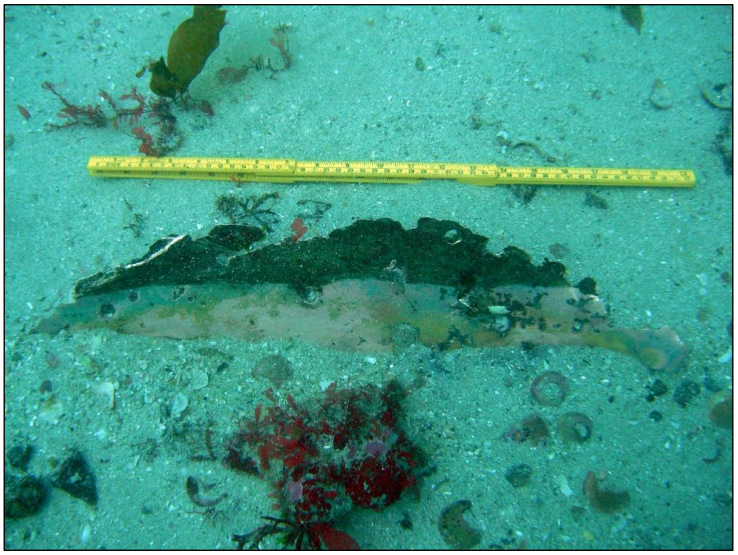


Fig 47

An example of upstanding objects demonstrating a fall in seabed sediment levels - a piece of copper sheathing on the wreck clearly showing where the copper has been newly exposed by the falling sediment levels

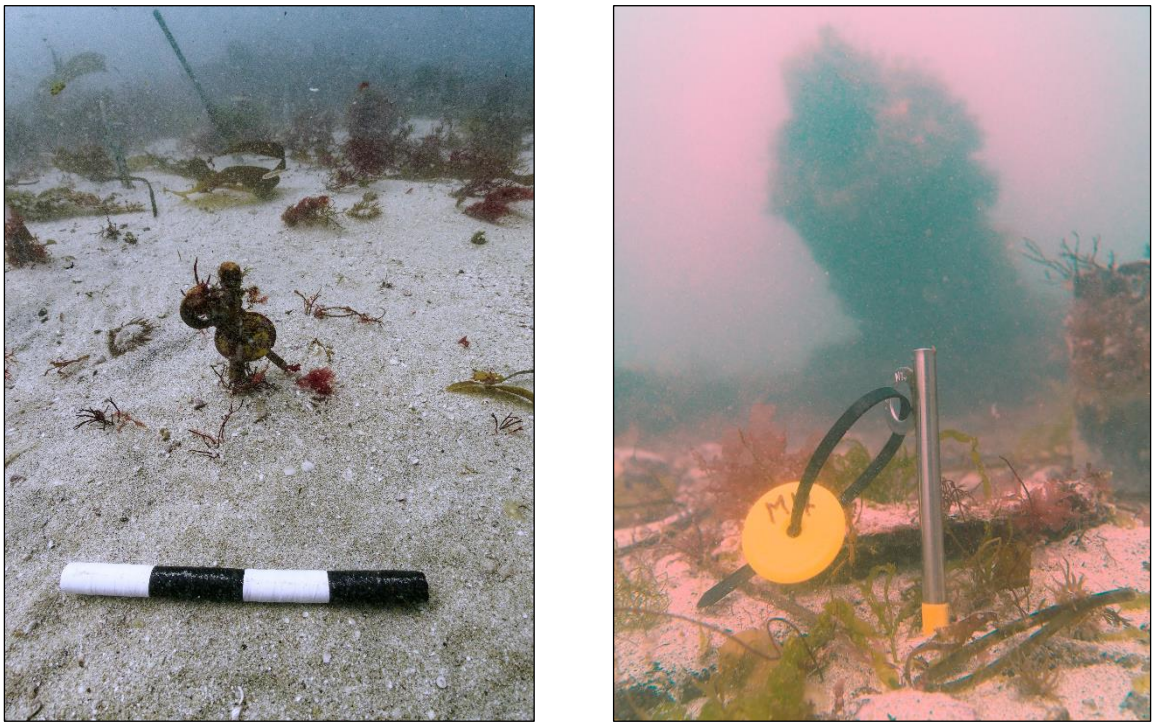


Fig 48
Left: A point after one year on the seabed - the 'weed' growth gets much worse after 2-3 years on the seabed.
Right: Sediment monitoring point when first installed.

Unless the sediment monitoring points are overhauled and the missing points replaced, the sediment monitoring at this site will come to an end.

The Dive Trail

The dive trail was installed in 2009, and was extended and refurbished in 2012. The installation and extension were enabled by a grant from Historic England.

The Mooring Buoy

Access to the site is by a permanent mooring buoy situated 22 metres to the north-east of the site. The buoy is attached to a concrete block by a rope and chain – these are sturdy enough to allow the dive charter boats to moor to the buoy. The buoy, rope and chain need to be replaced periodically. This replacement has been undertaken by Tim Allsop (previous dive charter boat skipper) in the past – but this might not be the case in the future.

Fig 49

Left: the mooring chain in September 2024 (recently replaced) Right: the previous mooring chain

The Seabed Sign

The 22 metres between the mooring and the start of the wreck is spanned by a leaded line. The start of the dive trail is marked by a seabed sign. This sign is made from a white polycarbonate plastic board[23] fastened to a concrete block with stainless steel screws, and has been replaced twice since it was installed in 2008.

Fig 50

Left: the original seabed sign installed in 2008 Right: the same sign after two years on the seabed

[23] This was in fact a CISMAS A3 drawing board, similar to those sold by NAS

This sign was made using commercial cut vinyl signage attached to a white A3 polycarbonate board. It was replaced with a similar one after the original was damaged by well-meaning visiting divers attempting to clean the flora from the sign using a dive knife. This type of sign quickly becomes illegible through marine growth over the face. For a while it can be successfully cleaned using nylon pan-scouring pads, but after about five years becomes scratched and is no longer cleanable.

