Odyssey Papers 3

The Jacksonville 'Blue China' Shipwreck & the Myth of Deep-Sea Preservation

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A major argument in favor of preserving shipwrecks *in situ* – a modern ideal of cultural resource management promoted by some archaeologists – is the invariable conviction that deep-ocean sites located beyond 75m of water will achieve a state of relative equilibrium in the depths unaffected by wave action and other forces of nature. However, new primary data demonstrate that shipwrecks within the ecosystem of the Atlantic Ocean's Gulf Stream and other areas not only face a level of biological activity much higher than comparable depths in more nutrient-deprived waters, but are also subjected to severe damage from deep-sea trawling.

One example is a shipwreck examined by Odyssey Marine Exploration (OME) at a depth of 370m, the Jacksonville 'Blue China' wreck, which has been badly damaged by trawls, with over 75% of the ship structure and its contents destroyed and inadvertently removed from the site in recent years, with the remainder displaying strong patterns of drag disturbance. What was originally intended to serve as a preliminary survey in 2003 developed into a rescue mission in 2005. Despite the poor state of preservation, sufficient material culture was examined to identify and reconstruct elements of this mid-19th century ship. This wreck is an example of an emerging global pattern for shipwreck destabilization and destruction in deep water.

1. Introduction

In his classic work of the 1970s, Keith Muckleroy (1978: 157) defined a shipwreck as "the event by which a highly organized and dynamic assemblage of artifacts are transformed into a static and disorganized state with long-term stability." Furthermore, his model for transformation processes – both cultural and non-cultural (human and natural) – that affect a submerged shipwreck envisaged a result whereby a wreck would eventually reach a state of equilibrium and stability within the confines of its new environment, following burial beneath bottom sediments.

With no criticism intended for Muckelroy's pioneering genius, it can nonetheless be argued that his legacy has been both misunderstood and misused to justify '*in situ* preservation' as a model for underwater cultural heritage management by some. Today the term carries heavy political connotations and refers less to an environmental condition than to modern archaeologists' and cultural resource managers' ideal that everything in this abyssal 'Eden of Preservation' should be left alone because deepwater sites are 'frozen' in a secure state of equilibrium.

This belief is, according to some, set in political concrete in Article 2.5 of the UNESCO Convention on the Protection of the Underwater Cultural Heritage, which stipulates that "The preservation *in situ* of underwater cultural heritage shall be considered as the first option before allowing or engaging in any activities directed at this heritage." Along identical lines, Article 6 of the ICOMOS Charter for the Protection and Management of the Cultural Heritage declares that "The overall objective of archaeological heritage management should be the preservation of monuments and sites *in situ*." Excavation is to be avoided in favor of non-destructive, non-intrusive survey methods (Godfrey *et al.*, 2004: 344).

The negotiations leading to the adoption of this Convention made it clear that the 'first option' consideration was originally meant to be the marine archaeological equivalent of the medical maxim to 'first do no harm'. Unfortunately, the tenet of the 'first option' has now been embraced by some resource managers and archaeologists as a preference and excuse to justify an absence of protective or preservative measures on many shipwreck sites.

The re-burial of shipwreck materials can decelerate rates of decay and, in a small number of pioneering cases, has seen short-term success in shallow water. Lacking funds and/or facilities for hull conservation, several projects have relied on this preservative option for long-term wood storage *in situ* following excavation and documentation. Thus, the hull of the 16th-century Basque whaler in Red Bay, Labrador, was excavated, dismantled, recorded and then reburied at a depth of 8-12m (Grenier, 1998: 269). Only time will tell whether this is a practical long-term solution.

Fig. 1. A beer can and plastic bag next to a heavily concreted iron anchor at 821m depth on Site E-82 in the Straits of Gibraltar.