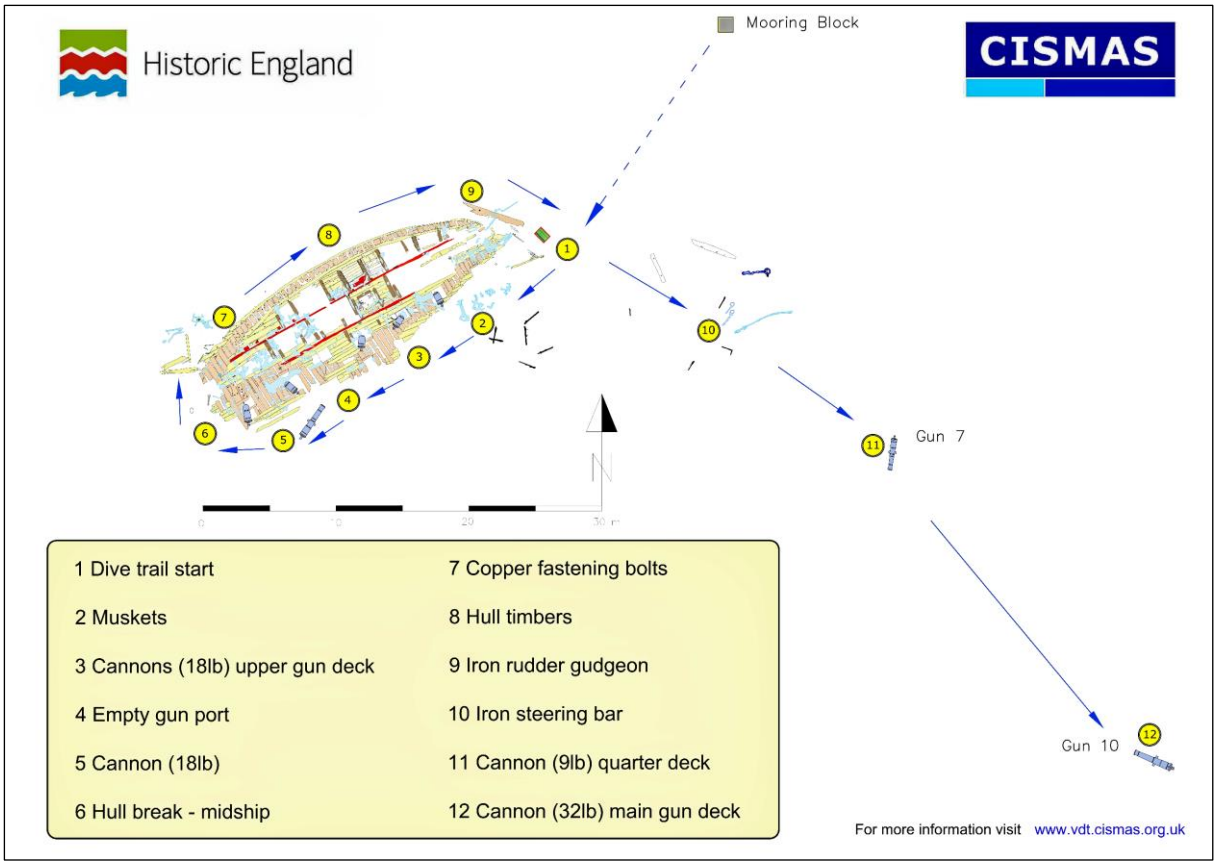
Fig 51
Left: The C-Tag sign shortly after installation in 2015 Right: The same sign in September 2024 (after some cleaning)

In 2015 we installed a new seabed sign made by a local company, C-Tag. They specialised in providing seabed signage for oyster fisheries, and these signs were resistant to fouling by marine growth for about five years, after which the marine growth started to colonise the material of the sign itself so it could no longer be successfully cleaned. C-Tag were still in business in 2022, but have since been taken over. As the new owners were quoting a price well beyond our means, the sign has not been replaced since 2015. It is now just about legible, but is unlikely to be for much longer.

If the dive trail is to continue, we need to consider installing a more permanent sign. We should perhaps take some advice from English Heritage who use a variety of different materials in their outside signage. Laser-etched copper or stainless steel would probably make a good underwater sign which could be easily cleaned.

Dive Trail Markers

The dive trail is defined by a series of numbered station markers. These appear on the underwater guide slate and help inform those exploring the trail as to where they are on the wreck. Each station marker has a number on the floating wash-buoy which corresponds to a description of what can be seen at that station on the guide slate. Each station also has a white arrow showing the direction of the next station marker (these are only visible when the markers have been newly cleaned of ‘sea weed’- fig 53).



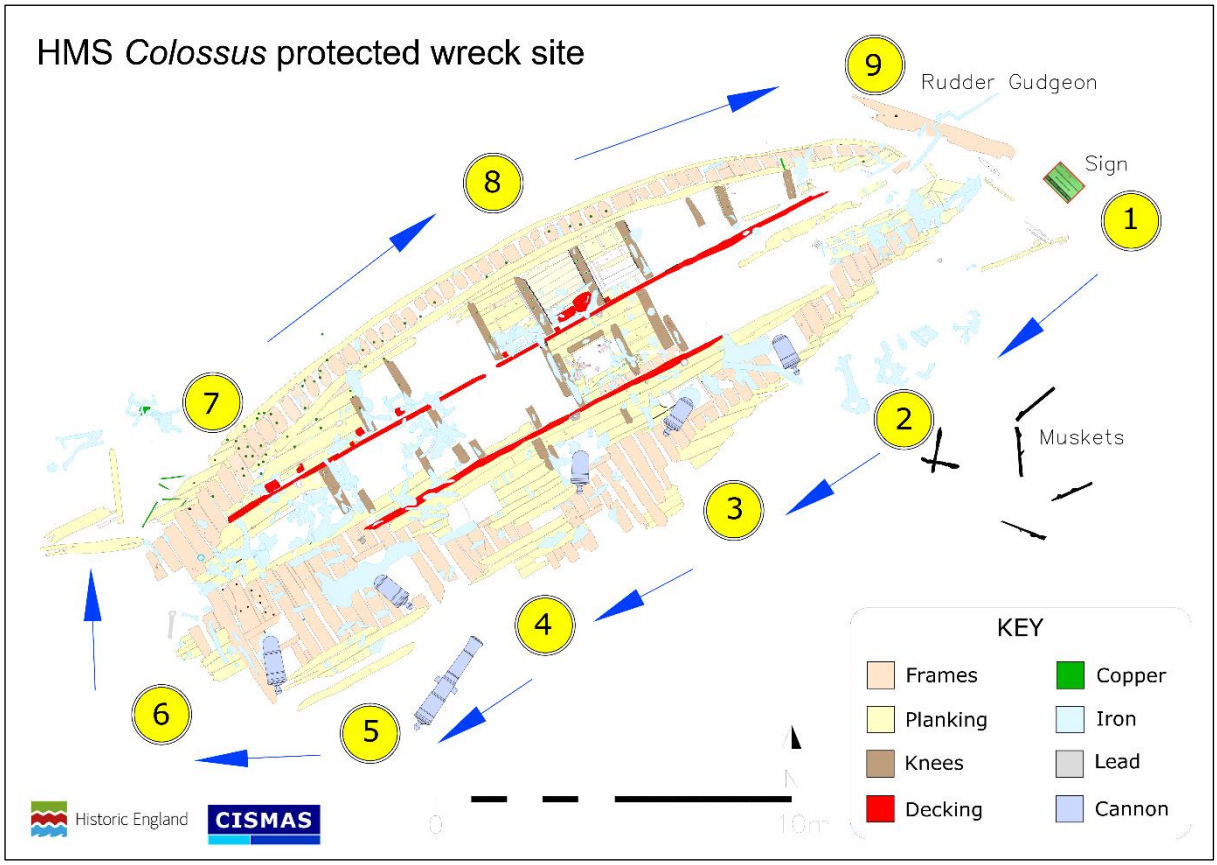


Fig 52

The front and back faces of the current *Colossus* underwater dive trail slate – showing the location of the dive station markers and points of interest

Fig 53

Station marker 4 shortly after it was installed in 2009. Note the white arrow on the concrete base showing the direction of the next station marker

One of the problems besetting physical dive trails is maintenance. Marine growth builds up on the station markers, making the numbers impossible to read. Many different solutions have been tried, including commercial and homemade anti-foul paints, embossed number tags and stamped metal disks. On this site, all were defeated by the luxuriant growths of ‘sea weed’ over anything we put onto the seabed.