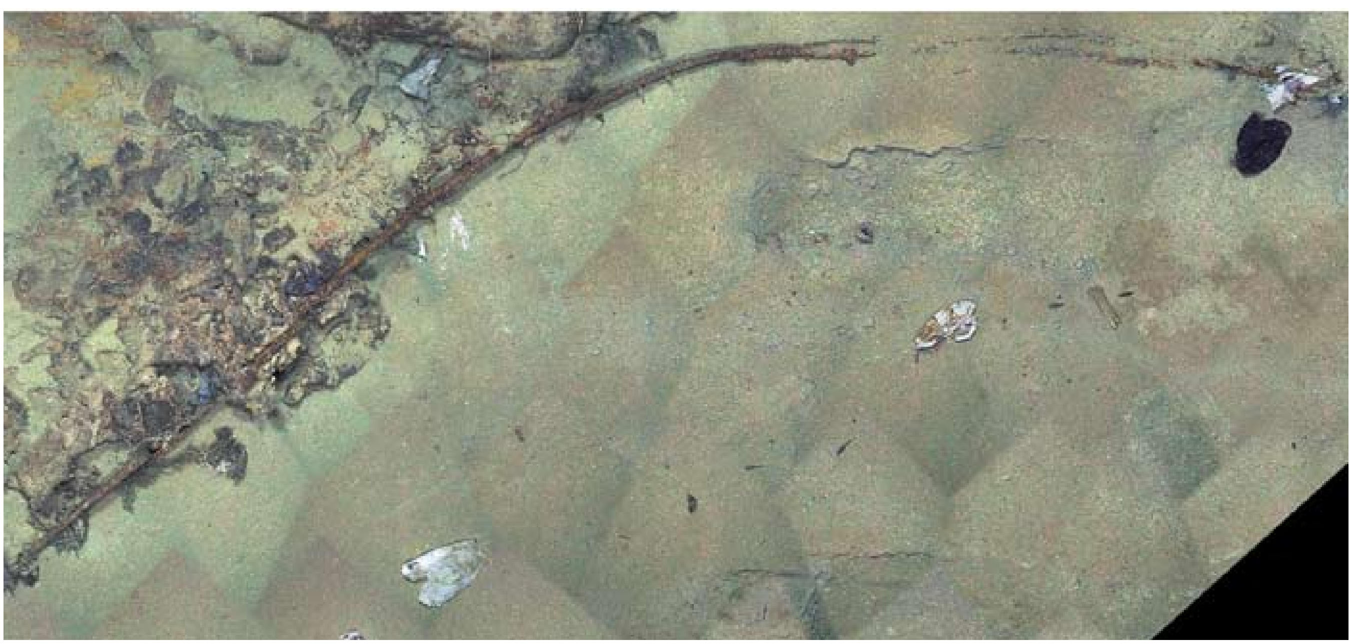

Fig. 2. Trawler fishing cable snagged on iron cannon on Site E-82 in the Straits of Gibraltar.

Fig. 3. A mid to late 19th-century shipwreck in around 100m in the English Channel (Site 2T3a6a-2) with fishing net rope caught on its structure. Snagging by trawler nets, scallop dredge heads, foot rope and steel cable is prevalent in the Channel and breaks off and displaces any ship's structure or cargo in its way.

This process often involves sandbagging or covering a wreck with a synthetic mesh designed to trap and hold sediment and foster the re-growth of natural flora and fauna, which theoretically helps seal and protect archaeological remains, as initiated in about 13m during stabilization trials on HMS *Colossus*, lost off the Scilly Isles in 1798 (Camidge, 2003: 12). A similar strategy of *in situ* preservation through reburial was adopted for the *Avondster*, a 4m-deep Dutch East Indiaman wrecked in 1659 on the shores of Galle Harbour, southern Sri Lanka (Manders, 2006), to deter looters and stop biological and chemical deterioration. Part of the site was covered with polypropylene nets in the hope of promoting the deposition and retention of the sediment cover, thus facilitating a return to the anaerobic environment that originally preserved the archaeological remains. Strips of artificial sea grass matting placed around the *William Salthouse*, a wooden sailing vessel lost in 1841 in 13m of water off Port Phillip Heads in Victoria, Australia, eliminated scour and increased the deposition of sediment across the site (Staniforth, 2006: 54). PVC ports are sometimes installed in such reconstructed seabeds to measure chemical activity and deterioration.