Fig 54

One of the station markers in 2024

Fig 55
Left: one of the station markers as they are now, the numbers completely obscured by marine growth
Right: in 2015 when the buoys were replaced and embossed numbered tags installed

A solution to this problem would be to mark the stations using a system which would work even when covered in marine growth. One possibility is outlined in fig 56 below. New underwater guide slates would need to be made to correspond with the new station markers.

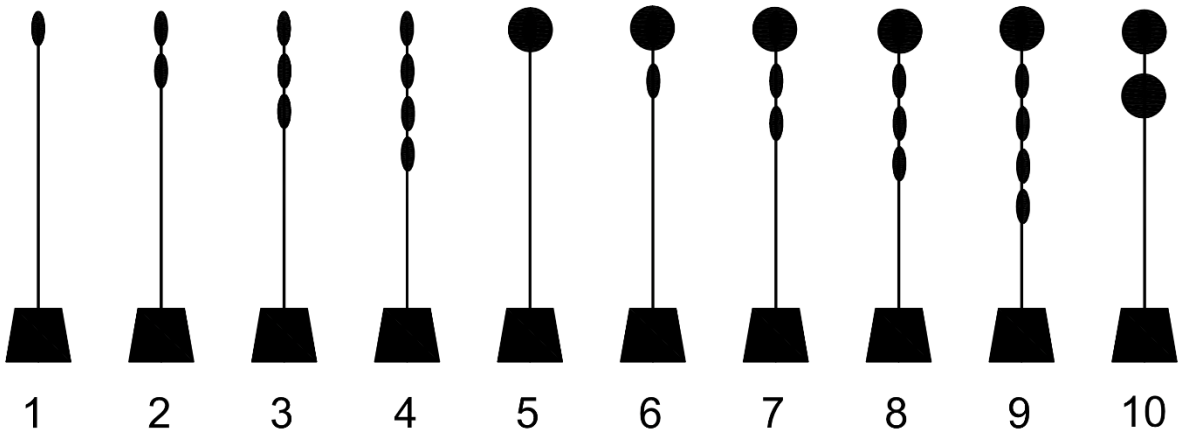


Fig 56
A proposed scheme to number the dive trail station markers using two different sizes of float. The small oval floats (net floats) would each represent 'one' and the larger, round floats (wash buoys) would represent 'five' – the system is additive.

Fig 57
The bottom line used to guide divers to the outlying features at stations 10-12. This line can collect large tangles of kelp and be dragged off the site by the flood tide – but without it, many divers lose their way

Conclusions

We have made a start on the investigation of the geophysics targets in the 'eastern debris field'. Although nothing of outstanding interest has been found so far,[24] we have only dived seven targets this year and have dozens yet to investigate. Clearly a long term project, but the more we dive this area the more we will come to understand the geophysical data.

The recording undertaken in the empty gunport this year has highlighted just how much of the wreck has disappeared since the initial recording in 2001/2. This is the first time we can actually say exactly which timbers have gone in a specific area – though we have long suspected that large areas of timber are no longer extant. This technique should perhaps be applied to another small part of the

[24] I console myself with the fact that Carter was in much the same boat before he found Tutankhamun

wreckage – probably at the north-east where it was drawn at the more detailed scale of 1:10. I would not be surprised if this too shows that significant parts of the wreck are no more.[25]

The sediment level monitoring has again demonstrated and quantified the falling sediment levels on the seabed around the wreck of *Colossus.* However, some sediment monitoring points are now missing, and those that remain are in need of maintenance. The choice now facing us is whether to refurbish the sediment monitoring system, or discontinue sediment monitoring on this site altogether.

The successful identification of the large iron object as the broken shank of the stream anchor was one of the high points of this year's project. It has demonstrated the possible value of investigating in the future some of the larger iron concretions on the site. This can only enhance our understanding of *Colossus* and other similar wrecks – where the concreted iron is usually the least understood element of the wreckage.

The exploratory dive on the area of wreckage in the western debris field was also a great success. It has demonstrated that there is a variety of different materials (wood, iron and copper) surviving in this area – and that it is worthy of proper recording before the timber succumbs to wood-boring beasties, and the copper to 'shiny bits' magpie divers.

The dive trail is now in a poor state, and this is probably one of the reasons why the site has not been attracting visiting dive groups to the extent it once did. We have suggested a number of possible remedies but decisions on the future of the *Colossus* dive trail will need to be made fairly soon.

Decisions Decisions…

In the following areas a decision in the near future would be beneficial to both the site itself and those involved with it:

The Dive Trail

I would suggest that this either needs to be either improved/altered to make it more attractive and informative to visiting divers, or removed from the site altogether. If we are to retain a physical dive trail, then the station markers, seabed sign and underwater dive slate all need to be replaced or updated. If this is not undertaken, I would suggest that it might be prudent to remove the ropes and station markers from the seabed, leaving the wreck site in a more 'natural' state rather than one of apparent neglect. Final decisions should be preceded by consultation with the dive skippers and other users of the site.

The Site Mooring

The original boat mooring on the site was tied to Gun 1. It was eventually moved to the offsite mooring block and has since been maintained by the local dive boat skippers Tim and Izzy Allsop.

[25] This part of the wreck was recorded in great detail, after which half of the area was covered with Terram 4000 as part of a long-term trial of the efficacy of this technique of protecting exposed wreckage – see EH5235 *Colossus Stabilisation & Recording* 2008

While they are willing to maintain this mooring all is well – but if this arrangement ended, an alternative would need to be established.

Sediment Level Monitoring

Is this something which should be continued? I have long thought it would be good if someone with some expertise in oceanography/sediment transport could be co-opted – but to date nobody has shown any interest.

What Price Archaeology?

The cost of diving in the Isles of Scilly has always been unusually high. We reduced the cost to volunteers this year by paying for the charter boat from CISMAS reserves, but those reserves are now gone. We are concerned that the cost of participation may deter participants, especially newcomers and students. All our project work is undertaken entirely by volunteers and this report demonstrates what can be achieved in a single week on the *Colossus* protected wreck site.