Expanding on Muckleroy's research into site-formation processes, Tilmant (1993: 59) observed that wrecks and newly submerged artifacts are quickly colonized by organisms that require a hard substrate for life and growth. In addition, Murphy and Johnsson (1993: 108) have emphasized that the depth and environmental conditions surrounding a shipwreck site determine the level of additional disturbance resulting from wave action. Environmental factors dictating site stabilization include:

A. The nature of initial site deposition (cause of wreck event and breakup, if any).
B. Weather-related disturbance prior to stabilization.
C. Composition and slope of seabed.
D. Growth rates of organisms that colonize the hard substrate of a site.
E. The chemical and electrochemical environment of the wreck site affecting the rate of concretion growth.

Again, the creation of anaerobic conditions through burial beneath bottom sediments is currently judged to be a critical aspect of stabilization (Ward *et al*., 1999: 565-6).

Fig. 4. A mid to late 19th-century shipwreck in the English Channel (Site 2T11w24b-1) at a depth of 124m, where a cargo of probable white ironstone bowls and plates has been partly smashed and dragged out of context by beam trawlers or dredges.

Destructive cultural impacts on shallow water wrecks are, of course, reasonably well known. In addition to large-scale looting, these sites can be impacted by piers and jetty construction, for instance, as well as harborworks, pipelines and dredging (Stewart, 1999: 576-77). More recently, Quinn (2006: 1420) has rejected the widespread theory that considers wrecks to exist in a state of equilibrium with the surrounding environment and acknowledges that "wreck sites act as open systems, with the exchange of material (sediment, water, organics and inorganics) and energy (wave, tidal, storm) across system boundaries. Wrecks are therefore generally in a state of dynamic (not steady-state) equilibrium with respect to the natural environment, characterized by negative disequilibrium, ultimately leading to wreck disintegration."

2. Deep-Sea Preservation

When the shipwreck of the side-wheel steamer *Central America* (Herdendorf, 1995: 95) was discovered in 1987 at a depth of 2,200m, little information was available about the preservation of wrecks located deep on the ocean floor. Deep-sea shipwrecks theoretically have a fundamental preservation advantage by sinking more or less intact, rather than by the grounding and stranding that leads to the loss and breakup of wrecks in coastal shallows. Research on ancient wreckage dating between 100 BC and AD 400, lost in over 750m off Skerki Bank, northeast of Tunis, led the research team to suggest that ancient wooden ships, unlike modern steel vessels, founder and sink at a relatively slow speed and so come to rest upright on the seabed. "They most likely have a higher probability of sinking intact in deep water", proposed Ballard *et al*. (2000: 1616-17), "since they fill with water instead of breaking up on rock outcrops or coral reefs. Their subsequent burial in the bottom appears to be a function of initial impact, bottom type, sedimentation rates, and eventual benthic processes acting over long periods of time."

Deep-water wreck sites are defined here as those located in depths of 75m or greater, just beyond the range of recreational scuba divers and only accessible by manned or unmanned vehicles and saturation, rebreather or mixed gas divers. This predominantly restricts access to these sites to professional or military divers with large budgets and advanced equipment. Such deep-sea sites formed below the normal wave base have been considered traditionally to have been spared from the destructive scrambling processes caused by waves, currents and mobile sediment.

Recent investigations of deep-water wrecks, however, have proven that the basic principles of this body of theory are in many cases unjustified. The natural processes of deterioration may slow, but they certainly do not cease. Both shallow and deep sites are subjected to both human intervention and natural transformation processes.

Fig. 5. At a depth of around 100m in the English Channel, Odyssey's Site 35F is an extremely rare c. mid-17th century merchant vessel. The hull has been almost completely ground down by trawlers. Wooden planking and a small part of the cargo of elephant tusks and 'manilla' bracelets (used as currency) only survive where they have been sealed in place by the cargo/ballast of heavy iron cannon. Trawler cable (at left) is snagged next to ivory and is the probable cause of its snapped ends.

The diverse species known to inhabit the deep depend for their food on the detritus and biological matter that falls from above, given a lack of photosynthetic processes in the abyss. Ongoing research suggests that the voracious natures of deep-sea organisms may result in rapid consumption of the organic components of deep-water wrecks (Stewart, 1999: 581). In addition, the effects of scouring on both shallow and deep-sea wreck sites, especially during the early stages of their formation when physical processes dominate, can be equally damaging. Scour is particularly destructive because it not only results in physical deterioration, but also triggers chemical and biological reactions by exposing previously buried surfaces and stripping away protective concretion/corrosion layers (Quinn, 2006: 429).

The challenge of decelerating wreck destruction in deep water is aptly exemplified by the case of the wreck of the American Civil War ironclad *Monitor* (1862), resting at a depth of 71m off North Carolina's Cape Hatteras. Upon discovery, the US government rapidly enacted protective legislation to prevent looting and unwanted salvage. A comprehensive management plan drew on *in situ* preservation as its main objective, although provision was made for some artifacts to be recovered for museum display "out of concern that they would be lost to strong currents or looters" (Broadwater, 2006: 79).

However, experts later determined that adherence to the *in situ* preservation policy would have resulted in the destruction of *Monitor* by natural forces because the processes of deterioration were visibly accelerating. The ironclad suffered severe structural stresses and was exposed to strong currents, trawl nets and even illegal salvage. John Broadwater (2006: 79-80) has stated that "There was a growing realization that even under an *in situ* preservation policy, it was time to consider alternative plans for more rigorous research and recovery at the wreck site." The recovery of significant items from the site, including the engine, propeller and turret, has enabled millions of visitors to enjoy the history of *Monitor*.

Emerging evidence makes it clear that the deep ocean is, in fact, not immune from either natural or human impacts. Odyssey Marine Exploration's deep-sea investigations have revealed unexpected levels of deterioration, as in the case of the wreck of the side-wheel steamer *Republic*. Despite its depth of more than 500m, the site was still influenced by the Gulf Stream, whose rapidly flowing warm and nutrient-rich waters wore down the wreck physically, chemically and biologically. Other examples, distinct from Odyssey's research, include the *Central America* site where, even at a depth of 2,200m, wood, iron and cupreous metals were all subjected to various levels of degradation.

The *Lusitania* (1915) and *Andrea Doria* (1956) have also been found to be corroding at an alarming rate, and when the *Titanic* (1912) was discovered and examined in 4,000m of water, the majority of exposed hull remains had lost nearly all of their organic components, while the metal itself was discovered to be swiftly deteriorating. Rusticles, tiny microbes that feed off the ship's iron before falling off with the metal in five- to ten-year cycles, are rapidly destroying one of the world's most famous ships.[1]

In his model, Keith Muckleroy (1978) did address the issue of shipwreck sites being affected by post-depositional cultural processes, such as salvage and looting. Admittedly, so far casual looting of deep-ocean sites has been less problematic than in diver-accessible locations for logistical reasons alone. What he could not account for were technological developments post-dating his research, including inadvertent impacts such as trawling and 'wreck fishing' that directly target deep shipwreck sites. Until now, the effects of these forces have been a matter of speculation and theory, but Odyssey's recent projects have qualified their damage as a scientific fact.

Ocean floor trawlers skim the seabed with 1-8 ton nets that stretch over 12m high and 60m wide. Large, heavy rubber rollers called rock hoppers, intended to prevent the nets from snagging on rocks, have already been shown to destroy cold-water coral and other fish habitats, with an impact that has been compared to "racing several monster trucks across the sea floor".[2]

The fishing that is practiced in the Western Approaches to the English Channel has been demonstrated to have significant adverse impacts on wrecks as well. In these over-exploited waters, fish populations concentrate in the vicinity of hard substrates that project above the seabed, including shipwrecks, which function as artificial reefs. Trawlers target these locations and gill nets are deliberately set over and around such sites; when fishing nets are hauled in, if they do not break or become irretrievably snagged they catch on, drag and disarticulate the site's structure (Figs. 3-5). Odyssey has observed sites choked with entangled nets. In the western English Channel some of the cannon visible on the surface of HMS *Victory* (1744) have been dragged out of position by trawl nets and a lobster trap verifies the conscious targeting of this rich biological oasis by fishermen (Cunningham Dobson and Kingsley, 2009: 5-6). While the damage to this and other sites observed in the English Channel has not been revisited on multiple occasions over a period of years, enabling comparative analysis from year to year, the destruction caused by this kind of trawling is typified by the vivid example of a site discovered and documented by Odyssey, the Jacksonville 'Blue China' wreck (Site BA02).