Colossus 2024 Project	
Number of divers	7
Number of dives	51
Minutes underwater	3169
Hours underwater	52.8
Cost per minute / hour	£1.90 / £114
Project cost	c. £6000

The Voice of the People

Once again the team were invited to contribute to the project report, and I am delighted that they all chose to do so. The following offers some very different perspectives on our community archaeology efforts.

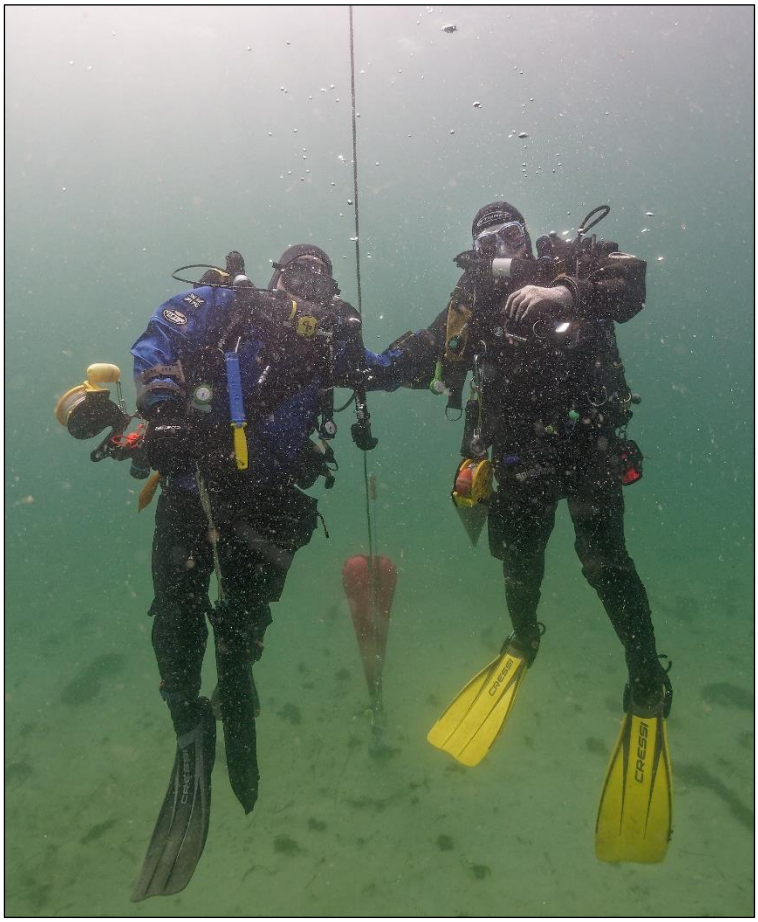
Departing the Waves by Nick Sodergren

I originally learned to dive through a local BSAC diving club back in 2009, as a 40th birthday present from my wife. My instructor for that course and all my subsequent dive qualifications was none other than our project diving supervisor Brendon Rowe, who also introduced me to CISMAS and particularly to the long-running projects on HMS *Colossus*.
I first became involved as a volunteer on the *Colossus* site about ten years ago and have been privileged to become a regular member of the CISMAS team since then, with many visits to the site in that time.

Unfortunately, back in July 2024 I suffered a decompression illness after a recreational dive. Whilst I was restored to good health after therapy in a hyperbaric chamber, this was the second time I had suffered a 'bend' within three years, so in the interests of my health, I have made the difficult decision to stop diving. The diving on and around *Colossus* for the 'Catching the Drift' project was therefore to be my 'swan song' as far as diving goes.
One aspect of the project was for the various team members to make an addition to the 25-year 'finds' repository which is buried on the seabed near to *Colossus*, and which is due to be recovered in 2037. We were given the brief to select one meaningful item to add to the repository.

Fig 58

Nick (on the right of the picture) and Bren ascend from Nick's final dive – a very sad day for CISMAS and certainly the end of an era (KC)



While I was in my garage at home, packing my final bits and pieces for what I knew would be my final dive trip, I saw a golf ball on the side. This seemed poignant as I had already decided that as my weekends are no longer to be dominated by diving, I would take up golf as a substitute hobby. That golf ball is now buried on the seabed near to HMS *Colossus*... hopefully it will be the last time one of my golf balls ends up in the water, but I suspect not!

Food for Thought by Andrew Earle

The food for the HMS *Colossus* 2024 expedition was chosen to reflect the cargo and final voyage from Naples including some of the more traditional food eaten on British naval ships of that time. Research was undertaken using a variety of sources including Hannah Glasse's *The Art of Cookery Made Plain and Simple*, *Feeding Nelson's Navy* by Janet McDonald and *Lobscouse and Spotted Dog* by Anne Chotzinoff Grossman. I am grateful to food historian Dr Annie Gray for her advice.

HMS *Colossus* left Naples with provisions to feed the men and officers calling at Valetta, Algiers, Gibraltar and Lisbon. *Feeding Nelson's Navy* reports that the sailors had a diet that gave them 5,000 calories per day to undertake the hard work of sailing the vessel. In honour of the meat free 'Banyan' days that the Navy had on Monday, Wednesday and Friday, 2 vegetarian dishes were chosen.

Fig 59

Double-shotted plum duff – apparently a firm favourite in the Georgian navy, and a 'substantial' pudding

Our initial dish was chosen to reflect the Greek origin of the pottery that *Colossus* carried – moussaka and Greek salad.

Two Italian dishes were chosen as the starting point of the journey - roasted tomato risotto and a vegetarian pasta bake. Unfortunately, the pasta bake had to become a meat dish as the butcher had over-supplied mutton for a meal later in the week, and there was a risk of the meat deteriorating.

This would not have been a problem for Hannah Glasse who recommended leaving the mutton for as long as possible before cooking. All meat in those days would have been boiled in a net bag by the ship's cook, who had no formal training but was usually a Greenwich pensioner – a seaman who had been disabled, so often missing one or more limbs. The role of cooking was arguably less important than making sure that everyone had their fair share.

The visit to Algiers prompted an African dish of a chicken stew flavoured with cayenne pepper and peanut butter served with couscous. We also dined on two more traditional dishes: 'sea venison', which was actually mutton slow-cooked in red wine and served as a pie with a suet pastry crust, and salt pork with pease pudding (the ration included a pint of dried peas per man, twice a week).

Following the main course, we enjoyed cheese boards, pancakes and sailors' favourite plum duff, as well as the traditional crumpets (or strumpets as they are known by CISMAS) as an afternoon snack. I don't think we quite achieved 5,000 calories but it was well on the way towards this target!