3. Site Description – 2003

Approximately 370m beneath the Atlantic Ocean, and within the body of the Gulf Stream current off the Florida/Georgia coast, the Jacksonville 'Blue China' wreck was first investigated by Odyssey in early 2003. The site was brought to the company's attention by a trawl fisherman who had retrieved cultural material from the location in his nets. Bottom currents across the site were observed to range from 0.5-1 knot, with water temperature and salinity varying seasonally and according to local weather conditions. The seabed environment is sparsely populated by flora and fauna.[3] In 2003, the site consisted of a large, low-lying mound of coherent wreckage measuring about 30 x 10m in extent.

A large quantity of hull remains were identified partly buried under the sand bottom, indicating the presence of a wood-planked and framed vessel. The long axis of the site runs generally north-south, with two encrusted anchors at the southern end denoting the bows. Numerous iron concretions were scattered around the site, but the nucleus of the mound consisted primarily of an extensive cargo of ceramics and glass bottles.

Based on a preliminary survey, the wreck appeared to consist of the lower section of a medium-sized mid-19th century wooden merchant vessel, possibly a coastal trader, with highly visible stacks of blue shell-edged ware. The wreck contained an estimated 2,500 artifacts distributed across what appeared to be frames or floors and the lowest section of the hull, which protruded above the seabed. A considerable quantity of the cargo had survived intact, including ceramics and dark green glass bottles (Tolson *et al.*, 2008).

Many of these wares survived in their original stacked positions following the disintegration of their surrounding packing materials (Figs. 7-8). The stacked pottery, however, had fallen over and apparently been spread across the site relatively recently by trawls, which had severely disturbed its integrity. Initial examination of the cargo identified glass bottles, stacks and individual pieces of pottery and porcelain of at least two different types, several boxlike objects that might have been small wooden crates, a ship's pulley, two anchors, wooden hull remains and various concretions.

Fig. 6. Photomosaic of the 370m-deep Jacksonville 'Blue China' wreck (Site BA02), 2005.

Fig. 7. The cargo of English blue shell-edged ceramic plates, bowls and serving platters at the southern end (bow) of the Jacksonville 'Blue China' wreck site, with a consignment of glass bottles in the background.

Fig. 8. Detail of English blue shell-edged ceramic plates, serving platters and slipware bowls from the Jacksonville 'Blue China' wreck.

More specifically, the stacked cargo included blue shell-edged octagonal platters in three sizes, large shallow soup bowls of similar design, and plates of the same style. Also present were thick glass bottles, dark green in color, possibly used to store alcoholic beverages; scattered Chinese porcelain 'ginger jars' bearing a blue decoration; paneled clear drinking glasses; stoneware pottery that may have been domestic assemblage rather than cargo; large pitchers with sharp-edged pouring spouts and banded patterns of decoration; and possible elements of ship's tackle. The site was videotaped in detail during this preliminary survey, but footage provided no indication of the vessel's origins or specific cause of sinking. Following the recovery of three items from the site, Odyssey filed an arrest on the wreck to protect it from looters.

4. Site Description – 2005

In early 2005, Odyssey returned to the Jacksonville 'Blue China' wreck (Fig. 9). On reaching the site, the cameras on the Remotely-Operated Vehicle (ROV) Zeus revealed direct and indirect evidence of fresh trawl damage. The former consisted of actual trawl scars visibly crossing the site and drag displacement of artifacts. Indirect evidence consisted of smashed artifacts and ship's structure and a lack of benthic organisms (which are typically slow to develop and spread) in the vicinity of the wreck. Sites such as this in untrawled areas are typically veritable oases for marine life, but in this case the wreck was deserted by biological activity (pers. comm. Tom Dettweiler, February 2005).

In stark contrast to the previous visit, little undisturbed stratigraphy now survived. The ship's structure had been largely flattened, with only a few relatively deep crevices in the hull preserving some stratigraphy below the trawl disturbance zone. The cargo was also more dispersed, with a greater percentage of artifacts chipped and broken.

As a result, a pre-disturbance survey of the wreck was conducted, with some of the endangered artifacts recovered for their own protection. A high-resolution photomosaic was produced in combination with close-up underwater still photography of the remains (Fig. 6).