Detectorist by Jezz Davies

The 2024 HMS Colossus project presented an opportunity to test a Quest 'Scuba Tector' metal detector, recently purchased by one of the team members, Jezz Davies. CISMAS has traditionally used an Aquascan metal detector which, whilst being effective, is cumbersome in that it has separate battery, detector coil and earpiece.[26] CISMAS has also recently tested 2 Quest Scuba Tector Pro devices, both of which succumbed to water ingress.

Effective down to 60m, the simple Scuba Tector has no wires, is just 42cm long and has audio, vibration and LED illumination indicators (fig 60). The detector is easily recharged (by USB connection) and has a healthy battery life; the team operated with the device for over four hours in a single day without the need to recharge.

The first evening at base camp provided an opportunity to read and understand the operating instructions, in particular how to set the device to dive mode before deployment (fig 60).

During dives on HMS *Colossus*, the Scuba Tector was deployed on a number of circular searches, proving particularly useful in confirming whether targets were rock or concretion, surprisingly not always easy to establish underwater. The traditional sweeping motion for metal detecting was easily performed. When iron concretion or copper sheath was located, the detector could provide an idea

[26] The Aquascan is also very expensive – but has proved to be reliable over many years of use. In 2023 CISMAS purchased the pro model of the Scuba Tector, which has a light signal to indicate a reading, so that one of our members who is deaf could use it. However, it flooded after a few uses - as indeed did the replacement supplied. The more basic model seems to be more resilient to flooding (KC)

of how far buried metal extended, continuing to activate when metallic objects were buried to some depth and where excavation was not possible.

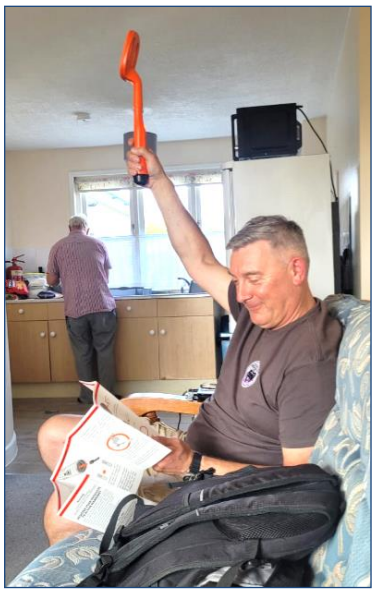


Fig 60
Above: the Scuba Tector
Right: Nick demonstrates the actions required to turn the device on and off in the water (not everyone was able to master this)

For me as a diver, being able to use a simple device to locate buried metallic objects very definitely added to the excitement during a dive, particularly in areas previously unknown.

The Scuba Tector is likely to become an effective addition to virtually all future dives, being so portable and easy to use. Further testing is probably required to establish the most effective method of attaching to a diver when not in use, especially during the ascent at the end of a dive.

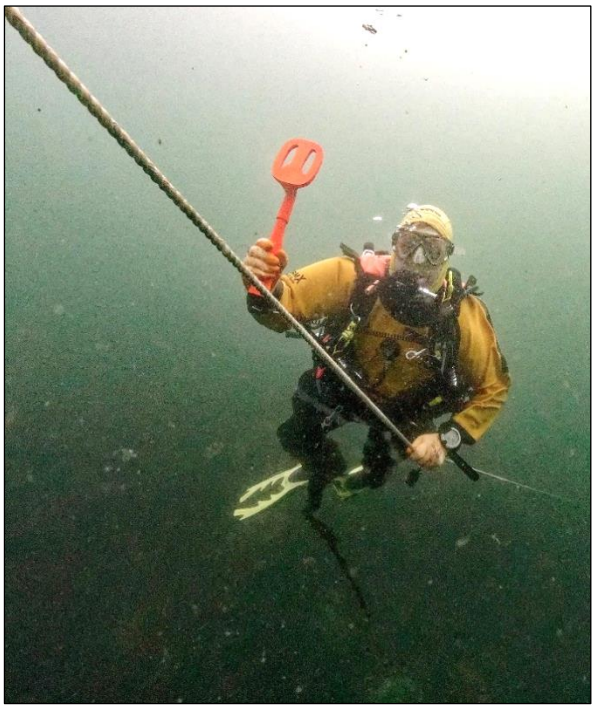


Fig 61
Jezz proudly displaying his new toy underwater during his ascent of the shot line

New Blood by Emlyn Morris

I was invited by Brendon Rowe to join the team as the designated photographer for the most recent CISMAS project. I am a student at Falmouth University studying Marine and Natural History Photography, and was probably chosen as I know how to operate a camera underwater. This being my first expedition trip outside the university and my first time diving the Scillies, I did not fathom the challenges that would arise while photographing. Getting to meet and work with new people beyond the confines of the university was a great experience for me, allowing me to form new friendships and to work during the trip with people who specialize in different tasks. We were working and living in close proximity on land and on water, but I found this allowed us to communicate our thoughts and ideas better, especially when gaining feedback on the images that I had taken on that day or selecting different targets that we would investigate on the next.

I came into this project with a miniscule amount of interest in underwater archaeology, but having been involved with the project, I have found myself researching about the dangers opposing underwater wrecks, in particular wooden wrecks such as *Colossus* - to the point where it has become the main subject for my university dissertation.

Being originally from Sandwell, West Midlands, an area classed as deprived, you would not expect to be given the opportunity to join a team of underwater archaeologists from Cornwall, but I did!
I would like to thank the Dive team at Falmouth University (Jane, Helen, Elle and Ruby) for teaching me the fundamentals of underwater photography, Sandwell Sub-aqua Club (Formerly Alpha Divers), Peninsula Sub-aqua club, Brendon Rowe for giving me the opportunity, Kevin Camidge for teaching me the skills and being an inspiration for my 3rd year project and the whole CISMAS team for taking me onboard.

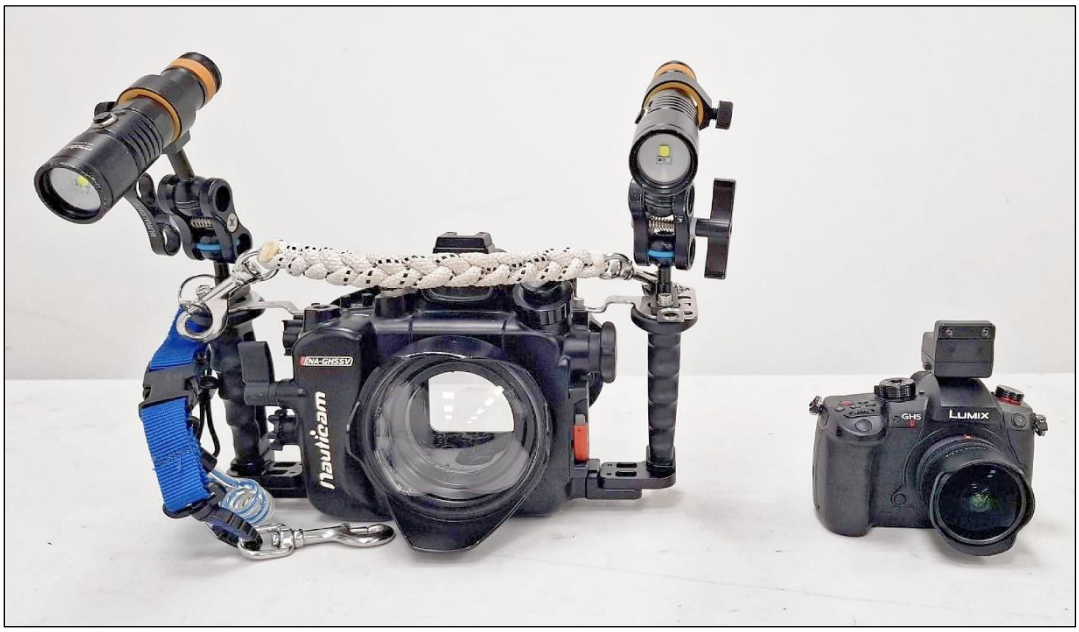


Fig 62
The equipment I used for the underwater photography: Panasonic LumixGH5SV with 8mm fisheye len, housed in a Nauticam underwater housing with two Orca LED torches

Playing it Safe by Brendon Rowe

Scuba diving of any kind requires a degree of thought and planning before you enter the underwater world, and all divers will consider in their dive plan certain safety factors such as: weather, tides, ability of divers, entry, exit, underwater visibility, depth, duration, gas required and water temperature to mention just a few. When undertaking project diving, however, a diver is usually being asked to complete a particular task underwater whilst sticking to a dive plan and remaining safe, so there are many more things to consider as there are defined aims to be achieved, often in a limited number of dives. Safety is always paramount and so CISMAS decided early on to nominate a suitably experienced, single team member to be responsible for the diving element of each project and therefore removing this responsibility from the archaeological director and the risk of pushing on with a plan and ignoring potential hazards just to 'get the job done'. The 'diving supervisor' therefore has the final say on all things diving-related: the planned tasks, the selection of divers and the conditions on the day.

The dive supervisor's role therefore begins long before the project takes place. At CISMAS the dive supervisor collates as much information as possible about the project aims (and therefore tasks), dive locations, divers' and other team members' abilities, travel arrangements, likely kit required and being brought by individuals, the dive support vessel (DSV), gas-filling availability and what to do in the event of a diving emergency - as well as all the usual considerations mentioned earlier. Dive qualifications and medical certificates are obtained and reviewed.

Once all the information is collected, a 'method statement' and 'risk assessment' are produced. These documents are circulated to all team members, and they are asked to confirm that they have read and understood them - being thereby given the opportunity to comment on any items they may need to.

The Method Statement

In simple terms this document details who, what, where, when and how the diving will take place throughout the project.

- Who is doing things and what their responsibilities are, such as: dive supervisor, surface support, divers, skipper
- What is to be done in the way of tasks which may be unfamiliar to the divers
- Where the diving is to take place, as well as the boat 'pick up' and 'drop off' locations
- When the project is to take place and what the time constraints are
- How each dive should be executed - and what to do in an emergency

An example of a CISMAS method statement is included here:

CISMAS Isles of Scilly Expedition 2024
Methos Statement – HMS COLOSSUS

SUPERVISION

- Diving Supervisor will be Brendon Rowe. The DSV Skipper, or any other team member may assume the role of "surface support" as required. At least one of these people will remain on the surface in this role at all times.
- The dive supervisor's responsibilities are as follows:
  - To check weather and tides daily
  - Complete daily risk assessment
  - Decide and inform divers of assembly and "ropes off" times
  - Decide diving pairs and order
  - Task the divers
  - Consult and liaise with the boat's master
  - Ensure surface support is maintained
  - Ensure oxygen, first aid and evacuation procedures are in place.
- The "surface support" responsibilities are as follows:
  - Check divers' equipment for suitability and operation
  - Complete the divers' checklist
  - Complete and maintain the diving control sheet
  - Monitor the conditions and divers, take emergency action if necessary
  - Liaise with the boat's master.
  - Remain vigilant for divers surfacing at unexpected times and locations.
- All divers have responsibility for their own diving in matters such as:
  - Timing- divers must ensure they arrive at the correct time for "ropes off".
  - Fitness- divers must ensure they are fit to dive.
  - Equipment- divers are required to provide their own diving suit and equipment appropriate for the planned dive(s), serviced and in working order.
  - Dive discipline- divers must ensure they comply with BSAC safe diving guide and adhere to this method statement and all other safety instructions.
  - Concerns- if any diver has a concern about diving at any point then they should immediately inform the dive supervisor or surface support and should not perform that dive or the task that concerns them.
  - Reports- all divers will be required to report on their dive and objectives but in addition to this, ANY diver experiencing ANY abnormality after a dive should report this to the dive supervisor or surface support immediately, should this not be possible then medical advice should be sought as a precaution.

GENERAL

- All diving will follow BSAC safe diving guide and BSAC 88 /ambient pressure diving closed circuit rebreather decompression tables/ or a recognised dive computer as appropriate with the following additions/clarifications:
  - All divers must hold a CMAS 2 star qualification or equivalent and a current certificate of fitness to dive
  - All divers will carry an alternative air source, octopus, an independent AAS is desirable
  - All divers will carry an alternative means buoyancy.
  - All divers will carry a surface marker buoy. This should be deployed immediately if the diver is in trouble or feels it is not possible to return to the fixed upline.
  - Dive times and instructions from the dive supervisor are to be adhered to unless an emergency situation arises.
  - All divers must be familiar with their chosen decompression timing device or tables and not exceed its limits.
- Diving will be in buddy pairs with the diving supervisor and/or the archaeological director designating specific roles to each buddy pair/diver.
- Whilst carrying out their designated duties, divers are reminded not to become distracted from ensuring sufficient breathing gas, monitoring time and staying within sight of their buddy. Generally, **the tasks in hand must always come second to safe diving.**
- Divers may be required to use tools and equipment on the seabed which are unfamiliar to them, if you are unsure about using a device, you must seek advice from your team leader and ensure that you only continue once training has been received.
- Divers will be expected to carry tools and equipment to the seabed, unless otherwise instructed it is the individual divers responsibility to ensure that all items return to the surface at the end of the dive.