During this survey, formerly unrecorded material was identified: small kegs of what appeared to be white lead, whose staves and hoops had completely deteriorated; yellow slip-decorated earthenware chamber pots and undecorated whiteware consisting of plates, bowls, chamber pots, wash basins and salve jars; hand-painted ceramic teaware, including tea bowls, saucers, cream jugs and sugar bowls decorated with floral and berry motifs; two individual printed plates, one bearing a Blue Willow pattern, the other a brown Asiatic Pheasants pattern; two different types of clay smoking pipes; transparent green, aqua and clear

Fig. 9. Broken pottery vessels on the Jacksonville 'Blue China' wreck, 2005.

glass bottles of a variety of shapes and functions; small lead spheres (possibly shot), approximately 1cm in diameter; green and clear glass tumblers; and small ingots of lead or solder (Figs. 10-14). Ship's domestic assemblage included the remains of a telescope and a sextant, the glass globe or font of an oil lamp, a ceramic gravy boat, a millstone and two possible wooden hatch rollers. The pottery is largely diagnostic of British (Staffordshire and Cardiff) markets, with a limited quantity of Oriental imports from Canton. This material culture will be described in a comprehensive manner in a subsequent report.

Using a delicate 'hover and recover' strategy, rather than sitting directly on and disturbing the seabed, Odyssey's 8-ton ROV was flown above the wreck, while its manipulator arms recovered a cross-section of artifacts. Limited trial-trench excavation confirmed the near-total absence of stratigraphy at the site, which had been flattened into a single layer of artifacts overlying the hull remains. Analysis of the recovered artifacts has confidently revealed a date of 1840-60 for the wreck, but so far has not produced a candidate for the identity of this lost ship. This collection of artifacts has been conserved, document-

Fig. 10. An intact English tea saucer with a floral pattern. England, c. 1845-55, H. 14.6cm. Jacksonville 'Blue China' wreck, 2005.

Fig. 11. English slipware jugs, tan and blue-grey bands flanked by two brighter blue bands. Larger jug H. 19.6cm. Eight jugs were recovered in four different sizes. Glass tumblers had been packed inside them to maximize storage space. Jacksonville 'Blue China' wreck.

Fig. 12. English mugs, cat's-eye slip decoration framed by double narrow brown bands. H. of larger jug 11.4cm. Jacksonville 'Blue China' wreck.

Fig. 13. Ginger jars, Canton, China, c. 1840-60. Porcelain, H. 15.3cm. Two of four examples found on the Jacksonville 'Blue China' wreck.

Fig. 14. Glass tumbler and bottles. Mold-made American paneled tumbler, 1845-75. Patent medicine bottle, tapered, narrow neck, designed for limited evaporation around the cork. Turn-mold, utilitarian bottle with indented base. Jacksonville 'Blue China' wreck.

ed and recorded and now resides in Odyssey's permanent collection, where it is available for study and educational purposes.

5. Conclusion

In general, deep-sea wrecks have been regarded as a resource that can and should be preserved *in situ* because they were believed to be largely stable. Odyssey's work continues to show that such sites are not immune from natural and cultural impacts, and that these impacts are potentially much more widespread and destructive than initially believed. Microorganisms and chemical processes continue to break down wreck materials and deep-ocean currents scour them. Stewart's (1999: 585) conclusions remain as valid for deep-water sites as they do for shallow wrecks: "Too often, underwater sites, especially shipwrecks, are treated simply as 'time capsules'. In reality, underwater sites, like those on land, are the result of complex formation processes that can result in the mixing of strata, destruction of artifacts, and deposition of new material. For this reason, understanding the formation processes present must become a primary goal of archaeologists studying submerged sites."

Odyssey's experience on the Jacksonville 'Blue China' wreck demonstrates that even shipwrecks lying in hundreds of meters of water are in reality not beyond the reach of destructive human influences. Such sites provide habitats for fish and so become targets for trawl nets in the Atlantic Ocean, as well as wreck fishing in the Western Approaches to the English Channel. For multiple reasons, the philosophy of benign neglect – the current prevailing model of *in situ* preservation – is neither a practical nor a responsible solution in many cases.