THE DIVE

- Divers will be given at least a 15 minute warning prior to their designated dive time to allow enough time for "kitting up" and the diver checking process.
- Entry to the water will be at the divers discretion but guidance will be sought from the DSV skipper.
- Descent to and ascent from the seabed will normally be via the fixed mooring rope to which the DSV may be secured or by a temporary shotline deployed at the centre of the circular search area.
- Buddy pairs should remain within visual range of each other during the dive, appropriate to the visibility.
- Safety stops should be carried out at an appropriate depth on the ascent whilst staying with the shot line.
- Exit from the water will be by a diver ladder, this will be fitted in position on the DSV.
- Should a problem arise during the dive, and return to the fixed mooring/shotline is deemed unsafe, the diver should deploy a delayed surface marker buoy and ascent beneath it at an appropriate and safe rate of ascent. If it is deemed unsafe to return to the fixed mooring/shotline and a DSMB cannot be deployed then the diver is to ascent directly to the surface at an appropriate and safe rate of ascent ensuring that extreme vigilance is employed within the last few metres to listen and look for other surface traffic. Once on the surface the diver should make themselves buoyant and attract the attention of the surface support by any means possible. The DSV will then collect them.
- At any point in the dive, if a diver is required to switch to his/her alternative source then the dive should be terminated and a safe ascent to the surface made immediately.

The Risk Assessment

The aim of this document is to consider every likely hazard to the diving and divers, and then to ensure that suitable control measures, protocols or equipment are in place to remove the risk entirely or to reduce the risk to an acceptable level which will enable the diving to continue in the

safest possible way. If any particular hazard remains as 'high risk' after the control measures are applied, then the diving cannot proceed.

Below is an example of a CISMAS Risk Assessment:

CISMAS Isles of Scilly Expedition 2024
Risk Assessment – HMS COLOSSUS

Title of Project: CISMAS Isles of Scilly Expedition 2024

Dates:	31st August – 7th September 2024
Location of diving operations:	Colossus Protected Wreck Site. The site lies just off the Island of Samson in St. Mary's sound, the Isles of Scilly. Position 49° 55.471'N 006° 20.505'W WSG84. Searches may be required in other areas of St Marys sound. Exact positions available in the project design documents.
Diving Times:	Diving can be carried out at any state of the tide. Some water movement is experienced at high water
Project Organisation	Cornwall & Isles of Scilly Maritime Archaeology Society
Diving Manager:	Brendon Rowe
Project Manager	Kevin Camidge
Names of Dive Supervisor/Surface Support	DSV Skipper Izzy Alsop, Brendon Rowe, Kevin Camidge, Nick Sodergren, Andrew Earle, Jezz Davies, Emlyn Morris may act as surface support. At least 1 will be on the surface at all times.
Names of Divers and qualifications:	B. Rowe-BSAC Advanced, K. Camidge-BSAC Advanced, N. Sodergren – BSAC Advanced, A. Earle-BSAC Dive Leader, E Morris – BSAC Dive Leader, J Davies – BSAC Advanced, Hefin Meara – HSE Scuba
Names of other personnel required and their duties:	Izzy Alsop -Diving Support Vessel Master
Others:	None
Aim	Searching, Photography, Survey and recording
Task to be undertaken	See task briefing
Any other groups / persons to contact before diving ops take place.	When arriving on Scilly Archaeological director, K Camidge will contact the Harbour Master and evidence a current licence to dive within the designated area of protected wreck HMS Colossus. Diving boats skipper will establish VHF communication with Harbour Control (HC). HC will be advised when diving operations are to commence and when they have been completed for the day.
Decompression schedule	BSAC '88 Tables, or recognised dive computer.
Equipment required:	Standard SCUBA/CCR, dive suit & basic diving essentials, AAS, DSMB, shot lines, metal detectors, survey tapes, incremented reels, recording slates, weighted search marker, lifting bags.
Emergency Oxygen equipment	On Diving Support Boat (& CCR as back up)
Special kit requirements	None
Any special competencies required from any personnel:	Experience of using camera, tapes and lines underwater would be an advantage
Project plan/RA prepared by:	B. Rowe

	Site specific details:	Risk
Sea / water conditions anticipated:	Smooth to Slight	
Tidal conditions:	Diving will take place throughout the tidal range	
Transport to site	Via Diving Support Vessel, MORVOREN	
Shipping	The site lies in St. Mary's sound. There is a moderate risk that the divers may be placed at risk by other water users. CONTROL- Whilst divers are in the water the DSV will fly the code Flag 'A' to warn other water users that diving operations are underway. A constant watch will be maintained by the surface crew for potentially hazardous shipping movements and in the event that these occur the diver will be shielded from the offending craft by the DSV. All divers will carry a delayed surface marker buoy. Communication will be kept with Harbour Control throughout the diving operation	Moderate
Anticipated minimum underwater visibility:	2 metres, could be reduced by suspended particles from the action of divers. CONTROL- Dive supervisor will cancel diving if underwater visibility is below 2 metres.	Moderate
Entrapment	The work may involve tapes & light lines which will be tied to weights and/or stakes. There is a possibility of entrapment with these or a very slight risk of encountering net or lines on the site. This risk is no greater than that found in recreational wreck diving. CONTROL- All diving will be carried out as a 'buddy pair' and all divers will carry a cutting device	Low
Restricted Surface visibility	The onset of restricted surface visibility may place the diving support vessel and the divers at risk from collision with other shipping in the area. CONTROL- Diving operations will not be started if forecast or actual conditions indicate that surface visibility is below that that is thought to be safe (1km). A constant check will be made on the weather and the divers recalled should conditions begin to deteriorate.	Low
Temperature	The sea temperature is expected to be around 12 degrees C, a risk of hypothermia if diving for extended periods with unsuitable insulation. CONTROL- All divers will be required to use either dry suits or suitable wet suits and hot/cold drinks will be available upon request.	Low
Access & Exit	Access is not considered to be a risk Entry to the water will be by jumping/rolling from the boat (less than 1m) Exit will be by dive ladder. CONTROLS- Instruction on entry and exit will be given by the DSV skipper. The boats engine is to be in NEUTRAL whenever divers are entering or exiting the water. The boat carries a means of recovering an injured diver from the water	Low

	Site specific details:	Risk
Breathing Gas Quantity	All divers will carry a single cylinder (or CCR) and an AAS, octopus. An independent cylinder, pony, is desirable. All cylinders will be checked for sufficient contents prior to each dive. Pony cylinders will only be used as a back up gas supply in the event of loss/failure of the main supply. Should a diver have any cause to change to their octopus/pony cylinder underwater, then the dive will be aborted immediately and a safe ascent to the surface will be made. CONTROL- All dive times will be limited to 60 minutes or a minimum main cylinder capacity of 60 Bar, whichever comes sooner. BSAC '88 decompression Tables or recognised dive computers to be followed.	Low
Breathing Gas	The depths at which the diving operations are to be conducted are less than 20 MSW. CONTROL- Air will be used as the breathing gas with the exception of Closed Circuit Rebreather's which will use Air diluent and Oxygen. Rebreathers will be calibrated and set to a bottom setpoint between 1.0 and 1.3 PO2 with 0.7 PO2 to be used shallower than 5 MSW. CCR users will "bail out" onto open circuit air should the PO2 of their breathing gas rise or fall outside of parameters set by their training agency or should there be any doubt about the accuracy of the breathing mix.	Low
Depth	Increasing depth of water can expose divers to addition risk of nitrogen narcosis and decompression sickness. The operations are to be conducted in between 0 and 20 meters of water. CONTROL- At these depths the risk presented by nitrogen narcosis is negligible to experienced divers and there is limited risk of decompression sickness provided BSAC '88 Tables or recognised dive computer profiles are adhered to.	Low
Weather	The site is relatively sheltered from adverse weather conditions. CONTROL- A weather forecast will be obtained each day. Diving operations will not be undertaken should the forecast indicate that weather conditions would make them unsafe. A constant check will be kept on weather conditions by both the master of the diving support vessel and the diving supervisor. Diving Operations will be abandoned when weather conditions appear likely to become hazardous.	Low
Underwater Visibility	In times of poor visibility, only experienced divers will be used and each diver will be given additional opportunity to decline the dive. CONTROL- Divers will be in constant visual or physical contact with each other Should they become separated they will surface immediately.	Moderate

Site specific details:		Risk
Underwater currents	The site is exposed to relatively mild underwater currents. Experienced gained by CISMAS on previous visits suggests that the site can be dived at any state of the tide. CONTROL- All divers will carry a DSMB for safe ascent if return to the shot line is not possible.	Low
Diving support vessels	All diving operations will be conducted the from a MCA Code of Practice category 2 Vessel. CONTROL- DSV master is experienced at working with divers	Low
Illumination	CONTROL- All diving will take place during daylight hours. Torches will be used at times of low light	Low
Tools	Underwater measuring, searching & recording tools will be used. CONTROL-Full instructions will be given.	Low
Becoming Lost	Most dives will be conducted around the main site and diver trail which leads back to the shot line. Searches taking place elsewhere will be marked with a temporary shot line, divers will use a reel and line attached to the shot line to perform circular searches. CONTROL- If diving elsewhere on the site, a baseline will be laid to the site to aid navigation. Any divers unsure of the location can "tie off" on this line to navigate the site. Divers who are unfamiliar with the site will be familiarised with a site plan guided around the site on the first dive by an experienced team member if necessary. Instructions will be given to all divers to deploy a DSMB and return to the surface should they become lost. All divers will carry a DSMB which can used to attract attention should a diver become separated from the DSV at the surface.	Moderate
Fire	The DSV will carry a fire extinguisher (powder or CO2). CONTROL- Oxygen cylinders will be stored safely in the forward storage compartment.	Low
Other hazards	None	

Emergency & Evacuation Information

Emergency procedures:	HM COASTGUARD- **VHF Ch 16 and GMDSS**. EMERGENCY SERVICES- 999.
HM Coastguard No.	FALMOUTH COASTGUARD- **01326 317575**
Chamber No.	DDRC PLYMOUTH-**01752 209999**
Royal Navy Diving Doctor	**07831 1511523** (24 hrs)
Medical expertise:	FIRST AIDER- **B. ROWE**
Medical equipment:	OXYGEN AND FIRST AID ON DSV.
Casualty evacuation plan:	FOLLOW MASTERS/COASTGUARD INSTRUCTIONS.

Providing all this information prior to the project commencement ensures that everyone knows exactly what to expect and what is expected of them.

During the project

When the project commences, the dive supervisor's work really starts with logistics of moving equipment to the locations, constant reviewing of weather and conditions each day and for the days ahead, liaison with the skipper, monitoring the team, checking that everyone has everything they need and planning the finer details of each days dives, and working with the archaeological director to meet their needs wherever possible.

It is important to give divers a brief at the beginning of the project - to confirm the logistics, reinforce the information in the method statement and risk assessment, address any last-minute concerns or issues, and generally remind divers that dive safety always comes before any task.

With divers being focused on the tasks they are to achieve, it is easy for them to forget things - and CISMAS has learnt from experience that even the most experienced and competent divers are capable of lapses resulting in such incidents as a diver entering the water with no fins on or with a drysuit zip partially undone, or forgetting a camera or pencil. Any of these can be embarrassing for the diver but when there are a limited number of dives available to achieve the project aims, a minor mishap or lapse can easily result in a safety issue or at best a wasted dive, resulting in ultimate project failure.

To mitigate this risk, we have developed a diver check sheet which is an extension of a standard diver log, so that in addition to checking the diver's gas contents and timings before and after each dive we also run through a simple checklist to ensure that each diver is ready to enter the water not only with all their equipment in place and functioning, but also carrying the correct tools for their particular task. To ensure this process is completed correctly, CISMAS has decided that one person will remain on the boat as 'surface support' for each dive, rather than relying on the DSV skipper.
An example of a CISMAS diver check sheet is shown below:

CISMAS DIVE LOG 2024

VIND FORCE & DIRECTION:	SEA STATE:	PROJECT:	
DATE:	SUPERVISOR:	SURFACE SUPPORT:	LOCATION:

DIVING DETAILS																CHECKLIST (tick)								
No.	Diver	Cyl Sizes Main and Res (OC)	Gas Mixes % Main and Res (OC)	Gas In Main and Res (OC)	O2 In (CCR)	Diluent In (CCR)	Scrub left before dive (CCR)	Surface Interval since last dive (Hour	Time In	Time Out	Dive Time (Mins)	Gas Out Main and Res (OC)	O2 Out (CCR)	Diluent Out (CCR)	Scrub left after dive (CCR)	Gas Switched On	Suit/BCD Inflate	Zips	Weights, DSMB	Computer/Timer	Fins, Mask, Knife	Slate & Pencil	Tools, Camera	Fills Needed
1																								
2																								
3																								
4																								
5																								
6																								
7																								
8																								

Sum of all above Dive Times (mins)		Total of above cylinder fills needed	

This checklist does not remove the responsibility of divers for their own checks and the usual 'buddy checks', but acts not only as a diver log but also as a separate check by the surface support for that dive. We have found that it significantly reduces the risk of a diver losing a dive and not achieving their tasks because of something as simple as a forgotten pencil. The final column also allows the

dive supervisor to check that all necessary cylinders are removed from the DSV for filling overnight, once again ensuring that the next day's diving runs smoothly and all possible tasks are achieved.

In addition to all the above, the dive supervisor has to consider the wellbeing of the divers in general. As dive spaces on CISMAS projects are limited, divers can and do feel privileged to take part. However, this can unwittingly put pressure on divers to dive when they don't really feel up to it. The dive supervisor must remain vigilant for this and be able to recognise when a diver may have ear clearing issues, be exhausted or struggling physically or even just not 'feeling up to it' on any particular day. It is important that the dive supervisor is able to tell a diver to have a break or sit this one out, not only for their own good but also for the good of the team and the project as a whole. Any diver who is underwater when they shouldn't be is going to execute a task poorly, if at all. The saying 'it is much better to be on the surface wishing you were underwater, than underwater wishing you were on the surface' is important to remember when the pressures of completing a project are weighing heavy.