The pattern of modern damage on the Jacksonville 'Blue China' wreck is just one small example of an emerging problematic pattern. As more research is conducted at depth, the scale of the problem and absence of wrecks 'frozen in time' is becoming increasingly obvious (Soreide, 2000). Odyssey's late 17th-century Site E-82 (the *Sussex* Shipwreck Project) lies in 821m in the Straits of Gibraltar and was found to be contaminated by fishing nets and modern debris (Figs. 1-2), including beer cans and socks concreted to iron cannon and even plastic bags containing asbestos labeled 'DANGER' (Cunningham Dobson *et al.*, 2009). Odyssey's Site 35F, a 17th-century merchant vessel discovered in the western English Channel, features trawler marks to such an extent that it resembles a deeply-ploughed field, and the wooden hull has been very heavily eroded and disarticulated. Only frames and strakes immediately adjacent to the keel survive well below the turn-of-the-bilge. Compared to the ubiquitous presence on shallow-water sites of large quantities of intact pottery vessels, a mere handful of heavily abraded sherds survived on both this wreck and Site E-82 discovered off Gibraltar.

Other marine archaeologists are arriving at the same conclusions about this phenomenon. The Woods Hole Oceanographic Institution (WHOI) has detected at least two trawl nets and one gill net wrapped around the windlass of the wreck of the schooner *Paul Palmer*, lost in 1913.[4] In the Mediterranean Sea, Brendan Foley of WHOI has recalled how "we optically surveyed the sea floor off the island of Malta, for centuries a center of maritime commerce. At depths of 500+ meters, we expected to encounter marine life and hoped to discover ancient shipwrecks. Instead, we found only furrows in the sediments, indicating intensive trawling… occasionally we have seen evidence of dragging at depths approaching 1000 meters. It is unlikely that many ancient archaeologically significant sites will survive in areas subjected to trawl fishing."[5]

Ballard (2008: 136) has also observed trawl marks in deep waters off Malta, the Gulf of Naples, Egypt and in the Black Sea. During the survey of Skerki Bank, he and his team reported that "In many of the areas searched, intense bottom fishing activities made search efforts impossible. In some cases, the presence of nets prohibited towing ARGO [an ROV] through the area, while in other places, the bottom had been so intensely scoured that surface artifacts had more than likely been removed years before" (Ballard *et al.*, 2000: 1594).

The site of the early 19th-century Ormen Lange shipwreck excavated in 170m off Bud, Norway, by the Norwegian University of Science and Technology, is covered with modern rubbish: tangles of wire, fishing equipment, steel frames, more than 50 kitchen appliances, a complete kitchen, oil drums and even a 1950s car (Bryn *et al.*, 2007: 100-101). As offshore oil production expands from an anticipated one-sixth to one-fourth of total world production and fiber optic cables are being laid throughout the oceans of the world, drilling and production platforms, pipelines and even trans-oceanic cables are increasingly threatening ancient and historic shipwrecks (Stewart, 1999: 576-77). Throughout the world, offshore wind farms and their attendant network of anchors, cables and power lines are proliferating.

The expansion of oil drilling activities in deep water has already resulted in an increase in the number of deepwater wrecks discovered, especially in the Gulf of Mexico. In recognition of this reality, the United States Minerals Management Service, in fulfillment of its legislative mandate to protect cultural heritage, requires the petroleum industry to mitigate offshore oilfield activities by conducting high-resolution remote sensing surveys. These must be undertaken in areas with a significant probability of historic shipwreck presence (Irion *et al*., 2008: 79).

The example of the Jacksonville 'Blue China' wreck is far from an isolated case, but it is a wake-up call to scientists to record a sample of this unique maritime cultural heritage before it is irretrievably destroyed. The ideal of preservation *in situ* is a myth that does not always respect or safeguard the past.

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Notes

1. See Johnston, L., *Life at the Bottom of the Ocean*: http:/www.deepimage.co.uk/wrecks/titanic titanic%20pages/titanic-science-mainpage.htm and Cullimore, R. and Johnston, L., *Rusticles Thrive on the Titanic*: http://oceanexplorer.noaa.gov/explorations/ 03titanic/rusticles/rusticles.html.
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